Cosh

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Notations

Traditional name

Hyperbolic cosine

Traditional notation

cosh(*z*)

Mathematica StandardForm notation

`Cosh[z]`

Primary definition

01.20.02.0001.01

$$\cosh(z) == \frac{e^{z} + e^{-z}}{2}$$

Specific values

Specialized values

01.20.03.0001.01

$$\cosh(\pi i\, m) == (-1)^{m} \text{ /; } m \in \mathbb{Z}$$

01.20.03.0002.01

$$\cosh\left(\pi i \left(\frac{1}{2} + m\right)\right) == 0 \text{ /; } m \in \mathbb{Z}$$

Values at fixed points

01.20.03.0003.01

$$\cosh(0) == 1$$

01.20.03.0004.01

$$\cosh\left(\frac{\pi i}{12}\right) == \frac{1 + \sqrt{3}}{2\sqrt{2}}$$

01.20.03.0005.01

$$\cosh\left(\frac{\pi i}{12}\right) == \left(z;\, 16 z^4 - 16 z^2 + 1\right)_4^{-1}$$

01.20.03.0006.01

$$\cosh\left(\frac{\pi i}{10}\right) == \frac{1}{2}\sqrt{\frac{5+\sqrt{5}}{2}}$$

01.20.03.0007.01

$$\cosh\left(\frac{\pi i}{10}\right) == \left(z;\, 16 z^4 - 20 z^2 + 5\right)_4^{-1}$$

01.20.03.0008.01

$$\cosh\left(\frac{\pi i}{9}\right) == \frac{-\left(-1 - i\sqrt{3}\right)^{4/3} - \left(-1 + i\sqrt{3}\right)^{4/3}}{4\sqrt[3]{2}}$$

01.20.03.0009.01

$$\cosh\left(\frac{\pi i}{9}\right) == \left(z;\, 8 z^3 - 6 z - 1\right)_3^{-1}$$

01.20.03.0010.01

$$\cosh\left(\frac{\pi i}{9}\right) == -\frac{1}{2}(-1)^{8/9}\left(1 + (-1)^{2/9}\right)$$

01.20.03.0011.01

$$\cosh\left(\frac{\pi i}{8}\right) == \frac{\sqrt{2+\sqrt{2}}}{2}$$

01.20.03.0012.01

$$\cosh\left(\frac{\pi i}{8}\right) == \left(z;\, 8 z^4 - 8 z^2 + 1\right)_4^{-1}$$

01.20.03.0013.01

$$\cosh\left(\frac{\pi i}{8}\right) == -\frac{1}{2}(-1)^{7/8}\left(1 + \sqrt[4]{-1}\right)$$

01.20.03.0014.01

$$\cosh\left(\frac{\pi i}{7}\right) == \frac{1}{24}\left(4 + \frac{2\sqrt{7}\left(i + \sqrt{3}\right)}{\sqrt[3]{7 - \frac{i\sqrt{7}}{2} - \frac{3\sqrt{21}}{2}}} + \right.$$

$$\left. \left(2 + 2i\sqrt{3}\right)\sqrt[3]{7 - \frac{i\sqrt{7}}{2} - \frac{3\sqrt{21}}{2}} + \frac{2\sqrt{7}\left(-i + \sqrt{3}\right)}{\sqrt[3]{7 + \frac{i\sqrt{7}}{2} + \frac{3\sqrt{21}}{2}}} + 2\left(1 - i\sqrt{3}\right)\sqrt[3]{7 + \frac{i\sqrt{7}}{2} + \frac{3\sqrt{21}}{2}}\right)$$

01.20.03.0015.01

$$\cosh\left(\frac{\pi i}{7}\right) == \left(z;\, 8 z^3 - 4 z^2 - 4 z + 1\right)_3^{-1}$$

01.20.03.0016.01

$$\cosh\left(\frac{\pi i}{7}\right) == -\frac{1}{2}(-1)^{6/7}\left(1 + (-1)^{2/7}\right)$$

01.20.03.0017.01

$$\cosh\left(\frac{\pi i}{6}\right) == \frac{\sqrt{3}}{2}$$

01.20.03.0018.01

$$\cosh\left(\frac{\pi i}{5}\right) == \frac{\sqrt{5}+1}{4}$$

01.20.03.0019.01

$$\cosh\left(\frac{2\pi i}{9}\right) == \frac{\sqrt[3]{-1-i\sqrt{3}}+\sqrt[3]{-1+i\sqrt{3}}}{2\sqrt[3]{2}}$$

01.20.03.0020.01

$$\cosh\left(\frac{2\pi i}{9}\right) == \left(z; 8z^3-6z+1\right)_3^{-1}$$

01.20.03.0021.01

$$\cosh\left(\frac{2\pi i}{9}\right) == -\frac{1}{2}(-1)^{7/9}\left(1+(-1)^{4/9}\right)$$

01.20.03.0022.01

$$\cosh\left(\frac{\pi i}{4}\right) == \frac{1}{\sqrt{2}}$$

01.20.03.0023.01

$$\cosh\left(\frac{2\pi i}{7}\right) == \frac{7-\sqrt[3]{\frac{7}{2}\left(1-3i\sqrt{3}\right)}+\left(\frac{7}{2}\left(1-3i\sqrt{3}\right)\right)^{2/3}}{3\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}}$$

01.20.03.0024.01

$$\cosh\left(\frac{2\pi i}{7}\right) == \left(z; 8z^3+4z^2-4z-1\right)_3^{-1}$$

01.20.03.0025.01

$$\cosh\left(\frac{2\pi i}{7}\right) == -\frac{1}{2}(-1)^{5/7}\left(1+(-1)^{4/7}\right)$$

01.20.03.0026.01

$$\cosh\left(\frac{3\pi i}{10}\right) == \frac{1}{2}\sqrt{\frac{5-\sqrt{5}}{2}}$$

01.20.03.0027.01

$$\cosh\left(\frac{3\pi i}{10}\right) == \left(z; 16z^4-20z^2+5\right)_3^{-1}$$

01.20.03.0028.01

$$\cosh\left(\frac{\pi i}{3}\right) == \frac{1}{2}$$

01.20.03.0029.01

$$\cosh\left(\frac{3\pi i}{8}\right) == \frac{\sqrt{2-\sqrt{2}}}{2}$$

01.20.03.0030.01

$$\cosh\left(\frac{3\pi i}{8}\right) == \left(z; 8z^4 - 8z^2 + 1\right)_3^{-1}$$

01.20.03.0031.01

$$\cosh\left(\frac{3\pi i}{8}\right) == -\frac{1}{2}(-1)^{5/8}\left(1 + (-1)^{3/4}\right)$$

01.20.03.0032.01

$$\cosh\left(\frac{2\pi i}{5}\right) == \frac{\sqrt{5}-1}{4}$$

01.20.03.0033.01

$$\cosh\left(\frac{5\pi i}{12}\right) == \frac{\sqrt{3}-1}{2\sqrt{2}}$$

01.20.03.0034.01

$$\cosh\left(\frac{5\pi i}{12}\right) == \left(z; 16z^4 - 16z^2 + 1\right)_3^{-1}$$

01.20.03.0035.01

$$\cosh\left(\frac{3\pi i}{7}\right) == \left(2\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}} - 2\sqrt{7}\left(i+\sqrt{3}\right)\sqrt[3]{7-\frac{i\sqrt{7}}{2}-\frac{3\sqrt{21}}{2}} - 4i\sqrt{7}\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}} - 2\left(14-i\sqrt{7}-3\sqrt{21}\right)^{2/3}\sqrt[3]{14+i\sqrt{7}+3\sqrt{21}} + \sqrt[3]{14-i\sqrt{7}-3\sqrt{21}}\left(14+i\sqrt{7}+3\sqrt{21}\right)^{2/3} + i\sqrt{3}\sqrt[3]{14-i\sqrt{7}-3\sqrt{21}}\left(14+i\sqrt{7}+3\sqrt{21}\right)^{2/3}\right) \Big/ \left(12\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}\right)$$

01.20.03.0036.01

$$\cosh\left(\frac{3\pi i}{7}\right) == \left(z; 8z^3 - 4z^2 - 4z + 1\right)_2^{-1}$$

01.20.03.0037.01

$$\cosh\left(\frac{3\pi i}{7}\right) == -\frac{1}{2}(-1)^{4/7}\left(1 + (-1)^{6/7}\right)$$

01.20.03.0038.01

$$\cosh\left(\frac{4\pi i}{9}\right) == \frac{i\left(-\sqrt[3]{-1+i\sqrt{3}}\left(-i+\sqrt{3}\right)+\sqrt[3]{-1-i\sqrt{3}}\left(i+\sqrt{3}\right)\right)}{4\sqrt[3]{2}}$$

01.20.03.0039.01

$$\cosh\left(\frac{4\pi i}{9}\right) == \left(z; 8z^3 - 6z + 1\right)_2^{-1}$$

01.20.03.0040.01

$$\cosh\left(\frac{4\pi i}{9}\right) == -\frac{1}{2}(-1)^{5/9}\left(1 + (-1)^{8/9}\right)$$

01.20.03.0041.01

$$\cosh\left(\frac{\pi i}{2}\right) == 0$$

01.20.03.0042.01

$$\cosh\left(\frac{5\pi i}{9}\right) == \frac{\sqrt[3]{-1-i\sqrt{3}}\left(1-i\sqrt{3}\right)+\sqrt[3]{-1+i\sqrt{3}}\left(1+i\sqrt{3}\right)}{4\sqrt[3]{2}}$$

01.20.03.0043.01

$$\cosh\left(\frac{5\pi i}{9}\right) == \left(z;\, 8z^3-6z-1\right)_2^{-1}$$

01.20.03.0044.01

$$\cosh\left(\frac{5\pi i}{9}\right) == -\frac{1}{2}(-1)^{4/9}\left(1-\sqrt[9]{-1}\right)$$

01.20.03.0045.01

$$\cosh\left(\frac{4\pi i}{7}\right) == -\frac{7+7i\sqrt{3}+\left(\frac{7}{2}\left(1-3i\sqrt{3}\right)\right)^{2/3}-i\sqrt{3}\left(\frac{7}{2}-\frac{21i\sqrt{3}}{2}\right)^{2/3}+2^{2/3}\sqrt[3]{7-21i\sqrt{3}}}{6\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}}$$

01.20.03.0046.01

$$\cosh\left(\frac{4\pi i}{7}\right) == \left(z;\, 8z^3+4z^2-4z-1\right)_2^{-1}$$

01.20.03.0047.01

$$\cosh\left(\frac{4\pi i}{7}\right) == -\frac{1}{2}(-1)^{3/7}\left(1-\sqrt[7]{-1}\right)$$

01.20.03.0048.01

$$\cosh\left(\frac{7\pi i}{12}\right) == -\frac{\sqrt{3}-1}{2\sqrt{2}}$$

01.20.03.0049.01

$$\cosh\left(\frac{7\pi i}{12}\right) == \left(z;\, 16z^4-16z^2+1\right)_2^{-1}$$

01.20.03.0050.01

$$\cosh\left(\frac{3\pi i}{5}\right) == -\frac{\sqrt{5}-1}{4}$$

01.20.03.0051.01

$$\cosh\left(\frac{5\pi i}{8}\right) == -\frac{\sqrt{2-\sqrt{2}}}{2}$$

01.20.03.0052.01

$$\cosh\left(\frac{5\pi i}{8}\right) == \left(z;\, 8z^4-8z^2+1\right)_2^{-1}$$

01.20.03.0053.01

$$\cosh\left(\frac{5\pi i}{8}\right) == -\frac{1}{2}(-1)^{3/8}\left(1-\sqrt[4]{-1}\right)$$

01.20.03.0054.01

$$\cosh\left(\frac{2\pi i}{3}\right) == -\frac{1}{2}$$

01.20.03.0055.01

$$\cosh\left(\frac{7\pi i}{10}\right) == -\frac{1}{2}\sqrt{\frac{5-\sqrt{5}}{2}}$$

01.20.03.0056.01

$$\cosh\left(\frac{7\pi i}{10}\right) == \left(z;\, 16z^4 - 20z^2 + 5\right)_2^{-1}$$

01.20.03.0057.01

$$\cosh\left(\frac{5\pi i}{7}\right) == \left(2\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}} + 4i\sqrt{7}\sqrt[3]{7-\frac{i\sqrt{7}}{2}-\frac{3\sqrt{21}}{2}} + 2i\sqrt{7}\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}} - 2\sqrt{21}\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}} + \left(14-i\sqrt{7}-3\sqrt{21}\right)^{2/3}\sqrt[3]{14+i\sqrt{7}+3\sqrt{21}} - i\sqrt{3}\left(14-i\sqrt{7}-3\sqrt{21}\right)^{2/3}\sqrt[3]{14+i\sqrt{7}+3\sqrt{21}} - 2\sqrt[3]{14-i\sqrt{7}-3\sqrt{21}}\left(14+i\sqrt{7}+3\sqrt{21}\right)^{2/3}\right) \Big/ \left(12\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}\right)$$

01.20.03.0058.01

$$\cosh\left(\frac{5\pi i}{7}\right) == \left(z;\, 8z^3 - 4z^2 - 4z + 1\right)_1^{-1}$$

01.20.03.0059.01

$$\cosh\left(\frac{5\pi i}{7}\right) == -\frac{1}{2}(-1)^{2/7}\left(1-(-1)^{3/7}\right)$$

01.20.03.0060.01

$$\cosh\left(\frac{3\pi i}{4}\right) == -\frac{1}{\sqrt{2}}$$

01.20.03.0061.01

$$\cosh\left(\frac{7\pi i}{9}\right) == -\frac{\sqrt[3]{-1-i\sqrt{3}}+\sqrt[3]{-1+i\sqrt{3}}}{2\sqrt[3]{2}}$$

01.20.03.0062.01

$$\cosh\left(\frac{7\pi i}{9}\right) == \left(z;\, 8z^3 - 6z - 1\right)_1^{-1}$$

01.20.03.0063.01

$$\cosh\left(\frac{7\pi i}{9}\right) == -\frac{1}{2}(-1)^{2/9}\left(1-(-1)^{5/9}\right)$$

01.20.03.0064.01

$$\cosh\left(\frac{4\pi i}{5}\right) == -\frac{\sqrt{5}+1}{4}$$

01.20.03.0065.01

$$\cosh\left(\frac{5\pi i}{6}\right) == -\frac{\sqrt{3}}{2}$$

01.20.03.0066.01

$$\cosh\left(\frac{6\pi i}{7}\right) == -\frac{7-7i\sqrt{3}+\left(\frac{7}{2}\left(1-3i\sqrt{3}\right)\right)^{2/3}+i\sqrt{3}\left(\frac{7}{2}-\frac{21i\sqrt{3}}{2}\right)^{2/3}+2^{2/3}\sqrt[3]{7-21i\sqrt{3}}}{6\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}}$$

01.20.03.0067.01

$$\cosh\left(\frac{6\pi i}{7}\right) == \left(z;\,8z^3+4z^2-4z-1\right)_1^{-1}$$

01.20.03.0068.01

$$\cosh\left(\frac{6\pi i}{7}\right) == -\frac{1}{2}\sqrt[7]{-1}\left(1-(-1)^{5/7}\right)$$

01.20.03.0069.01

$$\cosh\left(\frac{7\pi i}{8}\right) == -\frac{\sqrt{2+\sqrt{2}}}{2}$$

01.20.03.0070.01

$$\cosh\left(\frac{7\pi i}{8}\right) == \left(z;\,8z^4-8z^2+1\right)_1^{-1}$$

01.20.03.0071.01

$$\cosh\left(\frac{7\pi i}{8}\right) == -\frac{1}{2}\sqrt[8]{-1}\left(1-(-1)^{3/4}\right)$$

01.20.03.0072.01

$$\cosh\left(\frac{8\pi i}{9}\right) == \frac{\left(-1-i\sqrt{3}\right)^{4/3}+\left(-1+i\sqrt{3}\right)^{4/3}}{4\sqrt[3]{2}}$$

01.20.03.0073.01

$$\cosh\left(\frac{8\pi i}{9}\right) == \left(z;\,8z^3-6z+1\right)_1^{-1}$$

01.20.03.0074.01

$$\cosh\left(\frac{8\pi i}{9}\right) == -\frac{1}{2}\sqrt[9]{-1}\left(1-(-1)^{7/9}\right)$$

01.20.03.0075.01

$$\cosh\left(\frac{9\pi i}{10}\right) == -\frac{1}{2}\sqrt{\frac{5+\sqrt{5}}{2}}$$

01.20.03.0076.01

$$\cosh\left(\frac{9\pi i}{10}\right) == \left(z;\,16z^4-20z^2+5\right)_1^{-1}$$

01.20.03.0077.01

$$\cosh\left(\frac{11\,\pi\,i}{12}\right) == -\frac{1+\sqrt{3}}{2\,\sqrt{2}}$$

01.20.03.0078.01

$$\cosh\left(\frac{11\,\pi\,i}{12}\right) == \left(z;\, 16\,z^4 - 16\,z^2 + 1\right)_1^{-1}$$

01.20.03.0079.01

$$\cosh(\pi\,i) == -1$$

01.20.03.0080.01

$$\cosh\left(\frac{13\,\pi\,i}{12}\right) == -\frac{1+\sqrt{3}}{2\,\sqrt{2}}$$

01.20.03.0081.01

$$\cosh\left(\frac{13\,\pi\,i}{12}\right) == \left(z;\, 16\,z^4 - 16\,z^2 + 1\right)_1^{-1}$$

01.20.03.0082.01

$$\cosh\left(\frac{11\,\pi\,i}{10}\right) == -\frac{1}{2}\,\sqrt{\frac{5+\sqrt{5}}{2}}$$

01.20.03.0083.01

$$\cosh\left(\frac{11\,\pi\,i}{10}\right) == \left(z;\, 16\,z^4 - 20\,z^2 + 5\right)_1^{-1}$$

01.20.03.0084.01

$$\cosh\left(\frac{10\,\pi\,i}{9}\right) == \frac{\left(-1-i\,\sqrt{3}\right)^{4/3} + \left(-1+i\,\sqrt{3}\right)^{4/3}}{4\,\sqrt[3]{2}}$$

01.20.03.0085.01

$$\cosh\left(\frac{10\,\pi\,i}{9}\right) == \left(z;\, 8\,z^3 - 6\,z + 1\right)_1^{-1}$$

01.20.03.0086.01

$$\cosh\left(\frac{10\,\pi\,i}{9}\right) == -\frac{1}{2}\,\sqrt[9]{-1}\,\left(1-(-1)^{7/9}\right)$$

01.20.03.0087.01

$$\cosh\left(\frac{9\,\pi\,i}{8}\right) == -\frac{\sqrt{2+\sqrt{2}}}{2}$$

01.20.03.0088.01

$$\cosh\left(\frac{9\,\pi\,i}{8}\right) == \left(z;\, 8\,z^4 - 8\,z^2 + 1\right)_1^{-1}$$

01.20.03.0089.01

$$\cosh\left(\frac{9\,\pi\,i}{8}\right) == -\frac{1}{2}\,\sqrt[8]{-1}\,\left(1-(-1)^{3/4}\right)$$

01.20.03.0090.01

$$\cosh\left(\frac{8\pi i}{7}\right) == -\frac{7-7i\sqrt{3}+\left(\frac{7}{2}\left(1-3i\sqrt{3}\right)\right)^{2/3}+i\sqrt{3}\left(\frac{7}{2}-\frac{21i\sqrt{3}}{2}\right)^{2/3}+2^{2/3}\sqrt[3]{7-21i\sqrt{3}}}{6\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}}$$

01.20.03.0091.01

$$\cosh\left(\frac{8\pi i}{7}\right) == \left(z;\,8z^3+4z^2-4z-1\right)_1^{-1}$$

01.20.03.0092.01

$$\cosh\left(\frac{8\pi i}{7}\right) == -\frac{1}{2}\sqrt[7]{-1}\left(1-(-1)^{5/7}\right)$$

01.20.03.0093.01

$$\cosh\left(\frac{7\pi i}{6}\right) == -\frac{\sqrt{3}}{2}$$

01.20.03.0094.01

$$\cosh\left(\frac{6\pi i}{5}\right) == -\frac{\sqrt{5}+1}{4}$$

01.20.03.0095.01

$$\cosh\left(\frac{11\pi i}{9}\right) == -\frac{\sqrt[3]{-1-i\sqrt{3}}+\sqrt[3]{-1+i\sqrt{3}}}{2\sqrt[3]{2}}$$

01.20.03.0096.01

$$\cosh\left(\frac{11\pi i}{9}\right) == \left(z;\,8z^3-6z-1\right)_1^{-1}$$

01.20.03.0097.01

$$\cosh\left(\frac{11\pi i}{9}\right) == -\frac{1}{2}(-1)^{2/9}\left(1-(-1)^{5/9}\right)$$

01.20.03.0098.01

$$\cosh\left(\frac{5\pi i}{4}\right) == -\frac{1}{\sqrt{2}}$$

01.20.03.0099.01

$$\cosh\left(\frac{9\pi i}{7}\right) == \left(2\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}+4i\sqrt{7}\sqrt[3]{7-\frac{i\sqrt{7}}{2}-\frac{3\sqrt{21}}{2}}+\right.$$

$$2i\sqrt{7}\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}}-2\sqrt{21}\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}}+$$

$$\left(14-i\sqrt{7}-3\sqrt{21}\right)^{2/3}\sqrt[3]{14+i\sqrt{7}+3\sqrt{21}}-i\sqrt{3}\left(14-i\sqrt{7}-3\sqrt{21}\right)^{2/3}\sqrt[3]{14+i\sqrt{7}+3\sqrt{21}}-$$

$$\left.2\sqrt[3]{14-i\sqrt{7}-3\sqrt{21}}\left(14+i\sqrt{7}+3\sqrt{21}\right)^{2/3}\right)\Big/\left(12\,2^{2/3}\sqrt[3]{7-21i\sqrt{3}}\right)$$

01.20.03.0100.01

$$\cosh\left(\frac{9\pi i}{7}\right) == \left(z; 8z^3 - 4z^2 - 4z + 1\right)_1^{-1}$$

01.20.03.0101.01

$$\cosh\left(\frac{9\pi i}{7}\right) == -\frac{1}{2}(-1)^{2/7}\left(1 - (-1)^{3/7}\right)$$

01.20.03.0102.01

$$\cosh\left(\frac{13\pi i}{10}\right) == -\frac{1}{2}\sqrt{\frac{5-\sqrt{5}}{2}}$$

01.20.03.0103.01

$$\cosh\left(\frac{13\pi i}{10}\right) == \left(z; 16z^4 - 20z^2 + 5\right)_2^{-1}$$

01.20.03.0104.01

$$\cosh\left(\frac{4\pi i}{3}\right) == -\frac{1}{2}$$

01.20.03.0105.01

$$\cosh\left(\frac{11\pi i}{8}\right) == -\frac{\sqrt{2-\sqrt{2}}}{2}$$

01.20.03.0106.01

$$\cosh\left(\frac{11\pi i}{8}\right) == \left(z; 8z^4 - 8z^2 + 1\right)_2^{-1}$$

01.20.03.0107.01

$$\cosh\left(\frac{11\pi i}{8}\right) == -\frac{1}{2}(-1)^{3/8}\left(1 - \sqrt[4]{-1}\right)$$

01.20.03.0108.01

$$\cosh\left(\frac{7\pi i}{5}\right) == -\frac{\sqrt{5}-1}{4}$$

01.20.03.0109.01

$$\cosh\left(\frac{17\pi i}{12}\right) == -\frac{\sqrt{3}-1}{2\sqrt{2}}$$

01.20.03.0110.01

$$\cosh\left(\frac{17\pi i}{12}\right) == \left(z; 16z^4 - 16z^2 + 1\right)_2^{-1}$$

01.20.03.0111.01

$$\cosh\left(\frac{10\pi i}{7}\right) == -\frac{7 + 7i\sqrt{3} + \left(\frac{7}{2}\left(1 - 3i\sqrt{3}\right)\right)^{2/3} - i\sqrt{3}\left(\frac{7}{2} - \frac{21i\sqrt{3}}{2}\right)^{2/3} + 2^{2/3}\sqrt[3]{7 - 21i\sqrt{3}}}{6\,2^{2/3}\sqrt[3]{7 - 21i\sqrt{3}}}$$

01.20.03.0112.01

$$\cosh\left(\frac{10\pi i}{7}\right) == \left(z; 8z^3 + 4z^2 - 4z - 1\right)_2^{-1}$$

01.20.03.0113.01

$$\cosh\left(\frac{10\,\pi\,i}{7}\right) == -\frac{1}{2}\,(-1)^{3/7}\left(1-\sqrt[7]{-1}\right)$$

01.20.03.0114.01

$$\cosh\left(\frac{13\,\pi\,i}{9}\right) == \frac{\sqrt[3]{-1-i\sqrt{3}}\,\left(1-i\sqrt{3}\right)+\sqrt[3]{-1+i\sqrt{3}}\,\left(1+i\sqrt{3}\right)}{4\sqrt[3]{2}}$$

01.20.03.0115.01

$$\cosh\left(\frac{13\,\pi\,i}{9}\right) == \left(z;\,8\,z^3-6\,z-1\right)_2^{-1}$$

01.20.03.0116.01

$$\cosh\left(\frac{13\,\pi\,i}{9}\right) == -\frac{1}{2}\,(-1)^{4/9}\left(1-\sqrt[9]{-1}\right)$$

01.20.03.0117.01

$$\cosh\left(\frac{3\,\pi\,i}{2}\right) == 0$$

01.20.03.0118.01

$$\cosh\left(\frac{14\,\pi\,i}{9}\right) == \frac{i\left(-\sqrt[3]{-1+i\sqrt{3}}\,\left(-i+\sqrt{3}\right)+\sqrt[3]{-1-i\sqrt{3}}\,\left(i+\sqrt{3}\right)\right)}{4\sqrt[3]{2}}$$

01.20.03.0119.01

$$\cosh\left(\frac{14\,\pi\,i}{9}\right) == \left(z;\,8\,z^3-6\,z+1\right)_2^{-1}$$

01.20.03.0120.01

$$\cosh\left(\frac{14\,\pi\,i}{9}\right) == -\frac{1}{2}\,(-1)^{5/9}\left(1+(-1)^{8/9}\right)$$

01.20.03.0121.01

$$\cosh\left(\frac{11\,\pi\,i}{7}\right) == \left(2\,2^{2/3}\sqrt[3]{7-21\,i\sqrt{3}}-2\sqrt{7}\,\left(i+\sqrt{3}\right)\sqrt[3]{7-\frac{i\sqrt{7}}{2}-\frac{3\sqrt{21}}{2}}-4\,i\sqrt{7}\,\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}}-\right.$$

$$2\left(14-i\sqrt{7}-3\sqrt{21}\right)^{2/3}\sqrt[3]{14+i\sqrt{7}+3\sqrt{21}}+\sqrt[3]{14-i\sqrt{7}-3\sqrt{21}}\,\left(14+i\sqrt{7}+3\sqrt{21}\right)^{2/3}+$$

$$\left.i\sqrt{3}\,\sqrt[3]{14-i\sqrt{7}-3\sqrt{21}}\,\left(14+i\sqrt{7}+3\sqrt{21}\right)^{2/3}\right)\Big/\left(12\,2^{2/3}\sqrt[3]{7-21\,i\sqrt{3}}\right)$$

01.20.03.0122.01

$$\cosh\left(\frac{11\,\pi\,i}{7}\right) == \left(z;\,8\,z^3-4\,z^2-4\,z+1\right)_2^{-1}$$

01.20.03.0123.01

$$\cosh\left(\frac{11\,\pi\,i}{7}\right) == -\frac{1}{2}\,(-1)^{4/7}\left(1+(-1)^{6/7}\right)$$

01.20.03.0124.01

$$\cosh\left(\frac{19\,\pi\,i}{12}\right) == \frac{\sqrt{3}\,-1}{2\,\sqrt{2}}$$

01.20.03.0125.01

$$\cosh\left(\frac{19\,\pi\,i}{12}\right) == \left(z;\,16\,z^4-16\,z^2+1\right)_3^{-1}$$

01.20.03.0126.01

$$\cosh\left(\frac{8\,\pi\,i}{5}\right) == \frac{\sqrt{5}\,-1}{4}$$

01.20.03.0127.01

$$\cosh\left(\frac{13\,\pi\,i}{8}\right) == \frac{\sqrt{2-\sqrt{2}}}{2}$$

01.20.03.0128.01

$$\cosh\left(\frac{13\,\pi\,i}{8}\right) == \left(z;\,8\,z^4-8\,z^2+1\right)_3^{-1}$$

01.20.03.0129.01

$$\cosh\left(\frac{13\,\pi\,i}{8}\right) == -\frac{1}{2}\,(-1)^{5/8}\left(1+(-1)^{3/4}\right)$$

01.20.03.0130.01

$$\cosh\left(\frac{5\,\pi\,i}{3}\right) == \frac{1}{2}$$

01.20.03.0131.01

$$\cosh\left(\frac{17\,\pi\,i}{10}\right) == \frac{1}{2}\,\sqrt{\frac{5-\sqrt{5}}{2}}$$

01.20.03.0132.01

$$\cosh\left(\frac{17\,\pi\,i}{10}\right) == \left(z;\,16\,z^4-20\,z^2+5\right)_3^{-1}$$

01.20.03.0133.01

$$\cosh\left(\frac{12\,\pi\,i}{7}\right) == \frac{7-\sqrt[3]{\frac{7}{2}\left(1-3\,i\,\sqrt{3}\right)}\;+\left(\frac{7}{2}\left(1-3\,i\,\sqrt{3}\right)\right)^{2/3}}{3\,2^{2/3}\,\sqrt[3]{7-21\,i\,\sqrt{3}}}$$

01.20.03.0134.01

$$\cosh\left(\frac{12\,\pi\,i}{7}\right) == \left(z;\,8\,z^3+4\,z^2-4\,z-1\right)_3^{-1}$$

01.20.03.0135.01

$$\cosh\left(\frac{12\,\pi\,i}{7}\right) == -\frac{1}{2}\,(-1)^{5/7}\left(1+(-1)^{4/7}\right)$$

01.20.03.0136.01

$$\cosh\left(\frac{7\,\pi\,i}{4}\right) == \frac{1}{\sqrt{2}}$$

01.20.03.0137.01

$$\cosh\left(\frac{16\pi i}{9}\right) == \frac{\sqrt[3]{-1-i\sqrt{3}}+\sqrt[3]{-1+i\sqrt{3}}}{2\sqrt[3]{2}}$$

01.20.03.0138.01

$$\cosh\left(\frac{16\pi i}{9}\right) == \left(z; 8z^3-6z+1\right)_3^{-1}$$

01.20.03.0139.01

$$\cosh\left(\frac{16\pi i}{9}\right) == -\frac{1}{2}(-1)^{7/9}\left(1+(-1)^{4/9}\right)$$

01.20.03.0140.01

$$\cosh\left(\frac{9\pi i}{5}\right) == \frac{\sqrt{5}+1}{4}$$

01.20.03.0141.01

$$\cosh\left(\frac{11\pi i}{6}\right) == \frac{\sqrt{3}}{2}$$

01.20.03.0142.01

$$\cosh\left(\frac{13\pi i}{7}\right) == \frac{1}{24}\left(4+\frac{2\sqrt{7}\left(i+\sqrt{3}\right)}{\sqrt[3]{7-\frac{i\sqrt{7}}{2}-\frac{3\sqrt{21}}{2}}}+\right.$$

$$\left.\left(2+2i\sqrt{3}\right)\sqrt[3]{7-\frac{i\sqrt{7}}{2}-\frac{3\sqrt{21}}{2}}+\frac{2\sqrt{7}\left(-i+\sqrt{3}\right)}{\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}}}+2\left(1-i\sqrt{3}\right)\sqrt[3]{7+\frac{i\sqrt{7}}{2}+\frac{3\sqrt{21}}{2}}\right)$$

01.20.03.0143.01

$$\cosh\left(\frac{13\pi i}{7}\right) == \left(z; 8z^3-4z^2-4z+1\right)_3^{-1}$$

01.20.03.0144.01

$$\cosh\left(\frac{13\pi i}{7}\right) == -\frac{1}{2}(-1)^{6/7}\left(1+(-1)^{2/7}\right)$$

01.20.03.0145.01

$$\cosh\left(\frac{15\pi i}{8}\right) == \frac{\sqrt{2+\sqrt{2}}}{2}$$

01.20.03.0146.01

$$\cosh\left(\frac{15\pi i}{8}\right) == \left(z; 8z^4-8z^2+1\right)_4^{-1}$$

01.20.03.0147.01

$$\cosh\left(\frac{15\pi i}{8}\right) == -\frac{1}{2}(-1)^{7/8}\left(1+\sqrt[4]{-1}\right)$$

01.20.03.0148.01

$$\cosh\left(\frac{17\,\pi\,i}{9}\right) == \frac{-\left(-1-i\,\sqrt{3}\right)^{4/3}-\left(-1+i\,\sqrt{3}\right)^{4/3}}{4\,\sqrt[3]{2}}$$

01.20.03.0149.01

$$\cosh\left(\frac{17\,\pi\,i}{9}\right) == \left(z;\,8\,z^3-6\,z-1\right)_3^{-1}$$

01.20.03.0150.01

$$\cosh\left(\frac{17\,\pi\,i}{9}\right) == -\frac{1}{2}\,(-1)^{8/9}\left(1+(-1)^{2/9}\right)$$

01.20.03.0151.01

$$\cosh\left(\frac{19\,\pi\,i}{10}\right) == \frac{1}{2}\,\sqrt{\frac{5+\sqrt{5}}{2}}$$

01.20.03.0152.01

$$\cosh\left(\frac{19\,\pi\,i}{10}\right) == \left(z;\,16\,z^4-20\,z^2+5\right)_4^{-1}$$

01.20.03.0153.01

$$\cosh\left(\frac{23\,\pi\,i}{12}\right) == \frac{1+\sqrt{3}}{2\,\sqrt{2}}$$

01.20.03.0154.01

$$\cosh\left(\frac{23\,\pi\,i}{12}\right) == \left(z;\,16\,z^4-16\,z^2+1\right)_4^{-1}$$

01.20.03.0155.01

$$\cosh(2\,\pi\,i) == 1$$

01.20.03.0156.01

$$\cosh\left(\frac{\pi\,i}{17}\right) == \frac{1}{4}\,\sqrt{\left(\frac{1}{2}\left(\sqrt{\left(2\left(-\sqrt{2\left(17-\sqrt{17}\right)}+6\,\sqrt{17}+\sqrt{34\left(17-\sqrt{17}\right)}-8\,\sqrt{2\left(17+\sqrt{17}\right)}+34\right)\right)}+\sqrt{17}+\sqrt{2\left(17-\sqrt{17}\right)}+15\right)\right)}$$

01.20.03.0157.01

$$\cosh\left(\frac{\pi\,i}{30}\right) == \frac{1}{4}\,\sqrt{\frac{5-\sqrt{5}}{2}}+\frac{\sqrt{5}+1}{8}\,\sqrt{3}$$

$\cosh\left(\frac{n\,i\,\pi}{m}\right)$ can be expressed using only square roots if $n \in \mathbb{Z}$ and m is a product of a power of 2 and distinct Fermat primes {3, 5, 17, 257, …}.

Values at infinities

01.20.03.0158.01

$$\cosh(\infty) == \infty$$

01.20.03.0159.01
$\cosh(-\infty) == \infty$

01.20.03.0160.01
$\cosh(\tilde{\infty}) == ¿$

General characteristics

Domain and analyticity

cosh(z) is an entire analytical function of z which is defined over the whole complex z-plane.

01.20.04.0001.01
$z \longrightarrow \cosh(z) :: \mathbb{C} \longrightarrow \mathbb{C}$

Symmetries and periodicities

Parity

cosh(z) is an even function.

01.20.04.0002.01
$\cosh(-z) == \cosh(z)$

Mirror symmetry

01.20.04.0003.01
$\cosh(\bar{z}) == \overline{\cosh(z)}$

Periodicity

cosh(z) is a periodic function with period $2\,\pi\,i$.

01.20.04.0009.01
$\cosh(z + 2\,\pi\,i) == \cosh(z)$

01.20.04.0004.01
$\cosh(z + 2\,\pi\,i\,m) == \cosh(z)\ /;\ m \in \mathbb{Z}$

01.20.04.0005.01
$\cosh(z + \pi\,i\,m) == (-1)^m \cosh(z)\ /;\ m \in \mathbb{Z}$

Poles and essential singularities

The function cosh(z) has only one singular point at $z = \tilde{\infty}$. It is an essential singular point.

01.20.04.0006.01
$\mathcal{S}ing_z(\cosh(z)) == \{\{\tilde{\infty}, \infty\}\}$

Branch points

The function cosh(z) does not have branch points.

01.20.04.0007.01
$\mathcal{BP}_z(\cosh(z)) == \{\}$

Branch cuts

The function cosh(z) does not have branch cuts.

01.20.04.0008.01

$\mathcal{BC}_z(\cosh(z)) == \{\}$

Series representations

Generalized power series

Expansions at $z == z_0$

For the function itself

01.20.06.0024.01

$$\cosh(z) \propto \cosh(z_0) + \sinh(z_0)\,(z - z_0) + \frac{1}{2}\cosh(z_0)\,(z - z_0)^2 + \ldots /;\ (z \to z_0)$$

01.20.06.0025.01

$$\cosh(z) \propto \cosh(z_0) + \sinh(z_0)\,(z - z_0) + \frac{1}{2}\cosh(z_0)\,(z - z_0)^2 + O\left((z - z_0)^3\right)$$

01.20.06.0026.01

$$\cosh(z) == \sum_{k=0}^{\infty} \frac{(-i)^k}{k!} \cosh\left(\frac{\pi\, i\, k}{2} + z_0\right) (z - z_0)^k$$

01.20.06.0027.01

$$\cosh(z) == \frac{1}{2}\left(e^{-z_0}\ {}_0F_0(;\,;\,-(z - z_0)) + e^{z_0}\ {}_0F_0(;\,;\,z - z_0)\right)$$

01.20.06.0028.01

$$\cosh(z) \propto \cosh(z_0)\,(1 + O(z - z_0))$$

01.20.06.0029.01

$$\cosh(z) == F_\infty(z,\, z_0)\ /;$$
$$\left(\left(F_n(z,\, z_0) == \sum_{k=0}^{n} \frac{(-i)^k}{k!} \cosh\left(\frac{i\,\pi\,k}{2} + z_0\right) (z - z_0)^k == \frac{1}{2}\left(e^{-z}\, Q(n+1,\, -(z - z_0)) + e^{z}\, Q(n+1,\, z - z_0)\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

Expansions at $z == 0$

For the function itself

01.20.06.0001.02

$$\cosh(z) \propto 1 + \frac{z^2}{2} + \frac{z^4}{24} + \ldots /;\ (z \to 0)$$

01.20.06.0030.01

$$\cosh(z) \propto 1 + \frac{z^2}{2} + \frac{z^4}{24} + O\left(z^6\right)$$

01.20.06.0002.01

$$\cosh(z) == \sum_{k=0}^{\infty} \frac{z^{2\,k}}{(2\,k)!}$$

01.20.06.0003.01

$$\cosh(z) == {}_0F_1\left(; \frac{1}{2}; \frac{z^2}{4}\right)$$

01.20.06.0004.02

$$\cosh(z) \propto 1 + O\left(z^2\right)$$

01.20.06.0031.01

$$\cosh(z) == F_\infty(z) \,/;\, \left(\left(F_n(z) == \sum_{k=0}^{n} \frac{z^{2\,k}}{(2\,k)!} == \cosh(z) - \frac{\sqrt{\pi}\; z^{2\,n+2}}{2^{2\,n+2}}\; {}_1\tilde{F}_2\left(1; n + \frac{3}{2}, n + 2; \frac{z^2}{4}\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For powers of the function

For the second power

01.20.06.0005.02

$$\cosh^2(z) \propto 1 + z^2 + \frac{z^4}{3} + \ldots \,/;\, (z \to 0)$$

01.20.06.0032.01

$$\cosh^2(z) \propto 1 + z^2 + \frac{z^4}{3} + O\left(z^6\right)$$

01.20.06.0006.01

$$\cosh^2(z) == 1 + \sum_{k=1}^{\infty} \frac{2^{2\,k-1}\; z^{2\,k}}{(2\,k)!}$$

01.20.06.0007.01

$$\cosh^2(z) == \frac{1}{2} + \frac{1}{2}\; {}_0F_1\left(; \frac{1}{2}; z^2\right)$$

01.20.06.0033.01

$$\cosh^2(z) \propto 1 + O\left(z^2\right)$$

01.20.06.0034.01

$$\cosh^2(z) == F_\infty(z) \,/;\, \left(\left(F_m(z) == 1 + \frac{1}{2}\sum_{j=1}^{m} \frac{2^{2\,j}\; z^{2\,j}}{(2\,j)!} == \cosh^2(z) - \frac{\sqrt{\pi}}{2}\; z^{2\,m+2}\; {}_1\tilde{F}_2\left(1; m + \frac{3}{2}, m + 2; z^2\right)\right) \bigwedge m \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For the third power

01.20.06.0008.02

$$\cosh^3(z) \propto 1 + \frac{3\,z^2}{2} + \frac{7\,z^4}{8} + \ldots /; (z \to 0)$$

01.20.06.0035.01

$$\cosh^3(z) \propto 1 + \frac{3\,z^2}{2} + \frac{7\,z^4}{8} + O\left(z^6\right)$$

01.20.06.0009.01

$$\cosh^3(z) == \frac{1}{4}\sum_{k=0}^{\infty} \frac{\left(3^{2\,k} + 3\right) z^{2\,k}}{(2\,k)!}$$

01.20.06.0036.01

$$\cosh^3(z) == \frac{3}{4}\,{}_0F_1\left(; \frac{1}{2}; \frac{z^2}{4}\right) + \frac{1}{4}\,{}_0F_1\left(; \frac{1}{2}; \frac{9\,z^2}{4}\right)$$

01.20.06.0037.01

$$\cosh^3(z) \propto 1 + O\left(z^2\right)$$

01.20.06.0038.01

$$\cosh^3(z) == F_\infty(z) /; \left(\left(F_m(z) == 1 + \frac{1}{4}\sum_{j=1}^{m} \frac{\left(3 + 3^{2\,j}\right) z^{2\,j}}{(2\,j)!} == \right.\right.$$

$$\left.\left.\cos^3(z) - 2^{-2\,m-4}\,\sqrt{\pi}\;z^{2\,m+2}\left(3\,{}_1\tilde{F}_2\left(1; m + \frac{3}{2}, m + 2; \frac{z^2}{4}\right) + 3^{2\,m+2}\,{}_1\tilde{F}_2\left(1; m + \frac{3}{2}, m + 2; \frac{9\,z^2}{4}\right)\right)\right) \bigwedge m \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For symbolical integer power

01.20.06.0039.01

$$\cosh^n(z) \propto 1 - \frac{1}{2^{n+2}}\left(\left(1 + (-1)^n\right)\binom{n}{\lfloor \frac{n}{2} \rfloor}\left(n - 2\left\lfloor \frac{n}{2} \right\rfloor\right)^2 - 2^{n+1}\,n\right) z^2 +$$

$$\frac{1}{3\,2^{n+4}}\left(2^{n+1}\,n\,(3\,n-2) - \left(1 + (-1)^n\right)\binom{n}{\lfloor \frac{n}{2} \rfloor}\left(n - 2\left\lfloor \frac{n}{2} \right\rfloor\right)^4\right) z^4 + \ldots /; (z \to 0) \bigwedge n \in \mathbb{N}^+$$

01.20.06.0040.01

$$\cosh^n(z) \propto 1 - \frac{1}{2^{n+2}}\left(\left(1 + (-1)^n\right)\binom{n}{\lfloor \frac{n}{2} \rfloor}\left(n - 2\left\lfloor \frac{n}{2} \right\rfloor\right)^2 - 2^{n+1}\,n\right) z^2 +$$

$$\frac{1}{3\,2^{n+4}}\left(2^{n+1}\,n\,(3\,n-2) - \left(1 + (-1)^n\right)\binom{n}{\lfloor \frac{n}{2} \rfloor}\left(n - 2\left\lfloor \frac{n}{2} \right\rfloor\right)^4\right) z^4 - O\left(z^6\right) /; n \in \mathbb{N}^+$$

01.20.06.0041.01

$$\cosh^n(z) == 1 + 2^{1-n}\sum_{j=1}^{\infty}\left(\frac{1}{(2\,j)!}\sum_{k=0}^{\lfloor \frac{n-1}{2} \rfloor}\binom{n}{k}(n - 2\,k)^{2\,j}\right) z^{2\,j} /; n \in \mathbb{N}^+$$

01.20.06.0042.01

$$\cosh^n(z) == 2^{-n}\binom{n}{\frac{n}{2}}(1-n \bmod 2) + 2^{1-n}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}\binom{n}{k}\,{}_0F_1\left(;\frac{1}{2};\frac{(n-2k)^2 z^2}{4}\right) /; n \in \mathbb{N}^+$$

01.20.06.0043.01

$$\cosh^n(z) \propto 1 + O\left(z^2\right) /; n \in \mathbb{N}^+$$

01.20.06.0044.01

$$\cosh^n(z) == F_\infty(z) /; \left(\left(F_m(z) == 1 + 2^{1-n}\sum_{j=1}^{m}\left(\frac{1}{(2j)!}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}\binom{n}{k}(n-2k)^{2j}\right)z^{2j} == \cosh^n(z) - \frac{\sqrt{\pi}\, z^{2m+2}}{2^{2m+n+1}}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}\binom{n}{k}(n-2k)^{2m+2}\,{}_1\tilde{F}_2\left(1; m+\frac{3}{2}, m+2; \frac{(n-2k)^2 z^2}{4}\right)\right) \bigwedge m \in \mathbb{N} \bigwedge n \in \mathbb{N}^+\right)$$

Summed form of the truncated series expansion.

Expansions at $z == \frac{\pi i}{2}$

For the function itself

01.20.06.0010.02

$$\cosh(z) \propto i\left(z - \frac{i\pi}{2}\right) + \frac{i}{6}\left(z - \frac{i\pi}{2}\right)^3 + \frac{i}{120}\left(z - \frac{i\pi}{2}\right)^5 + \ldots /; \left(z \to \frac{i\pi}{2}\right)$$

01.20.06.0045.01

$$\cosh(z) \propto i\left(z - \frac{i\pi}{2}\right) + \frac{i}{6}\left(z - \frac{i\pi}{2}\right)^3 + \frac{i}{120}\left(z - \frac{i\pi}{2}\right)^5 + O\left(\left(z - \frac{i\pi}{2}\right)^7\right)$$

01.20.06.0011.01

$$\cosh(z) == i\sum_{k=0}^{\infty}\frac{1}{(2k+1)!}\left(z - \frac{i\pi}{2}\right)^{2k+1}$$

01.20.06.0012.01

$$\cosh(z) == i\left(z - \frac{i\pi}{2}\right){}_0F_1\left(;\frac{3}{2};\frac{1}{4}\left(z - \frac{i\pi}{2}\right)^2\right)$$

01.20.06.0013.02

$$\cosh(z) \propto i\left(z - \frac{i\pi}{2}\right) + O\left(\left(z - \frac{i\pi}{2}\right)^3\right)$$

01.20.06.0046.01

$$\cosh(z) == F_\infty(z) /; \left(\left(F_n(z) == i\left(z - \frac{\pi i}{2}\right)\sum_{k=0}^{n}\frac{1}{(2k+1)!}\left(z - \frac{\pi i}{2}\right)^{2k} == \cosh(z) - \frac{i}{(2n+3)!}\left(z - \frac{i\pi}{2}\right)^{2n+3}\,{}_1F_2\left(1; n+2, n+\frac{5}{2}; \frac{1}{4}\left(z - \frac{i\pi}{2}\right)^2\right)\right) \bigwedge n \in \mathbb{N}\right)$$

Summed form of the truncated series expansion.

For powers of the function

For the second power

01.20.06.0014.02

$$\cosh^2(z) \propto -\left(z-\frac{i\pi}{2}\right)^2-\frac{1}{3}\left(z-\frac{i\pi}{2}\right)^4-\frac{2}{45}\left(z-\frac{i\pi}{2}\right)^6-\ldots /;\left(z\to\frac{i\pi}{2}\right)$$

01.20.06.0047.01

$$\cosh^2(z) \propto -\left(z-\frac{i\pi}{2}\right)^2-\frac{1}{3}\left(z-\frac{i\pi}{2}\right)^4-\frac{2}{45}\left(z-\frac{i\pi}{2}\right)^6+O\left(\left(z-\frac{i\pi}{2}\right)^8\right)$$

01.20.06.0048.01

$$\cosh^2(z) == -\sum_{k=1}^{\infty}\frac{2^{2k-1}}{(2k)!}\left(z-\frac{i\pi}{2}\right)^{2k}$$

01.20.06.0049.01

$$\cosh^2(z) == -\left(z-\frac{i\pi}{2}\right)^2{}_1F_2\left(1;2,\frac{3}{2};\left(z-\frac{i\pi}{2}\right)^2\right)$$

01.20.06.0050.01

$$\cosh^2(z) \propto -\left(z-\frac{i\pi}{2}\right)^2+O\left(\left(z-\frac{i\pi}{2}\right)^4\right)$$

01.20.06.0051.01

$$\cosh^2(z) == F_\infty(z)\ /;$$
$$\left(\left(F_m(z) == -\sum_{k=1}^{m}\frac{2^{2k-1}\left(z-\frac{i\pi}{2}\right)^{2k}}{(2k)!} == \cosh^2(z)+\frac{2^{2m+4}}{2(2m+4)!}\left(z-\frac{\pi i}{2}\right)^{2m+4}{}_1F_2\left(1;m+\frac{5}{2},m+3;\left(z-\frac{i\pi}{2}\right)^2\right)\right)\bigwedge m\in\mathbb{N}\right)$$

Summed form of the truncated series expansion.

For the third power

01.20.06.0015.02

$$\cosh^3(z) \propto -i\left(z-\frac{i\pi}{2}\right)^3-\frac{i}{2}\left(z-\frac{i\pi}{2}\right)^5-\frac{13i}{120}\left(z-\frac{i\pi}{2}\right)^7-\ldots /;\left(z\to\frac{i\pi}{2}\right)$$

01.20.06.0052.01

$$\cosh^3(z) \propto -i\left(z-\frac{i\pi}{2}\right)^3-\frac{i}{2}\left(z-\frac{i\pi}{2}\right)^5-\frac{13i}{120}\left(z-\frac{i\pi}{2}\right)^7+O\left(\left(z-\frac{i\pi}{2}\right)^9\right)$$

01.20.06.0053.01

$$\cosh^3(z) == \frac{i}{4}\sum_{k=1}^{\infty}\frac{\left(3-3^{2k+1}\right)}{(2k+1)!}\left(z-\frac{i\pi}{2}\right)^{2k+1}$$

01.20.06.0054.01

$$\cosh^3(z) == \frac{3\,i}{4}\left(z-\frac{i\,\pi}{2}\right)\left({}_0F_1\left(;\frac{3}{2};\frac{1}{4}\left(z-\frac{i\,\pi}{2}\right)^2\right)-{}_0F_1\left(;\frac{3}{2};\frac{9}{4}\left(z-\frac{i\,\pi}{2}\right)^2\right)\right)$$

01.20.06.0055.01

$$\cosh^3(z) \propto -i\left(z-\frac{i\,\pi}{2}\right)^3+O\left(\left(z-\frac{i\,\pi}{2}\right)^5\right)$$

01.20.06.0056.01

$$\cosh^3(z) == F_\infty(z)\,/;\left(\left(F_m(z) == \frac{i}{4}\sum_{k=1}^{m}\frac{3-3^{2\,k+1}}{(2\,k+1)!}\left(z-\frac{i\,\pi}{2}\right)^{2\,k+1} == \cosh^3(z)+\frac{3\,i}{4\,(2\,m+5)!}\left(z-\frac{i\,\pi}{2}\right)^{2\,m+5}\right.\right.$$
$$\left.\left.\left(3^{2\,(m+2)}\,{}_1F_2\left(1;\,m+3,\,m+\frac{7}{2};\frac{9}{4}\left(z-\frac{i\,\pi}{2}\right)^2\right)-{}_1F_2\left(1;\,m+3,\,m+\frac{7}{2};\frac{1}{4}\left(z-\frac{i\,\pi}{2}\right)^2\right)\right)\right)\bigwedge m\in\mathbb{N}\right)$$

Summed form of the truncated series expansion.

For symbolical integer power

01.20.06.0057.01

$$\cosh^n(z) \propto$$
$$i^n\left(z-\frac{\pi\,i}{2}\right)^n\left(1+\left(\frac{2^{1-n}}{(n+2)!}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^{n+2}\right)\left(z-\frac{\pi\,i}{2}\right)^2+\left(\frac{2^{1-n}}{(n+4)!}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^{n+4}\right)\left(z-\frac{\pi\,i}{2}\right)^4+\ldots\right)/;$$
$$\left(z\to\frac{\pi\,i}{2}\right)\bigwedge n\in\mathbb{N}^+$$

01.20.06.0058.01

$$\cosh^n(z) \propto i^n\left(z-\frac{\pi\,i}{2}\right)^n\left(1+\left(\frac{2^{1-n}}{(n+2)!}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^{n+2}\right)\left(z-\frac{\pi\,i}{2}\right)^2+\right.$$
$$\left.\left(\frac{2^{1-n}}{(n+4)!}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^{n+4}\right)\left(z-\frac{\pi\,i}{2}\right)^4+O\left(\left(z-\frac{\pi\,i}{2}\right)^6\right)\right)/;\,n\in\mathbb{N}^+$$

01.20.06.0059.01

$$\cosh^n(z) == 2^{1-n}\,i^n\left(z-\frac{\pi\,i}{2}\right)^n\sum_{j=0}^{\infty}\left(\frac{1}{(2\,j+n)!}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^{2\,j+n}\right)\left(z-\frac{\pi\,i}{2}\right)^{2\,j}\,/;\,n\in\mathbb{N}^+$$

01.20.06.0060.01

$$\cosh^n(z) == \frac{2^{1-n}\,i^n}{n!}\left(z-\frac{\pi\,i}{2}\right)^n\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^n\,{}_1F_2\left(1;\,\frac{n+1}{2},\,\frac{n}{2}+1;\,\frac{(n-2\,k)^2}{4}\left(z-\frac{\pi\,i}{2}\right)^2\right)/;\,n\in\mathbb{N}^+$$

01.20.06.0061.01

$$\cosh^n(z) \propto i^n\left(z-\frac{\pi\,i}{2}\right)^n\left(1+O\left(\left(z-\frac{\pi\,i}{2}\right)^2\right)\right)/;\,n\in\mathbb{N}^+$$

01.20.06.0062.01

$$\cosh^n(z) == F_\infty(z) /; \left(\left(F_m(z) == 2^{1-n}\, i^n \left(z-\frac{\pi\, i}{2}\right)^n \sum_{j=0}^{m}\left(\frac{1}{(2\,j+n)!}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^{2\,j+n}\right)\left(z-\frac{\pi\, i}{2}\right)^{2\,j} ==\right.\right.$$

$$2^{1-n}\, i^n\left(z-\frac{\pi\, i}{2}\right)^n \sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}(-1)^k\binom{n}{k}(n-2\,k)^n\left(\frac{1}{n!}\,{}_1F_2\left(1;\frac{n}{2}+\frac{1}{2},\frac{n}{2}+1;\frac{(n-2\,k)^2}{4}\left(z-\frac{\pi\, i}{2}\right)^2\right)-\right.$$

$$\left.\left.\left.\frac{\left((n-2\,k)^2\left(z-\frac{\pi\, i}{2}\right)^2\right)^{m+1}}{\Gamma(2\,m+n+3)}\,{}_1F_2\left(1;\frac{n+3}{2}+m,m+\frac{n}{2}+2;\frac{(n-2\,k)^2}{4}\left(z-\frac{\pi\, i}{2}\right)^2\right)\right)\right) \bigwedge m\in\mathbb{N} \bigwedge n\in\mathbb{N}^+\right)$$

Summed form of the truncated series expansion.

q-Series

01.20.06.0016.01

$$\cosh(z) == \frac{1}{2}\left(q+\frac{1}{q}\right) /; q == e^{\pi\, z}$$

Exponential Fourier series

01.20.06.0017.01

$$\cosh(a\,x) == \frac{2\,a\sinh(a\,\pi)}{\pi}\left(\frac{1}{2\,a^2}+\sum_{k=1}^{\infty}\frac{(-1)^k\cos(k\,x)}{a^2+k^2}\right) /; i\,a\notin\mathbb{Z} \bigwedge -\pi<x<\pi$$

Asymptotic series expansions

01.20.06.0018.01

$$\cosh(z) \propto \cosh(z) /; (|z|\to\infty)$$

01.20.06.0019.01

$$\cosh(z) \propto \frac{e^z}{2} /; \left(z\to e^{i\,\phi}\,\infty\right) \bigwedge -\frac{\pi}{2}<\phi<\frac{\pi}{2}$$

01.20.06.0020.01

$$\cosh(z) \propto \frac{e^{-z}}{2} /; \left(z\to e^{i\,\phi}\,\infty\right) \bigwedge -\pi<\phi<-\frac{\pi}{2} \bigvee \frac{\pi}{2}<\phi\le\pi$$

01.20.06.0063.01

$$\cosh(z) \propto \begin{cases} \frac{e^{-z}}{2} & -\pi<\arg(z)<-\frac{\pi}{2} \bigvee \frac{\pi}{2}<\arg(z)\le\pi \\ \frac{e^{z}}{2} & -\frac{\pi}{2}<\arg(z)<\frac{\pi}{2} \\ \cosh(z) & \text{True} \end{cases} /; (|z|\to\infty)$$

Other series representations

01.20.06.0022.01

$$\log(\cosh(z)) == \sum_{k=1}^{\infty} \frac{2^{2k-1}\left(4^k-1\right) B_{2k}\, z^{2k}}{k\,(2k)!} \;/;\; |z| < \frac{\pi}{2}$$

01.20.06.0023.01

$$\cosh(z) == I_0(z) + 2\sum_{k=1}^{\infty} I_{2k}(z)$$

Residue representations

01.20.06.0021.01

$$\cosh(z) == \sqrt{\pi}\ \sum_{j=0}^{\infty} \text{res}_s\left(\frac{\left(-\frac{z^2}{4}\right)^{-s}}{\Gamma\left(\frac{1}{2}-s\right)}\,\Gamma(s)\right)(-j)$$

Integral representations

On the real axis

Of the direct function

01.20.07.0001.01

$$\cosh(z) == \int_{\frac{\pi i}{2}}^{z} \sinh(t)\, dt$$

01.20.07.0002.01

$$\cosh(z) == z\int_0^1 \sinh(z\,t)\, dt + 1$$

Contour integral representations

01.20.07.0003.01

$$\cosh(z) == \frac{\sqrt{\pi}}{2\pi i}\int_{\gamma-i\infty}^{\gamma+i\infty} e^{s+\frac{z^2}{4s}}\, s^{-\frac{1}{2}}\, ds \;/;\; \gamma > 0$$

01.20.07.0004.01

$$\cosh(z) == \frac{\sqrt{\pi}}{2i}\int_{\mathcal{L}} \frac{\Gamma(s)}{\Gamma\left(s+\frac{1}{2}\right)\Gamma\left(\frac{1}{2}-s\right)^2}\left(\frac{z^2}{4}\right)^{-s} ds$$

Product representations

01.20.08.0001.01

$$\cosh(z) == \prod_{k=-\infty}^{\infty}\left(1-\frac{2iz}{\pi(2k+1)}\right)\exp\left(\frac{2iz}{\pi(2k+1)}\right)$$

01.20.08.0002.01

$$\cosh(z) == \prod_{k=1}^{\infty}\left(\frac{4z^2}{\pi^2(2k-1)^2}+1\right)$$

Limit representations

01.20.09.0001.01

$$\cosh(z) == \lim_{n\to\infty} \frac{(-1)^n\, n\, \pi^{2\,n}}{2\,(2\,n)!}\, E_{2\,n-1}\left(\frac{i\,z}{\pi}\right)$$

01.20.09.0002.01

$$\cosh(z) == \lim_{a\to\infty} \mathrm{Ce}\left(a,\, q,\, \frac{i\,z}{\sqrt{a}}\right) /;\, q \in \mathbb{R}$$

01.20.09.0003.01

$$\cosh(z) == -\left(\lim_{a\to\infty} \frac{1}{\sqrt{a}}\, \mathrm{Se}'\left(a,\, q,\, \frac{i\,z}{\sqrt{a}}\right)\right) /;\, q \in \mathbb{R}$$

Differential equations

Ordinary linear differential equations and wronskians

For the direct function itself

01.20.13.0001.01

$$w''(z) - w(z) == 0\ /;\ w(z) == \cosh(z) \bigwedge w(0) == 1 \bigwedge w'(0) == 0$$

01.20.13.0002.01

$$w''(z) - w(z) == 0\ /;\ w(z) == c_1 \cosh(z) + c_2 \sinh(z)$$

01.20.13.0003.01

$$W_z(\cosh(z),\, \sinh(z)) == 1$$

01.20.13.0004.01

$$w''(z) - a\, w(z) + b == 0\ /;\ w(z) == \frac{b}{a} + c_1 \cosh\left(\sqrt{a}\ z\right) + c_2 \sinh\left(\sqrt{a}\ z\right)$$

01.20.13.0005.01

$$W_z\left(\cosh\left(\sqrt{a}\ z\right),\, \sinh\left(\sqrt{a}\ z\right)\right) == \sqrt{a}$$

01.20.13.0008.01

$$w''(z) - \frac{g''(z)}{g'(z)}\, w'(z) - g'(z)^2\, w(z) = 0\ /;\ w(z) = c_1 \cosh(g(z)) + c_2 \sinh(g(z))$$

01.20.13.0009.01

$$W_z(\cosh(g(z)),\, \sinh(g\,(z))) == g'(z)$$

01.20.13.0010.01

$$w''(z) - \left(\frac{2\,h'(z)}{h(z)} + \frac{g''(z)}{g'(z)}\right) w'(z) + \left(-g'(z)^2 + \frac{2\,h'(z)^2}{h(z)^2} + \frac{h'(z)\,g''(z)}{h(z)\,g'(z)} - \frac{h''(z)}{h(z)}\right) w(z) = 0\ /;$$
$$w(z) = c_1\, h(z) \cosh(g(z)) + c_2\, h(z) \sinh(g(z))$$

01.20.13.0011.01

$$W_z(h(z) \cosh(g(z)),\, h(z) \sinh(g\,(z))) == h(z)^2\, g'(z)$$

01.20.13.0012.01

$$z^2\, w''(z) - (r + 2\,s - 1)\, z\, w'(z) + \left(s\,(r+s) - a^2\, r^2\, z^{2\,r}\right) w(z) = 0\ /;\ w(z) = c_1\, z^s \cosh(a\, z^r) + c_2\, z^s \sinh(a\, z^r)$$

01.20.13.0013.01

$$W_z(z^s \cosh(a\, z^r),\, z^s \sinh(a\, z^r)) == a\, r\, z^{r+2\, s-1}$$

01.20.13.0014.01

$$w''(z) - (\log(r) + 2\log(s))\, w'(z) + \left(\log(s)\,(\log(r) + \log(s)) - a^2\, r^{2\, z} \log^2(r)\right) w(z) = 0 \,/;\, w(z) = c_1\, s^z \cosh(a\, r^z) + c_2\, s^z \sinh(a\, r^z)$$

01.20.13.0015.01

$$W_z(s^z \cosh(a\, r^z),\, s^z \sinh(a\, r^z)) == a\, r^z\, s^{2\, z} \log(r)$$

Ordinary nonlinear differential equations

01.20.13.0006.02

$$w'(z) - \sqrt{w(z)^2 - 1} == 0 \,/;\, w(z) == \cosh(z) \bigwedge w(0) == 1 \bigwedge |\mathrm{Im}(z)| < \frac{\pi}{2}$$

01.20.13.0007.01

$$w'(z) + \sqrt{a\, w(z)^2 + b\, w(z) + c} == 0 \,/;\, w(z) == \frac{\sqrt{b^2 - 4\, a\, c}}{2\, a}\left(i\, \sqrt{c_1}\, \sinh\left(\sqrt{-a}\, z\right) - \sqrt{1 - c_1}\, \cosh\left(\sqrt{-a}\, z\right)\right) - \frac{b}{2\, a}$$

Transformations

Transformations and argument simplifications

Argument involving basic arithmetic operations

01.20.16.0001.01

$$\cosh(-z) == \cosh(z)$$

01.20.16.0002.01

$$\cosh(a\, (b\, z^c)^m) == \cosh(a\, b^m\, z^{m\, c}) \,/;\, 2\, m \in \mathbb{Z}$$

01.20.16.0003.01

$$\cosh\left(\sqrt{z^2}\right) == \cosh(z)$$

Argument involving inverse trigonometric and hyperbolic functions

Involving $\sin^{-1}$

01.20.16.0125.01

$$\cosh\left(\sin^{-1}(z)\right) = \frac{1}{2}\left(i\, z + \sqrt{1 - z^2}\right)^{-i}\left(\left(i\, z + \sqrt{1 - z^2}\right)^{2\, i} + 1\right)$$

01.20.16.0004.01

$$\cosh\left(i\, \sin^{-1}(z)\right) == \sqrt{1 - z^2}$$

01.20.16.0017.01

$$\cosh\left(\frac{i}{2}\, \sin^{-1}(z)\right) == \frac{\sqrt{1 + \sqrt{1 - z^2}}}{\sqrt{2}}$$

01.20.16.0126.01

$$\cosh\left(a \sin^{-1}(z)\right) = \frac{1}{2}\left(i z + \sqrt{1 - z^2}\right)^{-i a}\left(\left(i z + \sqrt{1 - z^2}\right)^{2 i a} + 1\right)$$

01.20.16.0029.01

$$\cosh\left(i n \sin^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{n-2k-1} \left(1 - z^2\right)^{\frac{n}{2}-k}}{k!\, (n-2k)!} \text{ /; } n \in \mathbb{N}$$

01.20.16.0030.01

$$\cosh\left(i n \sin^{-1}(z)\right) == T_n\left(\sqrt{1 - z^2}\right)$$

01.20.16.0055.01

$$\cosh\left(\frac{i n}{2} \sin^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\, (n-2k)!} \left(\sqrt{1 - z^2} + 1\right)^{\frac{n}{2}-k} \text{ /; } n \in \mathbb{N}^+$$

01.20.16.0056.01

$$\cosh\left(\frac{i n}{2} \sin^{-1}(z)\right) == T_n\left(\frac{\sqrt{\sqrt{1 - z^2} + 1}}{\sqrt{2}}\right) \text{ /; } n \in \mathbb{N}^+$$

Involving $\cos^{-1}$

01.20.16.0127.01

$$\cosh\left(\cos^{-1}(z)\right) = \frac{1}{2} e^{-\frac{\pi}{2}}\left(i z + \sqrt{1 - z^2}\right)^{-i}\left(e^{\pi}\left(i z + \sqrt{1 - z^2}\right)^{2 i} + 1\right)$$

01.20.16.0005.01

$$\cosh\left(i \cos^{-1}(z)\right) == z$$

01.20.16.0018.01

$$\cosh\left(\frac{i}{2} \cos^{-1}(z)\right) == \frac{\sqrt{z + 1}}{\sqrt{2}}$$

01.20.16.0128.01

$$\cosh\left(a \cos^{-1}(z)\right) = \frac{1}{2} e^{\frac{1}{2}(-a)\pi}\left(i z + \sqrt{1 - z^2}\right)^{-i a}\left(e^{a \pi}\left(i z + \sqrt{1 - z^2}\right)^{2 i a} + 1\right)$$

01.20.16.0031.01

$$\cosh\left(i n \cos^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{n-2k-1} z^{n-2k}}{k!\, (n-2k)!} \text{ /; } n \in \mathbb{N}$$

01.20.16.0032.01

$$\cosh\left(i n \cos^{-1}(z)\right) == T_n(z)$$

01.20.16.0057.01

$$\cosh\left(\frac{i n}{2} \cos^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\, (n-2k)!} (1 + z)^{\frac{n}{2}-k} \text{ /; } n \in \mathbb{N}^+$$

01.20.16.0058.01

$$\cosh\left(\frac{i\,n}{2}\cos^{-1}(z)\right) == T_n\left(\frac{\sqrt{z+1}}{\sqrt{2}}\right) /;\ n \in \mathbb{N}^+$$

Involving $\tan^{-1}$

01.20.16.0129.01

$$\cosh\left(\tan^{-1}(z)\right) == \frac{1}{2}\left((i\,z+1)^i + (1-i\,z)^i\right)\left(z^2+1\right)^{-\frac{1}{2}i}$$

01.20.16.0130.01

$$\cosh\left(\tan^{-1}(x,\,y)\right) = \frac{1}{2}\left(\frac{x+i\,y}{\sqrt{x^2+y^2}}\right)^{-i}\left(\left(\frac{x+i\,y}{\sqrt{x^2+y^2}}\right)^{2i}+1\right)$$

01.20.16.0006.01

$$\cosh\left(i\tan^{-1}(z)\right) == \frac{1}{\sqrt{1+z^2}}$$

01.20.16.0007.01

$$\cosh\left(i\tan^{-1}(x,\,y)\right) == \frac{x}{\sqrt{x^2+y^2}}$$

01.20.16.0019.01

$$\cosh\left(\frac{i}{2}\tan^{-1}(z)\right) == \frac{1}{\sqrt{2}}\sqrt{1+\frac{1}{\sqrt{1+z^2}}}$$

01.20.16.0131.01

$$\cosh\left(\frac{1}{2}i\tan^{-1}(x,\,y)\right) = \frac{\frac{x+i\,y}{\sqrt{x^2+y^2}}+1}{2\sqrt{\frac{x+i\,y}{\sqrt{x^2+y^2}}}}$$

01.20.16.0132.01

$$\cosh\left(a\tan^{-1}(z)\right) == \frac{1}{2}\left((i\,z+1)^{a\,i} + (1-i\,z)^{a\,i}\right)\left(z^2+1\right)^{-\frac{1}{2}(a\,i)}$$

01.20.16.0133.01

$$\cosh\left(a\tan^{-1}(x,\,y)\right) = \frac{1}{2}\left(\frac{x+i\,y}{\sqrt{x^2+y^2}}\right)^{-i\,a}\left(\left(\frac{x+i\,y}{\sqrt{x^2+y^2}}\right)^{2\,i\,a}+1\right)$$

01.20.16.0033.01

$$\cosh\left(i\,n\tan^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k\,(n-k-1)!\,2^{n-2\,k-1}\left(z^2+1\right)^{k-\frac{n}{2}}}{k!\,(n-2\,k)!} /;\ n \in \mathbb{N}$$

01.20.16.0034.01

$$\cosh\left(i\,n\tan^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{1+z^2}}\right)$$

01.20.16.0035.01

$$\cosh\left(i\, n \tan^{-1}(x, y)\right) == \frac{n\, x^n}{\left(x^2+y^2\right)^{n/2}} \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k\, (n-k-1)!\, 2^{n-2\,k-1}}{k!\, (n-2\,k)!} \left(\frac{x^2+y^2}{x^2}\right)^k /;\ n \in \mathbb{N}$$

01.20.16.0036.01

$$\cosh\left(i\, n \tan^{-1}(x, y)\right) == T_n\left(\frac{x}{\sqrt{x^2+y^2}}\right)$$

01.20.16.0059.01

$$\cosh\left(\frac{i\, n}{2} \tan^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k\, (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\, (n-2\,k)!} \left(1+\frac{1}{\sqrt{z^2+1}}\right)^{\frac{n}{2}-k} /;\ n \in \mathbb{N}^+$$

01.20.16.0060.01

$$\cosh\left(\frac{i\, n}{2} \tan^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{2}} \sqrt{1+\frac{1}{\sqrt{z^2+1}}}\right) /;\ n \in \mathbb{N}^+$$

Involving $\cot^{-1}$

01.20.16.0134.01

$$\cosh\left(\cot^{-1}(z)\right) = \frac{1}{2}\left(1+\frac{1}{z^2}\right)^{-\frac{i}{2}} \left(\left(\frac{-i+z}{z}\right)^i + \left(\frac{i+z}{z}\right)^i\right)$$

01.20.16.0135.01

$$\cosh\left(i \cot^{-1}(z)\right) = \frac{1}{\sqrt{1+\frac{1}{z^2}}}$$

01.20.16.0008.01

$$\cosh\left(i \cot^{-1}(z)\right) == \frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}$$

01.20.16.0020.01

$$\cosh\left(\frac{i}{2} \cot^{-1}(z)\right) == \frac{1}{\sqrt{2}} \sqrt{1+\frac{1}{\sqrt{1+\frac{1}{z^2}}}}$$

01.20.16.0136.01

$$\cosh\left(a \cot^{-1}(z)\right) = \frac{1}{2}\left(1+\frac{1}{z^2}\right)^{-\frac{1}{2}(a\,i)} \left(\left(\frac{-i+z}{z}\right)^{a\,i} + \left(\frac{i+z}{z}\right)^{a\,i}\right)$$

01.20.16.0037.01

$$\cosh\left(i\, n \cot^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k\, (n-k-1)!\, 2^{n-2\,k-1}}{k!\, (n-2\,k)!} \left(\frac{1+z^2}{z^2}\right)^{k-\frac{n}{2}} /;\ n \in \mathbb{N}$$

01.20.16.0038.01

$$\cosh\left(i\, n \cot^{-1}(z)\right) == T_n\left(\frac{\sqrt{-z^2}}{\sqrt{-1-z^2}}\right)$$

01.20.16.0061.01

$$\cosh\left(\frac{i\, n}{2} \cot^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k\, (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\, (n-2\,k)!} \left(\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}} + 1\right)^{\frac{n}{2}-k} /;\ n \in \mathbb{N}^+$$

01.20.16.0062.01

$$\cosh\left(\frac{i\, n}{2} \cot^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{2}} \sqrt{\frac{\sqrt{-z^2}}{\sqrt{-z^2-1}} + 1}\right) /;\ n \in \mathbb{N}^+$$

Involving $\csc^{-1}$

01.20.16.0137.01

$$\cosh\left(\csc^{-1}(z)\right) = \frac{1}{2}\left(\left(\sqrt{1-\frac{1}{z^2}} + \frac{i}{z}\right)^{2\,i} + 1\right)\left(\sqrt{1-\frac{1}{z^2}} + \frac{i}{z}\right)^{-i}$$

01.20.16.0009.01

$$\cosh\left(i \csc^{-1}(z)\right) == \sqrt{1-\frac{1}{z^2}}$$

01.20.16.0021.01

$$\cosh\left(\frac{i}{2} \csc^{-1}(z)\right) == \frac{1}{\sqrt{2}} \sqrt{1 + \frac{\sqrt{z^2}\ \sqrt{z^2-1}}{z^2}}$$

01.20.16.0138.01

$$\cosh\left(a \csc^{-1}(z)\right) = \frac{1}{2}\left(\left(\sqrt{1-\frac{1}{z^2}} + \frac{i}{z}\right)^{2\,i\,a} + 1\right)\left(\sqrt{1-\frac{1}{z^2}} + \frac{i}{z}\right)^{-i\,a}$$

01.20.16.0039.01

$$\cosh\left(i\, n \csc^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k\, (n-k-1)!\, 2^{n-2\,k-1}}{k!\, (n-2\,k)!} \left(1-\frac{1}{z^2}\right)^{\frac{n}{2}-k} /;\ n \in \mathbb{N}$$

01.20.16.0040.01

$$\cosh\left(i\, n \csc^{-1}(z)\right) == T_n\left(\sqrt{1-\frac{1}{z^2}}\right)$$

01.20.16.0063.01

$$\cosh\left(\frac{i\, n}{2} \csc^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k\, (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\, (n-2\,k)!} \left(1+\sqrt{1-\frac{1}{z^2}}\right)^{\frac{n}{2}-k} /;\ n \in \mathbb{N}^+$$

01.20.16.0064.01

$$\cosh\left(\frac{i\,n}{2}\csc^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{2}}\sqrt{\sqrt{1-\frac{1}{z^2}}+1}\right) /;\ n\in\mathbb{N}^+$$

Involving $\sec^{-1}$

01.20.16.0139.01

$$\cosh\left(\sec^{-1}(z)\right) = \frac{1}{2}e^{-\frac{\pi}{2}}\left(e^{\pi}\left(\sqrt{1-\frac{1}{z^2}}+\frac{i}{z}\right)^{2i}+1\right)\left(\sqrt{1-\frac{1}{z^2}}+\frac{i}{z}\right)^{-i}$$

01.20.16.0010.01

$$\cosh\left(i\sec^{-1}(z)\right) == \frac{1}{z}$$

01.20.16.0022.01

$$\cosh\left(\frac{i}{2}\sec^{-1}(z)\right) == \frac{\sqrt{-z-1}}{\sqrt{-2\,z}}$$

01.20.16.0140.01

$$\cosh\left(a\sec^{-1}(z)\right) == \frac{1}{2}e^{\frac{1}{2}(-a)\pi}\left(e^{a\pi}\left(\sqrt{1-\frac{1}{z^2}}+\frac{i}{z}\right)^{2ia}+1\right)\left(\sqrt{1-\frac{1}{z^2}}+\frac{i}{z}\right)^{-ia}$$

01.20.16.0041.01

$$\cosh\left(i\,n\sec^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k\,(n-k-1)!\,2^{n-2k-1}\,z^{2k-n}}{k!\,(n-2\,k)!} /;\ n\in\mathbb{N}$$

01.20.16.0042.01

$$\cosh\left(i\,n\sec^{-1}(z)\right) == T_n\left(\frac{1}{z}\right)$$

01.20.16.0065.01

$$\cosh\left(\frac{i\,n}{2}\sec^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k\,(n-k-1)!\,2^{\frac{n}{2}-k-1}}{k!\,(n-2\,k)!}\left(\frac{z+1}{z}\right)^{\frac{n}{2}-k} /;\ n\in\mathbb{N}^+$$

01.20.16.0066.01

$$\cosh\left(\frac{i\,n}{2}\sec^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{2}}\sqrt{\frac{z+1}{z}}\right) /;\ n\in\mathbb{N}^+$$

Involving $\sinh^{-1}$

01.20.16.0011.01

$$\cosh\left(\sinh^{-1}(z)\right) == \sqrt{1+z^2}$$

01.20.16.0023.01

$$\cosh\left(\frac{1}{2}\sinh^{-1}(z)\right) == \frac{\sqrt{\sqrt{z^2+1}+1}}{\sqrt{2}}$$

01.20.16.0141.01

$$\cosh\left(i\sinh^{-1}(z)\right) = \frac{1}{2}\left(z+\sqrt{z^2+1}\right)^{-i}\left(\left(z+\sqrt{z^2+1}\right)^{2i}+1\right)$$

01.20.16.0142.01

$$\cosh\left(a\sinh^{-1}(z)\right) = \frac{1}{2}\left(z+\sqrt{z^2+1}\right)^{-a}\left(\left(z+\sqrt{z^2+1}\right)^{2a}+1\right)$$

01.20.16.0043.01

$$\cosh\left(n\sinh^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k(n-k-1)!\,2^{n-2k-1}\left(1+z^2\right)^{\frac{n}{2}-k}}{k!\,(n-2k)!}\;/;\; n\in\mathbb{N}$$

01.20.16.0044.01

$$\cosh\left(n\sinh^{-1}(z)\right) == T_n\left(\sqrt{1+z^2}\right)$$

01.20.16.0067.01

$$\cosh\left(\frac{n}{2}\sinh^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k(n-k-1)!\,2^{\frac{n}{2}-k-1}}{k!\,(n-2k)!}\left(\sqrt{1+z^2}+1\right)^{\frac{n}{2}-k}\;/;\; n\in\mathbb{N}^+$$

01.20.16.0068.01

$$\cosh\left(\frac{n}{2}\sinh^{-1}(z)\right) == T_n\left(\frac{\sqrt{\sqrt{1+z^2}+1}}{\sqrt{2}}\right)\;/;\; n\in\mathbb{N}^+$$

Involving $\cosh^{-1}$

01.20.16.0012.01

$$\cosh\left(\cosh^{-1}(z)\right) == z$$

01.20.16.0024.01

$$\cosh\left(\frac{1}{2}\cosh^{-1}(z)\right) == \frac{\sqrt{z+1}}{\sqrt{2}}$$

01.20.16.0143.01

$$\cosh\left(i\cosh^{-1}(z)\right) = \frac{1}{2}\left(z+\sqrt{z-1}\,\sqrt{z+1}\right)^{-i}\left(\left(z+\sqrt{z-1}\,\sqrt{z+1}\right)^{2i}+1\right)$$

01.20.16.0144.01

$$\cosh\left(a\cosh^{-1}(z)\right) = \frac{1}{2}\left(z+\sqrt{z-1}\,\sqrt{z+1}\right)^{-a}\left(\left(z+\sqrt{z-1}\,\sqrt{z+1}\right)^{2a}+1\right)$$

01.20.16.0045.01

$$\cosh\left(n \cosh^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{n-2k-1} z^{n-2k}}{k!\, (n-2k)!} /; n \in \mathbb{N}$$

01.20.16.0046.01

$$\cosh\left(n \cosh^{-1}(z)\right) == T_n(z)$$

01.20.16.0069.01

$$\cosh\left(\frac{n}{2} \cosh^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\, (n-2k)!} (1+z)^{\frac{n}{2}-k} /; n \in \mathbb{N}^+$$

01.20.16.0070.01

$$\cosh\left(\frac{n}{2} \cosh^{-1}(z)\right) == T_n\left(\frac{\sqrt{z+1}}{\sqrt{2}}\right) /; n \in \mathbb{N}^+$$

Involving $\tanh^{-1}$

01.20.16.0013.01

$$\cosh\left(\tanh^{-1}(z)\right) == \frac{1}{\sqrt{1-z^2}}$$

01.20.16.0025.01

$$\cosh\left(\frac{1}{2} \tanh^{-1}(z)\right) == \frac{1}{\sqrt{2}} \sqrt{1 + \frac{1}{\sqrt{1-z^2}}}$$

01.20.16.0145.01

$$\cosh\left(i \tanh^{-1}(z)\right) == \frac{1}{2} \left(1-z^2\right)^{-\frac{i}{2}} \left((1-z)^i + (z+1)^i\right)$$

01.20.16.0146.01

$$\cosh\left(a \tanh^{-1}(z)\right) == \frac{1}{2} \left(1-z^2\right)^{-\frac{a}{2}} \left((1-z)^a + (z+1)^a\right)$$

01.20.16.0047.01

$$\cosh\left(n \tanh^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{n-2k-1} \left(1-z^2\right)^{k-\frac{n}{2}}}{k!\, (n-2k)!} /; n \in \mathbb{N}$$

01.20.16.0048.01

$$\cosh\left(n \tanh^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{1-z^2}}\right)$$

01.20.16.0071.01

$$\cosh\left(\frac{n}{2} \tanh^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\, (n-2k)!} \left(1 + \frac{1}{\sqrt{1-z^2}}\right)^{\frac{n}{2}-k} /; n \in \mathbb{N}^+$$

01.20.16.0072.01

$$\cosh\left(\frac{n}{2}\tanh^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{2}}\sqrt{1+\frac{1}{\sqrt{1-z^2}}}\right) /; n \in \mathbb{N}^+$$

Involving $\coth^{-1}$

01.20.16.0014.01

$$\cosh\left(\coth^{-1}(z)\right) == \frac{\sqrt{z^2}}{\sqrt{z^2-1}}$$

01.20.16.0026.01

$$\cosh\left(\frac{1}{2}\coth^{-1}(z)\right) == \frac{1}{\sqrt{2}}\sqrt{1+\frac{1}{\sqrt{1-\frac{1}{z^2}}}}$$

01.20.16.0147.01

$$\cosh\left(i\coth^{-1}(z)\right) = \frac{1}{2}\left(\left(1+\frac{1}{z}\right)^i + \left(\frac{z-1}{z}\right)^i\right)\left(1-\frac{1}{z^2}\right)^{-\frac{i}{2}}$$

01.20.16.0148.01

$$\cosh\left(a\coth^{-1}(z)\right) = \frac{1}{2}\left(\left(1+\frac{1}{z}\right)^a + \left(1-\frac{1}{z}\right)^a\right)\left(1-\frac{1}{z^2}\right)^{-\frac{a}{2}}$$

01.20.16.0049.01

$$\cosh\left(n\coth^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k(n-k-1)!\,2^{n-2k-1}}{k!\,(n-2k)!}\left(\frac{z^2-1}{z^2}\right)^{k-\frac{n}{2}} /; n \in \mathbb{N}$$

01.20.16.0050.01

$$\cosh\left(n\coth^{-1}(z)\right) == T_n\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}\right)$$

01.20.16.0073.01

$$\cosh\left(\frac{n}{2}\coth^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k(n-k-1)!\,2^{\frac{n}{2}-k-1}}{k!\,(n-2k)!}\left(\frac{\sqrt{z^2}}{\sqrt{z^2-1}}+1\right)^{\frac{n}{2}-k} /; n \in \mathbb{N}^+$$

01.20.16.0074.01

$$\cosh\left(\frac{n}{2}\coth^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{2}}\sqrt{\frac{\sqrt{z^2}}{\sqrt{z^2-1}}+1}\right) /; n \in \mathbb{N}^+$$

Involving csch^{-1}

01.20.16.0015.01

$$\cosh\left(\operatorname{csch}^{-1}(z)\right) == \sqrt{1+\frac{1}{z^2}}$$

01.20.16.0027.01

$$\cosh\left(\frac{1}{2}\operatorname{csch}^{-1}(z)\right) == \frac{1}{\sqrt{2}}\sqrt{\sqrt{1+\frac{1}{z^2}}+1}$$

01.20.16.0149.01

$$\cosh\left(i\operatorname{csch}^{-1}(z)\right) = \frac{1}{2}\left(\left(\sqrt{1+\frac{1}{z^2}}+\frac{1}{z}\right)^{2i}+1\right)\left(\sqrt{1+\frac{1}{z^2}}+\frac{1}{z}\right)^{-i}$$

01.20.16.0150.01

$$\cosh\left(a\operatorname{csch}^{-1}(z)\right) = \frac{1}{2}\left(\left(\sqrt{1+\frac{1}{z^2}}+\frac{1}{z}\right)^{2a}+1\right)\left(\sqrt{1+\frac{1}{z^2}}+\frac{1}{z}\right)^{-a}$$

01.20.16.0051.01

$$\cosh\left(n\operatorname{csch}^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k\,(n-k-1)!\,2^{n-2k-1}}{k!\,(n-2k)!}\left(1+\frac{1}{z^2}\right)^{\frac{n}{2}-k} /;\ n\in\mathbb{N}$$

01.20.16.0052.01

$$\cosh\left(n\operatorname{csch}^{-1}(z)\right) == T_n\left(\sqrt{1+\frac{1}{z^2}}\right)$$

01.20.16.0075.01

$$\cosh\left(\frac{n}{2}\operatorname{csch}^{-1}(z)\right) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k\,(n-k-1)!\,2^{\frac{n}{2}-k-1}}{k!\,(n-2k)!}\left(1+\sqrt{1+\frac{1}{z^2}}\right)^{\frac{n}{2}-k} /;\ n\in\mathbb{N}^+$$

01.20.16.0076.01

$$\cosh\left(\frac{n}{2}\operatorname{csch}^{-1}(z)\right)\Big) == T_n\left(\frac{1}{\sqrt{2}}\sqrt{\sqrt{1+\frac{1}{z^2}}+1}\right) /;\ n\in\mathbb{N}^+$$

Involving sech^{-1}

01.20.16.0016.01

$$\cosh\left(\operatorname{sech}^{-1}(z)\right) == \frac{1}{z}$$

01.20.16.0028.01

$$\cosh\left(\frac{1}{2}\operatorname{sech}^{-1}(z)\right) == \frac{\sqrt{-z-1}}{\sqrt{-2z}}$$

01.20.16.0151.01

$$\cosh\left(i \operatorname{sech}^{-1}(z)\right) = \frac{1}{2}\left(\left(\sqrt{\frac{1}{z}-1}\,\sqrt{1+\frac{1}{z}}+\frac{1}{z}\right)^{2i}+1\right)\left(\sqrt{\frac{1}{z}-1}\,\sqrt{1+\frac{1}{z}}+\frac{1}{z}\right)^{-i}$$

01.20.16.0152.01

$$\cosh\left(a \operatorname{sech}^{-1}(z)\right) = \frac{1}{2}\left(\left(\sqrt{\frac{1}{z}-1}\,\sqrt{1+\frac{1}{z}}+\frac{1}{z}\right)^{2a}+1\right)\left(\sqrt{\frac{1}{z}-1}\,\sqrt{1+\frac{1}{z}}+\frac{1}{z}\right)^{-a}$$

01.20.16.0053.01

$$\cosh\left(n \operatorname{sech}^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{n-2k-1} z^{2k-n}}{k!\,(n-2k)!} \text{ /; } n \in \mathbb{N}$$

01.20.16.0054.01

$$\cosh\left(n \operatorname{sech}^{-1}(z)\right) == T_n\left(\frac{1}{z}\right)$$

01.20.16.0077.01

$$\cosh\left(\frac{n}{2} \operatorname{sech}^{-1}(z)\right) == n \sum_{k=0}^{\left\lfloor \frac{n}{2} \right\rfloor} \frac{(-1)^k (n-k-1)!\, 2^{\frac{n}{2}-k-1}}{k!\,(n-2k)!} \left(\frac{z+1}{z}\right)^{\frac{n}{2}-k} \text{ /; } n \in \mathbb{N}^+$$

01.20.16.0078.01

$$\cosh\left(\frac{n}{2} \operatorname{sech}^{-1}(z)\right) == T_n\left(\frac{1}{\sqrt{2}}\sqrt{\frac{z+1}{z}}\right) \text{ /; } n \in \mathbb{N}^+$$

Addition formulas

01.20.16.0079.01

$$\cosh(a+b) == \cosh(a)\cosh(b) + \sinh(a)\sinh(b)$$

01.20.16.0080.01

$$\cosh(a-b) == \cosh(b)\cosh(a) - \sinh(a)\sinh(b)$$

01.20.16.0081.01

$$\cosh(a+i\,b) == \cos(b)\cosh(a) + i\sin(b)\sinh(a)$$

01.20.16.0082.01

$$\cosh(a-i\,b) == \cos(b)\cosh(a) - i\sinh(a)\sin(b)$$

Half-angle formulas

01.20.16.0083.01

$$\cosh\left(\frac{z}{2}\right) == \sqrt{\frac{1+\cosh(z)}{2}} \text{ /; } |\operatorname{Im}(z)| < \pi$$

01.20.16.0084.01

$$\cosh\left(\frac{z}{2}\right) == (-1)^{\left\lfloor \frac{\operatorname{Im}(z)+\pi}{2\pi} \right\rfloor} \sqrt{\frac{1+\cosh(z)}{2}} \left(1 - \left(1+(-1)^{\left\lfloor \frac{\operatorname{Im}(z)+\pi}{2\pi} \right\rfloor + \left\lfloor -\frac{\operatorname{Im}(z)+\pi}{2\pi} \right\rfloor}\right)\theta(\operatorname{Re}(z))\right)$$

Multiple arguments

Argument involving numeric multiples of variable

01.20.16.0085.01

$$\cosh(2\,z) == \cosh^2(z) + \sinh^2(z)$$

01.20.16.0086.01

$$\cosh(2\,z) == 2\cosh^2(z) - 1$$

01.20.16.0087.01

$$\cosh(3\,z) == \cosh^3(z) + 3\sinh^2(z)\cosh(z)$$

01.20.16.0088.01

$$\cosh(3\,z) == 4\cosh^3(z) - 3\cosh(z)$$

Argument involving symbolic multiples of variable

01.20.16.0089.01

$$\cosh(n\,z) == n\sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\frac{(-1)^k\,(n-k-1)!\,2^{n-2\,k-1}\cosh^{n-2\,k}(z)}{k!\,(n-2\,k)!}\;/;\;n\in\mathbb{N}$$

01.20.16.0090.01

$$\cosh(n\,z) == 2^{n-1}\cosh^n(z) + n\sum_{k=1}^{\left\lfloor\frac{n}{2}\right\rfloor}\binom{n-k-1}{k-1}\frac{(-1)^k\;2^{n-2\,k-1}}{k}\cosh^{n-2\,k}(z)\;/;\;n\in\mathbb{N}$$

01.20.16.0091.01

$$\cosh(n\,z) == \sum_{k=0}^{\left\lfloor\frac{n}{2}\right\rfloor}\binom{n}{2\,k}\sinh^{2\,k}(z)\cosh^{n-2\,k}(z)\;/;\;n\in\mathbb{N}$$

01.20.16.0092.01

$$\cosh(n\,z) == T_n(\cosh(z))$$

01.20.16.0153.01

$$\cosh(a\,z) == \frac{1}{2}\left(e^{-2\,i\,\pi\,a\left\lfloor\frac{\mathrm{Im}(z)+\pi}{2\,\pi}\right\rfloor}(\cosh(z)-\sinh(z))^a + e^{-2\,i\,\pi\,a\left\lfloor\frac{\pi-\mathrm{Im}(z)}{2\,\pi}\right\rfloor}(\cosh(z)+\sinh(z))^a\right)$$

Products, sums, and powers of the direct function

Products of the direct function

01.20.16.0093.01

$$\cosh(a)\cosh(b) == \frac{1}{2}(\cosh(a-b)+\cosh(a+b))$$

01.20.16.0108.01

$$\prod_{k=1}^{n}\cosh(z_k) == 2^{-n}\sum_{\substack{k_1=-1\\ \Delta\,k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta\,k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta\,k_n=2}}^{1}\cosh\left(\sum_{j=1}^{n}k_j\,z_j\right)\;/;\;n\in\mathbb{N}^+$$

Products involving the direct function

01.20.16.0094.01

$$\cosh(a)\sinh(b) == \frac{1}{2}(\sinh(a+b)-\sinh(a-b))$$

01.20.16.0109.01

$$\left(\prod_{k=1}^{m}\cosh(z_k)\right)\left(\prod_{k=m+1}^{n}\sinh(z_k)\right) == 2^{-n}\sum_{\substack{k_1=-1\\ \Delta k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta k_n=2}}^{1}(-1)^{\sum_{j=m+1}^{n}\frac{1}{4}(2k_j+2)}\cosh\left(\sum_{j=1}^{n}k_j z_j\right)/;$$

$$n\in\mathbb{N}\bigwedge m\in\mathbb{N}\bigwedge m\le n\bigwedge\frac{n-m}{2}\in\mathbb{N}$$

01.20.16.0110.01

$$\left(\prod_{k=1}^{m}\cosh(z_k)\right)\left(\prod_{k=m+1}^{n}\sinh(z_k)\right) == -2^{-n}\sum_{\substack{k_1=-1\\ \Delta k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta k_n=2}}^{1}(-1)^{\sum_{j=m+1}^{n}\frac{1}{4}(2k_j+2)}\sinh\left(\sum_{j=1}^{n}k_j z_j\right)/;$$

$$n\in\mathbb{N}\bigwedge m\in\mathbb{N}\bigwedge m\le n\bigwedge\frac{n-m+1}{2}\in\mathbb{N}$$

Sums of the direct function

01.20.16.0095.01

$$\cosh(a)+\cosh(b) == 2\cosh\left(\frac{a-b}{2}\right)\cosh\left(\frac{a+b}{2}\right)$$

01.20.16.0096.01

$$\cosh(a)-\cosh(b) == 2\sinh\left(\frac{a+b}{2}\right)\sinh\left(\frac{a-b}{2}\right)$$

Sums involving the direct function

Involving other hyperbolic functions

Involving sinh

01.20.16.0111.01

$$\cosh(z)+\sinh(z) == e^{z}$$

01.20.16.0112.01

$$\cosh(z)-\sinh(z) == e^{-z}$$

01.20.16.0113.01

$$\cosh(a)+i\sinh(b) == 2\cosh\left(\frac{a+b}{2}+\frac{i\pi}{4}\right)\cosh\left(\frac{a-b}{2}-\frac{i\pi}{4}\right)$$

01.20.16.0114.01

$$\cosh(a)-i\sinh(b) == 2\cosh\left(\frac{a-b}{2}+\frac{i\pi}{4}\right)\cosh\left(\frac{a+b}{2}-\frac{i\pi}{4}\right)$$

01.20.16.0115.01

$$a\cosh(z)+b\sinh(z) == \sqrt{1-\frac{a^2}{b^2}}\;\;b\sinh\left(z+\tanh^{-1}\left(\frac{a}{b}\right)\right)$$

Involving trigonometric functions

Involving sin

01.20.16.0116.01

$$\cosh(z) + \sin(z) == 2 \cos\left(\frac{\pi}{4} - \frac{i\, e^{-\frac{1}{4}(i\pi)}\, z}{\sqrt{2}}\right) \cos\left(\frac{e^{\frac{i\pi}{4}}\, i\, z}{\sqrt{2}} + \frac{\pi}{4}\right)$$

01.20.16.0117.01

$$\cosh(z) - \sin(z) == 2 \cos\left(\frac{\pi}{4} - \frac{i\, e^{\frac{1}{4}(i\pi)}\, z}{\sqrt{2}}\right) \cos\left(\frac{e^{-\frac{i\pi}{4}}\, i\, z}{\sqrt{2}} + \frac{\pi}{4}\right)$$

01.20.16.0118.01

$$\cosh(a) - \sin(b) == 2 \cosh\left(\frac{a - i\, b}{2} + \frac{i\pi}{4}\right) \cosh\left(\frac{a + i\, b}{2} - \frac{i\pi}{4}\right)$$

01.20.16.0119.01

$$\cosh(a) - \sin(b) == 2 \cosh\left(\frac{a + i\, b}{2} + \frac{i\pi}{4}\right) \cosh\left(\frac{a - i\, b}{2} - \frac{i\pi}{4}\right)$$

Involving cos

01.20.16.0120.01

$$\cosh(z) + \cos(z) == 2 \cosh\left(\frac{z\, e^{-\frac{1}{4}(i\pi)}}{\sqrt{2}}\right) \cosh\left(\frac{z\, e^{\frac{i\pi}{4}}}{\sqrt{2}}\right)$$

01.20.16.0121.01

$$\cosh(z) - \cos(z) == 2 \sinh\left(\frac{z\, e^{-\frac{1}{4}(i\pi)}}{\sqrt{2}}\right) \sinh\left(\frac{z\, e^{\frac{i\pi}{4}}}{\sqrt{2}}\right)$$

01.20.16.0122.01

$$\cos(b) + \cosh(a) == 2 \cosh\left(\frac{a + i\, b}{2}\right) \cosh\left(\frac{a - i\, b}{2}\right)$$

01.20.16.0123.01

$$\cosh(a) - \cos(b) == 2 \sinh\left(\frac{a + i\, b}{2}\right) \sinh\left(\frac{a - i\, b}{2}\right)$$

Powers of the direct function

01.20.16.0097.01

$$\cosh^2(z) == \frac{1 + \cosh(2\, z)}{2}$$

01.20.16.0098.01

$$\cosh^3(z) == \frac{1}{4}(3 \cosh(z) + \cosh(3\, z))$$

01.20.16.0099.01

$$\cosh^{2\,n}(z) == 2^{-2\,n} \binom{2\,n}{n} + 2^{1-2\,n} \sum_{k=0}^{n-1} \binom{2\,n}{k} \cosh(2\,(n-k)\, z) \;/;\; n \in \mathbb{N}$$

01.20.16.0124.01

$$\cosh^{2n}(z) == 2^{1-2n}\sum_{k=0}^{n-1}\binom{2n}{k}(\cosh(2(n-k)z)-1)+1 \;/;\; n\in\mathbb{N}$$

01.20.16.0100.01

$$\cosh^{2n+1}(z) == 2^{-2n}\sum_{k=0}^{n}\binom{2n+1}{k}\cosh((-2k+2n+1)z) \;/;\; n\in\mathbb{N}$$

01.20.16.0101.01

$$\cosh^{n}(z) == 2^{-n}\binom{n}{\frac{n}{2}}(1-n \bmod 2)+2^{1-n}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}\binom{n}{k}\cosh((n-2k)z) \;/;\; n\in\mathbb{N}^{+}$$

Powers involving the direct function

01.20.16.0102.01

$$(\cosh(z)+\sinh(z))^{n} == \cosh(nz)+\sinh(nz) \;/;\; n\in\mathbb{N}$$

01.20.16.0103.01

$$(\cosh(z)+\sinh(z))^{n} == e^{nz} \;/;\; n\in\mathbb{N}$$

01.20.16.0104.01

$$(\cosh(z)-\sinh(z))^{n} == \cosh(nz)-\sinh(nz) \;/;\; n\in\mathbb{N}$$

01.20.16.0105.01

$$(\cosh(z)-\sinh(z))^{n} == e^{-nz} \;/;\; n\in\mathbb{N}$$

Sums of powers involving the direct function

01.20.16.0106.01

$$\cosh^{2}(a)-\cosh^{2}(b) == \sinh(a-b)\sinh(a+b)$$

01.20.16.0107.01

$$\cosh^{2}(a)+\sinh^{2}(b) == \cosh(a-b)\cosh(a+b)$$

Identities

Functional identities

Bivariate functional identities

01.20.17.0001.01

$$\cosh^{2}(z_1)-2\cosh(z_2)\cosh(z_1+z_2)\cosh(z_1)+\cosh^{2}(z_2)+\cosh^{2}(z_1+z_2) == 1$$

01.20.17.0002.01

$$g(x-y)+g(x+y) == 2g(x)g(y) \;/;\; g(z) == \cosh(cz) \bigwedge x\in\mathbb{R} \bigwedge y\in\mathbb{R}$$

Complex characteristics

Real part

01.20.19.0001.01

$$\operatorname{Re}(\cosh(x+iy)) == \cos(y)\cosh(x)$$

01.20.19.0008.01

$$\mathrm{Re}(\cosh(z)) == \cos(\mathrm{Im}(z))\cosh(\mathrm{Re}(z))$$

Imaginary part

01.20.19.0002.01

$$\mathrm{Im}(\cosh(x + i\,y)) == \sin(y)\sinh(x)$$

01.20.19.0009.01

$$\mathrm{Im}(\cosh(z)) == \sin(\mathrm{Im}(z))\sinh(\mathrm{Re}(z))$$

Absolute value

01.20.19.0010.01

$$|\cosh(z)| == \sqrt{\frac{1}{2}(\cos(2\,y) + \cosh(2\,x))}$$

01.20.19.0003.01

$$|\cosh(x + i\,y)| == \sqrt{\cos^2(y)\cosh^2(x) + \sin^2(y)\sinh^2(x)}$$

01.20.19.0004.01

$$|\cosh(z)| == \sqrt{\frac{1}{2}(\cos(2\,\mathrm{Im}(z)) + \cosh(2\,\mathrm{Re}(z)))}$$

Argument

01.20.19.0005.01

$$\arg(\cosh(x + i\,y)) == \tan^{-1}(\cos(y)\cosh(x),\ \sin(y)\sinh(x))$$

01.20.19.0011.01

$$\arg(\cosh(x + i\,y)) == \tan^{-1}(\tan(y)\tanh(x)) + \frac{1}{2}\pi\,\mathrm{sgn}\left(\mathrm{sgn}(\sin(y)\sinh(x)) + \frac{1}{2}\right)(1 - \mathrm{sgn}(\cos(y)\cosh(x)))$$

01.20.19.0012.01

$$\arg(\cosh(z)) == \tan^{-1}(\cos(\mathrm{Im}(z))\cosh(\mathrm{Re}(z)),\ \sin(\mathrm{Im}(z))\sinh(\mathrm{Re}(z)))$$

01.20.19.0006.01

$$\arg(\cosh(z)) == \tan^{-1}(\tan(\mathrm{Im}(z))\tanh(\mathrm{Re}(z))) + \frac{\pi}{2}\,\mathrm{sgn}\left(\mathrm{sgn}(\sin(\mathrm{Im}(z))\sinh(\mathrm{Re}(z))) + \frac{1}{2}\right)(1 - \mathrm{sgn}(\cos(\mathrm{Im}(z))\cosh(\mathrm{Re}(z))))$$

Conjugate value

01.20.19.0007.01

$$\overline{\cosh(x + i\,y)} == \cos(y)\cosh(x) - i\sin(y)\sinh(x)$$

01.20.19.0013.01

$$\overline{\cosh(z)} == \cos(\mathrm{Im}(z))\cosh(\mathrm{Re}(z)) - i\sin(\mathrm{Im}(z))\sinh(\mathrm{Re}(z))$$

Signum value

01.20.19.0014.01

$$\mathrm{sgn}(\cos(x + i\,y)) == \sqrt{2}\,\frac{\cos(x)\cosh(y) - i\sin(x)\sinh(y)}{\sqrt{\cos(2\,x) + \cosh(2\,y)}}$$

01.20.19.0015.01

$$\operatorname{sgn}(\cos(z)) == \sqrt{2}\,\frac{\cos(\operatorname{Re}(z))\cosh(\operatorname{Im}(z)) - i\sin(\operatorname{Re}(z))\sinh(\operatorname{Im}(z))}{\sqrt{\cos(2\operatorname{Re}(z)) + \cosh(2\operatorname{Im}(z))}}$$

Differentiation

Low-order differentiation

01.20.20.0001.01

$$\frac{\partial \cosh(z)}{\partial z} == \sinh(z)$$

01.20.20.0002.01

$$\frac{\partial^2 \cosh(z)}{\partial z^2} == \cosh(z)$$

Symbolic differentiation

01.20.20.0003.02

$$\frac{\partial^n \cosh(z)}{\partial z^n} == (-i)^n \cosh\left(z + \frac{i\pi n}{2}\right) /; n \in \mathbb{N}$$

01.20.20.0004.01

$$\frac{\partial^n f(\cosh(z))}{\partial z^n} == \sum_{m=1}^{n} \frac{1}{m!}\left(\sum_{j=0}^{m-1}(-1)^j \binom{m}{j}\sum_{i=0}^{m-j} 2^{j-m}\cosh^j(z)\,(2i+j-m)^n\, e^{(2i+j-m)z}\binom{m-j}{i} f^{(m)}(\cosh(z))\right) /; n \in \mathbb{N}^+$$

01.20.20.0005.02

$$\frac{\partial^n f(\cosh(z))}{\partial z^n} == \sum_{m=0}^{n} \frac{f^{(m)}(\cosh(z))}{m!}\left(\frac{\partial^n (\cosh(y) - \cosh(z))^m}{\partial y^n} /. \{y \to z\}\right) /; n \in \mathbb{N}$$

01.20.20.0007.02

$$\frac{\partial^n \cosh(a z + b)}{\partial z^n} == (-i a)^n \cosh\left(a z + b + \frac{i n \pi}{2}\right) /; n \in \mathbb{N}$$

01.20.20.0011.01

$$\frac{\partial^n \cosh^m(z)}{\partial z^n} == 2^{-m}\sum_{k=0}^{m}\binom{m}{k}(2k-m)^n\, e^{(2k-m)z} /; m \in \mathbb{N} \bigwedge n \in \mathbb{N}^+$$

01.20.20.0012.01

$$\frac{\partial^n \cosh^m(z)}{\partial z^n} == 2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(m-2k)^n\left(e^{(m-2k)z} + (-1)^n e^{-(m-2k)z}\right) /; m \in \mathbb{N} \bigwedge n \in \mathbb{N}^+$$

01.20.20.0008.02

$$\frac{\partial^n \cosh^m(z)}{\partial z^n} == 2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(-i(m-2k))^n \cosh\left(\frac{i\pi n}{2} + (m-2k)z\right) /; m \in \mathbb{N} \bigwedge n \in \mathbb{N}^+$$

01.20.20.0013.01

$$\frac{\partial^n \cosh^m(z)}{\partial z^n} == 2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(2k-m)^n\left(((-1)^n+1)\cosh((m-2k)z) + ((-1)^n-1)\sinh((m-2k)z)\right) /; m \in \mathbb{N} \bigwedge n \in \mathbb{N}^+$$

01.20.20.0014.01

$$\frac{\partial^n \cosh^m(z)}{\partial z^n} == 2^{-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} (2k-m)^n \left((1+(-1)^n) \sum_{j=0}^{\left\lfloor \frac{m}{2} \right\rfloor - k} \binom{m-2k}{2j} \sinh^{2j}(z) \cosh^{-2j-2k+m}(z) - \right.$$

$$\left. (1-(-1)^n) \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor - k} \binom{m-2k}{2j+1} \sinh^{2j+1}(z) \cosh^{-2j-2k+m-1}(z) \right) /; m \in \mathbb{N} \bigwedge n \in \mathbb{N}^+$$

Fractional integro-differentiation

01.20.20.0006.01

$$\frac{\partial^\alpha \cosh(z)}{\partial z^\alpha} == 2^\alpha \sqrt{\pi}\ z^{-\alpha}\ {}_1\tilde{F}_2\left(1; \frac{1}{2} - \frac{\alpha}{2}, 1 - \frac{\alpha}{2}; \frac{z^2}{4}\right)$$

01.20.20.0009.01

$$\frac{\partial^\alpha \cosh(a z + b)}{\partial z^\alpha} == 2^{\alpha-1} \sqrt{\pi}\ z^{-\alpha} \left(2\cosh(b)\ {}_1\tilde{F}_2\left(1; \frac{1}{2} - \frac{\alpha}{2}, 1 - \frac{\alpha}{2}; \frac{a^2 z^2}{4}\right) + a z\ {}_1\tilde{F}_2\left(1; 1 - \frac{\alpha}{2}, \frac{3}{2} - \frac{\alpha}{2}; \frac{a^2 z^2}{4}\right) \sinh(b) \right)$$

01.20.20.0010.01

$$\frac{\partial^\alpha \cosh^n(z)}{\partial z^\alpha} == 2^{-n+\alpha+1} \sqrt{\pi}\ z^{-\alpha} \sum_{k=0}^{\left\lfloor \frac{n-1}{2} \right\rfloor} \binom{n}{k}\ {}_1\tilde{F}_2\left(1; \frac{1}{2} - \frac{\alpha}{2}, 1 - \frac{\alpha}{2}; \frac{1}{4}(n-2k)^2 z^2\right) + \frac{2^{-n} z^{-\alpha} (1 - n \bmod 2)}{\Gamma(1-\alpha)} \binom{n}{\frac{n}{2}} /; n \in \mathbb{N}^+$$

Integration

Indefinite integration

Involving only one direct function

01.20.21.0022.01

$$\int \cosh(b + a z)\, dz == \frac{\sinh(b + a z)}{a}$$

01.20.21.0023.01

$$\int \cosh(a z)\, dz == \frac{\sinh(a z)}{a}$$

01.20.21.0024.01

$$\int \cosh(z)\, dz == \sinh(z)$$

Involving one direct function and elementary functions

Involving power function

Involving power

Power arguments

01.20.21.0025.01

$$\int \cosh(a\,z^r)\,dz == -\frac{z\left(-a^2\,z^{2\,r}\right)^{-1/r}}{2\,r}\left(\Gamma\left(\frac{1}{r},\,a\,z^r\right)(-a\,z^r)^{1/r}+(a\,z^r)^{1/r}\,\Gamma\left(\frac{1}{r},\,-a\,z^r\right)\right)$$

01.20.21.0026.01

$$\int \cosh\left(a\,z^2\right)dz == \frac{\sqrt{\pi}\,\left(\operatorname{erf}\left(\sqrt{a}\;z\right)+\operatorname{erfi}\left(\sqrt{a}\;z\right)\right)}{4\,\sqrt{a}}$$

01.20.21.0027.01

$$\int \cosh\left(a\,\sqrt{z}\right)dz == \frac{2\left(a\,\sqrt{z}\,\sinh\left(a\,\sqrt{z}\right)-\cosh\left(a\,\sqrt{z}\right)\right)}{a^2}$$

01.20.21.0028.01

$$\int \cosh(a\,(z^r)^p)\,dz == -\frac{z\left(\Gamma\left(\frac{1}{p\,r},\,-a\,(z^r)^p\right)(-a\,(z^r)^p)^{-\frac{1}{p\,r}}+(a\,(z^r)^p)^{-\frac{1}{p\,r}}\,\Gamma\left(\frac{1}{p\,r},\,a\,(z^r)^p\right)\right)}{2\,p\,r}$$

01.20.21.0029.01

$$\int \cosh\left(a\,(z^r)^{1/r}\right)dz == \frac{z\,(z^r)^{-1/r}\,\sinh\left(a\,(z^r)^{1/r}\right)}{a}$$

01.20.21.0030.01

$$\int \cosh\left(a\,\sqrt{z^2}\right)dz == \frac{\sqrt{z^2}\;\sinh\left(a\,\sqrt{z^2}\right)}{a\,z}$$

Involving $z^{\alpha-1}$ and arguments $a\,z$

01.20.21.0031.01

$$\int z^{\alpha-1}\cosh(a\,z)\,dz == -\frac{1}{2}\,z^{\alpha}\left(\Gamma(\alpha,\,-a\,z)\,(-a\,z)^{-\alpha}+(a\,z)^{-\alpha}\,\Gamma(\alpha,\,a\,z)\right)$$

01.20.21.0032.01

$$\int z^{\alpha-1}\cosh(z)\,dz == -\frac{1}{2}\left(z^{\alpha}\,\Gamma(\alpha,\,-z)\,(-z)^{-\alpha}+\Gamma(\alpha,\,z)\right)$$

01.20.21.0033.01

$$\int z^n\cosh(a\,z)\,dz == -\frac{1}{2}\,a^{-n-1}\left((-1)^{n-1}\,\Gamma(n+1,\,-a\,z)+\Gamma(n+1,\,a\,z)\right)/;\,n\in\mathbb{Z}$$

01.20.21.0034.01

$$\int z^n\cosh(a\,z)\,dz == \frac{1}{2}\,a^{-n-1}$$
$$\left(\frac{\operatorname{Ei}(a\,z)-(-1)^n\operatorname{Ei}(-a\,z)}{(-n-1)!}-(-1)^n\,e^{a\,z}\left(\sum_{k=n+1}^{-1}\frac{(-a\,z)^k}{(n+1)_{k-n}}-\sum_{k=0}^{n}\frac{(-a\,z)^k}{(n+1)_{k-n}}\right)+e^{-a\,z}\left(\sum_{k=n+1}^{-1}\frac{(a\,z)^k}{(n+1)_{k-n}}-\sum_{k=0}^{n}\frac{(a\,z)^k}{(n+1)_{k-n}}\right)\right)/;\,n\in\mathbb{Z}$$

01.20.21.0035.01

$$\int z\cosh(a\,z)\,dz == \frac{a\,z\sinh(a\,z)-\cosh(a\,z)}{a^2}$$

01.20.21.0036.01

$$\int z^2 \cosh(a\,z)\,dz == \frac{\left(a^2\,z^2+2\right)\sinh(a\,z)-2\,a\,z\cosh(a\,z)}{a^3}$$

01.20.21.0037.01

$$\int z^3 \cosh(a\,z)\,dz == \frac{a\,z\left(a^2\,z^2+6\right)\sinh(a\,z)-3\left(a^2\,z^2+2\right)\cosh(a\,z)}{a^4}$$

01.20.21.0038.01

$$\int z^4 \cosh(a\,z)\,dz == \frac{\left(a^4\,z^4+12\,a^2\,z^2+24\right)\sinh(a\,z)-4\,a\,z\left(a^2\,z^2+6\right)\cosh(a\,z)}{a^5}$$

01.20.21.0039.01

$$\int z^5 \cosh(a\,z)\,dz == \frac{a\,z\left(a^4\,z^4+20\,a^2\,z^2+120\right)\sinh(a\,z)-5\left(a^4\,z^4+12\,a^2\,z^2+24\right)\cosh(a\,z)}{a^6}$$

01.20.21.0040.01

$$\int z^6 \cosh(a\,z)\,dz == \frac{\left(a^6\,z^6+30\,a^4\,z^4+360\,a^2\,z^2+720\right)\sinh(a\,z)-6\,a\,z\left(a^4\,z^4+20\,a^2\,z^2+120\right)\cosh(a\,z)}{a^7}$$

01.20.21.0041.01

$$\int z^7 \cosh(a\,z)\,dz == \frac{1}{a^8}\left(a\,z\left(a^6\,z^6+42\,a^4\,z^4+840\,a^2\,z^2+5040\right)\sinh(a\,z)-7\left(a^6\,z^6+30\,a^4\,z^4+360\,a^2\,z^2+720\right)\cosh(a\,z)\right)$$

01.20.21.0042.01

$$\int z^8 \cosh(a\,z)\,dz == \frac{1}{a^9}\left(\left(a^8\,z^8+56\,a^6\,z^6+1680\,a^4\,z^4+20\,160\,a^2\,z^2+40\,320\right)\sinh(a\,z)-8\,a\,z\left(a^6\,z^6+42\,a^4\,z^4+840\,a^2\,z^2+5040\right)\cosh(a\,z)\right)$$

01.20.21.0043.01

$$\int \frac{\cosh(a\,z)}{z}\,dz == \text{Chi}(a\,z)$$

01.20.21.0044.01

$$\int \frac{\cosh(a\,z)}{z^2}\,dz == a\,\text{Shi}(a\,z)-\frac{\cosh(a\,z)}{z}$$

01.20.21.0045.01

$$\int \frac{\cosh(a\,z)}{z^3}\,dz == -\frac{-a^2\,\text{Chi}(a\,z)\,z^2+a\sinh(a\,z)\,z+\cosh(a\,z)}{2\,z^2}$$

01.20.21.0046.01

$$\int \frac{\cosh(a\,z)}{z^4}\,dz == -\frac{-a^3\,\text{Shi}(a\,z)\,z^3+a\sinh(a\,z)\,z+\left(a^2\,z^2+2\right)\cosh(a\,z)}{6\,z^3}$$

01.20.21.0047.01

$$\int \frac{\cosh(a\,z)}{z^5}\,dz == -\frac{-a^4\,\text{Chi}(a\,z)\,z^4+a\left(a^2\,z^2+2\right)\sinh(a\,z)\,z+\left(a^2\,z^2+6\right)\cosh(a\,z)}{24\,z^4}$$

01.20.21.0048.01

$$\int z^{n+\frac{1}{2}} \cosh(a\,z)\,dz == \frac{a^{-n-1}\sqrt{z}\left((-1)^n\sqrt{a\,z}\;\Gamma\left(n+\frac{3}{2},-a\,z\right)-\sqrt{-a\,z}\;\Gamma\left(n+\frac{3}{2},a\,z\right)\right)}{2\sqrt{-a^2\,z^2}}\;/;\;n\in\mathbb{Z}$$

01.20.21.0049.01

$$\int z^{n+\frac{1}{2}} \cosh(a\,z)\,dz == \frac{(-1)^n a^{-n-1}\sqrt{z}}{2\sqrt{-a^2\,z^2}}\left(\left(\sqrt{a\,z}\;\operatorname{erfc}\left(\sqrt{-a\,z}\right)-(-1)^n\sqrt{-a\,z}\;\operatorname{erfc}\left(\sqrt{a\,z}\right)\right)\Gamma\left(n+\frac{3}{2}\right)+ e^{a\,z}\sqrt{a\,z}\left(\sum_{k=0}^{n}\frac{(-a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\sum_{k=n+1}^{-1}\frac{(-a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)-(-1)^n\sqrt{-a\,z}\;e^{-a\,z}\left(\sum_{k=0}^{n}\frac{(a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\sum_{k=n+1}^{-1}\frac{(a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)\;/;\;n\in\mathbb{Z}$$

01.20.21.0050.01

$$\int \sqrt{z}\;\cosh(a\,z)\,dz == \frac{\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)-\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)\right)}{4\,a^{3/2}}+\frac{\sqrt{z}\;\sinh(a\,z)}{a}$$

01.20.21.0051.01

$$\int z^{3/2}\cosh(a\,z)\,dz == \frac{\sinh(a\,z)\,z^{3/2}}{a}-\frac{3\cosh(a\,z)\sqrt{z}}{2\,a^2}+\frac{3\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)+\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)\right)}{8\,a^{5/2}}$$

01.20.21.0052.01

$$\int z^{5/2}\cosh(a\,z)\,dz == \frac{1}{16\,a^{7/2}}\left(15\sqrt{\pi}\;\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)-15\sqrt{\pi}\;\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)+4\sqrt{a}\;\sqrt{z}\;\left(\left(4\,a^2\,z^2+15\right)\sinh(a\,z)-10\,a\,z\cosh(a\,z)\right)\right)$$

01.20.21.0053.01

$$\int z^{7/2}\cosh(a\,z)\,dz == \frac{\left(4\,a^2\,z^2+35\right)\sinh(a\,z)\,z^{3/2}}{4\,a^3}-\frac{7\left(4\,a^2\,z^2+15\right)\cosh(a\,z)\sqrt{z}}{8\,a^4}+\frac{105\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)+\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)\right)}{32\,a^{9/2}}$$

01.20.21.0054.01

$$\int z^{9/2}\cosh(a\,z)\,dz == \frac{1}{64\,a^{11/2}}\left(945\sqrt{\pi}\;\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)-945\sqrt{\pi}\;\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)+4\sqrt{a}\;\sqrt{z}\;\left(\left(16\,a^4\,z^4+252\,a^2\,z^2+945\right)\sinh(a\,z)-18\,a\,z\left(4\,a^2\,z^2+35\right)\cosh(a\,z)\right)\right)$$

01.20.21.0055.01

$$\int \frac{\cosh(a\,z)}{\sqrt{z}}\,dz == \frac{\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)+\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)\right)}{2\sqrt{a}}$$

01.20.21.0056.01

$$\int \frac{\cosh(a\,z)}{z^{3/2}}\,dz == \sqrt{a}\;\sqrt{\pi}\left(\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)-\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)\right)-\frac{2\cosh(a\,z)}{\sqrt{z}}$$

01.20.21.0057.01

$$\int \frac{\cosh(a\,z)}{z^{5/2}}\,dz == \frac{2}{3}\left(\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{a}\;\sqrt{z}\right)+\operatorname{erfi}\left(\sqrt{a}\;\sqrt{z}\right)\right)a^{3/2}-\frac{2\sinh(a\,z)\,a}{\sqrt{z}}-\frac{\cosh(a\,z)}{z^{3/2}}\right)$$

01.20.21.0058.01

$$\int \frac{\cosh(a\,z)}{z^{7/2}}\,dz == \frac{2}{15}\left(2\sqrt{\pi}\,\left(\operatorname{erfi}\left(\sqrt{a}\,\sqrt{z}\right)-\operatorname{erf}\left(\sqrt{a}\,\sqrt{z}\right)\right)a^{5/2}-\frac{2\sinh(a\,z)\,a}{z^{3/2}}-\frac{\left(4\,a^2\,z^2+3\right)\cosh(a\,z)}{z^{5/2}}\right)$$

01.20.21.0059.01

$$\int \frac{\cosh(a\,z)}{z^{9/2}}\,dz == \frac{2}{105}\left(4\sqrt{\pi}\,\left(\operatorname{erf}\left(\sqrt{a}\,\sqrt{z}\right)+\operatorname{erfi}\left(\sqrt{a}\,\sqrt{z}\right)\right)a^{7/2}-\frac{2\left(4\,a^2\,z^2+3\right)\sinh(a\,z)\,a}{z^{5/2}}-\frac{\left(4\,a^2\,z^2+15\right)\cosh(a\,z)}{z^{7/2}}\right)$$

Involving $z^{\alpha-1}$ and arguments $a\,z+b$

01.20.21.0060.01

$$\int z^{\alpha-1}\cosh(b+a\,z)\,dz == \frac{1}{2}\,e^{-b}\,z^{\alpha}\left(-e^{2\,b}\,E_{1-\alpha}(-a\,z)-E_{1-\alpha}(a\,z)\right)$$

01.20.21.0061.01

$$\int z^{n}\cosh(b+a\,z)\,dz == \frac{1}{2}\,a^{-n-1}\left((-1)^n\,e^{b}\,\Gamma(n+1,\,-a\,z)-e^{-b}\,\Gamma(n+1,\,a\,z)\right)$$

01.20.21.0062.01

$$\int z^{n}\cosh(b+a\,z)\,dz == \frac{1}{2}\,a^{-n-1}\left(\frac{e^{b}\,\operatorname{Ei}(a\,z)-(-1)^n\,e^{-b}\,\operatorname{Ei}(-a\,z)}{(-n-1)!}+\right.$$
$$\left.(-1)^n\,e^{b+a\,z}\left(\sum_{k=0}^{n}\frac{(-a\,z)^k}{(n+1)_{k-n}}-\sum_{k=n+1}^{-1}\frac{(-a\,z)^k}{(n+1)_{k-n}}\right)+e^{-b-a\,z}\left(\sum_{k=n+1}^{-1}\frac{(a\,z)^k}{(n+1)_{k-n}}-\sum_{k=0}^{n}\frac{(a\,z)^k}{(n+1)_{k-n}}\right)\right)/;\,n\in\mathbb{Z}$$

01.20.21.0063.01

$$\int z\cosh(b+a\,z)\,dz == \frac{a\,z\sinh(b+a\,z)-\cosh(b+a\,z)}{a^2}$$

01.20.21.0064.01

$$\int z^2\cosh(b+a\,z)\,dz == \frac{\left(a^2\,z^2+2\right)\sinh(b+a\,z)-2\,a\,z\cosh(b+a\,z)}{a^3}$$

01.20.21.0065.01

$$\int z^3\cosh(b+a\,z)\,dz == \frac{a\,z\left(a^2\,z^2+6\right)\sinh(b+a\,z)-3\left(a^2\,z^2+2\right)\cosh(b+a\,z)}{a^4}$$

01.20.21.0066.01

$$\int z^4\cosh(b+a\,z)\,dz == \frac{\left(a^4\,z^4+12\,a^2\,z^2+24\right)\sinh(b+a\,z)-4\,a\,z\left(a^2\,z^2+6\right)\cosh(b+a\,z)}{a^5}$$

01.20.21.0067.01

$$\int z^5\cosh(b+a\,z)\,dz == \frac{a\,z\left(a^4\,z^4+20\,a^2\,z^2+120\right)\sinh(b+a\,z)-5\left(a^4\,z^4+12\,a^2\,z^2+24\right)\cosh(b+a\,z)}{a^6}$$

01.20.21.0068.01

$$\int \frac{\cosh(b+a\,z)}{z}\,dz == \cosh(b)\operatorname{Chi}(a\,z)+\sinh(b)\operatorname{Shi}(a\,z)$$

01.20.21.0069.01

$$\int \frac{\cosh(b+a\,z)}{z^2}\,dz == -\frac{\cosh(b+a\,z)}{z}+a\operatorname{Chi}(a\,z)\sinh(b)+a\cosh(b)\operatorname{Shi}(a\,z)$$

01.20.21.0070.01

$$\int \frac{\cosh(b+a\,z)}{z^3}\,dz == \frac{a^2\cosh(b)\,\mathrm{Chi}(a\,z)\,z^2+a^2\sinh(b)\,\mathrm{Shi}(a\,z)\,z^2-a\sinh(b+a\,z)\,z-\cosh(b+a\,z)}{2\,z^2}$$

01.20.21.0071.01

$$\int \frac{\cosh(b+a\,z)}{z^4}\,dz == \frac{1}{6\,z^3}\left(a^3\,\mathrm{Chi}(a\,z)\sinh(b)\,z^3+a^3\cosh(b)\,\mathrm{Shi}(a\,z)\,z^3-a^2\cosh(b+a\,z)\,z^2-a\sinh(b+a\,z)\,z-2\cosh(b+a\,z)\right)$$

01.20.21.0072.01

$$\int \frac{\cosh(b+a\,z)}{z^5}\,dz == -\frac{1}{24\,z^4}$$
$$\left(-a^4\cosh(b)\,\mathrm{Chi}(a\,z)\,z^4-a^4\sinh(b)\,\mathrm{Shi}(a\,z)\,z^4+a^3\sinh(b+a\,z)\,z^3+a^2\cosh(b+a\,z)\,z^2+2\,a\sinh(b+a\,z)\,z+6\cosh(b+a\,z)\right)$$

01.20.21.0073.01

$$\int z^{n+\frac{1}{2}}\cosh(b+a\,z)\,dz == \frac{a^{-n-1}\sqrt{z}\left((-1)^n\,e^b\sqrt{a\,z}\;\Gamma\left(n+\frac{3}{2},-a\,z\right)-e^{-b}\sqrt{-a\,z}\;\Gamma\left(n+\frac{3}{2},a\,z\right)\right)}{2\sqrt{-a^2\,z^2}}\;/;\;n\in\mathbb{Z}$$

01.20.21.0074.01

$$\int z^{n+\frac{1}{2}}\cosh(b+a\,z)\,dz ==$$
$$\frac{1}{2\sqrt{-a^2\,z^2}}\left(\left((-1)^{n-1}\,a^{-n-1}\,e^{-b}\sqrt{z}\right)\left(\left((-1)^n\sqrt{-a\,z}\;\mathrm{erfc}\left(\sqrt{a\,z}\right)-e^{2\,b}\sqrt{a\,z}\;\mathrm{erfc}\left(\sqrt{-a\,z}\right)\right)\Gamma\left(n+\frac{3}{2}\right)-\right.\right.$$
$$\left.\left.\sqrt{a\,z}\;e^{2\,b+a\,z}\left(\sum_{k=0}^{n}\frac{(-a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\sum_{k=n+1}^{-1}\frac{(-a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)+(-1)^n\,e^{-a\,z}\sqrt{-a\,z}\left(\sum_{k=0}^{n}\frac{(a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\sum_{k=n+1}^{-1}\frac{(a\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)\right)\;/;\;n\in\mathbb{Z}$$

01.20.21.0075.01

$$\int \sqrt{z}\,\cosh(b+a\,z)\,dz ==$$
$$\frac{1}{4\,a^{3/2}}\left(\sqrt{\pi}\;\mathrm{erf}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)-\sinh(b))-\sqrt{\pi}\;\mathrm{erfi}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)+\sinh(b))+4\sqrt{a}\;\sqrt{z}\;\sinh(b+a\,z)\right)$$

01.20.21.0076.01

$$\int z^{3/2}\cosh(b+a\,z)\,dz == \frac{1}{8\,a^{5/2}}\left(3\sqrt{\pi}\;\mathrm{erf}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)-\sinh(b))+\right.$$
$$\left.3\sqrt{\pi}\;\mathrm{erfi}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)+\sinh(b))+4\sqrt{a}\;\sqrt{z}\;(2\,a\,z\sinh(b+a\,z)-3\cosh(b+a\,z))\right)$$

01.20.21.0077.01

$$\int z^{5/2}\cosh(b+a\,z)\,dz == \frac{1}{16\,a^{7/2}}\left(15\sqrt{\pi}\;\mathrm{erf}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)-\sinh(b))-\right.$$
$$\left.15\sqrt{\pi}\;\mathrm{erfi}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)+\sinh(b))+4\sqrt{a}\;\sqrt{z}\;\left(\left(4\,a^2\,z^2+15\right)\sinh(b+a\,z)-10\,a\,z\cosh(b+a\,z)\right)\right)$$

01.20.21.0078.01

$$\int z^{7/2}\cosh(b+a\,z)\,dz == \frac{1}{32\,a^{9/2}}\left(105\sqrt{\pi}\;\mathrm{erf}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)-\sinh(b))+\right.$$
$$\left.105\sqrt{\pi}\;\mathrm{erfi}\left(\sqrt{a}\;\sqrt{z}\right)(\cosh(b)+\sinh(b))+4\sqrt{a}\;\sqrt{z}\;\left(2\,a\,z\left(4\,a^2\,z^2+35\right)\sinh(b+a\,z)-7\left(4\,a^2\,z^2+15\right)\cosh(b+a\,z)\right)\right)$$

01.20.21.0079.01

$$\int z^{9/2} \cosh(b + a\,z)\,dz == \frac{1}{64\,a^{11/2}} \left(945\sqrt{\pi}\ \operatorname{erf}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) - \sinh(b)) - 945\sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) + \sinh(b)) + 4\sqrt{a}\ \sqrt{z}\ \left(\left(16\,a^4\,z^4 + 252\,a^2\,z^2 + 945\right)\sinh(b + a\,z) - 18\,a\,z\left(4\,a^2\,z^2 + 35\right)\cosh(b + a\,z)\right)\right)$$

01.20.21.0080.01

$$\int \frac{\cosh(b + a\,z)}{\sqrt{z}}\,dz == \frac{\sqrt{\pi}\ \left(\operatorname{erf}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) - \sinh(b)) + \operatorname{erfi}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) + \sinh(b))\right)}{2\sqrt{a}}$$

01.20.21.0081.01

$$\int \frac{\cosh(b + a\,z)}{z^{3/2}}\,dz == \frac{1}{\sqrt{z}} \left(-2\cosh(b + a\,z) + \sqrt{a}\ \sqrt{\pi}\ \sqrt{z}\ \operatorname{erf}\left(\sqrt{a}\ \sqrt{z}\right)(\sinh(b) - \cosh(b)) + \sqrt{a}\ \sqrt{\pi}\ \sqrt{z}\ \operatorname{erfi}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) + \sinh(b))\right)$$

01.20.21.0082.01

$$\int \frac{\cosh(b + a\,z)}{z^{5/2}}\,dz == \frac{1}{3\,z^{3/2}} \left(2\left(a^{3/2}\sqrt{\pi}\ \operatorname{erf}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) - \sinh(b))\,z^{3/2} + a^{3/2}\sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) + \sinh(b))\,z^{3/2} - 2\,a\sinh(b + a\,z)\,z - \cosh(b + a\,z)\right)\right)$$

01.20.21.0083.01

$$\int \frac{\cosh(b + a\,z)}{z^{7/2}}\,dz == \frac{1}{15\,z^{5/2}} \left(4\,a^{5/2}\sqrt{\pi}\ \operatorname{erf}\left(\sqrt{a}\ \sqrt{z}\right)(\sinh(b) - \cosh(b))\,z^{5/2} + 4\,a^{5/2}\sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) + \sinh(b))\,z^{5/2} - 2\left(\left(4\,a^2\,z^2 + 3\right)\cosh(b + a\,z) + 2\,a\,z\sinh(b + a\,z)\right)\right)$$

01.20.21.0084.01

$$\int \frac{\cosh(b + a\,z)}{z^{9/2}}\,dz == -\frac{1}{105\,z^{7/2}} \left(2\left(4\,a^{7/2}\sqrt{\pi}\ \operatorname{erf}\left(\sqrt{a}\ \sqrt{z}\right)(\sinh(b) - \cosh(b))\,z^{7/2} - 4\,a^{7/2}\sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{a}\ \sqrt{z}\right)(\cosh(b) + \sinh(b))\,z^{7/2} + 8\,a^3\sinh(b + a\,z)\,z^3 + 4\,a^2\cosh(b + a\,z)\,z^2 + 6\,a\sinh(b + a\,z)\,z + 15\cosh(b + a\,z)\right)\right)$$

Involving $z^{\alpha-1}$ and arguments $a\ z^r$

01.20.21.0085.01

$$\int z^{\alpha-1}\cosh(a\,z^r)\,dz == -\frac{z^\alpha \left(-a^2\,z^{2\,r}\right)^{-\frac{\alpha}{r}} \left(\Gamma\left(\frac{\alpha}{r},\ a\,z^r\right)(-a\,z^r)^{\alpha/r} + (a\,z^r)^{\alpha/r}\,\Gamma\left(\frac{\alpha}{r},\ -a\,z^r\right)\right)}{2\,r}$$

01.20.21.0086.01

$$\int \frac{\cosh(a\,z^r)}{z}\,dz == \frac{\operatorname{Chi}(a\,z^r)}{r}$$

01.20.21.0087.01

$$\int z^{2n}\cosh\left(a z^2\right)dz == -\frac{1}{4}z\left(\frac{(-a)^{-n}}{\sqrt{-a z^2}}\left(\operatorname{erfc}\left(\sqrt{-a z^2}\right)\Gamma\left(n+\frac{1}{2}\right)+e^{a z^2}\sum_{k=0}^{n-1}\frac{\left(-a z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}-e^{a z^2}\sum_{k=n}^{-1}\frac{\left(-a z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}\right)+\right.$$

$$\left.\frac{a^{-n}}{\sqrt{a z^2}}\left(\operatorname{erfc}\left(\sqrt{a z^2}\right)\Gamma\left(n+\frac{1}{2}\right)+e^{-a z^2}\sum_{k=0}^{n-1}\frac{\left(a z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}-e^{-a z^2}\sum_{k=n}^{-1}\frac{\left(a z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}\right)\right)\Big/;\ n\in\mathbb{Z}$$

01.20.21.0088.01

$$\int z^{2n-1}\cosh\left(a z^2\right)dz == -\frac{1}{4}\left(\left(\frac{(-1)^{n-1}\operatorname{Ei}\left(a z^2\right)}{(-n)!}+e^{a z^2}\sum_{k=0}^{n-1}\frac{\left(-a z^2\right)^k}{(n)_{k-n+1}}-e^{a z^2}\sum_{k=n}^{-1}\frac{\left(-a z^2\right)^k}{(n)_{k-n+1}}\right)(-a)^{-n}+\right.$$

$$\left.a^{-n}\left(\frac{(-1)^{n-1}\operatorname{Ei}\left(-a z^2\right)}{(-n)!}+e^{-a z^2}\sum_{k=0}^{n-1}\frac{\left(a z^2\right)^k}{(n)_{k-n+1}}-e^{-a z^2}\sum_{k=n}^{-1}\frac{\left(a z^2\right)^k}{(n)_{k-n+1}}\right)\right)\Big/;\ n\in\mathbb{Z}$$

01.20.21.0089.01

$$\int z\cosh\left(a z^2\right)dz == \frac{\sinh\left(a z^2\right)}{2a}$$

01.20.21.0090.01

$$\int z^2\cosh\left(a z^2\right)dz == \frac{\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{a}\ z\right)-\operatorname{erfi}\left(\sqrt{a}\ z\right)\right)}{8a^{3/2}}+\frac{z\sinh\left(a z^2\right)}{2a}$$

01.20.21.0091.01

$$\int z^3\cosh\left(a z^2\right)dz == -\frac{\cosh\left(a z^2\right)-a z^2\sinh\left(a z^2\right)}{2a^2}$$

01.20.21.0092.01

$$\int z^4\cosh\left(a z^2\right)dz == \frac{\sinh\left(a z^2\right)z^3}{2a}-\frac{3\cosh\left(a z^2\right)z}{4a^2}+\frac{3\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{a}\ z\right)+\operatorname{erfi}\left(\sqrt{a}\ z\right)\right)}{16a^{5/2}}$$

01.20.21.0093.01

$$\int z^5\cosh\left(a z^2\right)dz == \frac{\left(a^2z^4+2\right)\sinh\left(a z^2\right)-2a z^2\cosh\left(a z^2\right)}{2a^3}$$

01.20.21.0094.01

$$\int\frac{\cosh\left(a z^2\right)}{z}dz == \frac{1}{2}\operatorname{Chi}\left(a z^2\right)$$

01.20.21.0095.01

$$\int\frac{\cosh\left(a z^2\right)}{z^2}dz == \frac{1}{2}\sqrt{a}\ \sqrt{\pi}\left(\operatorname{erfi}\left(\sqrt{a}\ z\right)-\operatorname{erf}\left(\sqrt{a}\ z\right)\right)-\frac{\cosh\left(a z^2\right)}{z}$$

01.20.21.0096.01

$$\int\frac{\cosh\left(a z^2\right)}{z^3}dz == \frac{1}{2}\left(a\operatorname{Shi}\left(a z^2\right)-\frac{\cosh\left(a z^2\right)}{z^2}\right)$$

01.20.21.0097.01

$$\int \frac{\cosh(a\,z^2)}{z^4}\,dz == \frac{1}{3}\left(\sqrt{\pi}\,\left(\operatorname{erf}(\sqrt{a}\,z)+\operatorname{erfi}(\sqrt{a}\,z)\right)a^{3/2}-\frac{2\sinh(a\,z^2)\,a}{z}-\frac{\cosh(a\,z^2)}{z^3}\right)$$

01.20.21.0098.01

$$\int \frac{\cosh(a\,z^2)}{z^5}\,dz == -\frac{-a^2\operatorname{Chi}(a\,z^2)\,z^4+a\sinh(a\,z^2)\,z^2+\cosh(a\,z^2)}{4\,z^4}$$

01.20.21.0099.01

$$\int z^n\cosh\left(a\sqrt{z}\right)dz == a^{-2(n+1)}\left(\frac{\operatorname{Ei}\left(-a\sqrt{z}\right)}{(-2n-2)!}-e^{a\sqrt{z}}\sum_{k=0}^{2n+1}\frac{\left(-a\sqrt{z}\right)^k}{(2n+2)_{k-2n-1}}+e^{a\sqrt{z}}\sum_{k=2n+2}^{-1}\frac{\left(-a\sqrt{z}\right)^k}{(2n+2)_{k-2n-1}}-\right.$$

$$\left.e^{-a\sqrt{z}}\sum_{k=0}^{2n+1}\frac{\left(a\sqrt{z}\right)^k}{(2n+2)_{k-2n-1}}+e^{-a\sqrt{z}}\sum_{k=2n+2}^{-1}\frac{\left(a\sqrt{z}\right)^k}{(2n+2)_{k-2n-1}}+\frac{\operatorname{Ei}\left(a\sqrt{z}\right)}{(-2n-2)!}\right)/;\ n\in\mathbb{Z}$$

01.20.21.0100.01

$$\int z\cosh\left(a\sqrt{z}\right)dz == \frac{2\left(a\sqrt{z}\,\left(z\,a^2+6\right)\sinh\left(a\sqrt{z}\right)-3\left(z\,a^2+2\right)\cosh\left(a\sqrt{z}\right)\right)}{a^4}$$

01.20.21.0101.01

$$\int z^2\cosh\left(a\sqrt{z}\right)dz == \frac{2\left(a\sqrt{z}\,\left(z^2\,a^4+20\,z\,a^2+120\right)\sinh\left(a\sqrt{z}\right)-5\left(z^2\,a^4+12\,z\,a^2+24\right)\cosh\left(a\sqrt{z}\right)\right)}{a^6}$$

01.20.21.0102.01

$$\int z^3\cosh\left(a\sqrt{z}\right)dz ==$$

$$\frac{1}{a^8}\left(2\left(a\sqrt{z}\,\left(z^3\,a^6+42\,z^2\,a^4+840\,z\,a^2+5040\right)\sinh\left(a\sqrt{z}\right)-7\left(z^3\,a^6+30\,z^2\,a^4+360\,z\,a^2+720\right)\cosh\left(a\sqrt{z}\right)\right)\right)$$

01.20.21.0103.01

$$\int z^4\cosh\left(a\sqrt{z}\right)dz == \frac{1}{a^{10}}\left(2\left(a\sqrt{z}\,\left(z^4\,a^8+72\,z^3\,a^6+3024\,z^2\,a^4+60\,480\,z\,a^2+362\,880\right)\sinh\left(a\sqrt{z}\right)-\right.\right.$$

$$\left.\left.9\left(z^4\,a^8+56\,z^3\,a^6+1680\,z^2\,a^4+20\,160\,z\,a^2+40\,320\right)\cosh\left(a\sqrt{z}\right)\right)\right)$$

01.20.21.0104.01

$$\int z^5\cosh\left(a\sqrt{z}\right)dz ==$$

$$\frac{1}{a^{12}}\left(2\left(a\sqrt{z}\,\left(z^5\,a^{10}+110\,z^4\,a^8+7920\,z^3\,a^6+332\,640\,z^2\,a^4+6\,652\,800\,z\,a^2+39\,916\,800\right)\sinh\left(a\sqrt{z}\right)-11\right.\right.$$

$$\left.\left.\left(z^5\,a^{10}+90\,z^4\,a^8+5040\,z^3\,a^6+151\,200\,z^2\,a^4+1\,814\,400\,z\,a^2+3\,628\,800\right)\cosh\left(a\sqrt{z}\right)\right)\right)$$

01.20.21.0105.01

$$\int \frac{\cosh\left(a\sqrt{z}\right)}{z}\,dz == 2\operatorname{Chi}\left(a\sqrt{z}\right)$$

01.20.21.0106.01

$$\int \frac{\cosh\left(a\sqrt{z}\right)}{z^2}\,dz == -\frac{-z\,\mathrm{Chi}\left(a\sqrt{z}\right)a^2+\sqrt{z}\,\sinh\left(a\sqrt{z}\right)a+\cosh\left(a\sqrt{z}\right)}{z}$$

01.20.21.0107.01

$$\int \frac{\cosh\left(a\sqrt{z}\right)}{z^3}\,dz == -\frac{-z^2\,\mathrm{Chi}\left(a\sqrt{z}\right)a^4+\sqrt{z}\,\left(z\,a^2+2\right)\sinh\left(a\sqrt{z}\right)a+\left(z\,a^2+6\right)\cosh\left(a\sqrt{z}\right)}{12\,z^2}$$

01.20.21.0108.01

$$\int \frac{\cosh\left(a\sqrt{z}\right)}{z^4}\,dz == -\frac{1}{360\,z^3}\left(-z^3\,\mathrm{Chi}\left(a\sqrt{z}\right)a^6+\sqrt{z}\,\left(z^2\,a^4+2\,z\,a^2+24\right)\sinh\left(a\sqrt{z}\right)a+\left(z^2\,a^4+6\,z\,a^2+120\right)\cosh\left(a\sqrt{z}\right)\right)$$

01.20.21.0109.01

$$\int \frac{\cosh\left(a\sqrt{z}\right)}{z^5}\,dz == -\frac{1}{20\,160\,z^4}$$
$$\left(-z^4\,\mathrm{Chi}\left(a\sqrt{z}\right)a^8+\sqrt{z}\,\left(z^3\,a^6+2\,z^2\,a^4+24\,z\,a^2+720\right)\sinh\left(a\sqrt{z}\right)a+\left(z^3\,a^6+6\,z^2\,a^4+120\,z\,a^2+5040\right)\cosh\left(a\sqrt{z}\right)\right)$$

Involving $z^{\alpha-1}$ and arguments $a\,z^r+b$

01.20.21.0110.01

$$\int z^{\alpha-1}\cosh(a\,z^r+b)\,dz == \frac{z^\alpha\left(-e^b\,\Gamma\left(\frac{\alpha}{r},-a\,z^r\right)(-a\,z^r)^{-\frac{\alpha}{r}}-e^{-b}\,(a\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},a\,z^r\right)\right)}{2\,r}$$

01.20.21.0111.01

$$\int \frac{\cosh(a\,z^r+b)}{z}\,dz == \frac{\cosh(b)\,\mathrm{Chi}(a\,z^r)+\sinh(b)\,\mathrm{Shi}(a\,z^r)}{r}$$

01.20.21.0112.01

$$\int z^n\cosh\left(a\,z^2+b\right)dz == \frac{1}{4}\,z^{n+1}\left(-e^b\,\Gamma\left(\frac{n+1}{2},-a\,z^2\right)\left(-a\,z^2\right)^{\frac{1}{2}(-n-1)}-e^{-b}\left(a\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},a\,z^2\right)\right)/;\,n\in\mathbb{Z}$$

01.20.21.0113.01

$$\int z^{2\,n}\cosh\left(a\,z^2+b\right)dz == -\frac{1}{4}\,z\left(\frac{(-a)^{-n}\,e^b}{\sqrt{-a\,z^2}}\left(\mathrm{erfc}\left(\sqrt{-a\,z^2}\right)\Gamma\left(n+\frac{1}{2}\right)+e^{a\,z^2}\sum_{k=0}^{n-1}\frac{\left(-a\,z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}-e^{a\,z^2}\sum_{k=n}^{-1}\frac{\left(-a\,z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}\right)+\right.$$
$$\left.\frac{a^{-n}\,e^{-b}}{\sqrt{a\,z^2}}\left(\mathrm{erfc}\left(\sqrt{a\,z^2}\right)\Gamma\left(n+\frac{1}{2}\right)+e^{-a\,z^2}\sum_{k=0}^{n-1}\frac{\left(a\,z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}-e^{-a\,z^2}\sum_{k=n}^{-1}\frac{\left(a\,z^2\right)^{k+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{k-n+1}}\right)\right)/;\,n\in\mathbb{Z}$$

01.20.21.0114.01

$$\int z^{2\,n-1}\cosh\left(a\,z^2+b\right)dz == -\frac{1}{4}\left(e^b\left(\frac{(-1)^{n-1}\,\mathrm{Ei}\left(a\,z^2\right)}{(-n)!}+e^{a\,z^2}\sum_{k=0}^{n-1}\frac{\left(-a\,z^2\right)^k}{(n)_{k-n+1}}-e^{a\,z^2}\sum_{k=n}^{-1}\frac{\left(-a\,z^2\right)^k}{(n)_{k-n+1}}\right)(-a)^{-n}+\right.$$
$$\left.a^{-n}\,e^{-b}\left(\frac{(-1)^{n-1}\,\mathrm{Ei}\left(-a\,z^2\right)}{(-n)!}+e^{-a\,z^2}\sum_{k=0}^{n-1}\frac{\left(a\,z^2\right)^k}{(n)_{k-n+1}}-e^{-a\,z^2}\sum_{k=n}^{-1}\frac{\left(a\,z^2\right)^k}{(n)_{k-n+1}}\right)\right)/;\,n\in\mathbb{Z}$$

01.20.21.0115.01

$$\int z \cosh\left(a z^2 + b\right) dz == \frac{\sinh\left(a z^2 + b\right)}{2 a}$$

01.20.21.0116.01

$$\int z^2 \cosh\left(a z^2 + b\right) dz == \frac{1}{8 a^{3/2}} \left(\sqrt{\pi}\ \operatorname{erf}\left(\sqrt{a}\ z\right) (\cosh(b) - \sinh(b)) - \sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{a}\ z\right) (\cosh(b) + \sinh(b)) + 4 \sqrt{a}\ z \sinh\left(a z^2 + b\right)\right)$$

01.20.21.0117.01

$$\int z^3 \cosh\left(a z^2 + b\right) dz == \frac{a z^2 \sinh\left(a z^2 + b\right) - \cosh\left(a z^2 + b\right)}{2 a^2}$$

01.20.21.0118.01

$$\int z^4 \cosh\left(a z^2 + b\right) dz == \frac{1}{16 a^{5/2}} \left(3 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{a}\ z\right) (\cosh(b) - \sinh(b)) + 3 \sqrt{\pi}\ \operatorname{erfi}\left(\sqrt{a}\ z\right) (\cosh(b) + \sinh(b)) + 4 \sqrt{a}\ z \left(2 a z^2 \sinh\left(a z^2 + b\right) - 3 \cosh\left(a z^2 + b\right)\right)\right)$$

01.20.21.0119.01

$$\int z^5 \cosh\left(a z^2 + b\right) dz == \frac{\left(a^2 z^4 + 2\right) \sinh\left(a z^2 + b\right) - 2 a z^2 \cosh\left(a z^2 + b\right)}{2 a^3}$$

01.20.21.0120.01

$$\int \frac{\cosh\left(a z^2 + b\right)}{z} dz == \frac{1}{2} \left(\cosh(b) \operatorname{Chi}\left(a z^2\right) + \sinh(b) \operatorname{Shi}\left(a z^2\right)\right)$$

01.20.21.0121.01

$$\int \frac{\cosh\left(a z^2 + b\right)}{z^2} dz == \frac{1}{2 z} \left(-2 \cosh\left(a z^2 + b\right) + \sqrt{a}\ \sqrt{\pi}\ z \operatorname{erf}\left(\sqrt{a}\ z\right) (\sinh(b) - \cosh(b)) + \sqrt{a}\ \sqrt{\pi}\ z \operatorname{erfi}\left(\sqrt{a}\ z\right) (\cosh(b) + \sinh(b))\right)$$

01.20.21.0122.01

$$\int \frac{\cosh\left(a z^2 + b\right)}{z^3} dz == \frac{1}{2} \left(-\frac{\cosh\left(a z^2 + b\right)}{z^2} + a \operatorname{Chi}\left(a z^2\right) \sinh(b) + a \cosh(b) \operatorname{Shi}\left(a z^2\right)\right)$$

01.20.21.0123.01

$$\int \frac{\cosh\left(a z^2 + b\right)}{z^4} dz == \frac{1}{3 z^3} \left(\sqrt{\pi}\ z^3 \operatorname{erf}\left(\sqrt{a}\ z\right) (\cosh(b) - \sinh(b))\, a^{3/2} + \sqrt{\pi}\ z^3 \operatorname{erfi}\left(\sqrt{a}\ z\right) (\cosh(b) + \sinh(b))\, a^{3/2} - 2 z^2 \sinh\left(a z^2 + b\right) a - \cosh\left(a z^2 + b\right)\right)$$

01.20.21.0124.01

$$\int \frac{\cosh\left(a z^2 + b\right)}{z^5} dz == \frac{a^2 \cosh(b) \operatorname{Chi}\left(a z^2\right) z^4 + a^2 \sinh(b) \operatorname{Shi}\left(a z^2\right) z^4 - a \sinh\left(a z^2 + b\right) z^2 - \cosh\left(a z^2 + b\right)}{4 z^4}$$

01.20.21.0125.01

$$\int z^{\alpha - 1} \cosh\left(\sqrt{z}\ a + b\right) dz == z^{\alpha} \left(-e^{b} \Gamma\left(2 \alpha, -a \sqrt{z}\right) \left(-a \sqrt{z}\right)^{-2 \alpha} - e^{-b} \left(a \sqrt{z}\right)^{-2 \alpha} \Gamma\left(2 \alpha, a \sqrt{z}\right)\right)$$

01.20.21.0126.01

$$\int z^n \cosh\left(\sqrt{z}\ a+b\right) dz == -e^b\, \Gamma\left(2\,(n+1),\, -a\,\sqrt{z}\right) a^{-2\,(n+1)} - e^{-b}\, \Gamma\left(2\,(n+1),\, a\,\sqrt{z}\right) a^{-2\,(n+1)} \text{ /; } n \in \mathbb{Z}$$

01.20.21.0127.01

$$\int z^n \cosh\left(\sqrt{z}\ a+b\right) dz ==$$

$$-a^{-2\,(n+1)} \left(e^b \left(-\frac{\text{Ei}\left(a\,\sqrt{z}\right)}{(-2\,(n+1))!} + e^{a\,\sqrt{z}} \sum_{k=0}^{2\,(n+1)-1} \frac{\left(-a\,\sqrt{z}\right)^k}{(2\,(n+1))_{k-2\,(n+1)+1}} - e^{a\,\sqrt{z}} \sum_{k=2\,(n+1)}^{-1} \frac{\left(-a\,\sqrt{z}\right)^k}{(2\,(n+1))_{k-2\,(n+1)+1}} \right) + \right.$$

$$\left. e^{-b} \left(-\frac{\text{Ei}\left(-a\,\sqrt{z}\right)}{(-2\,(n+1))!} + e^{-a\,\sqrt{z}} \sum_{k=0}^{2\,(n+1)-1} \frac{\left(a\,\sqrt{z}\right)^k}{(2\,(n+1))_{k-2\,(n+1)+1}} - e^{-a\,\sqrt{z}} \sum_{k=2\,(n+1)}^{-1} \frac{\left(a\,\sqrt{z}\right)^k}{(2\,(n+1))_{k-2\,(n+1)+1}} \right) \right) \text{ /; } n \in \mathbb{Z}$$

01.20.21.0128.01

$$\int z \cosh\left(\sqrt{z}\ a+b\right) dz == \frac{2\left(a\,\sqrt{z}\,\left(z\,a^2+6\right)\sinh\left(\sqrt{z}\ a+b\right) - 3\left(z\,a^2+2\right)\cosh\left(\sqrt{z}\ a+b\right)\right)}{a^4}$$

01.20.21.0129.01

$$\int z^2 \cosh\left(\sqrt{z}\ a+b\right) dz == \frac{2\left(a\,\sqrt{z}\,\left(z^2\,a^4+20\,z\,a^2+120\right)\sinh\left(\sqrt{z}\ a+b\right) - 5\left(z^2\,a^4+12\,z\,a^2+24\right)\cosh\left(\sqrt{z}\ a+b\right)\right)}{a^6}$$

01.20.21.0130.01

$$\int z^3 \cosh\left(\sqrt{z}\ a+b\right) dz ==$$

$$\frac{1}{a^8}\left(2\left(a\,\sqrt{z}\,\left(z^3\,a^6+42\,z^2\,a^4+840\,z\,a^2+5040\right)\sinh\left(\sqrt{z}\ a+b\right) - 7\left(z^3\,a^6+30\,z^2\,a^4+360\,z\,a^2+720\right)\cosh\left(\sqrt{z}\ a+b\right)\right)\right)$$

01.20.21.0131.01

$$\int z^4 \cosh\left(\sqrt{z}\ a+b\right) dz == \frac{1}{a^{10}}\left(2\left(a\,\sqrt{z}\,\left(z^4\,a^8+72\,z^3\,a^6+3024\,z^2\,a^4+60\,480\,z\,a^2+362\,880\right)\sinh\left(\sqrt{z}\ a+b\right) - \right.\right.$$

$$\left.\left. 9\left(z^4\,a^8+56\,z^3\,a^6+1680\,z^2\,a^4+20\,160\,z\,a^2+40\,320\right)\cosh\left(\sqrt{z}\ a+b\right)\right)\right)$$

01.20.21.0132.01

$$\int z^5 \cosh\left(\sqrt{z}\ a+b\right) dz ==$$

$$\frac{1}{a^{12}}\left(2\left(a\,\sqrt{z}\,\left(z^5\,a^{10}+110\,z^4\,a^8+7920\,z^3\,a^6+332\,640\,z^2\,a^4+6\,652\,800\,z\,a^2+39\,916\,800\right)\sinh\left(\sqrt{z}\ a+b\right) - \right.\right.$$

$$\left.\left. 11\left(z^5\,a^{10}+90\,z^4\,a^8+5040\,z^3\,a^6+151\,200\,z^2\,a^4+1\,814\,400\,z\,a^2+3\,628\,800\right)\cosh\left(\sqrt{z}\ a+b\right)\right)\right)$$

01.20.21.0133.01

$$\int \frac{\cosh\left(\sqrt{z}\ a+b\right)}{z} dz == 2\left(\cosh(b)\,\text{Chi}\left(a\,\sqrt{z}\right) + \sinh(b)\,\text{Shi}\left(a\,\sqrt{z}\right)\right)$$

01.20.21.0134.01

$$\int \frac{\cosh\left(\sqrt{z}\ a+b\right)}{z^2} dz == \cosh(b)\,\text{Chi}\left(a\,\sqrt{z}\right) a^2 + \sinh(b)\,\text{Shi}\left(a\,\sqrt{z}\right) a^2 - \frac{\sinh\left(\sqrt{z}\ a+b\right) a}{\sqrt{z}} - \frac{\cosh\left(\sqrt{z}\ a+b\right)}{z}$$

01.20.21.0135.01

$$\int \frac{\cosh\left(\sqrt{z}\ a+b\right)}{z^3}\,dz == -\frac{1}{12\,z^2}\left(a^3\sinh\left(\sqrt{z}\ a+b\right)z^{3/2}-a^4\cosh(b)\,\mathrm{Chi}\left(a\sqrt{z}\right)z^2-\right.$$
$$\left.a^4\sinh(b)\,\mathrm{Shi}\left(a\sqrt{z}\right)z^2+a^2\cosh\left(\sqrt{z}\ a+b\right)z+2\,a\sinh\left(\sqrt{z}\ a+b\right)\sqrt{z}\ +6\cosh\left(\sqrt{z}\ a+b\right)\right)$$

01.20.21.0136.01

$$\int \frac{\cosh\left(\sqrt{z}\ a+b\right)}{z^4}\,dz ==$$
$$-\frac{1}{360\,z^3}\left(2\,a^3\sinh\left(\sqrt{z}\ a+b\right)z^{3/2}+a^5\sinh\left(\sqrt{z}\ a+b\right)z^{5/2}-a^6\cosh(b)\,\mathrm{Chi}\left(a\sqrt{z}\right)z^3-a^6\sinh(b)\,\mathrm{Shi}\left(a\sqrt{z}\right)z^3+\right.$$
$$\left.a^4\cosh\left(\sqrt{z}\ a+b\right)z^2+6\,a^2\cosh\left(\sqrt{z}\ a+b\right)z+24\,a\sinh\left(\sqrt{z}\ a+b\right)\sqrt{z}\ +120\cosh\left(\sqrt{z}\ a+b\right)\right)$$

01.20.21.0137.01

$$\int \frac{\cosh\left(\sqrt{z}\ a+b\right)}{z^5}\,dz ==$$
$$-\frac{1}{20\,160\,z^4}\left(24\,a^3\sinh\left(\sqrt{z}\ a+b\right)z^{3/2}+2\,a^5\sinh\left(\sqrt{z}\ a+b\right)z^{5/2}+a^7\sinh\left(\sqrt{z}\ a+b\right)z^{7/2}-a^8\cosh(b)\,\mathrm{Chi}\left(a\sqrt{z}\right)z^4-\right.$$
$$a^8\sinh(b)\,\mathrm{Shi}\left(a\sqrt{z}\right)z^4+a^6\cosh\left(\sqrt{z}\ a+b\right)z^3+6\,a^4\cosh\left(\sqrt{z}\ a+b\right)z^2+$$
$$\left.120\,a^2\cosh\left(\sqrt{z}\ a+b\right)z+720\,a\sinh\left(\sqrt{z}\ a+b\right)\sqrt{z}\ +5040\cosh\left(\sqrt{z}\ a+b\right)\right)$$

Involving rational functions

Involving $(a\,z+b)^{-n}$

01.20.21.0138.01

$$\int \frac{\cosh(c\,z)}{b+a\,z}\,dz == \frac{\cosh\left(\frac{b\,c}{a}\right)\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)-\sinh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)}{a}$$

01.20.21.0139.01

$$\int \frac{\cosh(c\,z)}{(a\,z+b)^2}\,dz == \frac{1}{a^2}\left(-\frac{a\cosh(c\,z)}{b+a\,z}-c\,\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)\sinh\left(\frac{b\,c}{a}\right)+c\cosh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)\right)$$

01.20.21.0140.01

$$\int \frac{\cosh(c\,z)}{(a\,z+b)^3}\,dz == -\frac{1}{2\,a^3}\left(\sinh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)c^2-c^2\cosh\left(\frac{b\,c}{a}\right)\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)+\frac{a\,(a\cosh(c\,z)+c\,(b+a\,z)\sinh(c\,z))}{(b+a\,z)^2}\right)$$

01.20.21.0141.01

$$\int \frac{\cosh(c\,z)}{(b+a\,z)^4}\,dz == -\frac{1}{6\,a^4}$$
$$\left(\left(\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)\sinh\left(\frac{b\,c}{a}\right)-\cosh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)\right)c^3+\frac{a^2\sinh(c\,z)\,c}{(b+a\,z)^2}+\frac{a\left(\left(c^2\,z^2+2\right)a^2+2\,b\,c^2\,z\,a+b^2\,c^2\right)\cosh(c\,z)}{(b+a\,z)^3}\right)$$

01.20.21.0142.01

$$\int \frac{\cosh(c\,z)}{(a\,z+b)^5}\,dz == -\frac{1}{24\,a^5}\left(-\left(\cosh\left(\frac{b\,c}{a}\right)\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)-\sinh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)\right)c^4+\frac{a\left(\left(c^2\,z^2+2\right)a^2+2\,b\,c^2\,z\,a+b^2\,c^2\right)\sinh(c\,z)\,c}{(b+a\,z)^3}+\frac{a^2\left(\left(c^2\,z^2+6\right)a^2+2\,b\,c^2\,z\,a+b^2\,c^2\right)\cosh(c\,z)}{(b+a\,z)^4}\right)$$

01.20.21.0143.01

$$\int \frac{\cosh(c\,z)}{(a\,z+b)^6}\,dz == -\frac{1}{120\,a^6}\left(\left(\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)\sinh\left(\frac{b\,c}{a}\right)-\cosh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)\right)c^5+\frac{a^2\left(\left(c^2\,z^2+6\right)a^2+2\,b\,c^2\,z\,a+b^2\,c^2\right)\sinh(c\,z)\,c}{(b+a\,z)^4}+\frac{1}{(b+a\,z)^5}\left(a\left(\left(c^4\,z^4+2\,c^2\,z^2+24\right)a^4+4\,b\,c^2\,z\left(c^2\,z^2+1\right)a^3+2\,b^2\,c^2\left(3\,c^2\,z^2+1\right)a^2+4\,b^3\,c^4\,z\,a+b^4\,c^4\right)\cosh(c\,z)\right)\right)$$

01.20.21.0144.01

$$\int \frac{z\cosh(c\,z)}{b+a\,z}\,dz == \frac{-b\,c\cosh\left(\frac{b\,c}{a}\right)\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)+a\sinh(c\,z)+b\,c\sinh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)}{a^2\,c}$$

01.20.21.0145.01

$$\int \frac{z^2\cosh(c\,z)}{b+a\,z}\,dz == \frac{1}{a^3\,c^2}\left(b^2\cosh\left(\frac{b\,c}{a}\right)\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)c^2-b^2\sinh\left(\frac{b\,c}{a}\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)c^2+a\left(c\left(a\,z-b\right)\sinh(c\,z)-a\cosh(c\,z)\right)\right)$$

01.20.21.0146.01

$$\int \frac{z\cosh(c\,z)}{(b+a\,z)^2}\,dz == \frac{1}{a^3\,(b+a\,z)}\left(a\,b\cosh(c\,z)+(b+a\,z)\,\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)\left(a\cosh\left(\frac{b\,c}{a}\right)+b\,c\sinh\left(\frac{b\,c}{a}\right)\right)-(b+a\,z)\left(b\,c\cosh\left(\frac{b\,c}{a}\right)+a\sinh\left(\frac{b\,c}{a}\right)\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)\right)$$

01.20.21.0147.01

$$\int \frac{z^2\cosh(c\,z)}{(b+a\,z)^2}\,dz == \frac{1}{a^4\,c\,(b+a\,z)}\left(-b\,c\,(b+a\,z)\,\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)\left(2\,a\cosh\left(\frac{b\,c}{a}\right)+b\,c\sinh\left(\frac{b\,c}{a}\right)\right)+a\left(a\,(b+a\,z)\sinh(c\,z)-b^2\,c\cosh(c\,z)\right)+b\,c\,(b+a\,z)\left(b\,c\cosh\left(\frac{b\,c}{a}\right)+2\,a\sinh\left(\frac{b\,c}{a}\right)\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)\right)$$

01.20.21.0148.01

$$\int \frac{z^3\cosh(c\,z)}{(b+a\,z)^2}\,dz == \frac{1}{a^5\,c^2\,(b+a\,z)}\left(b^2\,(b+a\,z)\,\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)\left(3\,a\cosh\left(\frac{b\,c}{a}\right)+b\,c\sinh\left(\frac{b\,c}{a}\right)\right)c^2-b^2\,(b+a\,z)\left(b\,c\cosh\left(\frac{b\,c}{a}\right)+3\,a\sinh\left(\frac{b\,c}{a}\right)\right)\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)c^2-a\left(\left(z\,a^3+b\,a^2-b^3\,c^2\right)\cosh(c\,z)+a\,c\left(2\,b^2+a\,z\,b-a^2\,z^2\right)\sinh(c\,z)\right)\right)$$

01.20.21.0149.01

$$\int \frac{z^4 \cosh(c\,z)}{(b+a\,z)^2}\,dz ==$$
$$\frac{1}{a^6\,c^3\,(b+a\,z)}\left(-b^3\,(b+a\,z)\,\mathrm{Chi}\left(c\left(\frac{b}{a}+z\right)\right)\left(4\,a\cosh\left(\frac{b\,c}{a}\right)+b\,c\sinh\left(\frac{b\,c}{a}\right)\right)c^3+b^3\,(b+a\,z)\left(b\,c\cosh\left(\frac{b\,c}{a}\right)+4\,a\sinh\left(\frac{b\,c}{a}\right)\right)\right.$$
$$\left.\mathrm{Shi}\left(c\left(\frac{b}{a}+z\right)\right)c^3+a\left(a\,(b+a\,z)\left(\left(c^2\,z^2+2\right)a^2-2\,b\,c^2\,z\,a+3\,b^2\,c^2\right)\sinh(c\,z)-c\left(2\,z^2\,a^4-2\,b^2\,a^2+b^4\,c^2\right)\cosh(c\,z)\right)\right)$$

Involving $\left(a\,z^2+b\right)^{-n}$

01.20.21.0150.01

$$\int \frac{\cosh(c\,z)}{a\,z^2+b}\,dz == \frac{1}{2\sqrt{a}\,\sqrt{b}}$$
$$\left(i\left(-\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Ci}\left(i\,z\,c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Ci}\left(i\,c\,z-\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\left(\mathrm{Si}\left(\frac{\sqrt{b}\,c}{\sqrt{a}}-i\,c\,z\right)-\mathrm{Si}\left(i\,z\,c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\right)\right)\right)$$

01.20.21.0151.01

$$\int \frac{z\cosh(c\,z)}{a\,z^2+b}\,dz ==$$
$$\frac{1}{2\,a}\left(\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Ci}\left(i\,z\,c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Ci}\left(i\,c\,z-\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\left(\mathrm{Si}\left(i\,z\,c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\mathrm{Si}\left(\frac{\sqrt{b}\,c}{\sqrt{a}}-i\,c\,z\right)\right)\right)$$

01.20.21.0152.01

$$\int \frac{\cosh(c\,z)}{\left(a\,z^2+b\right)^2}\,dz == \frac{1}{4\,b^{3/2}}\left(\frac{2\sqrt{b}\,z\cosh(c\,z)}{a\,z^2+b}-\frac{i\,\mathrm{Ci}\left(i\,z\,c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\left(\sqrt{a}\,\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\sqrt{b}\,c\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\right)}{a}+\right.$$
$$\frac{i\,\mathrm{Ci}\left(i\,c\,z-\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\left(\sqrt{a}\,\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\sqrt{b}\,c\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\right)}{a}+\frac{\sqrt{b}\,c\,i\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Si}\left(i\,z\,c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)}{a}+$$
$$\left.\frac{i\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Si}\left(\frac{\sqrt{b}\,c}{\sqrt{a}}-i\,c\,z\right)}{\sqrt{a}}-\frac{i\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Si}\left(i\,z\,c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)}{\sqrt{a}}-\frac{i\sqrt{b}\,c\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\mathrm{Si}\left(\frac{\sqrt{b}\,c}{\sqrt{a}}-i\,c\,z\right)}{a}\right)$$

01.20.21.0153.01

$$\int \frac{z \cosh(c z)}{(a z^2+b)^2}\, dz == \frac{1}{4 a^{3/2}}\left(-\frac{2\sqrt{a}\,\cosh(c z)}{a z^2+b} + \frac{c\left(\text{Ci}\left(i z c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)-\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\text{Si}\left(i z c+\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\right)}{\sqrt{b}} + \frac{c\left(\text{Ci}\left(i c z-\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\sin\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)+\cos\left(\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\text{Si}\left(i c z-\frac{\sqrt{b}\,c}{\sqrt{a}}\right)\right)}{\sqrt{b}}\right)$$

Involving $(a z^2+b z+c)^{-n}$

01.20.21.0154.01

$$\int \frac{\cosh(d z)}{a z^2+b z+c}\, dz == \frac{1}{\sqrt{b^2-4 a c}}\left(\cosh\left(\frac{\left(b-\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Ci}\left(\frac{i d\left(b+2 a z-\sqrt{b^2-4 a c}\right)}{2 a}\right)-\cosh\left(\frac{\left(b+\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Ci}\left(\frac{i d\left(b+2 a z+\sqrt{b^2-4 a c}\right)}{2 a}\right)-\sinh\left(\frac{\left(b-\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Shi}\left(\frac{d\left(b+2 a z-\sqrt{b^2-4 a c}\right)}{2 a}\right)+\sinh\left(\frac{\left(b+\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Shi}\left(\frac{d\left(b+2 a z+\sqrt{b^2-4 a c}\right)}{2 a}\right)\right)$$

01.20.21.0155.01

$$\int \frac{z \cosh(d z)}{a z^2+b z+c}\, dz == \frac{1}{2 a \sqrt{b^2-4 a c}}\left(\left(\sqrt{b^2-4 a c}-b\right)\left(\cosh\left(\frac{\left(b-\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Ci}\left(\frac{i d\left(b+2 a z-\sqrt{b^2-4 a c}\right)}{2 a}\right)-\sinh\left(\frac{\left(b-\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Shi}\left(\frac{d\left(b+2 a z-\sqrt{b^2-4 a c}\right)}{2 a}\right)\right)+\left(b+\sqrt{b^2-4 a c}\right)\left(\cosh\left(\frac{\left(b+\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Ci}\left(\frac{i d\left(b+2 a z+\sqrt{b^2-4 a c}\right)}{2 a}\right)-\sinh\left(\frac{\left(b+\sqrt{b^2-4 a c}\right)d}{2 a}\right)\text{Shi}\left(\frac{d\left(b+2 a z+\sqrt{b^2-4 a c}\right)}{2 a}\right)\right)\right)$$

01.20.21.0156.01

$$\int \frac{\cosh(d\,z)}{\left(a\,z^2+b\,z+c\right)^2}\,dz ==$$

$$-\frac{(b+2\,a\,z)\cosh(d\,z)}{\left(b^2-4\,a\,c\right)(c+z\,(b+a\,z))}-\left(\frac{2\,a\cosh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{\left(b^2-4\,a\,c\right)^{3/2}}+\frac{d\sinh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{b^2-4\,a\,c}\right)\mathrm{Ci}\left(\frac{i\,d\left(b+2\,a\,z-\sqrt{b^2-4\,a\,c}\right)}{2\,a}\right)+$$

$$\left(\frac{2\,a\cosh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{\left(b^2-4\,a\,c\right)^{3/2}}-\frac{d\sinh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{b^2-4\,a\,c}\right)\mathrm{Ci}\left(\frac{i\,d\left(b+2\,a\,z+\sqrt{b^2-4\,a\,c}\right)}{2\,a}\right)+$$

$$\left(\frac{d\cosh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{b^2-4\,a\,c}+\frac{2\,a\sinh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{\left(b^2-4\,a\,c\right)^{3/2}}\right)\mathrm{Shi}\left(\frac{d\left(b+2\,a\,z-\sqrt{b^2-4\,a\,c}\right)}{2\,a}\right)+$$

$$\left(\frac{d\cosh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{b^2-4\,a\,c}-\frac{2\,a\sinh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)}{\left(b^2-4\,a\,c\right)^{3/2}}\right)\mathrm{Shi}\left(\frac{d\left(b+2\,a\,z+\sqrt{b^2-4\,a\,c}\right)}{2\,a}\right)$$

01.20.21.0157.01

$$\int \frac{z\cosh(d\,z)}{\left(a\,z^2+b\,z+c\right)^2}\,dz == \frac{(2\,c+b\,z)\cosh(d\,z)}{\left(b^2-4\,a\,c\right)(c+z\,(b+a\,z))}+\frac{1}{2\,a\left(b^2-4\,a\,c\right)^2}\left(\mathrm{Ci}\left(\frac{i\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}+i\,d\,z\right)\right.$$
$$\left(2\,a\,b\sqrt{b^2-4\,a\,c}\,\cosh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)-\left(b^2-4\,a\,c\right)\left(\sqrt{b^2-4\,a\,c}-b\right)d\sinh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)\right)+$$
$$\frac{1}{2\,a\left(b^2-4\,a\,c\right)^2}\left(\mathrm{Ci}\left(\frac{i\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}+i\,d\,z\right)\right)\left(\left(b^2-4\,a\,c\right)\left(b+\sqrt{b^2-4\,a\,c}\right)d\sinh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)-\right.$$
$$\left.2\,a\,b\sqrt{b^2-4\,a\,c}\,\cosh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)\right)-\frac{1}{2\,a\left(b^2-4\,a\,c\right)^2}$$
$$\left(\left(i\left(\left(b^2-4\,a\,c\right)\left(\sqrt{b^2-4\,a\,c}-b\right)d\cosh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)-2\,a\,b\sqrt{b^2-4\,a\,c}\,\sinh\left(\frac{\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)\right)\right)\right.$$
$$\left.\mathrm{Si}\left(\frac{i\left(b-\sqrt{b^2-4\,a\,c}\right)d}{2\,a}+i\,d\,z\right)\right)+\frac{1}{2\,a\left(b^2-4\,a\,c\right)^2}$$
$$\left(\left(i\left(\left(b^2-4\,a\,c\right)\left(b+\sqrt{b^2-4\,a\,c}\right)d\cosh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)-2\,a\,b\sqrt{b^2-4\,a\,c}\,\sinh\left(\frac{\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}\right)\right)\right)\right.$$
$$\left.\mathrm{Si}\left(\frac{i\left(b+\sqrt{b^2-4\,a\,c}\right)d}{2\,a}+i\,d\,z\right)\right)$$

Involving algebraic functions

Involving $(a\,z+b)^{\beta}$

01.20.21.0158.01

$$\int (b+a\,z)^{\beta}\cosh(d+c\,z)\,dz == \frac{1}{2\,c}\left((b+a\,z)^{\beta}\left(-\frac{c^2\,(b+a\,z)^2}{a^2}\right)^{-\beta}\left(\left(\frac{c\,(b+a\,z)}{a}\right)^{\beta}\Gamma\left(\beta+1,\,-\frac{c\,(b+a\,z)}{a}\right)\left(\cosh\left(\frac{b\,c}{a}\right)-\sinh\left(\frac{b\,c}{a}\right)\right)(\cosh(d)+\sinh(d))-\left(-\frac{c\,(b+a\,z)}{a}\right)^{\beta}\Gamma\left(\beta+1,\,\frac{c\,(b+a\,z)}{a}\right)\left(\cosh\left(\frac{b\,c}{a}-d\right)+\sinh\left(\frac{b\,c}{a}-d\right)\right)\right)\right)$$

01.20.21.0159.01

$$\int (b+a\,z)^{\beta}\cosh(c\,z)\,dz == \frac{1}{2\,c}\left((b+a\,z)^{\beta}\left(-\frac{c^2\,(b+a\,z)^2}{a^2}\right)^{-\beta}\left(\left(\frac{c\,(b+a\,z)}{a}\right)^{\beta}\Gamma\left(\beta+1,\,-\frac{c\,(b+a\,z)}{a}\right)\left(\cosh\left(\frac{b\,c}{a}\right)-\sinh\left(\frac{b\,c}{a}\right)\right)-\left(-\frac{c\,(b+a\,z)}{a}\right)^{\beta}\Gamma\left(\beta+1,\,\frac{c\,(b+a\,z)}{a}\right)\left(\cosh\left(\frac{b\,c}{a}\right)+\sinh\left(\frac{b\,c}{a}\right)\right)\right)\right)$$

01.20.21.0160.01

$$\int (b+a\,z)^{3/2}\cosh(c\,z)\,dz == \frac{1}{2\,a}\left(e^{-\frac{b\,c}{a}}(b+a\,z)^{5/2}\left(-\frac{1}{\left(\frac{c\,(b+a\,z)}{a}\right)^{5/2}}\left(e^{\frac{2\,b\,c}{a}}\left(e^{-c\left(\frac{b}{a}+z\right)}\left(\frac{c\,(b+a\,z)}{a}\right)^{3/2}+\frac{3}{2}\left(e^{-c\left(\frac{b}{a}+z\right)}\sqrt{\frac{c\,(b+a\,z)}{a}}-\frac{1}{2}\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{\frac{c\,(b+a\,z)}{a}}\right)-1\right)\right)\right)\right)-\frac{1}{\left(-\frac{c\,(b+a\,z)}{a}\right)^{5/2}}\left(e^{c\left(\frac{b}{a}+z\right)}\left(-\frac{c\,(b+a\,z)}{a}\right)^{3/2}+\frac{3}{4}\left(-\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{-\frac{c\,(b+a\,z)}{a}}\right)+2\sqrt{-\frac{c\,(b+a\,z)}{a}}\,e^{c\left(\frac{b}{a}+z\right)}+\sqrt{\pi}\right)\right)\right)\right)$$

01.20.21.0161.01

$$\int \sqrt{b+a\,z}\,\cosh(c\,z)\,dz == \frac{1}{4\,c^{3/2}}\left(\sqrt{a}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{\sqrt{c}\,\sqrt{b+a\,z}}{\sqrt{a}}\right)\left(\sinh\left(\frac{b\,c}{a}\right)-\cosh\left(\frac{b\,c}{a}\right)\right)+\sqrt{a}\,\sqrt{\pi}\,\operatorname{erf}\left(\frac{\sqrt{c}\,\sqrt{b+a\,z}}{\sqrt{a}}\right)\left(\cosh\left(\frac{b\,c}{a}\right)+\sinh\left(\frac{b\,c}{a}\right)\right)+4\sqrt{c}\,\sqrt{b+a\,z}\,\sinh(c\,z)\right)$$

01.20.21.0162.01

$$\int \frac{\cosh(c\,z)}{\sqrt{b+a\,z}}\,dz == \frac{\sqrt{\pi}\left(\operatorname{erfi}\left(\frac{\sqrt{c}\,\sqrt{b+a\,z}}{\sqrt{a}}\right)\left(\cosh\left(\frac{b\,c}{a}\right)-\sinh\left(\frac{b\,c}{a}\right)\right)+\operatorname{erf}\left(\frac{\sqrt{c}\,\sqrt{b+a\,z}}{\sqrt{a}}\right)\left(\cosh\left(\frac{b\,c}{a}\right)+\sinh\left(\frac{b\,c}{a}\right)\right)\right)}{2\sqrt{a}\,\sqrt{c}}$$

01.20.21.0163.01

$$\int \frac{\cosh(c\,z)}{(b+a\,z)^{3/2}}\,dz == \frac{1}{2\,a\,\sqrt{b+a\,z}}\left(e^{-\frac{b\,c}{a}}\left(-e^{\frac{2\,b\,c}{a}}\sqrt{\frac{c\,(b+a\,z)}{a}}\left(2\sqrt{\pi}\left(\operatorname{erf}\left(\sqrt{\frac{c\,(b+a\,z)}{a}}\right)-1\right)+\frac{2\,e^{-c\left(\frac{b}{a}+z\right)}}{\sqrt{\frac{c\,(b+a\,z)}{a}}}\right)-\right.\right.$$
$$\left.\left.2\left(\sqrt{-\frac{c\,(b+a\,z)}{a}}\;\sqrt{\pi}\;\operatorname{erf}\left(\sqrt{-\frac{c\,(b+a\,z)}{a}}\right)+e^{c\left(\frac{b}{a}+z\right)}-\sqrt{\pi}\;\sqrt{-\frac{c\,(b+a\,z)}{a}}\right)\right)$$

Involving exponential function

Involving exp

Involving $a^{b\,z}\cosh(c\,z)$

01.20.21.0164.01

$$\int a^{b\,z}\cosh(c\,z)\,dz == \frac{a^{b\,z}\,(c\sinh(c\,z)-b\cosh(c\,z)\log(a))}{c^2-b^2\log^2(a)}$$

01.20.21.0165.01

$$\int e^{b\,z}\cosh(c\,z)\,dz == \frac{e^{b\,z}\,(b\cosh(c\,z)-c\sinh(c\,z))}{b^2-c^2}$$

01.20.21.0166.01

$$\int e^{c\,z}\cosh(c\,z)\,dz == \frac{2\,c\,z+e^{2\,c\,z}}{4\,c}$$

01.20.21.0167.01

$$\int e^{-c\,z}\cosh(c\,z)\,dz == -\frac{e^{-2\,c\,z}-2\,c\,z}{4\,c}$$

Involving $a^{b\,z+e}\cosh(c\,z)$

01.20.21.0168.01

$$\int a^{e+b\,z}\cosh(c\,z)\,dz == \frac{a^{e+b\,z}\,(c\sinh(c\,z)-b\cosh(c\,z)\log(a))}{c^2-b^2\log^2(a)}$$

01.20.21.0169.01

$$\int e^{e+b\,z}\cosh(c\,z)\,dz == \frac{e^{e+b\,z}\,(b\cosh(c\,z)-c\sinh(c\,z))}{b^2-c^2}$$

01.20.21.0170.01

$$\int e^{e+c\,z}\cosh(c\,z)\,dz == \frac{e^{e}\left(2\,c\,z+e^{2\,c\,z}\right)}{4\,c}$$

01.20.21.0171.01

$$\int e^{e-c\,z}\cosh(c\,z)\,dz == \frac{e^{e}\left(2\,c\,z-e^{-2\,c\,z}\right)}{4\,c}$$

Involving $a^{b\,z}\cosh(c\,z+d)$

01.20.21.0172.01

$$\int a^{b\,z}\cosh(d+c\,z)\,dz == \frac{a^{b\,z}\,(c\sinh(d+c\,z)-b\cosh(d+c\,z)\log(a))}{c^2-b^2\log^2(a)}$$

01.20.21.0173.01

$$\int e^{b\,z}\cosh(d+c\,z)\,dz == \frac{e^{b\,z}\,(b\cosh(d+c\,z)-c\sinh(d+c\,z))}{b^2-c^2}$$

01.20.21.0174.01

$$\int e^{c\,z}\cosh(d+c\,z)\,dz == \frac{2\,c\,e^{-d}\,z+e^{d+2\,c\,z}}{4\,c}$$

01.20.21.0175.01

$$\int e^{-c\,z}\cosh(d+c\,z)\,dz == -\frac{e^{-d-2\,c\,z}-2\,c\,e^{d}\,z}{4\,c}$$

Involving $a^{b\,z+e}\cosh(c\,z+d)$

01.20.21.0176.01

$$\int a^{e+b\,z}\cosh(d+c\,z)\,dz == \frac{a^{e+b\,z}\,(c\sinh(d+c\,z)-b\cosh(d+c\,z)\log(a))}{c^2-b^2\log^2(a)}$$

01.20.21.0177.01

$$\int e^{e+b\,z}\cosh(d+c\,z)\,dz == \frac{e^{e+b\,z}\,(b\cosh(d+c\,z)-c\sinh(d+c\,z))}{b^2-c^2}$$

01.20.21.0178.01

$$\int e^{e+c\,z}\cosh(d+c\,z)\,dz == \frac{2\,c\,e^{e-d}\,z+e^{d+e+2\,c\,z}}{4\,c}$$

01.20.21.0179.01

$$\int e^{e-c\,z}\cosh(d+c\,z)\,dz == -\frac{e^{-d+e-2\,c\,z}-2\,c\,e^{d+e}\,z}{4\,c}$$

Involving $a^{b\,z^r}\cosh(c\,z)$

01.20.21.0180.01

$$\int a^{b\,z^2}\cosh(c\,z)\,dz == \frac{e^{-\frac{c^2}{4\,b\log(a)}}\sqrt{\pi}\left(\operatorname{erfi}\left(\frac{2\,b\,z\log(a)-c}{2\sqrt{b}\,\log^{\frac{1}{2}}(a)}\right)+\operatorname{erfi}\left(\frac{c+2\,b\,z\log(a)}{2\sqrt{b}\,\log^{\frac{1}{2}}(a)}\right)\right)}{4\sqrt{b}\,\log^{\frac{1}{2}}(a)}$$

01.20.21.0181.01

$$\int e^{b z^2} \cosh(c z)\, dz == \frac{e^{-\frac{c^2}{4 b}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{c+2 b z}{2 \sqrt{b}}\right) - \operatorname{erfi}\left(\frac{c-2 b z}{2 \sqrt{b}}\right)\right)}{4 \sqrt{b}}$$

01.20.21.0182.01

$$\int a^{\sqrt{z}\ b} \cosh(c z)\, dz == \frac{1}{2}\left(\frac{2 \sinh(c z)\, a^{b \sqrt{z}}}{c} + \frac{1}{2} b \left(\frac{\operatorname{erf}\left(\frac{-2 \sqrt{z}\ c - b \log(a)}{2 \sqrt{-c}}\right)}{(-c)^{3/2}} + \frac{e^{\frac{b^2 \log^2(a)}{2 c}} \operatorname{erf}\left(\frac{2 c \sqrt{z} - b \log(a)}{2 \sqrt{c}}\right)}{c^{3/2}}\right) e^{-\frac{b^2 \log^2(a)}{4 c}} \sqrt{\pi} \log(a)\right)$$

01.20.21.0183.01

$$\int e^{\sqrt{z}\ b} \cosh(c z)\, dz == \frac{-b \sqrt{-c}\ e^{-\frac{b^2}{4 c}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{b+2 c \sqrt{z}}{2 \sqrt{-c}}\right) - b \sqrt{c}\ e^{\frac{b^2}{4 c}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{b-2 c \sqrt{z}}{2 \sqrt{c}}\right) + 4 c\, e^{b \sqrt{z}} \sinh(c z)}{4 c^2}$$

Involving $a^{b z^r + e} \cosh(c z)$

01.20.21.0184.01

$$\int a^{b z^2 + e} \cosh(c z)\, dz == \frac{a^e\, e^{-\frac{c^2}{4 b \log(a)}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{2 b z \log(a) - c}{2 \sqrt{b}\ \log^{\frac{1}{2}}(a)}\right) + \operatorname{erfi}\left(\frac{c + 2 b z \log(a)}{2 \sqrt{b}\ \log^{\frac{1}{2}}(a)}\right)\right)}{4 \sqrt{b}\ \log^{\frac{1}{2}}(a)}$$

01.20.21.0185.01

$$\int e^{b z^2 + e} \cosh(c z)\, dz == \frac{e^{e - \frac{c^2}{4 b}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{c+2 b z}{2 \sqrt{b}}\right) - \operatorname{erfi}\left(\frac{c-2 b z}{2 \sqrt{b}}\right)\right)}{4 \sqrt{b}}$$

01.20.21.0186.01

$$\int a^{\sqrt{z}\ b + e} \cosh(c z)\, dz == \frac{1}{2} a^e \left(\frac{2 \sinh(c z)\, a^{b \sqrt{z}}}{c} + \frac{1}{2} b \left(\frac{\operatorname{erf}\left(\frac{-2 \sqrt{z}\ c - b \log(a)}{2 \sqrt{-c}}\right)}{(-c)^{3/2}} + \frac{e^{\frac{b^2 \log^2(a)}{2 c}} \operatorname{erf}\left(\frac{2 c \sqrt{z} - b \log(a)}{2 \sqrt{c}}\right)}{c^{3/2}}\right) e^{-\frac{b^2 \log^2(a)}{4 c}} \sqrt{\pi} \log(a)\right)$$

01.20.21.0187.01

$$\int e^{\sqrt{z}\ b + e} \cosh(c z)\, dz == \frac{e^e \left(-b \sqrt{-c}\ e^{-\frac{b^2}{4 c}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{b+2 c \sqrt{z}}{2 \sqrt{-c}}\right) - b \sqrt{c}\ e^{\frac{b^2}{4 c}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{b-2 c \sqrt{z}}{2 \sqrt{c}}\right) + 4 c\, e^{b \sqrt{z}} \sinh(c z)\right)}{4 c^2}$$

Involving $a^{b z^r + d z} \cosh(c z)$

01.20.21.0188.01

$$\int a^{b z^2 + d z} \cosh(c z)\, dz == \frac{a^{-\frac{d^2}{4 b}}\, e^{-\frac{c\,(c + 2 d \log(a))}{4 b \log(a)}} \sqrt{\pi} \left(e^{\frac{c d}{b}} \operatorname{erfi}\left(\frac{(d+2 b z) \log(a) - c}{2 \sqrt{b}\ \log^{\frac{1}{2}}(a)}\right) + \operatorname{erfi}\left(\frac{c + (d + 2 b z) \log(a)}{2 \sqrt{b}\ \log^{\frac{1}{2}}(a)}\right)\right)}{4 \sqrt{b}\ \log^{\frac{1}{2}}(a)}$$

01.20.21.0189.01

$$\int e^{b z^2+d z} \cosh(c z)\, dz == \frac{e^{-\frac{c^2+2 d c+d^2}{4 b}} \sqrt{\pi} \left(e^{\frac{c d}{b}} \operatorname{erfi}\left(\frac{-c+d+2 b z}{2 \sqrt{b}}\right)+\operatorname{erfi}\left(\frac{c+d+2 b z}{2 \sqrt{b}}\right)\right)}{4 \sqrt{b}}$$

01.20.21.0190.01

$$\int a^{\sqrt{z}\, b+d z} \cosh(c z)\, dz == \frac{1}{2}\left(-\frac{e^{c z}\, a^{\sqrt{z}\, b+d z}}{-c-d \log(a)}-\frac{e^{-c z}\, a^{\sqrt{z}\, b+d z}}{c-d \log(a)}+\right.$$

$$\left. b \sqrt{\pi}\, \log(a)\left(\frac{e^{\frac{b^2 \log^2(a)}{4(-c-d \log(a))}} \operatorname{erf}\left(\frac{-2 \sqrt{z}\, c-b \log(a)-2 d \sqrt{z}\, \log(a)}{2 \sqrt{-c-d \log(a)}}\right)}{2 (-c-d \log(a))^{3/2}}+\frac{e^{\frac{b^2 \log^2(a)}{4(c-d \log(a))}} \operatorname{erf}\left(\frac{2 \sqrt{z}\, c-b \log(a)-2 d \sqrt{z}\, \log(a)}{2 \sqrt{c-d \log(a)}}\right)}{2 (c-d \log(a))^{3/2}}\right)\right)$$

01.20.21.0191.01

$$\int e^{\sqrt{z}\, b+d z} \cosh(c z)\, dz ==$$

$$\frac{1}{2}\left(\frac{b\, e^{\frac{b^2}{4(-c-d)}} \sqrt{\pi}\, \operatorname{erf}\left(\frac{-b-2 c \sqrt{z}-2 d \sqrt{z}}{2 \sqrt{-c-d}}\right)}{2 (-c-d)^{3/2}}+\frac{b\, e^{\frac{b^2}{4(c-d)}} \sqrt{\pi}\, \operatorname{erf}\left(\frac{-b+2 c \sqrt{z}-2 d \sqrt{z}}{2 \sqrt{c-d}}\right)}{2 (c-d)^{3/2}}-\frac{e^{b \sqrt{z}-(-c-d) z}}{-c-d}-\frac{e^{b \sqrt{z}-(c-d) z}}{c-d}\right)$$

Involving $a^{b z^r+d z+e} \cosh(c z)$

01.20.21.0192.01

$$\int a^{b z^2+d z+e} \cosh(c z)\, dz == \frac{a^{e-\frac{d^2}{4 b}} e^{-\frac{c (c+2 d \log(a))}{4 b \log(a)}} \sqrt{\pi} \left(e^{\frac{c d}{b}} \operatorname{erfi}\left(\frac{(d+2 b z) \log(a)-c}{2 \sqrt{b}\, \log^{\frac{1}{2}}(a)}\right)+\operatorname{erfi}\left(\frac{c+(d+2 b z) \log(a)}{2 \sqrt{b}\, \log^{\frac{1}{2}}(a)}\right)\right)}{4 \sqrt{b}\, \log^{\frac{1}{2}}(a)}$$

01.20.21.0193.01

$$\int e^{b z^2+d z+e} \cosh(c z)\, dz == \frac{\sqrt{\pi}\, e^{-\frac{c^2+2 d c+d^2-4 b e}{4 b}} \left(e^{\frac{c d}{b}} \operatorname{erfi}\left(\frac{-c+d+2 b z}{2 \sqrt{b}}\right)+\operatorname{erfi}\left(\frac{c+d+2 b z}{2 \sqrt{b}}\right)\right)}{4 \sqrt{b}}$$

01.20.21.0194.01

$$\int a^{\sqrt{z}\ b+e+d\,z}\cosh(c\,z)\,dz == \frac{1}{2}\,a^{e}\left(-\frac{e^{c\,z}\,a^{\sqrt{z}\ b+d\,z}}{-c-d\log(a)}-\frac{e^{-c\,z}\,a^{\sqrt{z}\ b+d\,z}}{c-d\log(a)}+\right.$$

$$\left.b\sqrt{\pi}\ \log(a)\left(\frac{e^{\frac{b^2\log^2(a)}{4(-c-d\log(a))}}\ \operatorname{erf}\left(\frac{-2\sqrt{z}\ c-b\log(a)-2\,d\sqrt{z}\ \log(a)}{2\sqrt{-c-d\log(a)}}\right)}{2\,(-c-d\log(a))^{3/2}}+\frac{e^{\frac{b^2\log^2(a)}{4(c-d\log(a))}}\ \operatorname{erf}\left(\frac{2\sqrt{z}\ c-b\log(a)-2\,d\sqrt{z}\ \log(a)}{2\sqrt{c-d\log(a)}}\right)}{2\,(c-d\log(a))^{3/2}}\right)\right)$$

01.20.21.0195.01

$$\int e^{\sqrt{z}\ b+e+d\,z}\cosh(c\,z)\,dz ==$$

$$\frac{1}{2}\,e^{e}\left(\frac{b\,e^{\frac{b^2}{4(-c-d)}}\sqrt{\pi}\ \operatorname{erf}\left(\frac{-b-2\,c\sqrt{z}-2\,d\sqrt{z}}{2\sqrt{-c-d}}\right)}{2\,(-c-d)^{3/2}}+\frac{b\,e^{\frac{b^2}{4(c-d)}}\sqrt{\pi}\ \operatorname{erf}\left(\frac{-b+2\,c\sqrt{z}-2\,d\sqrt{z}}{2\sqrt{c-d}}\right)}{2\,(c-d)^{3/2}}-\frac{e^{b\sqrt{z}-(-c-d)\,z}}{-c-d}-\frac{e^{b\sqrt{z}-(c-d)\,z}}{c-d}\right)$$

Involving $a^{b\,z^r}\cosh(f\,z+g)$

01.20.21.0196.01

$$\int a^{b\,z^2}\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{4\sqrt{b\log(a)}}\left(a^{-\frac{f^2}{2\,b\log^2(a)}}\,e^{\frac{f^2}{4\,b\log(a)}}\sqrt{\pi}\left(\operatorname{erfi}\left(\frac{f+2\,b\,z\log(a)}{2\sqrt{b\log(a)}}\right)(\cosh(g)+\sinh(g))-\operatorname{erfi}\left(\frac{2\,b\,z\log(a)-f}{2\sqrt{b\log(a)}}\right)(\sinh(g)-\cosh(g))\right)\right)$$

01.20.21.0197.01

$$\int e^{b\,z^2}\cosh(g+f\,z)\,dz == \frac{e^{-\frac{f^2}{4b}}\sqrt{\pi}\left(\operatorname{erfi}\left(\frac{f+2\,b\,z}{2\sqrt{b}}\right)(\cosh(g)+\sinh(g))-\operatorname{erfi}\left(\frac{2\,b\,z-f}{2\sqrt{b}}\right)(\sinh(g)-\cosh(g))\right)}{4\sqrt{b}}$$

01.20.21.0198.01

$$\int a^{\sqrt{z}\ b}\cosh(g+f\,z)\,dz ==$$

$$-\frac{1}{4}\,e^{-g}\left(\frac{2\,e^{-f\,z}\left(1-e^{2\,(g+f\,z)}\right)a^{b\sqrt{z}}}{f}+\frac{b\,e^{\frac{b^2\log^2(a)}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\log(a)-2\,f\sqrt{z}}{2\sqrt{-f}}\right)\log(a)}{(-f)^{3/2}}+\frac{b\,e^{2\,g-\frac{b^2\log^2(a)}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\sqrt{z}\ f+b\log(a)}{2\sqrt{f}}\right)\log(a)}{f^{3/2}}\right)$$

01.20.21.0199.01

$$\int e^{\sqrt{z}\ b}\cosh(g+f\,z)\,dz == -\frac{1}{4}\,e^{-g}\left(\frac{2\,e^{b\sqrt{z}-f\,z}\left(1-e^{2\,(g+f\,z)}\right)}{f}+\frac{b\,e^{\frac{b^2}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-2\,f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{b\,e^{2\,g-\frac{b^2}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}\right)$$

Involving $a^{b z^r+e}$ cosh$(f z+g)$

01.20.21.0200.01

$$\int a^{b z^2+e} \cosh(g+f z)\, dz == \frac{1}{4\sqrt{b \log(a)}}\left(a^{e-\frac{f^2}{2 b \log^2(a)}} e^{\frac{f^2}{4 b \log(a)}} \sqrt{\pi}\left(\operatorname{erfi}\left(\frac{f+2 b z \log(a)}{2\sqrt{b \log(a)}}\right)(\cosh(g)+\sinh(g)) - \operatorname{erfi}\left(\frac{2 b z \log(a)-f}{2\sqrt{b \log(a)}}\right)(\sinh(g)-\cosh(g))\right)\right)$$

01.20.21.0201.01

$$\int e^{b z^2+e} \cosh(g+f z)\, dz == \frac{e^{e-\frac{f^2}{4 b}}\sqrt{\pi}\left(\operatorname{erfi}\left(\frac{f+2 b z}{2\sqrt{b}}\right)(\cosh(g)+\sinh(g)) - \operatorname{erfi}\left(\frac{2 b z-f}{2\sqrt{b}}\right)(\sinh(g)-\cosh(g))\right)}{4\sqrt{b}}$$

01.20.21.0202.01

$$\int a^{\sqrt{z}\, b+e} \cosh(g+f z)\, dz == -\frac{1}{4} a^e e^{-g}\left(\frac{2 e^{-f z}\left(1-e^{2(g+f z)}\right) a^{b\sqrt{z}}}{f} + \frac{b e^{\frac{b^2 \log^2(a)}{4 f}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b \log(a)-2 f\sqrt{z}}{2\sqrt{-f}}\right)\log(a)}{(-f)^{3/2}} + \frac{b e^{2 g-\frac{b^2 \log^2(a)}{4 f}}\sqrt{\pi}\operatorname{erfi}\left(\frac{2\sqrt{z}\, f+b \log(a)}{2\sqrt{f}}\right)\log(a)}{f^{3/2}}\right)$$

01.20.21.0203.01

$$\int e^{\sqrt{z}\, b+e} \cosh(g+f z)\, dz == -\frac{1}{4} e^{e-g}\left(\frac{2 e^{b\sqrt{z}-f z}\left(1-e^{2(g+f z)}\right)}{f} + \frac{b e^{\frac{b^2}{4 f}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b-2 f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}} + \frac{b e^{2 g-\frac{b^2}{4 f}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+2 f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}\right)$$

Involving $a^{b z^r+d z}$ cosh$(f z+g)$

01.20.21.0204.01

$$\int a^{b z^2+d z} \cosh(g+f z)\, dz == \frac{1}{4\sqrt{b \log(a)}}\left(a^{-\frac{2 f^2+2 d \log(a) f+d^2 \log^2(a)}{4 b \log^2(a)}} e^{\frac{f^2}{4 b \log(a)}}\sqrt{\pi}\left(e^{\frac{d f}{b}}\operatorname{erfi}\left(\frac{(d+2 b z)\log(a)-f}{2\sqrt{b \log(a)}}\right)(\cosh(g)-\sinh(g)) + \operatorname{erfi}\left(\frac{f+(d+2 b z)\log(a)}{2\sqrt{b \log(a)}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0205.01

$$\int e^{b z^2+d z} \cosh(g+f z)\, dz == \frac{1}{4\sqrt{b}}\left(e^{-\frac{d^2+2 f d+f^2}{4 b}}\sqrt{\pi}\left(e^{\frac{d f}{b}}\operatorname{erfi}\left(\frac{d-f+2 b z}{2\sqrt{b}}\right)(\cosh(g)-\sinh(g)) + \operatorname{erfi}\left(\frac{d+f+2 b z}{2\sqrt{b}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0206.01

$$\int a^{\sqrt{z}\ b+d\,z}\cosh(g+f\,z)\,dz == \frac{1}{4}\,e^{-g}\left(-2\,e^{-f\,z}\left(\frac{1}{f-d\log(a)}-\frac{e^{2\,(g+f\,z)}}{f+d\log(a)}\right)a^{\sqrt{z}\ b+d\,z}-\right.$$

$$\left.\frac{b\,e^{\frac{b^2\log^2(a)}{4\,f-4\,d\log(a)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\log(a)-2\sqrt{z}\ (f-d\log(a))}{2\sqrt{d\log(a)-f}}\right)\log(a)}{(d\log(a)-f)^{3/2}}-\frac{b\,e^{2\,g-\frac{b^2\log^2(a)}{4\,(f+d\log(a))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\log(a)+2\sqrt{z}\ (f+d\log(a))}{2\sqrt{f+d\log(a)}}\right)\log(a)}{(f+d\log(a))^{3/2}}\right)$$

01.20.21.0207.01

$$\int e^{\sqrt{z}\ b+d\,z}\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{4}\,e^{-g}\left(-2\,e^{b\sqrt{z}}\left(\frac{e^{(d-f)\,z}}{f-d}-\frac{e^{2\,g+(d+f)\,z}}{d+f}\right)-\frac{b\,e^{\frac{b^2}{4\,f-4\,d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}-\frac{b\,e^{2\,g-\frac{b^2}{4\,(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)$$

Involving $a^{b\,z^r+d\,z+e}\cosh(f\,z+g)$

01.20.21.0208.01

$$\int a^{b\,z^2+d\,z+e}\cosh(g+f\,z)\,dz == \frac{1}{4\sqrt{b\log(a)}}\left(a^{-\frac{2\,f^2+2\,d\log(a)\,f+\left(d^2-4\,b\,e\right)\log^2(a)}{4\,b\log^2(a)}}\,e^{\frac{f^2}{4\,b\log(a)}}\sqrt{\pi}\right.$$

$$\left.\left(e^{\frac{d\,f}{b}}\operatorname{erfi}\left(\frac{(d+2\,b\,z)\log(a)-f}{2\sqrt{b\log(a)}}\right)(\cosh(g)-\sinh(g))+\operatorname{erfi}\left(\frac{f+(d+2\,b\,z)\log(a)}{2\sqrt{b\log(a)}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0209.01

$$\int e^{b\,z^2+d\,z+e}\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{4\sqrt{b}}\left(e^{-\frac{d^2+2\,f\,d+f^2-4\,b\,e}{4\,b}}\sqrt{\pi}\left(e^{\frac{d\,f}{b}}\operatorname{erfi}\left(\frac{d-f+2\,b\,z}{2\sqrt{b}}\right)(\cosh(g)-\sinh(g))+\operatorname{erfi}\left(\frac{d+f+2\,b\,z}{2\sqrt{b}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0210.01

$$\int a^{\sqrt{z}\ b+e+d\,z}\cosh(g+f\,z)\,dz == \frac{1}{4}\,a^{e}\,e^{-g}\left(-2\,e^{-f\,z}\left(\frac{1}{f-d\log(a)}-\frac{e^{2\,(g+f\,z)}}{f+d\log(a)}\right)a^{\sqrt{z}\ b+d\,z}-\right.$$

$$\left.\frac{b\,e^{\frac{b^2\log^2(a)}{4\,f-4\,d\log(a)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\log(a)-2\sqrt{z}\ (f-d\log(a))}{2\sqrt{d\log(a)-f}}\right)\log(a)}{(d\log(a)-f)^{3/2}}-\frac{b\,e^{2\,g-\frac{b^2\log^2(a)}{4\,(f+d\log(a))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\log(a)+2\sqrt{z}\ (f+d\log(a))}{2\sqrt{f+d\log(a)}}\right)\log(a)}{(f+d\log(a))^{3/2}}\right)$$

01.20.21.0211.01

$$\int e^{\sqrt{z}\,b+e+d\,z}\cosh(g+f\,z)\,dz == \frac{1}{4}e^{e-g}\left(-2e^{b\sqrt{z}}\left(\frac{e^{(d-f)z}}{f-d}-\frac{e^{2g+(d+f)z}}{d+f}\right)-\frac{b\,e^{\frac{b^2}{4f-4d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}-\frac{b\,e^{2g-\frac{b^2}{4(d+f)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)$$

Involving $a^{b\,z}\cosh(c\,z^r)$

01.20.21.0212.01

$$\int a^{b\,z}\cosh(c\,z^2)\,dz == \frac{\sqrt{\pi}\left(e^{\frac{b^2\log^2(a)}{4c}}\operatorname{erf}\left(\frac{2cz-b\log(a)}{2\sqrt{c}}\right)+e^{-\frac{b^2\log^2(a)}{4c}}\operatorname{erfi}\left(\frac{2cz+b\log(a)}{2\sqrt{c}}\right)\right)}{4\sqrt{c}}$$

01.20.21.0213.01

$$\int e^{b\,z}\cosh(c\,z^2)\,dz == \frac{\sqrt{\pi}\left(e^{\frac{b^2}{4c}}\operatorname{erf}\left(\frac{2cz-b}{2\sqrt{c}}\right)+e^{-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{b+2cz}{2\sqrt{c}}\right)\right)}{4\sqrt{c}}$$

01.20.21.0214.01

$$\int a^{b\,z}\cosh\left(c\sqrt{z}\right)dz == \frac{\cosh\left(c\sqrt{z}\right)a^{b\,z}}{b\log(a)}-\frac{c\sqrt{\pi}\,e^{-\frac{c^2}{4b\log(a)}}\operatorname{erfi}\left(\frac{c+2b\sqrt{z}\log(a)}{2\sqrt{b\log(a)}}\right)}{4(b\log(a))^{3/2}}-\frac{c\sqrt{\pi}\,e^{-\frac{c^2}{4b\log(a)}}\operatorname{erfi}\left(\frac{c-2b\sqrt{z}\log(a)}{2\sqrt{b\log(a)}}\right)}{4(b\log(a))^{3/2}}$$

01.20.21.0215.01

$$\int e^{b\,z}\cosh\left(c\sqrt{z}\right)dz == \frac{e^{b\,z}\cosh\left(c\sqrt{z}\right)}{b}-\frac{c\,e^{-\frac{c^2}{4b}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,b+c}{2\sqrt{b}}\right)}{4b^{3/2}}-\frac{c\,e^{-\frac{c^2}{4b}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c-2b\sqrt{z}}{2\sqrt{b}}\right)}{4b^{3/2}}$$

Involving $a^{d\,z+e}\cosh(c\,z^r)$

01.20.21.0216.01

$$\int a^{e+d\,z}\cosh(c\,z^2)\,dz == \frac{a^e e^{-\frac{d^2\log^2(a)}{4c}}\sqrt{\pi}\left(\sqrt{c}\,\operatorname{erfi}\left(\frac{2cz+d\log(a)}{2\sqrt{c}}\right)-\sqrt{-c}\,e^{\frac{d^2\log^2(a)}{2c}}\operatorname{erfi}\left(\frac{d\log(a)-2cz}{2\sqrt{-c}}\right)\right)}{4c}$$

01.20.21.0217.01

$$\int e^{e+d\,z}\cosh(c\,z^2)\,dz == \frac{e^{e-\frac{d^2}{4c}}\sqrt{\pi}\left(\sqrt{c}\,\operatorname{erfi}\left(\frac{d+2cz}{2\sqrt{c}}\right)-\sqrt{-c}\,e^{\frac{d^2}{2c}}\operatorname{erfi}\left(\frac{d-2cz}{2\sqrt{-c}}\right)\right)}{4c}$$

01.20.21.0218.01

$$\int a^{e+d\,z}\cosh\left(c\,\sqrt{z}\right)dz == \frac{1}{4\,(d\log(a))^{3/2}}\left(a^{e}\,e^{-\frac{c^2}{4\,d\log(a)}-c\,\sqrt{z}}\right.$$
$$\left.\left(2\,e^{\frac{c^2}{4\,d\log(a)}}\left(1+e^{2\,c\,\sqrt{z}}\right)\sqrt{d\log(a)}\;a^{d\,z}+c\,e^{c\,\sqrt{z}}\;\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;\log(a)-c}{2\,\sqrt{d\log(a)}}\right)-c\,e^{c\,\sqrt{z}}\;\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,d\,\sqrt{z}\;\log(a)}{2\,\sqrt{d\log(a)}}\right)\right)\right)$$

01.20.21.0219.01

$$\int e^{e+d\,z}\cosh\left(c\,\sqrt{z}\right)dz == \frac{e^{e-\frac{c^2}{4\,d}}\left(2\,\sqrt{d}\;e^{\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{4\,d}}\left(1+e^{2\,c\,\sqrt{z}}\right)-c\,\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,d\,\sqrt{z}}{2\,\sqrt{d}}\right)-c\,\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c-2\,d\,\sqrt{z}}{2\,\sqrt{d}}\right)\right)}{4\,d^{3/2}}$$

Involving $a^{b\,z^r}\cosh\left(c\,z^r\right)$

01.20.21.0220.01

$$\int a^{b\,z^r}\cosh(c\,z^r)\,dz == -\frac{1}{2\,r}\left(z\left(\Gamma\left(\frac{1}{r},\,-z^r\,(c+b\log(a))\right)(-z^r\,(c+b\log(a)))^{-1/r}+\Gamma\left(\frac{1}{r},\,z^r\,(c-b\log(a))\right)(z^r\,(c-b\log(a)))^{-1/r}\right)\right)$$

01.20.21.0221.01

$$\int e^{b\,z^r}\cosh(c\,z^r)\,dz == -\frac{z\left(\Gamma\left(\frac{1}{r},\,(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}+((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-b)\,z^r\right)\right)}{2\,r}$$

01.20.21.0222.01

$$\int a^{b\,z^2}\cosh\left(c\,z^2\right)dz == \frac{1}{4\left(c^2-b^2\log^2(a)\right)}$$
$$\left(\sqrt{\pi}\left(\operatorname{erfi}\left(z\,\sqrt{c+b\log(a)}\right)(c-b\log(a))\,\sqrt{c+b\log(a)}\;-\operatorname{erfi}\left(\frac{b\,z\log(a)-c\,z}{\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\;(c+b\log(a))\right)\right)$$

01.20.21.0223.01

$$\int e^{b\,z^2}\cosh\left(c\,z^2\right)dz == \frac{\sqrt{\pi}\left(\sqrt{b-c}\;(b+c)\operatorname{erfi}\left(\sqrt{b-c}\;z\right)+(b-c)\,\sqrt{b+c}\;\operatorname{erfi}\left(\sqrt{b+c}\;z\right)\right)}{4\,(b-c)\,(b+c)}$$

01.20.21.0224.01

$$\int a^{b\,\sqrt{z}}\cosh\left(c\,\sqrt{z}\right)dz == \frac{1}{\left(c^2-b^2\log^2(a)\right)^2}\left(2\,a^{b\,\sqrt{z}}\right.$$
$$\left.\left(c\left(\sqrt{z}\;c^2-b^2\,\sqrt{z}\;\log^2(a)+2\,b\log(a)\right)\sinh\left(c\,\sqrt{z}\right)-\cosh\left(c\,\sqrt{z}\right)\left(-b^3\,\sqrt{z}\;\log^3(a)+b^2\log^2(a)+b\,c^2\,\sqrt{z}\;\log(a)+c^2\right)\right)\right)$$

01.20.21.0225.01

$$\int e^{b\,\sqrt{z}}\cosh\left(c\,\sqrt{z}\right)dz == \frac{2\,e^{b\,\sqrt{z}}\left(\left(\sqrt{z}\;b^3-b^2-c^2\,\sqrt{z}\;b-c^2\right)\cosh\left(c\,\sqrt{z}\right)+\left(\sqrt{z}\;c^3+2\,b\,c-b^2\,\sqrt{z}\;c\right)\sinh\left(c\,\sqrt{z}\right)\right)}{\left(b^2-c^2\right)^2}$$

Involving $a^{b\,z^r+e}\cosh\left(c\,z^r\right)$

01.20.21.0226.01

$$\int a^{b z^r+e} \cosh(c z^r)\, dz == -\frac{1}{2r}\left(a^e z\left(\Gamma\left(\frac{1}{r}, -z^r (c+b\log(a))\right)(-z^r (c+b\log(a)))^{-1/r} + \Gamma\left(\frac{1}{r}, z^r (c-b\log(a))\right)(z^r (c-b\log(a)))^{-1/r}\right)\right)$$

01.20.21.0227.01

$$\int e^{b z^r+e} \cosh(c z^r)\, dz == -\frac{e^e z\left(\Gamma\left(\frac{1}{r}, (-b-c) z^r\right)((-b-c) z^r)^{-1/r} + ((c-b) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c-b) z^r\right)\right)}{2r}$$

01.20.21.0228.01

$$\int a^{b z^2+e} \cosh\left(c z^2\right) dz == \frac{1}{4\left(c^2 - b^2 \log^2(a)\right)}$$
$$\left(a^e \sqrt{\pi}\left(\operatorname{erfi}\left(z\sqrt{c+b\log(a)}\right)(c-b\log(a))\sqrt{c+b\log(a)} - \operatorname{erfi}\left(\frac{b z\log(a) - c z}{\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\,(c+b\log(a))\right)\right)$$

01.20.21.0229.01

$$\int e^{b z^2+e} \cosh\left(c z^2\right) dz == \frac{e^e \sqrt{\pi}\left(\sqrt{b-c}\,(b+c)\operatorname{erfi}\left(\sqrt{b-c}\,z\right) + (b-c)\sqrt{b+c}\,\operatorname{erfi}\left(\sqrt{b+c}\,z\right)\right)}{4(b-c)(b+c)}$$

01.20.21.0230.01

$$\int a^{\sqrt{z}\,b+e} \cosh\left(c\sqrt{z}\right) dz == \frac{1}{\left(c^2 - b^2\log^2(a)\right)^2}\left(2a^{\sqrt{z}\,b+e}\right.$$
$$\left.\left(c\left(\sqrt{z}\,c^2 - b^2\sqrt{z}\,\log^2(a) + 2b\log(a)\right)\sinh\left(c\sqrt{z}\right) - \cosh\left(c\sqrt{z}\right)\left(-b^3\sqrt{z}\,\log^3(a) + b^2\log^2(a) + b c^2\sqrt{z}\,\log(a) + c^2\right)\right)\right)$$

01.20.21.0231.01

$$\int e^{\sqrt{z}\,b+e} \cosh\left(c\sqrt{z}\right) dz == \frac{1}{\left(b^2-c^2\right)^2}\left(2e^{\sqrt{z}\,b+e}\left(\left(\sqrt{z}\,b^3 - b^2 - c^2\sqrt{z}\,b - c^2\right)\cosh\left(c\sqrt{z}\right) + \left(\sqrt{z}\,c^3 + 2bc - b^2\sqrt{z}\,c\right)\sinh\left(c\sqrt{z}\right)\right)\right)$$

Involving $a^{b z^r+d z}\cosh\left(c z^r\right)$

01.20.21.0232.01

$$\int a^{b z^2+d z} \cosh\left(c z^2\right) dz == \frac{1}{4\left(c^2 - b^2\log^2(a)\right)}\left(a^{\frac{b d^2\log^2(a)}{2c^2-2b^2\log^2(a)}}\sqrt{\pi}\left(e^{\frac{d^2\log^2(a)}{4b\log(a)-4c}}\operatorname{erfi}\left(\frac{2cz + (d+2bz)\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)} - \right.\right.$$
$$\left.\left.e^{\frac{d^2\log^2(a)}{4c+4b\log(a)}}\operatorname{erfi}\left(\frac{(d+2bz)\log(a) - 2cz}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\,(c+b\log(a))\right)\right)$$

01.20.21.0233.01

$$\int e^{b z^2+d z} \cosh\left(c z^2\right) dz == \frac{1}{4 (b-c) (b+c)} \left(e^{\frac{2 b d^2+c d^2}{4 c^2-4 b^2}} \sqrt{\pi} \left(\sqrt{b-c}\ (b+c)\, e^{\frac{b d^2}{4 b^2-4 c^2}} \operatorname{erfi}\left(\frac{d+2 (b-c) z}{2 \sqrt{b-c}} \right) + (b-c) \sqrt{b+c}\ e^{\frac{(b+2 c) d^2}{4 (b-c) (b+c)}} \operatorname{erfi}\left(\frac{d+2 (b+c) z}{2 \sqrt{b+c}} \right) \right) \right)$$

01.20.21.0234.01

$$\int a^{\sqrt{z}\ b+d z} \cosh\left(c \sqrt{z}\right) dz == \frac{1}{4 (d \log(a))^{3/2}} \left(a^{-\frac{b^2}{4 d}} e^{-\frac{c^2+2 \left(b c+2 d \sqrt{z}\ c\right) \log(a)}{4 d \log(a)}} \left(2 e^{\frac{c (c+2 b \log(a))}{4 d \log(a)}} \left(1+e^{2 c \sqrt{z}}\right) \sqrt{d \log(a)}\ a^{\frac{\left(b+2 d \sqrt{z}\right)^2}{4 d}} - e^{c \sqrt{z}} \sqrt{\pi} \right.\right.$$
$$\left.\left. \operatorname{erfi}\left(\frac{c+\left(b+2 d \sqrt{z}\right) \log(a)}{2 \sqrt{d \log(a)}} \right) (c+b \log(a)) + e^{c \left(\frac{b}{d}+\sqrt{z}\right)} \sqrt{\pi} \operatorname{erfi}\left(\frac{\left(b+2 d \sqrt{z}\right) \log(a)-c}{2 \sqrt{d \log(a)}} \right) (c-b \log(a)) \right) \right)$$

01.20.21.0235.01

$$\int e^{\sqrt{z}\ b+d z} \cosh\left(c \sqrt{z}\right) dz == \frac{1}{4 d^{3/2}} \left(e^{-\frac{b^2+2 c b+c^2}{4 d}} \left(2 \sqrt{d}\ e^{\frac{b^2+2 \left(c+2 d \sqrt{z}\right) b+\left(c-2 d \sqrt{z}\right)^2}{4 d}} \left(1+e^{2 c \sqrt{z}}\right) - (b-c) e^{\frac{b c}{d}} \sqrt{\pi} \operatorname{erfi}\left(\frac{b-c+2 d \sqrt{z}}{2 \sqrt{d}} \right) - (b+c) \sqrt{\pi} \operatorname{erfi}\left(\frac{b+c+2 d \sqrt{z}}{2 \sqrt{d}} \right) \right) \right)$$

Involving $a^{b z^r+d z+e} \cosh\left(c z^r\right)$

01.20.21.0236.01

$$\int a^{b z^2+d z+e} \cosh\left(c z^2\right) dz == \frac{1}{4 \left(c^2-b^2 \log^2(a)\right)} \left(a^{\frac{b d^2 \log^2(a)}{2 c^2-2 b^2 \log^2(a)}+e} \sqrt{\pi} \left(e^{\frac{d^2 \log^2(a)}{4 b \log(a)-4 c}} \operatorname{erfi}\left(\frac{2 c z+(d+2 b z) \log(a)}{2 \sqrt{c+b \log(a)}} \right) (c-b \log(a)) \sqrt{c+b \log(a)} - \right.\right.$$
$$\left.\left. e^{\frac{d^2 \log^2(a)}{4 c+4 b \log(a)}} \operatorname{erfi}\left(\frac{(d+2 b z) \log(a)-2 c z}{2 \sqrt{b \log(a)-c}} \right) \sqrt{b \log(a)-c}\ (c+b \log(a)) \right) \right)$$

01.20.21.0237.01

$$\int e^{b z^2+d z+e} \cosh\left(c z^2\right) dz == \frac{1}{4 (b-c) (b+c)} \left(e^{\frac{-4 e b^2+2 d^2 b+c \left(d^2+4 c e\right)}{4 c^2-4 b^2}} \sqrt{\pi} \left(\sqrt{b-c}\ (b+c)\, e^{\frac{b d^2}{4 b^2-4 c^2}} \operatorname{erfi}\left(\frac{d+2 (b-c) z}{2 \sqrt{b-c}} \right) + (b-c) \sqrt{b+c}\ e^{\frac{(b+2 c) d^2}{4 (b-c) (b+c)}} \operatorname{erfi}\left(\frac{d+2 (b+c) z}{2 \sqrt{b+c}} \right) \right) \right)$$

01.20.21.0238.01

$$\int a^{\sqrt{z}\ b+e+d\,z}\cosh\left(c\sqrt{z}\right)dz == \frac{1}{4\,(d\log(a))^{3/2}}\left(a^{e-\frac{b^2}{4d}}\,e^{-\frac{c^2+2\left(b\,c+2\,d\sqrt{z}\ c\right)\log(a)}{4\,d\log(a)}}\left(2\,e^{\frac{c\left(c+2\,b\log(a)\right)}{4\,d\log(a)}}\left(1+e^{2\,c\sqrt{z}}\right)\sqrt{d\log(a)}\ a^{\frac{\left(b+2\,d\sqrt{z}\right)^2}{4\,d}}-e^{c\sqrt{z}}\ \sqrt{\pi}\right.\right.$$
$$\left.\left.\text{erfi}\left(\frac{c+\left(b+2\,d\sqrt{z}\right)\log(a)}{2\sqrt{d\log(a)}}\right)(c+b\log(a))+e^{c\left(\frac{b}{d}+\sqrt{z}\right)}\sqrt{\pi}\ \text{erfi}\left(\frac{\left(b+2\,d\sqrt{z}\right)\log(a)-c}{2\sqrt{d\log(a)}}\right)(c-b\log(a))\right)\right)$$

01.20.21.0239.01

$$\int e^{\sqrt{z}\ b+e+d\,z}\cosh\left(c\sqrt{z}\right)dz == \frac{1}{4\,d^{3/2}}\left(e^{-\frac{b^2+2\,c\,b+c^2-4\,d\,e}{4\,d}}\right.$$
$$\left.\left(2\sqrt{d}\ e^{\frac{b^2+2\left(c+2\,d\sqrt{z}\right)b+\left(c-2\,d\sqrt{z}\right)^2}{4\,d}}\left(1+e^{2\,c\sqrt{z}}\right)-(b-c)\,e^{\frac{b\,c}{d}}\sqrt{\pi}\ \text{erfi}\left(\frac{b-c+2\,d\sqrt{z}}{2\sqrt{d}}\right)-(b+c)\sqrt{\pi}\ \text{erfi}\left(\frac{b+c+2\,d\sqrt{z}}{2\sqrt{d}}\right)\right)\right)$$

Involving $a^{d\,z}\cosh\left(c\,z^r+g\right)$

01.20.21.0240.01

$$\int a^{d\,z}\cosh\left(c\,z^2+g\right)dz == \frac{1}{4\,c}\left(e^{-\frac{d^2\log^2(a)}{4\,c}}\sqrt{\pi}\left(\sqrt{c}\ \text{erfi}\left(\frac{2\,c\,z+d\log(a)}{2\sqrt{c}}\right)(\cosh(g)+\sinh(g))-\sqrt{-c}\ e^{\frac{d^2\log^2(a)}{2\,c}}\ \text{erfi}\left(\frac{d\log(a)-2\,c\,z}{2\sqrt{-c}}\right)(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0241.01

$$\int e^{d\,z}\cosh\left(c\,z^2+g\right)dz == \frac{1}{4\,c}\left(e^{-\frac{d^2}{4\,c}}\sqrt{\pi}\left(\sqrt{c}\ \text{erfi}\left(\frac{d+2\,c\,z}{2\sqrt{c}}\right)(\cosh(g)+\sinh(g))-\sqrt{-c}\ e^{\frac{d^2}{2\,c}}\ \text{erfi}\left(\frac{d-2\,c\,z}{2\sqrt{-c}}\right)(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0242.01

$$\int a^{d\,z}\cosh\left(\sqrt{z}\ c+g\right)dz == \frac{1}{4\,(d\log(a))^{3/2}}\left(e^{-\frac{c^2}{4\,d\log(a)}-\sqrt{z}\ c-g}\left(2\,e^{\frac{c^2}{4\,d\log(a)}}\left(1+e^{2\left(\sqrt{z}\ c+g\right)}\right)\sqrt{d\log(a)}\ a^{d\,z}+c\,e^{c\sqrt{z}}\ \sqrt{\pi}\ \text{erfi}\left(\frac{2\,d\sqrt{z}\ \log(a)-c}{2\sqrt{d\log(a)}}\right)-\right.\right.$$
$$\left.\left.c\,e^{\sqrt{z}\ c+2\,g}\sqrt{\pi}\ \text{erfi}\left(\frac{c+2\,d\sqrt{z}\ \log(a)}{2\sqrt{d\log(a)}}\right)\right)\right)$$

01.20.21.0243.01

$$\int e^{d\,z}\cosh\left(\sqrt{z}\ c+g\right)dz == \frac{1}{4\,d^{3/2}}\left(e^{-\frac{c^2}{4\,d}-g}\left(2\sqrt{d}\ e^{\frac{\left(c-2\,d\sqrt{z}\right)^2}{4\,d}}\left(1+e^{2\left(\sqrt{z}\ c+g\right)}\right)-c\,e^{2\,g}\sqrt{\pi}\ \text{erfi}\left(\frac{c+2\,d\sqrt{z}}{2\sqrt{d}}\right)-c\sqrt{\pi}\ \text{erfi}\left(\frac{c-2\,d\sqrt{z}}{2\sqrt{d}}\right)\right)\right)$$

Involving $a^{d z+e} \cosh(c z^r + g)$

01.20.21.0244.01

$$\int a^{e+d z} \cosh(c z^2 + g)\, dz == \frac{1}{4 c}$$
$$\left(a^e e^{-\frac{d^2 \log^2(a)}{4 c}} \sqrt{\pi} \left(\sqrt{c}\ \operatorname{erfi}\left(\frac{2 c z + d \log(a)}{2 \sqrt{c}}\right)(\cosh(g) + \sinh(g)) - \sqrt{-c}\ e^{\frac{d^2 \log^2(a)}{2 c}} \operatorname{erfi}\left(\frac{d \log(a) - 2 c z}{2 \sqrt{-c}}\right)(\cosh(g) - \sinh(g))\right)\right)$$

01.20.21.0245.01

$$\int e^{e+d z} \cosh(c z^2 + g)\, dz ==$$
$$\frac{1}{4 c}\left(e^{e-\frac{d^2}{4 c}} \sqrt{\pi} \left(\sqrt{c}\ \operatorname{erfi}\left(\frac{d + 2 c z}{2 \sqrt{c}}\right)(\cosh(g) + \sinh(g)) - \sqrt{-c}\ e^{\frac{d^2}{2 c}} \operatorname{erfi}\left(\frac{d - 2 c z}{2 \sqrt{-c}}\right)(\cosh(g) - \sinh(g))\right)\right)$$

01.20.21.0246.01

$$\int a^{e+d z} \cosh\left(\sqrt{z}\ c + g\right) dz ==$$
$$\frac{1}{4 (d \log(a))^{3/2}}\left(a^e e^{-\frac{c^2}{4 d \log(a)} - \sqrt{z}\ c - g}\left(2 e^{\frac{c^2}{4 d \log(a)}}\left(1 + e^{2\left(\sqrt{z}\ c + g\right)}\right)\sqrt{d \log(a)}\ a^{d z} + c\, e^{c \sqrt{z}}\ \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2 d \sqrt{z}\ \log(a) - c}{2 \sqrt{d \log(a)}}\right) - \right.\right.$$
$$\left.\left. c\, e^{\sqrt{z}\ c + 2 g}\ \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c + 2 d \sqrt{z}\ \log(a)}{2 \sqrt{d \log(a)}}\right)\right)\right)$$

01.20.21.0247.01

$$\int e^{e+d z} \cosh\left(\sqrt{z}\ c + g\right) dz ==$$
$$\frac{1}{4 d^{3/2}}\left(e^{-\frac{c^2}{4 d} + e - g}\left(2 \sqrt{d}\ e^{\frac{\left(c - 2 d \sqrt{z}\right)^2}{4 d}}\left(1 + e^{2\left(\sqrt{z}\ c + g\right)}\right) - c\, e^{2 g}\ \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c + 2 d \sqrt{z}}{2 \sqrt{d}}\right) - c \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c - 2 d \sqrt{z}}{2 \sqrt{d}}\right)\right)\right)$$

Involving $a^{b z^r} \cosh(c z^r + g)$

01.20.21.0248.01

$$\int a^{b z^r} \cosh(c z^r + g)\, dz ==$$
$$-\frac{1}{2 r}\left(e^{-g} z \left(e^{2 g}\, \Gamma\left(\frac{1}{r}, -z^r (c + b \log(a))\right)(-z^r (c + b \log(a)))^{-1/r} + \Gamma\left(\frac{1}{r}, z^r (c - b \log(a))\right)(z^r (c - b \log(a)))^{-1/r}\right)\right)$$

01.20.21.0249.01

$$\int e^{b z^r} \cosh(c z^r + g)\, dz == -\frac{e^{-g} z \left(\Gamma\left(\frac{1}{r}, (c - b) z^r\right)((c - b) z^r)^{-1/r} + e^{2 g} (-(b + c) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, -(b + c) z^r\right)\right)}{2 r}$$

01.20.21.0250.01

$$\int a^{b z^2} \cosh\left(c z^2 + g\right) dz == \frac{1}{4\left(c^2 - b^2 \log^2(a)\right)} \left(\sqrt{\pi} \left(\operatorname{erfi}\left(z \sqrt{c + b \log(a)}\right) (c - b \log(a)) \sqrt{c + b \log(a)} \, (\cosh(g) + \sinh(g)) - \operatorname{erfi}\left(\frac{b z \log(a) - c z}{\sqrt{b \log(a) - c}}\right) \sqrt{b \log(a) - c} \, (c + b \log(a)) (\cosh(g) - \sinh(g))\right)\right)$$

01.20.21.0251.01

$$\int e^{b z^2} \cosh\left(c z^2 + g\right) dz == \frac{1}{4 (b - c) (b + c)} \left(\sqrt{\pi} \left(\sqrt{b - c} \, (b + c) \operatorname{erfi}\left(\sqrt{b - c} \, z\right) (\cosh(g) - \sinh(g)) + (b - c) \sqrt{b + c} \, \operatorname{erfi}\left(\sqrt{b + c} \, z\right) (\cosh(g) + \sinh(g))\right)\right)$$

01.20.21.0252.01

$$\int a^{\sqrt{z}\, b} \cosh\left(\sqrt{z} \, c + g\right) dz == \frac{1}{\left(c^2 - b^2 \log^2(a)\right)^2} \left(2 a^{\sqrt{z}\, b} \left(c \sinh\left(\sqrt{z} \, c + g\right) \left(\sqrt{z} \, c^2 - b^2 \sqrt{z} \, \log^2(a) + 2 b \log(a)\right) - \left(-b^3 \sqrt{z} \, \log^3(a) + b^2 \log^2(a) + b c^2 \sqrt{z} \, \log(a) + c^2\right) \cosh\left(\sqrt{z} \, c + g\right)\right)\right)$$

01.20.21.0253.01

$$\int e^{\sqrt{z}\, b} \cosh\left(\sqrt{z} \, c + g\right) dz == \frac{1}{\left(b^2 - c^2\right)^2} \left(2 e^{\sqrt{z}\, b} \left(\left(\sqrt{z} \, b^3 - b^2 - c^2 \sqrt{z} \, b - c^2\right) \cosh\left(\sqrt{z} \, c + g\right) + \left(\sqrt{z} \, c^3 + 2 b c - b^2 \sqrt{z} \, c\right) \sinh\left(\sqrt{z} \, c + g\right)\right)\right)$$

Involving $a^{b z^r + e} \cosh\left(c z^r + g\right)$

01.20.21.0254.01

$$\int a^{b z^r + e} \cosh(c z^r + g) \, dz == -\frac{1}{2 r} \left(a^e e^{-g} z \left(e^{2 g} \Gamma\left(\frac{1}{r}, -z^r (c + b \log(a))\right) (-z^r (c + b \log(a)))^{-1/r} + \Gamma\left(\frac{1}{r}, z^r (c - b \log(a))\right) (z^r (c - b \log(a)))^{-1/r}\right)\right)$$

01.20.21.0255.01

$$\int e^{b z^r + e} \cosh(c z^r + g) \, dz == -\frac{e^{e - g} z \left(\Gamma\left(\frac{1}{r}, (c - b) z^r\right) ((c - b) z^r)^{-1/r} + e^{2 g} (-(b + c) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, -(b + c) z^r\right)\right)}{2 r}$$

01.20.21.0256.01

$$\int a^{b z^2 + e} \cosh\left(c z^2 + g\right) dz == \frac{1}{4\left(c^2 - b^2 \log^2(a)\right)} \left(a^e \sqrt{\pi} \left(\operatorname{erfi}\left(z \sqrt{c + b \log(a)}\right) (c - b \log(a)) \sqrt{c + b \log(a)} \, (\cosh(g) + \sinh(g)) - \operatorname{erfi}\left(\frac{b z \log(a) - c z}{\sqrt{b \log(a) - c}}\right) \sqrt{b \log(a) - c} \, (c + b \log(a)) (\cosh(g) - \sinh(g))\right)\right)$$

01.20.21.0257.01

$$\int e^{b z^2+e} \cosh\left(c z^2+g\right) dz == \frac{1}{4 (b-c) (b+c)}$$
$$\left(e^e \sqrt{\pi} \left(\sqrt{b-c}\ (b+c) \operatorname{erfi}\left(\sqrt{b-c}\ z\right) (\cosh(g)-\sinh(g)) + (b-c) \sqrt{b+c}\ \operatorname{erfi}\left(\sqrt{b+c}\ z\right) (\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0258.01

$$\int a^{\sqrt{z}\ b+e} \cosh\left(\sqrt{z}\ c+g\right) dz == \frac{1}{\left(c^2-b^2 \log^2(a)\right)^2} \left(2 a^{\sqrt{z}\ b+e} \left(c \sinh\left(\sqrt{z}\ c+g\right) \left(\sqrt{z}\ c^2-b^2 \sqrt{z}\ \log^2(a)+2 b \log(a)\right)-\right.\right.$$
$$\left.\left.\left(-b^3 \sqrt{z}\ \log^3(a)+b^2 \log^2(a)+b c^2 \sqrt{z}\ \log(a)+c^2\right) \cosh\left(\sqrt{z}\ c+g\right)\right)\right)$$

01.20.21.0259.01

$$\int e^{\sqrt{z}\ b+e} \cosh\left(\sqrt{z}\ c+g\right) dz ==$$
$$\frac{1}{\left(b^2-c^2\right)^2} \left(2 e^{\sqrt{z}\ b+e} \left(\left(\sqrt{z}\ b^3-b^2-c^2 \sqrt{z}\ b-c^2\right) \cosh\left(\sqrt{z}\ c+g\right)+\left(\sqrt{z}\ c^3+2 b c-b^2 \sqrt{z}\ c\right) \sinh\left(\sqrt{z}\ c+g\right)\right)\right)$$

Involving $a^{b z^r+d z} \cosh\left(c z^r+g\right)$

01.20.21.0260.01

$$\int a^{b z^2+d z} \cosh\left(c z^2+g\right) dz == \frac{1}{4\left(c^2-b^2 \log^2(a)\right)}$$
$$\left(a^{\frac{b d^2 \log^2(a)}{2 c^2-2 b^2 \log^2(a)}} \sqrt{\pi} \left(e^{\frac{d^2 \log^2(a)}{4 b \log(a)-4 c}} \operatorname{erfi}\left(\frac{2 c z+(d+2 b z) \log(a)}{2 \sqrt{c+b \log(a)}}\right) (c-b \log(a)) \sqrt{c+b \log(a)}\ (\cosh(g)+\sinh(g))-\right.\right.$$
$$\left.\left.e^{\frac{d^2 \log^2(a)}{4 c+4 b \log(a)}} \operatorname{erfi}\left(\frac{(d+2 b z) \log(a)-2 c z}{2 \sqrt{b \log(a)-c}}\right) \sqrt{b \log(a)-c}\ (c+b \log(a)) (\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0261.01

$$\int e^{b z^2+d z} \cosh\left(c z^2+g\right) dz ==$$
$$\frac{1}{4 (b-c) (b+c)} \left(e^{\frac{2 b d^2+c d^2}{4 c^2-4 b^2}} \sqrt{\pi} \left(\sqrt{b-c}\ (b+c)\, e^{\frac{b d^2}{4 b^2-4 c^2}} \operatorname{erfi}\left(\frac{d+2 (b-c) z}{2 \sqrt{b-c}}\right) (\cosh(g)-\sinh(g))+(b-c)\right.\right.$$
$$\left.\left.\sqrt{b+c}\ e^{\frac{(b+2 c) d^2}{4 (b-c) (b+c)}} \operatorname{erfi}\left(\frac{d+2 (b+c) z}{2 \sqrt{b+c}}\right) (\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0262.01

$$\int a^{\sqrt{z}\ b+d z} \cosh\left(\sqrt{z}\ c+g\right) dz ==$$
$$\frac{1}{4 (d \log(a))^{3/2}} \left(a^{-\frac{b^2}{4 d}} e^{-\frac{c^2+2 \left(b c+2 d \left(\sqrt{z}\ c+g\right)\right) \log(a)}{4 d \log(a)}} \left(2 e^{\frac{c \left(c+2 b \log(a)\right)}{4 d \log(a)}} \left(1+e^{2 \left(\sqrt{z}\ c+g\right)}\right) \sqrt{d \log(a)}\ a^{\frac{\left(b+2 d \sqrt{z}\right)^2}{4 d}}-e^{\sqrt{z}\ c+2 g} \sqrt{\pi}\right.\right.$$
$$\left.\left.\operatorname{erfi}\left(\frac{c+\left(b+2 d \sqrt{z}\right) \log(a)}{2 \sqrt{d \log(a)}}\right) (c+b \log(a))+e^{c \left(\frac{b}{d}+\sqrt{z}\right)} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{\left(b+2 d \sqrt{z}\right) \log(a)-c}{2 \sqrt{d \log(a)}}\right) (c-b \log(a))\right)\right)$$

01.20.21.0263.01

$$\int e^{\sqrt{z}\ b+d\,z}\cosh\left(\sqrt{z}\ c+g\right)dz==$$
$$\frac{1}{4\,d^{3/2}}\left(e^{-\frac{b^2+2\,c\,b+c^2+4\,d\,g}{4\,d}}\left(2\sqrt{d}\ e^{\frac{b^2+2\left(c+2\,d\sqrt{z}\right)b+\left(c-2\,d\sqrt{z}\right)^2}{4\,d}}\left(1+e^{2\left(\sqrt{z}\ c+g\right)}\right)-(b-c)\,e^{\frac{b\,c}{d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c+2\,d\sqrt{z}}{2\sqrt{d}}\right)-\right.\right.$$
$$\left.\left.(b+c)\,e^{2\,g}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2\,d\sqrt{z}}{2\sqrt{d}}\right)\right)\right)$$

Involving $a^{b\,z^r+d\,z+e}\cosh\left(c\,z^r+g\right)$

01.20.21.0264.01

$$\int a^{b\,z^2+d\,z+e}\cosh\left(c\,z^2+g\right)dz==\frac{1}{4\left(c^2-b^2\log^2(a)\right)}$$
$$\left(a^{\frac{b\,d^2\log^2(a)}{2\,c^2-2\,b^2\log^2(a)}+e}\sqrt{\pi}\left(e^{\frac{d^2\log^2(a)}{4\,b\log(a)-4\,c}}\operatorname{erfi}\left(\frac{2\,c\,z+(d+2\,b\,z)\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)}\ (\cosh(g)+\sinh(g))-\right.\right.$$
$$\left.\left.e^{\frac{d^2\log^2(a)}{4\,c+4\,b\log(a)}}\operatorname{erfi}\left(\frac{(d+2\,b\,z)\log(a)-2\,c\,z}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\ (c+b\log(a))\,(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0265.01

$$\int e^{b\,z^2+d\,z+e}\cosh\left(c\,z^2+g\right)dz==$$
$$\frac{1}{4\,(b-c)\,(b+c)}\left(e^{\frac{-4\,e\,b^2+2\,d^2\,b+c\left(d^2+4\,c\,e\right)}{4\,c^2-4\,b^2}}\sqrt{\pi}\left(\sqrt{b-c}\ (b+c)\,e^{\frac{b\,d^2}{4\,b^2-4\,c^2}}\operatorname{erfi}\left(\frac{d+2\,(b-c)\,z}{2\sqrt{b-c}}\right)(\cosh(g)-\sinh(g))+\right.\right.$$
$$\left.\left.(b-c)\sqrt{b+c}\ e^{\frac{(b+2\,c)\,d^2}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{d+2\,(b+c)\,z}{2\sqrt{b+c}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0266.01

$$\int a^{\sqrt{z}\ b+e+d\,z}\cosh\left(\sqrt{z}\ c+g\right)dz==$$
$$\frac{1}{4\,(d\log(a))^{3/2}}\left(a^{e-\frac{b^2}{4\,d}}e^{-\frac{c^2+2\left(b\,c+2\,d\left(\sqrt{z}\ c+g\right)\right)\log(a)}{4\,d\log(a)}}\left(2\,e^{\frac{c\,(c+2\,b\log(a))}{4\,d\log(a)}}\left(1+e^{2\left(\sqrt{z}\ c+g\right)}\right)\sqrt{d\log(a)}\ a^{\frac{\left(b+2\,d\sqrt{z}\right)^2}{4\,d}}-e^{\sqrt{z}\ c+2\,g}\sqrt{\pi}\right.\right.$$
$$\left.\left.\operatorname{erfi}\left(\frac{c+\left(b+2\,d\sqrt{z}\right)\log(a)}{2\sqrt{d\log(a)}}\right)(c+b\log(a))+e^{c\left(\frac{b}{d}+\sqrt{z}\right)}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{\left(b+2\,d\sqrt{z}\right)\log(a)-c}{2\sqrt{d\log(a)}}\right)(c-b\log(a))\right)\right)$$

01.20.21.0267.01

$$\int e^{\sqrt{z}\ b+e+d\,z}\cosh\left(\sqrt{z}\ c+g\right)dz == \frac{1}{4\,d^{3/2}}\left(e^{-\frac{b^2+2\,c\,b+c^2-4\,d\,e+4\,d\,g}{4\,d}}\left(2\sqrt{d}\ e^{\frac{b^2+2\left(c+2\,d\sqrt{z}\right)b+\left(c-2\,d\sqrt{z}\right)^2}{4\,d}}\left(1+e^{2\left(\sqrt{z}\ c+g\right)}\right)-(b-c)\,e^{\frac{b\,c}{d}}\sqrt{\pi}\ \text{erfi}\left(\frac{b-c+2\,d\sqrt{z}}{2\sqrt{d}}\right)-(b+c)\,e^{2\,g}\sqrt{\pi}\ \text{erfi}\left(\frac{b+c+2\,d\sqrt{z}}{2\sqrt{d}}\right)\right)\right)$$

Involving rational functions of exp

Involving $\left(a+b\,e^{d\,z}\right)^{-n}\cosh(c\,z+e)$

01.20.21.0268.01

$$\int\frac{\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz == \frac{a^{-n}}{2\,c}\left(e^{c\,z}\ {}_2F_1\left(\frac{c}{d},\,n;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,z}\ {}_2F_1\left(-\frac{c}{d},\,n;\,\frac{d-c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)/;\ n\in\mathbb{N}^+$$

01.20.21.0269.01

$$\int\frac{\cosh(e+c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz == \frac{a^{-n}}{2\,c}\left(e^{e+c\,z}\ {}_2F_1\left(\frac{c}{d},\,n;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-e-c\,z}\ {}_2F_1\left(-\frac{c}{d},\,n;\,\frac{d-c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)/;\ n\in\mathbb{N}^+$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{-n}\cosh(c\,z+e)$

01.20.21.0270.01

$$\int\frac{e^{p\,z}\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz == \frac{a^{-n}}{2\,(c-p)\,(c+p)}\left(e^{(c+p)\,z}\,(c-p)\ {}_2F_1\left(\frac{c+p}{d},\,n;\,\frac{c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(p-c)\,z}\,(c+p)\ {}_2F_1\left(\frac{p-c}{d},\,n;\,\frac{-c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)/;\ n\in\mathbb{N}^+$$

01.20.21.0271.01

$$\int\frac{e^{p\,z}\cosh(e+c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz == \frac{a^{-n}}{2\,(c-p)\,(c+p)}\left(e^{e+(c+p)\,z}\,(c-p)\ {}_2F_1\left(\frac{c+p}{d},\,n;\,\frac{c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(p-c)\,z-e}\,(c+p)\ {}_2F_1\left(\frac{p-c}{d},\,n;\,\frac{-c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)/;\ n\in\mathbb{N}^+$$

Involving algebraic functions of exp

Involving $\left(a+b\,e^{d\,z}\right)^{\beta}\cosh(c\ +ez)$

01.20.21.0272.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta} \cosh(c\,z)\,dz ==$$

$$\frac{e^{-c\,z}\left(a+b\,e^{d\,z}\right)^{\beta}}{2\,c}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\left(e^{2\,c\,z}\,{}_2F_1\left(\frac{c}{d},\,-\beta;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-{}_2F_1\left(-\frac{c}{d},\,-\beta;\,1-\frac{c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)$$

01.20.21.0273.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta} \cosh(e+c\,z)\,dz ==$$

$$\frac{e^{-e-c\,z}\left(a+b\,e^{d\,z}\right)^{\beta}}{2\,c}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\left(e^{2\,(e+c\,z)}\,{}_2F_1\left(\frac{c}{d},\,-\beta;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-{}_2F_1\left(-\frac{c}{d},\,-\beta;\,1-\frac{c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cosh(c\,z+e)$

01.20.21.0274.01

$$\int e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cosh(c\,z)\,dz == \frac{1}{2\,(c-p)\,(c+p)}\left(\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\right.$$
$$\left.\left(e^{(c+p)\,z}\,(c-p)\,{}_2F_1\left(\frac{c+p}{d},\,-\beta;\,\frac{c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(p-c)\,z}\,(c+p)\,{}_2F_1\left(\frac{p-c}{d},\,-\beta;\,\frac{-c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)$$

01.20.21.0275.01

$$\int e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cosh(e+c\,z)\,dz == \frac{1}{2\,(c-p)\,(c+p)}\left(\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\right.$$
$$\left.\left(e^{e+(c+p)\,z}\,(c-p)\,{}_2F_1\left(\frac{c+p}{d},\,-\beta;\,\frac{c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(p-c)\,z-e}\,(c+p)\,{}_2F_1\left(\frac{p-c}{d},\,-\beta;\,\frac{-c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)$$

Involving exponential function and a power function

Involving exp and power

Involving $z^{\alpha-1}\,e^{b\,z}\cosh(c\,z)$

01.20.21.0276.01

$$\int z^{\alpha-1}\,e^{b\,z}\cosh(c\,z)\,dz == -\frac{1}{2}\,z^{\alpha}\left(E_{1-\alpha}((c-b)\,z)+E_{1-\alpha}(-(b+c)\,z)\right)$$

01.20.21.0277.01

$$\int z^{\alpha-1}\,e^{b\,z}\cosh(c\,z)\,dz == \frac{1}{2}\,z^{\alpha}\left(-((c-b)\,z)^{-\alpha}\,\Gamma(\alpha,\,(c-b)\,z)-(-(b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(b+c)\,z)\right)$$

01.20.21.0278.01

$$\int z^{\alpha-1}\,e^{c\,z}\cosh(c\,z)\,dz == \frac{1}{2}\,z^{\alpha}\left(\frac{1}{\alpha}-2^{-\alpha}\,(-c\,z)^{-\alpha}\,\Gamma(\alpha,\,-2\,c\,z)\right)$$

01.20.21.0279.01

$$\int z^{\alpha-1}\, e^{-c\,z} \cosh(c\,z)\, dz == \frac{1}{2}\, z^{\alpha}\left(\frac{1}{\alpha} - 2^{-\alpha}\,(c\,z)^{-\alpha}\,\Gamma(\alpha,\, 2\,c\,z)\right)$$

01.20.21.0280.01

$$\int z^{n}\, e^{b\,z} \cosh(c\,z)\, dz == -\frac{1}{2}\left(\left(\frac{(-1)^{n}\,\mathrm{Ei}((b+c)\,z)}{(-n-1)!} + e^{(b+c)\,z}\sum_{k=0}^{n}\frac{((-b-c)\,z)^{k}}{(n+1)_{k-n}} - e^{(b+c)\,z}\sum_{k=n+1}^{-1}\frac{((-b-c)\,z)^{k}}{(n+1)_{k-n}}\right)(-b-c)^{-n-1} + (c-b)^{-n-1}\left(\frac{(-1)^{n}\,\mathrm{Ei}((b-c)\,z)}{(-n-1)!} + e^{(b-c)\,z}\sum_{k=0}^{n}\frac{((c-b)\,z)^{k}}{(n+1)_{k-n}} - e^{(b-c)\,z}\sum_{k=n+1}^{-1}\frac{((c-b)\,z)^{k}}{(n+1)_{k-n}}\right)\right) /;\ n \in \mathbb{Z}$$

01.20.21.0281.01

$$\int z^{n}\, e^{b\,z} \cosh(c\,z)\, dz == -\frac{1}{2}\, n!\left(e^{(b+c)\,z}\left(\sum_{k=0}^{n}\frac{((-b-c)\,z)^{k}}{k!}\right)(-b-c)^{-n-1} + (c-b)^{-n-1}\, e^{(b-c)\,z}\sum_{k=0}^{n}\frac{((c-b)\,z)^{k}}{k!}\right) /;\ n \in \mathbb{N}$$

01.20.21.0282.01

$$\int z\, e^{b\,z} \cosh(c\,z)\, dz == \frac{e^{b\,z}\left(\left(z\,b^{3} - b^{2} - c^{2}\,z\,b - c^{2}\right)\cosh(c\,z) + c\left(-z\,b^{2} + 2\,b + c^{2}\,z\right)\sinh(c\,z)\right)}{(b-c)^{2}\,(b+c)^{2}}$$

01.20.21.0283.01

$$\int z\, e^{c\,z} \cosh(c\,z)\, dz == \frac{\left(2\,c^{2}\,z^{2} + e^{2\,c\,z}\,(2\,c\,z-1)\right)}{8\,c^{2}}$$

01.20.21.0284.01

$$\int z\, e^{-c\,z} \cosh(c\,z)\, dz == \frac{e^{-2\,c\,z}\left(2\,c^{2}\,e^{2\,c\,z}\,z^{2} - 2\,c\,z - 1\right)}{8\,c^{2}}$$

01.20.21.0285.01

$$\int z^{2}\, e^{b\,z} \cosh(c\,z)\, dz == \frac{1}{(b-c)^{3}\,(b+c)^{3}}\left(e^{b\,z}\left(\left(z^{2}\,b^{5} - 2\,z\,b^{4} + \left(2 - 2\,c^{2}\,z^{2}\right)b^{3} + c^{2}\left(c^{2}\,z^{2} + 6\right)b + 2\,c^{4}\,z\right)\cosh(c\,z) - c\left(z^{2}\,b^{4} - 4\,z\,b^{3} + \left(6 - 2\,c^{2}\,z^{2}\right)b^{2} + 4\,c^{2}\,z\,b + c^{2}\left(c^{2}\,z^{2} + 2\right)\right)\sinh(c\,z)\right)\right)$$

01.20.21.0286.01

$$\int z^{2}\, e^{c\,z} \cosh(c\,z)\, dz == \frac{\left(4\,c^{3}\,z^{3} + e^{2\,c\,z}\left(6\,c^{2}\,z^{2} - 6\,c\,z + 3\right)\right)}{24\,c^{3}}$$

01.20.21.0287.01

$$\int z^{2}\, e^{-c\,z} \cosh(c\,z)\, dz == \frac{e^{-2\,c\,z}\left(4\,c^{3}\,e^{2\,c\,z}\,z^{3} - 6\,c^{2}\,z^{2} - 6\,c\,z - 3\right)}{24\,c^{3}}$$

01.20.21.0288.01

$$\int z^{3}\, e^{b\,z} \cosh(c\,z)\, dz == \frac{1}{(b-c)^{4}\,(b+c)^{4}}\left(e^{b\,z}\left(\left(z^{3}\,b^{7} - 3\,z^{2}\,b^{6} + \left(6\,z - 3\,c^{2}\,z^{3}\right)b^{5} + 3\left(c^{2}\,z^{2} - 2\right)b^{4} + 3\,c^{2}\,z\left(c^{2}\,z^{2} + 4\right)b^{3} + 3\,c^{2}\left(c^{2}\,z^{2} - 12\right)b^{2} - c^{4}\,z\left(c^{2}\,z^{2} + 18\right)b - 3\,c^{4}\left(c^{2}\,z^{2} + 2\right)\right)\cosh(c\,z) + c\left(-z^{3}\,b^{6} + 6\,z^{2}\,b^{5} + 3\,z\left(c^{2}\,z^{2} - 6\right)b^{4} - 12\left(c^{2}\,z^{2} - 2\right)b^{3} - 3\,c^{2}\,z\left(c^{2}\,z^{2} - 4\right)b^{2} + 6\,c^{2}\left(c^{2}\,z^{2} + 4\right)b + c^{4}\,z\left(c^{2}\,z^{2} + 6\right)\right)\sinh(c\,z)\right)\right)$$

01.20.21.0289.01

$$\int z^4\, e^{b\,z} \cosh(c\,z)\, dz ==$$

$$\frac{1}{(b-c)^5\,(b+c)^5}\left(e^{b\,z}\left(\left(z^4\,b^9-4\,z^3\,b^8-4\,z^2\left(c^2\,z^2-3\right)b^7+8\,z\left(c^2\,z^2-3\right)b^6+6\left(c^4\,z^4+2\,c^2\,z^2+4\right)b^5-120\,c^2\,z\,b^4-\right.\right.\right.$$
$$\left.\left.\left.4\,c^2\left(c^4\,z^4+15\,c^2\,z^2-60\right)b^3-8\,c^4\,z\left(c^2\,z^2-15\right)b^2+c^4\left(c^4\,z^4+36\,c^2\,z^2+120\right)b+4\,c^6\,z\left(c^2\,z^2+6\right)\right)\cosh(c\,z)-\right.$$
$$c\left(z^4\,b^8-8\,z^3\,b^7-4\,z^2\left(c^2\,z^2-9\right)b^6+24\,z\left(c^2\,z^2-4\right)b^5+6\left(c^4\,z^4-10\,c^2\,z^2+20\right)b^4-24\,c^4\,z^3\,b^3-\right.$$
$$\left.\left.4\,c^2\left(c^4\,z^4-3\,c^2\,z^2-60\right)b^2+8\,c^4\,z\left(c^2\,z^2+12\right)b+c^4\left(c^4\,z^4+12\,c^2\,z^2+24\right)\right)\sinh(c\,z)\right)\Big)$$

01.20.21.0290.01

$$\int z^5\, e^{b\,z} \cosh(c\,z)\, dz == \frac{1}{(b-c)^6\,(b+c)^6}$$
$$\left(e^{b\,z}\left(\left(z^5\,b^{11}-5\,z^4\,b^{10}-5\,z^3\left(c^2\,z^2-4\right)b^9+15\,z^2\left(c^2\,z^2-4\right)b^8+10\,z\left(c^4\,z^4+12\right)b^7-10\left(c^4\,z^4+24\,c^2\,z^2+12\right)b^6-\right.\right.\right.$$
$$\left.\left.\left.10\,c^2\,z\left(c^4\,z^4+12\,c^2\,z^2-108\right)b^5-10\,c^2\left(c^4\,z^4-60\,c^2\,z^2+180\right)b^4+5\,c^4\,z\left(c^4\,z^4+32\,c^2\,z^2-120\right)b^3+\right.\right.$$
$$\left.\left.15\,c^4\left(c^4\,z^4-16\,c^2\,z^2-120\right)b^2-c^6\,z\left(c^4\,z^4+60\,c^2\,z^2+600\right)b-5\,c^6\left(c^4\,z^4+12\,c^2\,z^2+24\right)\right)\cosh(c\,z)+\right.$$
$$c\left(-z^5\,b^{10}+10\,z^4\,b^9+5\,z^3\left(c^2\,z^2-12\right)b^8-40\,z^2\left(c^2\,z^2-6\right)b^7-10\,z\left(c^4\,z^4-16\,c^2\,z^2+60\right)b^6+\right.$$
$$\left.\left.60\left(c^4\,z^4-4\,c^2\,z^2+12\right)b^5+10\,c^2\,z\left(c^4\,z^4-12\,c^2\,z^2-60\right)b^4-40\,c^2\left(c^4\,z^4+6\,c^2\,z^2-60\right)b^3-\right.\right.$$
$$\left.\left.5\,c^4\,z\left(c^4\,z^4-216\right)b^2+10\,c^4\left(c^4\,z^4+24\,c^2\,z^2+72\right)b+c^6\,z\left(c^4\,z^4+20\,c^2\,z^2+120\right)\right)\sinh(c\,z)\right)\Big)$$

01.20.21.0291.01

$$\int z^{-n}\, e^{b\,z} \cosh(c\,z)\, dz == -\frac{1}{2\left(b^2-c^2\right)(n-1)!}$$
$$\left(e^{(c-b)\,z}\left((b-c)\,e^{2\,b\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(-b-c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(-b-c)^n-(c-b)^n\,e^{2\,(b-c)\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(c-b)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(-b-c)+\right.\right.$$
$$\left.\left.(-1)^n\,e^{(b-c)\,z}\left((-b-c)\,(c-b)^n\,\mathrm{Ei}((b-c)\,z)-(-b-c)^n\,(b-c)\,\mathrm{Ei}((b+c)\,z)\right)\right)\Big/;\, n\in\mathbb{N}^+\right.$$

01.20.21.0292.01

$$\int \frac{e^{b\,z}\cosh(c\,z)}{z}\, dz == \frac{1}{2}\left(\mathrm{Ei}((b-c)\,z)+\mathrm{Ei}((b+c)\,z)\right)$$

01.20.21.0293.01

$$\int \frac{e^{c\,z}\cosh(c\,z)}{z}\, dz == \frac{1}{2}\left(\mathrm{Ei}(2\,c\,z)+\log(z)\right)$$

01.20.21.0294.01

$$\int \frac{e^{-c\,z}\cosh(c\,z)}{z}\, dz == \frac{1}{2}\left(\mathrm{Ei}(-2\,c\,z)+\log(z)\right)$$

01.20.21.0295.01

$$\int \frac{e^{b\,z}\cosh(c\,z)}{z^2}\, dz == -\frac{\left((c-b)\,z\,\mathrm{Ei}((b-c)\,z)+e^{(b-c)\,z}+e^{(b+c)\,z}-(b+c)\,z\,\mathrm{Ei}((b+c)\,z)\right)}{2\,z}$$

01.20.21.0296.01

$$\int \frac{e^{c\,z}\cosh(c\,z)}{z^2}\, dz == -\frac{\left(-2\,c\,z\,\mathrm{Ei}(2\,c\,z)+e^{2\,c\,z}+1\right)}{2\,z}$$

01.20.21.0297.01

$$\int \frac{e^{-c\,z}\cosh(c\,z)}{z^2}\,dz == -\frac{\left(2\,c\,z\,\mathrm{Ei}(-2\,c\,z)+e^{-2\,c\,z}+1\right)}{2\,z}$$

01.20.21.0298.01

$$\int \frac{e^{b\,z}\cosh(c\,z)}{z^3}\,dz == \frac{1}{4\,z^2}\left((b-c)^2\,\mathrm{Ei}((b-c)\,z)\,z^2+(b+c)^2\,\mathrm{Ei}((b+c)\,z)\,z^2-e^{(b-c)\,z}\left(b\,z-c\,z+e^{2\,c\,z}\,(b\,z+c\,z+1)+1\right)\right)$$

01.20.21.0299.01

$$\int \frac{e^{b\,z}\cosh(c\,z)}{z^4}\,dz == \frac{1}{12\,z^3}\left((b-c)^3\,\mathrm{Ei}((b-c)\,z)\,z^3+(b+c)^3\,\mathrm{Ei}((b+c)\,z)\,z^3-\right.$$
$$\left.e^{(b-c)\,z}\left(b^2\,z^2+c^2\,z^2-c\,z+b\left(z-2\,c\,z^2\right)+e^{2\,c\,z}\left(b^2\,z^2+c^2\,z^2+c\,z+b\,(2\,c\,z+1)\,z+2\right)+2\right)\right)$$

01.20.21.0300.01

$$\int \frac{e^{b\,z}\cosh(c\,z)}{z^5}\,dz == \frac{1}{48}\left(\mathrm{Ei}((b-c)\,z)\,(b-c)^4+(b+c)^4\,\mathrm{Ei}((b+c)\,z)-\right.$$
$$\left.\frac{e^{(b-c)\,z}\left((b-c)^3\,z^3+(b-c)^2\,z^2+2\,(b-c)\,z+6\right)}{z^4}-\frac{e^{(b+c)\,z}\left((b+c)^3\,z^3+(b+c)^2\,z^2+2\,(b+c)\,z+6\right)}{z^4}\right)$$

01.20.21.0301.01

$$\int z^{n+\frac{1}{2}}\,e^{b\,z}\cosh(c\,z)\,dz ==$$
$$-\frac{1}{2}\,z^{n+\frac{3}{2}}\left(\left(\mathrm{erfc}\left(\sqrt{(-b-c)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(b+c)\,z}\sum_{k=0}^{n}\frac{((-b-c)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{(b+c)\,z}\sum_{k=n+1}^{-1}\frac{((-b-c)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)((-b-c)\,z)^{-n-\frac{3}{2}}+\right.$$
$$\left.((c-b)\,z)^{-n-\frac{3}{2}}\left(\mathrm{erfc}\left(\sqrt{(c-b)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(b-c)\,z}\sum_{k=0}^{n}\frac{((c-b)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{(b-c)\,z}\sum_{k=n+1}^{-1}\frac{((c-b)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)/;\,n\in\mathbb{Z}$$

01.20.21.0302.01

$$\int \sqrt{z}\;e^{b\,z}\cosh(c\,z)\,dz ==$$
$$\frac{1}{2}\,z^{3/2}\left(\frac{\frac{1}{2}\sqrt{\pi}\,\left(\mathrm{erf}\left(\sqrt{(c-b)\,z}\right)-1\right)-e^{(b-c)\,z}\sqrt{(c-b)\,z}}{((c-b)\,z)^{3/2}}+\frac{\frac{1}{2}\sqrt{\pi}\,\left(\mathrm{erf}\left(\sqrt{-(b+c)\,z}\right)-1\right)-e^{(b+c)\,z}\sqrt{-(b+c)\,z}}{(-(b+c)\,z)^{3/2}}\right)$$

01.20.21.0303.01

$$\int z^{3/2}\,e^{b\,z}\cosh(c\,z)\,dz == \frac{1}{8}\,z^{5/2}\left(\frac{2\,e^{(b-c)\,z}\sqrt{(c-b)\,z}\;(2\,b\,z-2\,c\,z-3)+3\sqrt{\pi}\;\mathrm{erf}\left(\sqrt{(c-b)\,z}\right)-3\sqrt{\pi}}{(b-c)^2\,z^2\sqrt{(c-b)\,z}}+\right.$$
$$\left.\frac{2\,e^{(b+c)\,z}\sqrt{-(b+c)\,z}\;(2\,b\,z+2\,c\,z-3)+3\sqrt{\pi}\;\mathrm{erf}\left(\sqrt{-(b+c)\,z}\right)-3\sqrt{\pi}}{(-(b+c)\,z)^{5/2}}\right)$$

01.20.21.0304.01

$$\int z^{5/2}\, e^{b z} \cosh(c z)\, dz == \frac{1}{2} z^{7/2} \left(\frac{1}{((c-b) z)^{7/2}} \left(\frac{5}{8} \left(2\, e^{(b-c) z} \sqrt{(c-b) z}\ (2 b z - 2 c z - 3) + 3 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{(c-b) z} \right) - 3 \sqrt{\pi} \right) - e^{(b-c) z} ((c-b) z)^{5/2} \right) + \frac{1}{(-(b+c) z)^{7/2}} \left(\frac{5}{8} \left(2\, e^{(b+c) z} \sqrt{-(b+c) z}\ (2 b z + 2 c z - 3) + 3 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{-(b+c) z} \right) - 3 \sqrt{\pi} \right) - e^{(b+c) z} (-(b+c) z)^{5/2} \right) \right)$$

01.20.21.0305.01

$$\int z^{7/2}\, e^{b z} \cosh(c z)\, dz == -\frac{1}{2} z^{9/2} \left(\frac{1}{((c-b) z)^{9/2}} \left(e^{(b-c) z} ((c-b) z)^{7/2} + \frac{7}{16} e^{-c z} \left(2\, e^{b z} \sqrt{(c-b) z}\ \left(4 b^2 z^2 + 4 c^2 z^2 + 10 c z - 2 b (4 c z + 5) z + 15 \right) - 15\, e^{c z} \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{(c-b) z} \right) + 15\, e^{c z} \sqrt{\pi} \right) \right) + \frac{1}{(-(b+c) z)^{9/2}} \left(e^{(b+c) z} (-(b+c) z)^{7/2} + \frac{7}{16} \left(2\, e^{(b+c) z} \sqrt{-(b+c) z}\ \left(4 b^2 z^2 + 4 c^2 z^2 - 10 c z + 2 b (4 c z - 5) z + 15 \right) - 15 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{-(b+c) z} \right) + 15 \sqrt{\pi} \right) \right) \right)$$

01.20.21.0306.01

$$\int z^{9/2}\, e^{b z} \cosh(c z)\, dz == \frac{1}{2} z^{11/2} \left(-\frac{1}{((c-b) z)^{11/2}} \left(e^{(b-c) z} ((c-b) z)^{9/2} + \frac{9}{2} \left(e^{(b-c) z} ((c-b) z)^{7/2} + \frac{7}{16} e^{-c z} \left(2\, e^{b z} \sqrt{(c-b) z}\ \left(4 b^2 z^2 + 4 c^2 z^2 + 10 c z - 2 b (4 c z + 5) z + 15 \right) - 15\, e^{c z} \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{(c-b) z} \right) + 15\, e^{c z} \sqrt{\pi} \right) \right) \right) - \frac{1}{(-(b+c) z)^{11/2}} \left(e^{(b+c) z} (-(b+c) z)^{9/2} + \frac{9}{2} \left(e^{(b+c) z} (-(b+c) z)^{7/2} + \frac{7}{16} \left(2\, e^{(b+c) z} \sqrt{-(b+c) z}\ \left(4 b^2 z^2 + 4 c^2 z^2 - 10 c z + 2 b (4 c z - 5) z + 15 \right) - 15 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{-(b+c) z} \right) + 15 \sqrt{\pi} \right) \right) \right) \right)$$

01.20.21.0307.01

$$\int \frac{e^{b z} \cosh(c z)}{\sqrt{z}}\, dz == \frac{\sqrt{\pi} \left(\sqrt{b-c}\ (b+c) \operatorname{erfi}\left(\sqrt{b-c}\ \sqrt{z} \right) + (b-c) \sqrt{b+c}\ \operatorname{erfi}\left(\sqrt{b+c}\ \sqrt{z} \right) \right)}{2 (b-c) (b+c)}$$

01.20.21.0308.01

$$\int \frac{e^{b z} \cosh(c z)}{z^{3/2}}\, dz == -\frac{1}{\sqrt{z}} \left(\sqrt{\pi}\ \sqrt{(c-b) z}\ \operatorname{erf}\left(\sqrt{(c-b) z} \right) + e^{(b-c) z} + e^{(b+c) z} + \sqrt{\pi}\ \sqrt{-(b+c) z}\ \operatorname{erf}\left(\sqrt{-(b+c) z} \right) - \sqrt{\pi}\ \sqrt{(c-b) z}\ - \sqrt{\pi}\ \sqrt{-(b+c) z} \right)$$

01.20.21.0309.01

$$\int \frac{e^{b z} \cosh(c z)}{z^{5/2}} dz ==$$
$$\frac{1}{3 z^{3/2}} \left(2 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{(c-b) z}\right) ((c-b) z)^{3/2} - 2 \sqrt{\pi}\ ((c-b) z)^{3/2} - 2 \sqrt{\pi}\ (-(b+c) z)^{3/2} - e^{(b-c) z} - e^{(b+c) z} - \right.$$
$$\left. 2 (b-c) e^{(b-c) z} z - 2 (b+c) e^{(b+c) z} z + 2 \sqrt{\pi}\ (-(b+c) z)^{3/2} \operatorname{erf}\left(\sqrt{-(b+c) z}\right)\right)$$

01.20.21.0310.01

$$\int \frac{e^{b z} \cosh(c z)}{z^{7/2}} dz ==$$
$$-\frac{1}{15 z^{5/2}} \left(4 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{(c-b) z}\right) ((c-b) z)^{5/2} - 4 \sqrt{\pi}\ ((c-b) z)^{5/2} - 4 \sqrt{\pi}\ (-(b+c) z)^{5/2} + 3 e^{(b-c) z} + 3 e^{(b+c) z} + \right.$$
$$\left. 4 (b-c)^2 e^{(b-c) z} z^2 + 4 (b+c)^2 e^{(b+c) z} z^2 + 2 (b-c) e^{(b-c) z} z + 2 (b+c) e^{(b+c) z} z + 4 \sqrt{\pi}\ (-(b+c) z)^{5/2} \operatorname{erf}\left(\sqrt{-(b+c) z}\right)\right)$$

01.20.21.0311.01

$$\int \frac{e^{b z} \cosh(c z)}{z^{9/2}} dz ==$$
$$\frac{1}{105 z^{7/2}} \left(8 \sqrt{\pi}\ \operatorname{erf}\left(\sqrt{(c-b) z}\right) ((c-b) z)^{7/2} - 8 \sqrt{\pi}\ ((c-b) z)^{7/2} - 8 \sqrt{\pi}\ (-(b+c) z)^{7/2} - 15 e^{(b-c) z} - 15 e^{(b+c) z} + \right.$$
$$8 (c-b)^3 e^{(b-c) z} z^3 - 8 (b+c)^3 e^{(b+c) z} z^3 - 4 (b-c)^2 e^{(b-c) z} z^2 - 4 (b+c)^2 e^{(b+c) z} z^2 -$$
$$\left. 6 (b-c) e^{(b-c) z} z - 6 (b+c) e^{(b+c) z} z + 8 \sqrt{\pi}\ (-(b+c) z)^{7/2} \operatorname{erf}\left(\sqrt{-(b+c) z}\right)\right)$$

Involving $z^{\alpha-1}\, e^{b z+e} \cosh(c z)$

01.20.21.0312.01

$$\int z^{\alpha-1} e^{e+b z} \cosh(c z) dz == -\frac{1}{2} e^{e} z^{\alpha} \left(E_{1-\alpha}((c-b) z) + E_{1-\alpha}(-(b+c) z)\right)$$

01.20.21.0313.01

$$\int z^{\alpha-1} e^{e+b z} \cosh(c z) dz == \frac{1}{2} e^{e} z^{\alpha} \left(-((c-b) z)^{-\alpha} \Gamma(\alpha, (c-b) z) - (-(b+c) z)^{-\alpha} \Gamma(\alpha, -(b+c) z)\right)$$

01.20.21.0314.01

$$\int z^{\alpha-1} e^{e+c z} \cosh(c z) dz == \frac{1}{2} e^{e} z^{\alpha} \left(\frac{1}{\alpha} - 2^{-\alpha} (-c z)^{-\alpha} \Gamma(\alpha, -2 c z)\right)$$

01.20.21.0315.01

$$\int z^{\alpha-1} e^{e-c z} \cosh(c z) dz == \frac{1}{2} e^{e} z^{\alpha} \left(\frac{1}{\alpha} - 2^{-\alpha} (c z)^{-\alpha} \Gamma(\alpha, 2 c z)\right)$$

01.20.21.0316.01

$$\int z^{n} e^{e+b z} \cosh(c z) dz == -\frac{1}{2} e^{e} \left(\left(\frac{(-1)^n \operatorname{Ei}((b+c) z)}{(-n-1)!} + e^{(b+c) z} \sum_{k=0}^{n} \frac{((-b-c) z)^k}{(n+1)_{k-n}} - e^{(b+c) z} \sum_{k=n+1}^{-1} \frac{((-b-c) z)^k}{(n+1)_{k-n}}\right) (-b-c)^{-n-1} + \right.$$
$$\left. (c-b)^{-n-1} \left(\frac{(-1)^n \operatorname{Ei}((b-c) z)}{(-n-1)!} + e^{(b-c) z} \sum_{k=0}^{n} \frac{((c-b) z)^k}{(n+1)_{k-n}} - e^{(b-c) z} \sum_{k=n+1}^{-1} \frac{((c-b) z)^k}{(n+1)_{k-n}}\right)\right) /; n \in \mathbb{Z}$$

01.20.21.0317.01

$$\int z^n e^{e+b z} \cosh(c z)\, dz == -\frac{1}{2} e^e n! \left(e^{(b+c) z} \left(\sum_{k=0}^{n} \frac{((-b-c) z)^k}{k!} \right) (-b-c)^{-n-1} + (c-b)^{-n-1} e^{(b-c) z} \sum_{k=0}^{n} \frac{((c-b) z)^k}{k!} \right) /; n \in \mathbb{N}$$

01.20.21.0318.01

$$\int z e^{e+b z} \cosh(c z)\, dz == \frac{e^{e+b z} \left(\left(z b^3 - b^2 - c^2 z b - c^2 \right) \cosh(c z) + c \left(-z b^2 + 2 b + c^2 z \right) \sinh(c z) \right)}{(b-c)^2 (b+c)^2}$$

01.20.21.0319.01

$$\int z e^{e+c z} \cosh(c z)\, dz == \frac{e^e \left(2 c^2 z^2 + e^{2 c z} (2 c z - 1) \right)}{8 c^2}$$

01.20.21.0320.01

$$\int z e^{e-c z} \cosh(c z)\, dz == \frac{e^{e-2 c z} \left(2 c^2 e^{2 c z} z^2 - 2 c z - 1 \right)}{8 c^2}$$

01.20.21.0321.01

$$\int z^2 e^{e+b z} \cosh(c z)\, dz == \frac{1}{(b-c)^3 (b+c)^3} \left(e^{e+b z} \left(\left(z^2 b^5 - 2 z b^4 + \left(2 - 2 c^2 z^2 \right) b^3 + c^2 \left(c^2 z^2 + 6 \right) b + 2 c^4 z \right) \cosh(c z) - \right. \right.$$
$$\left. \left. c \left(z^2 b^4 - 4 z b^3 + \left(6 - 2 c^2 z^2 \right) b^2 + 4 c^2 z b + c^2 \left(c^2 z^2 + 2 \right) \right) \sinh(c z) \right) \right)$$

01.20.21.0322.01

$$\int z^2 e^{e+c z} \cosh(c z)\, dz == \frac{e^e \left(4 c^3 z^3 + e^{2 c z} \left(6 c^2 z^2 - 6 c z + 3 \right) \right)}{24 c^3}$$

01.20.21.0323.01

$$\int z^2 e^{e-c z} \cosh(c z)\, dz == \frac{e^{e-2 c z} \left(4 c^3 e^{2 c z} z^3 - 6 c^2 z^2 - 6 c z - 3 \right)}{24 c^3}$$

01.20.21.0324.01

$$\int z^3 e^{e+b z} \cosh(c z)\, dz ==$$
$$\frac{1}{(b-c)^4 (b+c)^4} \left(e^{e+b z} \left(\left(z^3 b^7 - 3 z^2 b^6 + \left(6 z - 3 c^2 z^3 \right) b^5 + 3 \left(c^2 z^2 - 2 \right) b^4 + 3 c^2 z \left(c^2 z^2 + 4 \right) b^3 + 3 c^2 \left(c^2 z^2 - 12 \right) b^2 - \right. \right.$$
$$\left. c^4 z \left(c^2 z^2 + 18 \right) b - 3 c^4 \left(c^2 z^2 + 2 \right) \right) \cosh(c z) + c \left(-z^3 b^6 + 6 z^2 b^5 + 3 z \left(c^2 z^2 - 6 \right) b^4 - \right.$$
$$\left. \left. 12 \left(c^2 z^2 - 2 \right) b^3 - 3 c^2 z \left(c^2 z^2 - 4 \right) b^2 + 6 c^2 \left(c^2 z^2 + 4 \right) b + c^4 z \left(c^2 z^2 + 6 \right) \right) \sinh(c z) \right) \right)$$

01.20.21.0325.01

$$\int z^4 e^{e+b z} \cosh(c z)\, dz ==$$
$$\frac{1}{(b-c)^5 (b+c)^5} \left(e^{e+b z} \left(\left(z^4 b^9 - 4 z^3 b^8 - 4 z^2 \left(c^2 z^2 - 3 \right) b^7 + 8 z \left(c^2 z^2 - 3 \right) b^6 + 6 \left(c^4 z^4 + 2 c^2 z^2 + 4 \right) b^5 - 120 c^2 z b^4 - \right. \right.$$
$$\left. 4 c^2 \left(c^4 z^4 + 15 c^2 z^2 - 60 \right) b^3 - 8 c^4 z \left(c^2 z^2 - 15 \right) b^2 + c^4 \left(c^4 z^4 + 36 c^2 z^2 + 120 \right) b + 4 c^6 z \left(c^2 z^2 + 6 \right) \right) \cosh(c z) -$$
$$c \left(z^4 b^8 - 8 z^3 b^7 - 4 z^2 \left(c^2 z^2 - 9 \right) b^6 + 24 z \left(c^2 z^2 - 4 \right) b^5 + 6 \left(c^4 z^4 - 10 c^2 z^2 + 20 \right) b^4 - 24 c^4 z^3 b^3 - \right.$$
$$\left. \left. 4 c^2 \left(c^4 z^4 - 3 c^2 z^2 - 60 \right) b^2 + 8 c^4 z \left(c^2 z^2 + 12 \right) b + c^4 \left(c^4 z^4 + 12 c^2 z^2 + 24 \right) \right) \sinh(c z) \right) \right)$$

01.20.21.0326.01

$$\int z^5\, e^{e+b\,z} \cosh(c\,z)\, dz == \frac{1}{(b-c)^6\,(b+c)^6}$$
$$\left(e^{e+b\,z}\left(\left(z^5\,b^{11} - 5\,z^4\,b^{10} - 5\,z^3\left(c^2\,z^2-4\right)b^9 + 15\,z^2\left(c^2\,z^2-4\right)b^8 + 10\,z\left(c^4\,z^4+12\right)b^7 - 10\left(c^4\,z^4+24\,c^2\,z^2+12\right)b^6 - \right.\right.\right.$$
$$10\,c^2\,z\left(c^4\,z^4+12\,c^2\,z^2-108\right)b^5 - 10\,c^2\left(c^4\,z^4-60\,c^2\,z^2+180\right)b^4 + 5\,c^4\,z\left(c^4\,z^4+32\,c^2\,z^2-120\right)b^3 +$$
$$15\,c^4\left(c^4\,z^4-16\,c^2\,z^2-120\right)b^2 - c^6\,z\left(c^4\,z^4+60\,c^2\,z^2+600\right)b - 5\,c^6\left(c^4\,z^4+12\,c^2\,z^2+24\right)\Big)\cosh(c\,z) +$$
$$c\left(-z^5\,b^{10} + 10\,z^4\,b^9 + 5\,z^3\left(c^2\,z^2-12\right)b^8 - 40\,z^2\left(c^2\,z^2-6\right)b^7 - 10\,z\left(c^4\,z^4-16\,c^2\,z^2+60\right)b^6 +\right.$$
$$60\left(c^4\,z^4-4\,c^2\,z^2+12\right)b^5 + 10\,c^2\,z\left(c^4\,z^4-12\,c^2\,z^2-60\right)b^4 - 40\,c^2\left(c^4\,z^4+6\,c^2\,z^2-60\right)b^3 -$$
$$\left.\left.5\,c^4\,z\left(c^4\,z^4-216\right)b^2 + 10\,c^4\left(c^4\,z^4+24\,c^2\,z^2+72\right)b + c^6\,z\left(c^4\,z^4+20\,c^2\,z^2+120\right)\Big)\sinh(c\,z)\Big)\right)$$

01.20.21.0327.01

$$\int z^{-n}\, e^{e+b\,z} \cosh(c\,z)\, dz == -\frac{1}{2\left(b^2-c^2\right)(n-1)!}$$
$$\left(e^{e+(c-b)\,z}\left((b-c)\,e^{2\,b\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(-b-c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(-b-c)^n - (c-b)^n\,e^{2\,(b-c)\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(c-b)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(-b-c) + \right.\right.$$
$$\left.\left.(-1)^n\,e^{(b-c)\,z}\left((-b-c)\,(c-b)^n\,\mathrm{Ei}((b-c)\,z) - (-b-c)^n\,(b-c)\,\mathrm{Ei}((b+c)\,z)\right)\right)\right) /;\ n \in \mathbb{N}^+$$

01.20.21.0328.01

$$\int \frac{e^{e+b\,z}\cosh(c\,z)}{z}\, dz == \frac{1}{2}\,e^e\left(\mathrm{Ei}((b-c)\,z) + \mathrm{Ei}((b+c)\,z)\right)$$

01.20.21.0329.01

$$\int \frac{e^{e+c\,z}\cosh(c\,z)}{z}\, dz == \frac{1}{2}\,e^e\left(\mathrm{Ei}(2\,c\,z) + \log(z)\right)$$

01.20.21.0330.01

$$\int \frac{e^{e-c\,z}\cosh(c\,z)}{z}\, dz == \frac{1}{2}\,e^e\left(\mathrm{Ei}(-2\,c\,z) + \log(z)\right)$$

01.20.21.0331.01

$$\int \frac{e^{e+b\,z}\cosh(c\,z)}{z^2}\, dz == -\frac{e^e\left((c-b)\,z\,\mathrm{Ei}((b-c)\,z) + e^{(b-c)\,z} + e^{(b+c)\,z} - (b+c)\,z\,\mathrm{Ei}((b+c)\,z)\right)}{2\,z}$$

01.20.21.0332.01

$$\int \frac{e^{e+c\,z}\cosh(c\,z)}{z^2}\, dz == -\frac{e^e\left(-2\,c\,z\,\mathrm{Ei}(2\,c\,z) + e^{2\,c\,z} + 1\right)}{2\,z}$$

01.20.21.0333.01

$$\int \frac{e^{e-c\,z}\cosh(c\,z)}{z^2}\, dz == -\frac{e^e\left(2\,c\,z\,\mathrm{Ei}(-2\,c\,z) + e^{-2\,c\,z} + 1\right)}{2\,z}$$

01.20.21.0334.01

$$\int \frac{e^{e+b\,z}\cosh(c\,z)}{z^3}\, dz == \frac{1}{4\,z^2}\left(e^e\left((b-c)^2\,\mathrm{Ei}((b-c)\,z)\,z^2 + (b+c)^2\,\mathrm{Ei}((b+c)\,z)\,z^2 - e^{(b-c)\,z}\left(b\,z - c\,z + e^{2\,c\,z}\,(b\,z + c\,z + 1) + 1\right)\right)\right)$$

01.20.21.0335.01

$$\int \frac{e^{e+b z} \cosh(c z)}{z^4}\, dz == \frac{1}{12} e^e \left(\mathrm{Ei}((b-c) z) (b-c)^3 + (b+c)^3 \mathrm{Ei}((b+c) z) - \frac{e^{(b+c) z} \left(b^2 z^2 + c^2 z^2 + c z + b (2 c z + 1) z + 2\right)}{z^3} - \frac{e^{(b-c) z} \left(b^2 z^2 + c^2 z^2 - c z + b \left(z - 2 c z^2\right) + 2\right)}{z^3} \right)$$

01.20.21.0336.01

$$\int \frac{e^{e+b z} \cosh(c z)}{z^5}\, dz == \frac{1}{48} e^e \left(\mathrm{Ei}((b-c) z) (b-c)^4 + (b+c)^4 \mathrm{Ei}((b+c) z) - \frac{e^{(b-c) z} \left((b-c)^3 z^3 + (b-c)^2 z^2 + 2 (b-c) z + 6\right)}{z^4} - \frac{e^{(b+c) z} \left((b+c)^3 z^3 + (b+c)^2 z^2 + 2 (b+c) z + 6\right)}{z^4} \right)$$

01.20.21.0337.01

$$\int z^{n+\frac{1}{2}} e^{e+b z} \cosh(c z)\, dz == -\frac{1}{2} e^e z^{n+\frac{3}{2}} \left(\left(\left(\mathrm{erfc}\left(\sqrt{(-b-c) z}\right) \Gamma\left(n+\frac{3}{2}\right) + e^{(b+c) z} \sum_{k=0}^{n} \frac{((-b-c) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - e^{(b+c) z} \sum_{k=n+1}^{-1} \frac{((-b-c) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} \right) ((-b-c) z)^{-n-\frac{3}{2}} + ((c-b) z)^{-n-\frac{3}{2}} \left(\mathrm{erfc}\left(\sqrt{(c-b) z}\right) \Gamma\left(n+\frac{3}{2}\right) + e^{(b-c) z} \sum_{k=0}^{n} \frac{((c-b) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - e^{(b-c) z} \sum_{k=n+1}^{-1} \frac{((c-b) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} \right) \right) /; n \in \mathbb{Z}$$

01.20.21.0338.01

$$\int \sqrt{z}\ e^{e+b z} \cosh(c z)\, dz == \frac{1}{2} e^e z^{3/2} \left(\frac{\frac{1}{2}\sqrt{\pi}\ \left(\mathrm{erf}\left(\sqrt{(c-b) z}\right) - 1\right) - e^{(b-c) z} \sqrt{(c-b) z}}{((c-b) z)^{3/2}} + \frac{\frac{1}{2}\sqrt{\pi}\ \left(\mathrm{erf}\left(\sqrt{-(b+c) z}\right) - 1\right) - e^{(b+c) z} \sqrt{-(b+c) z}}{(-(b+c) z)^{3/2}} \right)$$

01.20.21.0339.01

$$\int z^{3/2} e^{e+b z} \cosh(c z)\, dz == \frac{1}{8} e^e z^{5/2} \left(\frac{2 e^{(b-c) z} \sqrt{(c-b) z}\ (2 b z - 2 c z - 3) + 3\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{(c-b) z}\right) - 3\sqrt{\pi}}{(b-c)^2 z^2 \sqrt{(c-b) z}} + \frac{2 e^{(b+c) z} \sqrt{-(b+c) z}\ (2 b z + 2 c z - 3) + 3\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{-(b+c) z}\right) - 3\sqrt{\pi}}{(-(b+c) z)^{5/2}} \right)$$

01.20.21.0340.01

$$\int z^{5/2} e^{e+b z} \cosh(c z)\, dz == \frac{1}{2} e^e z^{7/2} \left(\frac{1}{((c-b) z)^{7/2}} \left(\frac{5}{8} \left(2 e^{(b-c) z} \sqrt{(c-b) z}\ (2 b z - 2 c z - 3) + 3\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{(c-b) z}\right) - 3\sqrt{\pi} \right) - e^{(b-c) z} ((c-b) z)^{5/2} \right) + \frac{1}{(-(b+c) z)^{7/2}} \left(\frac{5}{8} \left(2 e^{(b+c) z} \sqrt{-(b+c) z}\ (2 b z + 2 c z - 3) + 3\sqrt{\pi}\ \mathrm{erf}\left(\sqrt{-(b+c) z}\right) - 3\sqrt{\pi} \right) - e^{(b+c) z} (-(b+c) z)^{5/2} \right) \right)$$

01.20.21.0341.01

$$\int z^{7/2}\, e^{e+b z} \cosh(c z)\, dz == \frac{1}{2} e^{e} z^{9/2} \left(-\frac{1}{((c-b) z)^{9/2}} \left(e^{(b-c) z} ((c-b) z)^{7/2} + \frac{7}{16} e^{-c z} \left(2 e^{b z} \sqrt{(c-b) z}\, \left(4 b^2 z^2 + 4 c^2 z^2 + 10 c z - 2 b (4 c z + 5) z + 15\right) - 15 e^{c z} \sqrt{\pi}\, \operatorname{erf}\left(\sqrt{(c-b) z}\right) + 15 e^{c z} \sqrt{\pi}\right)\right) - \frac{1}{(-(b+c) z)^{9/2}} \left(e^{(b+c) z} (-(b+c) z)^{7/2} + \frac{7}{16} \left(2 e^{(b+c) z} \sqrt{-(b+c) z}\, \left(4 b^2 z^2 + 4 c^2 z^2 - 10 c z + 2 b (4 c z - 5) z + 15\right) - 15 \sqrt{\pi}\, \operatorname{erf}\left(\sqrt{-(b+c) z}\right) + 15 \sqrt{\pi}\right)\right)\right)$$

01.20.21.0342.01

$$\int z^{9/2}\, e^{e+b z} \cosh(c z)\, dz == \frac{1}{2} e^{e} z^{11/2} \left(-\frac{1}{((c-b) z)^{11/2}} \left(e^{(b-c) z} ((c-b) z)^{9/2} + \frac{9}{2} \left(e^{(b-c) z} ((c-b) z)^{7/2} + \frac{7}{16} e^{-c z} \left(2 e^{b z} \sqrt{(c-b) z}\, \left(4 b^2 z^2 + 4 c^2 z^2 + 10 c z - 2 b (4 c z + 5) z + 15\right) - 15 e^{c z} \sqrt{\pi}\, \operatorname{erf}\left(\sqrt{(c-b) z}\right) + 15 e^{c z} \sqrt{\pi}\right)\right)\right) - \frac{1}{(-(b+c) z)^{11/2}} \left(e^{(b+c) z} (-(b+c) z)^{9/2} + \frac{9}{2} \left(e^{(b+c) z} (-(b+c) z)^{7/2} + \frac{7}{16} \left(2 e^{(b+c) z} \sqrt{-(b+c) z}\, \left(4 b^2 z^2 + 4 c^2 z^2 - 10 c z + 2 b (4 c z - 5) z + 15\right) - 15 \sqrt{\pi}\, \operatorname{erf}\left(\sqrt{-(b+c) z}\right) + 15 \sqrt{\pi}\right)\right)\right)\right)$$

01.20.21.0343.01

$$\int \frac{e^{e+b z} \cosh(c z)}{\sqrt{z}}\, dz == \frac{e^{e} \sqrt{\pi} \left(\sqrt{b-c}\, (b+c) \operatorname{erfi}\left(\sqrt{b-c}\, \sqrt{z}\right) + (b-c) \sqrt{b+c}\, \operatorname{erfi}\left(\sqrt{b+c}\, \sqrt{z}\right)\right)}{2 (b-c) (b+c)}$$

01.20.21.0344.01

$$\int \frac{e^{e+b z} \cosh(c z)}{z^{3/2}}\, dz == -\frac{1}{\sqrt{z}} \left(e^{e} \left(\sqrt{\pi}\, \sqrt{(c-b) z}\, \operatorname{erf}\left(\sqrt{(c-b) z}\right) + e^{(b-c) z} + e^{(b+c) z} + \sqrt{\pi}\, \sqrt{-(b+c) z}\, \operatorname{erf}\left(\sqrt{-(b+c) z}\right) - \sqrt{\pi}\, \sqrt{(c-b) z} - \sqrt{\pi}\, \sqrt{-(b+c) z}\right)\right)$$

01.20.21.0345.01

$$\int \frac{e^{e+b z} \cosh(c z)}{z^{5/2}}\, dz == \frac{1}{3 z^{3/2}} \left(e^{e} \left(2 \sqrt{\pi}\, \operatorname{erf}\left(\sqrt{(c-b) z}\right) ((c-b) z)^{3/2} - 2 \sqrt{\pi}\, ((c-b) z)^{3/2} - 2 \sqrt{\pi}\, (-(b+c) z)^{3/2} - e^{(b-c) z} - e^{(b+c) z} - 2 (b-c) e^{(b-c) z} z - 2 (b+c) e^{(b+c) z} z + 2 \sqrt{\pi}\, (-(b+c) z)^{3/2} \operatorname{erf}\left(\sqrt{-(b+c) z}\right)\right)\right)$$

01.20.21.0346.01

$$\int \frac{e^{e+b z} \cosh(c z)}{z^{7/2}}\, dz == -\frac{1}{15 z^{5/2}} \left(e^{e} \left(4 \sqrt{\pi}\, \operatorname{erf}\left(\sqrt{(c-b) z}\right) ((c-b) z)^{5/2} - 4 \sqrt{\pi}\, ((c-b) z)^{5/2} - 4 \sqrt{\pi}\, (-(b+c) z)^{5/2} + 3 e^{(b-c) z} + 3 e^{(b+c) z} + 4 (b-c)^2 e^{(b-c) z} z^2 + 4 (b+c)^2 e^{(b+c) z} z^2 + 2 (b-c) e^{(b-c) z} z + 2 (b+c) e^{(b+c) z} z + 4 \sqrt{\pi}\, (-(b+c) z)^{5/2} \operatorname{erf}\left(\sqrt{-(b+c) z}\right)\right)\right)$$

01.20.21.0347.01

$$\int \frac{e^{e+b\,z}\cosh(c\,z)}{z^{9/2}}\,dz ==$$
$$\frac{1}{105\,z^{7/2}}\left(e^{e}\left(8\sqrt{\pi}\,\operatorname{erf}\left(\sqrt{(c-b)\,z}\right)((c-b)\,z)^{7/2}-8\sqrt{\pi}\,((c-b)\,z)^{7/2}-8\sqrt{\pi}\,(-(b+c)\,z)^{7/2}-15\,e^{(b-c)\,z}-\right.\right.$$
$$15\,e^{(b+c)\,z}+8\,(c-b)^3\,e^{(b-c)\,z}\,z^3-8\,(b+c)^3\,e^{(b+c)\,z}\,z^3-4\,(b-c)^2\,e^{(b-c)\,z}\,z^2-4\,(b+c)^2\,e^{(b+c)\,z}\,z^2-$$
$$\left.\left.6\,(b-c)\,e^{(b-c)\,z}\,z-6\,(b+c)\,e^{(b+c)\,z}\,z+8\sqrt{\pi}\,(-(b+c)\,z)^{7/2}\operatorname{erf}\left(\sqrt{-(b+c)\,z}\right)\right)\right)$$

Involving $z^{\alpha-1}\,e^{b\,z}\cosh(c\,z+d)$

01.20.21.0348.01

$$\int z^{\alpha-1}\,e^{b\,z}\cosh(d+c\,z)\,dz == -\frac{1}{2}\,e^{-d}\,z^{\alpha}\left(E_{1-\alpha}((c-b)\,z)+e^{2\,d}\,E_{1-\alpha}(-(b+c)\,z)\right)$$

01.20.21.0349.01

$$\int z^{n}\,e^{b\,z}\cosh(d+c\,z)\,dz == -\frac{1}{2}\,e^{d}\left(\left(\frac{(-1)^n\,\operatorname{Ei}((b+c)\,z)}{(-n-1)\,!}+e^{(b+c)\,z}\sum_{k=0}^{n}\frac{((-b-c)\,z)^k}{(n+1)_{k-n}}-e^{(b+c)\,z}\sum_{k=n+1}^{-1}\frac{((-b-c)\,z)^k}{(n+1)_{k-n}}\right)(-b-c)^{-n-1}+\right.$$
$$\left.(c-b)^{-n-1}\,e^{-2\,d}\left(\frac{(-1)^n\,\operatorname{Ei}((b-c)\,z)}{(-n-1)\,!}+e^{(b-c)\,z}\sum_{k=0}^{n}\frac{((c-b)\,z)^k}{(n+1)_{k-n}}-e^{(b-c)\,z}\sum_{k=n+1}^{-1}\frac{((c-b)\,z)^k}{(n+1)_{k-n}}\right)\right)/;\ n\in\mathbb{Z}$$

01.20.21.0350.01

$$\int z^{n+\frac{1}{2}}\,e^{b\,z}\cosh(d+c\,z)\,dz ==$$
$$-\frac{1}{2}\,e^{d}\,z^{n+\frac{3}{2}}\left(\left(\operatorname{erfc}\left(\sqrt{(-b-c)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(b+c)\,z}\sum_{k=0}^{n}\frac{((-b-c)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{(b+c)\,z}\sum_{k=n+1}^{-1}\frac{((-b-c)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)((-b-c)\,z)^{-n-\frac{3}{2}}+\right.$$
$$\left.e^{-2\,d}\,((c-b)\,z)^{-n-\frac{3}{2}}\left(\operatorname{erfc}\left(\sqrt{(c-b)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(b-c)\,z}\sum_{k=0}^{n}\frac{((c-b)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{(b-c)\,z}\sum_{k=n+1}^{-1}\frac{((c-b)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)/;\ n\in\mathbb{Z}$$

01.20.21.0351.01

$$\int z\,e^{b\,z}\cosh(d+c\,z)\,dz == \frac{e^{b\,z}\left(\left(z\,b^3-b^2-c^2\,z\,b-c^2\right)\cosh(d+c\,z)+c\left(-z\,b^2+2\,b+c^2\,z\right)\sinh(d+c\,z)\right)}{(b-c)^2\,(b+c)^2}$$

Involving $z^{\alpha-1}\,e^{b\,z+e}\cosh(c\,z+d)$

01.20.21.0352.01

$$\int z^{\alpha-1}\,e^{e+b\,z}\cosh(d+c\,z)\,dz == -\frac{1}{2}\,e^{e-d}\,z^{\alpha}\left(E_{1-\alpha}((c-b)\,z)+e^{2\,d}\,E_{1-\alpha}(-(b+c)\,z)\right)$$

01.20.21.0353.01

$$\int z^{n}\,e^{e+b\,z}\cosh(d+c\,z)\,dz == -\frac{1}{2}\,e^{e-d}\,z^{n+1}\left(E_{-n}((c-b)\,z)+e^{2\,d}\,E_{-n}(-(c+b)\,z)\right)/;\ n\in\mathbb{Z}$$

01.20.21.0354.01

$$\int z^n e^{e+b z} \cosh(d+c z)\, dz == -\frac{1}{2} e^{d+e} \left(\left(\frac{(-1)^n \operatorname{Ei}((b+c) z)}{(-n-1)!} + e^{(b+c) z} \sum_{k=0}^{n} \frac{((-b-c) z)^k}{(n+1)_{k-n}} - e^{(b+c) z} \sum_{k=n+1}^{-1} \frac{((-b-c) z)^k}{(n+1)_{k-n}} \right) (-b-c)^{-n-1} + (c-b)^{-n-1} e^{-2 d} \left(\frac{(-1)^n \operatorname{Ei}((b-c) z)}{(-n-1)!} + e^{(b-c) z} \sum_{k=0}^{n} \frac{((c-b) z)^k}{(n+1)_{k-n}} - e^{(b-c) z} \sum_{k=n+1}^{-1} \frac{((c-b) z)^k}{(n+1)_{k-n}} \right) \right) /; n \in \mathbb{Z}$$

01.20.21.0355.01

$$\int z^{n+\frac{1}{2}} e^{e+b z} \cosh(d+c z)\, dz == -\frac{1}{2} e^{d+e} z^{n+\frac{3}{2}} \left(e^{-2 d} E_{-n-\frac{1}{2}}((c-b) z) + E_{-n-\frac{1}{2}}(-(b+c) z) \right) /; n \in \mathbb{Z}$$

01.20.21.0356.01

$$\int z^{n+\frac{1}{2}} e^{e+b z} \cosh(d+c z)\, dz == -\frac{1}{2} e^{d+e} z^{n+\frac{3}{2}} \left(\left(\operatorname{erfc}\left(\sqrt{(-b-c) z}\right) \Gamma\left(n+\frac{3}{2}\right) + e^{(b+c) z} \sum_{k=0}^{n} \frac{((-b-c) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - e^{(b+c) z} \sum_{k=n+1}^{-1} \frac{((-b-c) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} \right) ((-b-c) z)^{-n-\frac{3}{2}} + e^{-2 d} ((c-b) z)^{-n-\frac{3}{2}} \left(\operatorname{erfc}\left(\sqrt{(c-b) z}\right) \Gamma\left(n+\frac{3}{2}\right) + e^{(b-c) z} \sum_{k=0}^{n} \frac{((c-b) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - e^{(b-c) z} \sum_{k=n+1}^{-1} \frac{((c-b) z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} \right) \right) /; n \in \mathbb{Z}$$

01.20.21.0357.01

$$\int z\, e^{e+b z} \cosh(d+c z)\, dz == \frac{e^{e+b z} \left(\left(z b^3 - b^2 - c^2 z b - c^2\right) \cosh(d+c z) + c \left(-z b^2 + 2 b + c^2 z\right) \sinh(d+c z) \right)}{(b-c)^2 (b+c)^2}$$

Involving $z^n e^{b z^r}$ cosh($c z$)

01.20.21.0358.01

$$\int z^n e^{b z^2} \cosh(c z)\, dz == -\frac{1}{4} b^{-n-1} e^{-\frac{c^2}{4 b}} \left(\sum_{q=0}^{n} 2^{q-n} c^{n-q} (2 b z - c)^{q+1} \left(-\frac{(2 b z - c)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2 b z - c)^2}{4 b}\right) + \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (c+2 b z)^{q+1} \left(-\frac{(c+2 b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2 b z)^2}{4 b}\right) \right) /; n \in \mathbb{N}$$

01.20.21.0359.01

$$\int z^n e^{\sqrt{z}\, b} \cosh(c\, z)\, dz == 2^{-2n-2} c^{-2n-2} \left(e^{\frac{b^2}{4c}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b - 2c\sqrt{z}\right)^{h+k} \left(\frac{\left(b - 2c\sqrt{z}\right)^2}{c} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \right.$$
$$\left(b\left(b - 2c\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b-2c\sqrt{z}\right)^2}{4c} \right) - 2c \sqrt{\frac{\left(b-2c\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b-2c\sqrt{z}\right)^2}{4c} \right) \right) +$$
$$e^{-\frac{b^2}{4c}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b + 2c\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2c\sqrt{z}\right)^2}{c} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b\left(b + 2c\sqrt{z}\right) \right.$$
$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2c\sqrt{z}\right)^2}{4c} \right) + 2 \sqrt{-\frac{\left(b+2c\sqrt{z}\right)^2}{c}}\ c\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2c\sqrt{z}\right)^2}{4c} \right) \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^n\, e^{b z^r + e} \cosh(c\, z)$

01.20.21.0360.01

$$\int z^n e^{b z^2 + e} \cosh(c\, z)\, dz == -\frac{1}{4} b^{-n-1} e^{e - \frac{c^2}{4b}} \left(\sum_{q=0}^{n} 2^{q-n} c^{n-q} (2\, b\, z - c)^{q+1} \left(-\frac{(2\, b\, z - c)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2\, b\, z - c)^2}{4\, b} \right) + \right.$$
$$\left. \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (c + 2\, b\, z)^{q+1} \left(-\frac{(c + 2\, b\, z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c + 2\, b\, z)^2}{4\, b} \right) \right) /;\ n \in \mathbb{N}$$

01.20.21.0361.01

$$\int z^n e^{\sqrt{z}\,b+e} \cosh(c\,z)\,dz == 2^{-2n-2}\,c^{-2n-2}\left(e^{\frac{b^2}{4c}+e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b-2c\sqrt{z}\right)^{h+k}\left(\frac{\left(b-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.$$
$$\left(b\left(b-2c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)-2c\sqrt{\frac{\left(b-2c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)\right)+$$
$$e^{e-\frac{b^2}{4c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2c\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2c\sqrt{z}\right)\right.$$
$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2c\sqrt{z}\right)^2}{4c}\right)+2\sqrt{-\frac{\left(b+2c\sqrt{z}\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2c\sqrt{z}\right)^2}{4c}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z}\cosh(c\,z)$

01.20.21.4938.01

$$\int z^n\,e^{b\,z^2+d\,z}\cosh(c\,z)\,dz ==$$
$$-\frac{1}{4}\,b^{-n-1}\left(e^{-\frac{(d-c)^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(c-d)^{n-q}\,(-c+d+2\,b\,z)^{q+1}\left(-\frac{(-c+d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-c+d+2\,b\,z)^2}{4\,b}\right)+\right.$$
$$\left.e^{-\frac{(c+d)^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(-c-d)^{n-q}\,(c+d+2\,b\,z)^{q+1}\left(-\frac{(c+d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+d+2\,b\,z)^2}{4\,b}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0362.01

$$\int z^n e^{\sqrt{z}\,b+d\,z}\cosh(c\,z)\,dz ==$$

$$2^{-2n-2}\left(e^{-\frac{b^2}{4(d-c)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d-c)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{d-c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\right.\right.$$

$$\binom{n}{k}\left(b\left(b+2(d-c)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(d-c)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{d-c}}\,(d-c)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(d-c)}\right)\right)\right)(d-c)^{-2n-2}+$$

$$(c+d)^{-2n-2}\,e^{-\frac{b^2}{4(c+d)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(c+d)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(c+d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}}\,(c+d)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh(c\,z)$

01.20.21.4939.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cosh(c\,z)\,dz ==$$

$$-\frac{1}{4}\,b^{-n-1}\,e^e\left(e^{-\frac{(d-c)^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(c-d)^{n-q}\,(-c+d+2\,b\,z)^{q+1}\left(-\frac{(-c+d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-c+d+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$\left.e^{-\frac{(c+d)^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(-c-d)^{n-q}\,(c+d+2\,b\,z)^{q+1}\left(-\frac{(c+d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+d+2\,b\,z)^2}{4\,b}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.0363.01

$$\int z^n e^{\sqrt{z}\,b+e+d\,z}\cosh(c\,z)\,dz ==$$

$$2^{-2n-2}\left(e^{e-\frac{b^2}{4(d-c)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d-c)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{d-c}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d-c)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(d-c)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{d-c}}\,(d-c)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(d-c)}\right)\right)\right)(d-c)^{-2n-2}+$$

$$(c+d)^{-2n-2}\,e^{e-\frac{b^2}{4(c+d)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(c+d)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(c+d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}}\,(c+d)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r}\cosh(f\,z+g)$

01.20.21.0364.01

$$\int z^n\,e^{b\,z^2}\cosh(g+f\,z)\,dz == -\frac{1}{4}\,b^{-n-1}\left(e^{-\frac{f^2}{4b}-g}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(2\,b\,z-f)^{q+1}\left(-\frac{(2\,b\,z-f)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,b\,z-f)^2}{4\,b}\right)+\right.$$

$$\left.e^{-\frac{f^2}{4b}+g}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2\,b\,z)^{q+1}\left(-\frac{(f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,b\,z)^2}{4\,b}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0365.01

$$\int z^n e^{\sqrt{z}\, b} \cosh(g + f\, z)\, dz ==$$

$$2^{-2n-2}\, f^{-2n-2} \left(e^{\frac{b^2}{4f} - g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2n} \left(b - 2\, f\, \sqrt{z}\right)^{h+k} \left(\frac{\left(b - 2\, f\, \sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \right.$$

$$\left(b \left(b - 2\, f\, \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b - 2\, f\, \sqrt{z}\right)^2}{4\, f} \right) - 2\, f \sqrt{\frac{\left(b - 2\, f\, \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b - 2\, f\, \sqrt{z}\right)^2}{4\, f} \right) \right) +$$

$$e^{-\frac{b^2}{4f} + g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2n} \left(b + 2\, f\, \sqrt{z}\right)^{h+k} \left(-\frac{\left(b + 2\, f\, \sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b + 2\, f\, \sqrt{z}\right) \Gamma\left(\right. \right.$$

$$\left. \left. \frac{1}{2}(h+k+1),\ -\frac{\left(b + 2\, f\, \sqrt{z}\right)^2}{4\, f} \right) + 2 \sqrt{-\frac{\left(b + 2\, f\, \sqrt{z}\right)^2}{f}}\ f\, \Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b + 2\, f\, \sqrt{z}\right)^2}{4\, f} \right) \right) \Bigg) \Bigg) /;\ n \in \mathbb{N}$$

Involving $z^n\, e^{b\, z^r + e} \cosh(f\, z + g)$

01.20.21.0366.01

$$\int z^n\, e^{b\, z^2 + e} \cosh(g + f\, z)\, dz ==$$

$$-\frac{1}{4}\, b^{-n-1} \left(e^{-\frac{f^2}{4b} + e - g} \sum_{q=0}^{n} 2^{q-n}\, f^{n-q}\, (2\, b\, z - f)^{q+1} \left(-\frac{(2\, b\, z - f)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\ -\frac{(2\, b\, z - f)^2}{4\, b} \right) + \right.$$

$$\left. e^{-\frac{f^2}{4b} + e + g} \sum_{q=0}^{n} 2^{q-n}\, (-f)^{n-q}\, (f + 2\, b\, z)^{q+1} \left(-\frac{(f + 2\, b\, z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\ -\frac{(f + 2\, b\, z)^2}{4\, b} \right) \right) /;\ n \in \mathbb{N}$$

01.20.21.0367.01

$$\int z^n e^{\sqrt{z}\,b+e} \cosh(g+f\,z)\,dz ==$$

$$2^{-2n-2} f^{-2n-2}\left(e^{\frac{b^2}{4f}+e-g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b-2f\sqrt{z}\right)^{h+k}\left(\frac{\left(b-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.$$

$$\left(b\left(b-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right)-2f\sqrt{\frac{\left(b-2f\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{-\frac{b^2}{4f}+e+g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2f\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2f\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}(h+k+1),-\frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right)+2\sqrt{-\frac{\left(b+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z}\cosh(f\,z+g)$

01.20.21.0368.01

$$\int z^n e^{b\,z^2+d\,z}\cosh(g+f\,z)\,dz ==$$

$$-\frac{1}{4}b^{-n-1}\left(e^{-\frac{(d-f)^2}{4b}-g}\sum_{q=0}^{n}2^{q-n}(f-d)^{n-q}(d-f+2bz)^{q+1}\left(-\frac{(d-f+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-f+2bz)^2}{4b}\right)+\right.$$

$$\left.e^{-\frac{(d+f)^2}{4b}+g}\sum_{q=0}^{n}2^{q-n}(-d-f)^{n-q}(d+f+2bz)^{q+1}\left(-\frac{(d+f+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2bz)^2}{4b}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.0369.01

$$\int z^n e^{\sqrt{z}\,b+d\,z}\cosh(g+f\,z)\,dz ==$$

$$2^{-2n-2}\left(e^{-\frac{b^2}{4(d-f)}-g}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}}\;(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)\right)(d-f)^{-2n-2}+$$

$$e^{-\frac{b^2}{4(d+f)}+g}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh(f\,z+g)$

01.20.21.0370.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cosh(g+f\,z)\,dz ==$$

$$-\frac{1}{4}b^{-n-1}\left(e^{-\frac{(d-f)^2}{4b}+e-g}\sum_{q=0}^{n}2^{q-n}(f-d)^{n-q}(d-f+2\,b\,z)^{q+1}\left(-\frac{(d-f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-f+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$\left.e^{-\frac{(d+f)^2}{4b}+e+g}\sum_{q=0}^{n}2^{q-n}(-d-f)^{n-q}(d+f+2\,b\,z)^{q+1}\left(-\frac{(d+f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2\,b\,z)^2}{4\,b}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.0371.01

$$\int z^n e^{\sqrt{z}\,b+e+d\,z}\cosh(g+f\,z)\,dz ==$$

$$2^{-2n-2}\left(e^{-\frac{b^2}{4(d-f)}+e-g}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}}\;(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)\right)(d-f)^{-2n-2}+$$

$$e^{-\frac{b^2}{4(d+f)}+e+g}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z}\cosh(c\,z^r)$

01.20.21.0372.01

$$\int z^n\,e^{b\,z}\cosh\left(c\,z^2\right)dz == -\frac{1}{4}\left(e^{\frac{b^2}{4c}}\left(\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b-2\,c\,z)^{q+1}\left(\frac{(b-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$\left.c^{-n-1}\,e^{-\frac{b^2}{4c}}\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b+2\,c\,z)^{q+1}\left(-\frac{(b+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.0373.01

$$\int z^n e^{b z} \cosh\left(c \sqrt{z}\right) dz == 2^{-2 n-2} b^{-2 n-2} e^{-\frac{c^2}{4 b}}$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k (-c)^{-h-k+2 n}\left(2 b \sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2 b \sqrt{z}-c\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2 b\sqrt{-\frac{\left(2 b \sqrt{z}-c\right)^2}{b}}\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 b \sqrt{z}-c\right)^2}{4 b}\right) - c\left(2 b \sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 b \sqrt{z}-c\right)^2}{4 b}\right)\Bigg) +$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k c^{-h-k+2 n}\left(2 \sqrt{z}\, b+c\right)^{h+k}\left(-\frac{\left(2 \sqrt{z}\, b+c\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\left(2 \sqrt{z}\, b+c\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 \sqrt{z}\, b+c\right)^2}{4 b}\right) + 2\sqrt{-\frac{\left(2 \sqrt{z}\, b+c\right)^2}{b}}\; b\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 \sqrt{z}\, b+c\right)^2}{4 b}\right)\right)\right) /; n \in \mathbb{N}$$

Involving $z^n e^{d z+e} \cosh\left(c z^r\right)$

01.20.21.0374.01

$$\int z^n e^{e+d z} \cosh\left(c z^2\right) dz ==$$

$$-\frac{1}{4}\left(\frac{1}{\sqrt{-c}} e^{\frac{d^2}{4 c}+e}\sum_{q=0}^{n} 2^{q-n}(-c)^{-n-\frac{1}{2}}(-d)^{n-q}(d-2 c z)^{q+1}\left(\frac{(d-2 c z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(d-2 c z)^2}{4 c}\right) +\right.$$

$$\left.\frac{1}{\sqrt{c}} e^{e-\frac{d^2}{4 c}}\sum_{q=0}^{n} 2^{q-n} c^{-n-\frac{1}{2}}(-d)^{n-q}(d+2 c z)^{q+1}\left(-\frac{(d+2 c z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(d+2 c z)^2}{4 c}\right)\right) /; n \in \mathbb{N}$$

01.20.21.0375.01

$$\int z^n e^{e+d z} \cosh\left(c \sqrt{z}\right) dz == 2^{-2 n-2} d^{-2 n-2} e^{e-\frac{c^2}{4 d}}$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k (-c)^{-h-k+2 n} \left(2 d \sqrt{z} - c\right)^{h+k} \left(-\frac{\left(2 d \sqrt{z} - c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(2 d \sqrt{-\frac{\left(2 d \sqrt{z} - c\right)^2}{d}}\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 d \sqrt{z} - c\right)^2}{4 d}\right) - c\left(2 d \sqrt{z} - c\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 d \sqrt{z} - c\right)^2}{4 d}\right)\Bigg) +$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k c^{-h-k+2 n} \left(c + 2 d \sqrt{z}\right)^{h+k} \left(-\frac{\left(c + 2 d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(c\left(c + 2 d \sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c + 2 d \sqrt{z}\right)^2}{4 d}\right) + 2\sqrt{-\frac{\left(c + 2 d \sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c + 2 d \sqrt{z}\right)^2}{4 d}\right)\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r} \cosh\left(c z^r\right)$

01.20.21.0376.01

$$\int z^{\alpha-1} e^{b z^r} \cosh(c z^r)\, dz == -\frac{z^\alpha \left(\Gamma\left(\frac{\alpha}{r}, (-b-c) z^r\right) \left((-b-c) z^r\right)^{-\frac{\alpha}{r}} + \left((c-b) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c-b) z^r\right)\right)}{2 r}$$

01.20.21.0377.01

$$\int z^n e^{b z^2} \cosh\left(c z^2\right) dz == -\frac{1}{4} z^{n+1} \left(\Gamma\left(\frac{n+1}{2}, (-b-c) z^2\right) \left((-b-c) z^2\right)^{\frac{1}{2}(-n-1)} + \left((c-b) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c-b) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.0378.01

$$\int z^n e^{\sqrt{z}\, b} \cosh\left(c \sqrt{z}\right) dz == -\left(\Gamma\left(2 (n+1), (c-b) \sqrt{z}\right) (c-b)^{-2 (n+1)} + (b+c)^{-2 (n+1)} \Gamma\left(2 (n+1), (-b-c) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r + e} \cosh\left(c z^r\right)$

01.20.21.0379.01

$$\int z^{\alpha-1} e^{b z^r + e} \cosh(c z^r)\, dz == -\frac{e^e z^\alpha \left(\Gamma\left(\frac{\alpha}{r}, (-b-c) z^r\right) \left((-b-c) z^r\right)^{-\frac{\alpha}{r}} + \left((c-b) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c-b) z^r\right)\right)}{2 r}$$

01.20.21.0380.01

$$\int z^n e^{b z^2 + e} \cosh\left(c z^2\right) dz ==$$

$$-\frac{1}{4} e^e z^{n+1} \left(\Gamma\left(\frac{n+1}{2}, (-b-c) z^2\right) \left((-b-c) z^2\right)^{\frac{1}{2}(-n-1)} + \left((c-b) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c-b) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.0381.01

$$\int z^n e^{\sqrt{z}\,b+e} \cosh\left(c\sqrt{z}\right) dz == -e^e \left(\Gamma\left(2(n+1), (c-b)\sqrt{z}\right)(c-b)^{-2(n+1)} + (b+c)^{-2(n+1)}\,\Gamma\left(2(n+1), (-b-c)\sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n\, e^{b z^r + d z} \cosh\left(c z^r\right)$

01.20.21.0382.01

$$\int z^n e^{b z^2 + d z} \cosh\left(c z^2\right) dz ==$$

$$-\frac{1}{4}\left(e^{-\frac{d^2}{4(b-c)}}\left(\sum_{q=0}^{n} 2^{q-n}(-d)^{n-q}(d+2(b-c)z)^{q+1}\left(-\frac{(d+2(b-c)z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(d+2(b-c)z)^2}{4(b-c)}\right)\right)(b-c)^{-n-1} + \right.$$

$$\left.(b+c)^{-n-1}\, e^{-\frac{d^2}{4(b+c)}} \sum_{q=0}^{n} 2^{q-n}(-d)^{n-q}(d+2bz+2cz)^{q+1}\left(-\frac{(d+2bz+2cz)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz+2cz)^2}{4(b+c)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.0383.01

$$\int z^n e^{\sqrt{z}\,b+d\,z}\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-2\,n-2}\,d^{-2\,n-2}\left(e^{-\frac{(b-c)^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+\right.$$

$$e^{-\frac{(b+c)^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2\,n}\left(b+c+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left((b+c)\left(b+c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh\left(c\,z^r\right)$

01.20.21.0384.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cosh\left(c\,z^2\right)dz ==$$

$$-\frac{1}{4}\left(e^{e-\frac{d^2}{4\,(b-c)}}\left(\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,(b-c)\,z)^{q+1}\left(-\frac{(d+2\,(b-c)\,z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b-c)\,z)^2}{4\,(b-c)}\right)\right)\right.$$

$$(b-c)^{-n-1}+(b+c)^{-n-1}\,e^{e-\frac{d^2}{4\,(b+c)}}$$

$$\left.\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,b\,z+2\,c\,z)^{q+1}\left(-\frac{(d+2\,b\,z+2\,c\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z+2\,c\,z)^2}{4\,(b+c)}\right)\right)\Big/;\,n\in\mathbb{N}$$

01.20.21.0385.01

$$\int z^n e^{\sqrt{z}\,b+e+d\,z}\cosh\left(c\sqrt{z}\right)dz ==$$

$$2^{-2n-2}\,d^{-2n-2}\left(e^{e-\frac{(b-c)^2}{4d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{e-\frac{(b+c)^2}{4d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left((b+c)\left(b+c+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{d\,z}\cosh\left(c\,z^r+g\right)$

01.20.21.0386.01

$$\int z^n\,e^{d\,z}\cosh\left(c\,z^2+g\right)dz ==$$

$$-\frac{1}{4}\left(\frac{1}{\sqrt{-c}}\,e^{\frac{d^2}{4c}-g}\sum_{q=0}^{n}2^{q-n}\,(-c)^{-n-\frac{1}{2}}\,(-d)^{n-q}\,(d-2\,c\,z)^{q+1}\left(\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\frac{1}{\sqrt{c}}\,e^{-\frac{d^2}{4c}+g}\sum_{q=0}^{n}2^{q-n}\,c^{-n-\frac{1}{2}}\,(-d)^{n-q}\,(d+2\,c\,z)^{q+1}\left(-\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\,n\in\mathbb{N}$$

01.20.21.0387.01

$$\int z^n e^{d z} \cosh\left(\sqrt{z}\, c + g\right) dz == 2^{-2n-2} d^{-2n-2}$$

$$\left(e^{-\frac{c^2}{4d}-g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c)^{-h-k+2n} \left(2 d \sqrt{z} - c\right)^{h+k} \left(-\frac{\left(2 d \sqrt{z} - c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(2 d \sqrt{-\frac{\left(2 d \sqrt{z} - c\right)^2}{d}} \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 d \sqrt{z} - c\right)^2}{4 d}\right) - c \left(2 d \sqrt{z} - c\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 d \sqrt{z} - c\right)^2}{4 d}\right) \right) +$$

$$e^{-\frac{c^2}{4d}+g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k c^{-h-k+2n} \left(c + 2 d \sqrt{z}\right)^{h+k} \left(-\frac{\left(c + 2 d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(c \left(c + 2 d \sqrt{z}\right) \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c + 2 d \sqrt{z}\right)^2}{4 d}\right) + 2 \sqrt{-\frac{\left(c + 2 d \sqrt{z}\right)^2}{d}}\, d\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c + 2 d \sqrt{z}\right)^2}{4 d}\right) \right) \right) /; n \in \mathbb{N}$$

Involving $z^n\, e^{d z+e} \cosh\left(c z^r + g\right)$

01.20.21.0388.01

$$\int z^n e^{e+d z} \cosh\left(c z^2 + g\right) dz ==$$

$$-\frac{1}{4} \left(\frac{1}{\sqrt{-c}} e^{\frac{d^2}{4c}+e-g} \sum_{q=0}^{n} 2^{q-n} (-c)^{-n-\frac{1}{2}} (-d)^{n-q} (d - 2 c z)^{q+1} \left(\frac{(d-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d-2cz)^2}{4c}\right) + \right.$$

$$\left. \frac{1}{\sqrt{c}} e^{-\frac{d^2}{4c}+e+g} \sum_{q=0}^{n} 2^{q-n} c^{-n-\frac{1}{2}} (-d)^{n-q} (d + 2 c z)^{q+1} \left(-\frac{(d+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2cz)^2}{4c}\right) \right) /; n \in \mathbb{N}$$

01.20.21.0389.01

$$\int z^n e^{e+d z} \cosh\left(\sqrt{z}\, c+g\right) dz == 2^{-2n-2} d^{-2n-2}$$

$$\left(e^{-\frac{c^2}{4d}+e-g} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k (-c)^{-h-k+2n} \left(2d\sqrt{z}-c\right)^{h+k} \left(-\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(2d\sqrt{-\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right) - c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\Bigg) +$$

$$e^{-\frac{c^2}{4d}+e+g} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k c^{-h-k+2n} \left(c+2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(c\left(c+2d\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right) + 2\sqrt{-\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\; d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r} \cosh(c z^r + g)$

01.20.21.0390.01

$$\int z^{\alpha-1} e^{b z^r} \cosh(c z^r + g)\, dz == -\frac{z^\alpha \left(e^g \Gamma\left(\frac{\alpha}{r}, (-b-c) z^r\right) \left((-b-c) z^r\right)^{-\frac{\alpha}{r}} + e^{-g} \left((c-b) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c-b) z^r\right)\right)}{2r}$$

01.20.21.0391.01

$$\int z^n e^{b z^2} \cosh\left(c z^2 + g\right) dz ==$$

$$-\frac{1}{4} z^{n+1} \left(e^g \Gamma\left(\frac{n+1}{2}, (-b-c) z^2\right) \left((-b-c) z^2\right)^{\frac{1}{2}(-n-1)} + e^{-g} \left((c-b) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c-b) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.0392.01

$$\int z^n e^{\sqrt{z}\, b} \cosh\left(\sqrt{z}\, c+g\right) dz ==$$

$$-\left(e^{-g} \Gamma\left(2(n+1), (c-b)\sqrt{z}\right) (c-b)^{-2(n+1)} + (b+c)^{-2(n+1)} e^g \Gamma\left(2(n+1), (-b-c)\sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r + e} \cosh(c z^r + g)$

01.20.21.0393.01

$$\int z^{\alpha-1} e^{b z^r+e} \cosh(c z^r + g)\, dz == -\frac{z^\alpha \left(e^{e+g} \Gamma\left(\frac{\alpha}{r}, (-b-c) z^r\right) \left((-b-c) z^r\right)^{-\frac{\alpha}{r}} + e^{e-g} \left((c-b) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c-b) z^r\right)\right)}{2r}$$

01.20.21.0394.01

$$\int z^n \, e^{b z^2+e} \cosh\left(c z^2+g\right) dz ==$$
$$-\frac{1}{4} z^{n+1} \left(e^{e+g} \Gamma\left(\frac{n+1}{2}, (-b-c) z^2\right) \left((-b-c) z^2\right)^{\frac{1}{2}(-n-1)} + e^{e-g} \left((c-b) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c-b) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.0395.01

$$\int z^n \, e^{\sqrt{z}\, b+e} \cosh\left(\sqrt{z}\, c+g\right) dz ==$$
$$-\left(e^{e-g} \Gamma\left(2 (n+1), (c-b) \sqrt{z}\right) (c-b)^{-2 (n+1)} + (b+c)^{-2 (n+1)} e^{e+g} \Gamma\left(2 (n+1), (-b-c) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n \, e^{b z^r+d z} \cosh\left(c z^r+g\right)$

01.20.21.0396.01

$$\int z^n \, e^{b z^2+d z} \cosh\left(c z^2+g\right) dz ==$$
$$-\frac{1}{4}\left(e^{-\frac{d^2}{4 (b-c)}-g} \left(\sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2 (b-c) z)^{q+1} \left(-\frac{(d+2 (b-c) z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2 (b-c) z)^2}{4 (b-c)}\right)\right)\right.$$
$$(b-c)^{-n-1} + (b+c)^{-n-1} \, e^{-\frac{d^2}{4 (b+c)}+g}$$
$$\left.\sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2 b z+2 c z)^{q+1} \left(-\frac{(d+2 b z+2 c z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2 b z+2 c z)^2}{4 (b+c)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.0397.01

$$\int z^n e^{\sqrt{z}\,b+d\,z}\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-2n-2}\,d^{-2n-2}\left(e^{-\frac{(b-c)^2}{4d}-g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{-\frac{(b+c)^2}{4d}+g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left((b+c)\left(b+c+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh\left(c\,z^r+g\right)$

01.20.21.0398.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cosh\left(c\,z^2+g\right)dz ==$$

$$-\frac{1}{4}\left(e^{-\frac{d^2}{4(b-c)}+e-g}\left(\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2(b-c)z)^{q+1}\left(-\frac{(d+2(b-c)z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2(b-c)z)^2}{4(b-c)}\right)\right)\right.$$

$$(b-c)^{-n-1}+(b+c)^{-n-1}\,e^{-\frac{d^2}{4(b+c)}+e+g}$$

$$\left.\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2bz+2cz)^{q+1}\left(-\frac{(d+2bz+2cz)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2bz+2cz)^2}{4(b+c)}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.0399.01

$$\int z^n e^{\sqrt{z}\ b+e+d z} \cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-2n-2} d^{-2n-2} \left(e^{-\frac{(b-c)^2}{4d}+e-g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c)^{-h-k+2n} \left(b-c+2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h}\binom{n}{k} \left((b-c)\left(b-c+2d\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right) + \right.$$

$$\left. \left. 2\sqrt{-\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right) \right) +$$

$$e^{-\frac{(b+c)^2}{4d}+e+g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c)^{-h-k+2n} \left(b+c+2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left((b+c)\left(b+c+2d\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2d\sqrt{z}\right)^2}{4d}\right) + \right.$$

$$\left. \left. \left. 2\sqrt{-\frac{\left(b+c+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+c+2d\sqrt{z}\right)^2}{4d}\right) \right) \right) /; n \in \mathbb{N}$$

Involving exponential and algebraic functions

Involving exp and algebraic functions

Involving $(a\,z+b)^{\beta}\,d^{z}\cosh(c\,z+e)$

01.20.21.0400.01

$$\int (b+a\,z)^{\beta}\, d^{z} \cosh(e+c\,z)\, dz == -\frac{d^{-\frac{b}{a}}\, e^{-\frac{b\,c}{a}-e}\, (b+a\,z)^{\beta+1} \left(e^{\frac{2\,b\,c}{a}}\, E_{-\beta}\left(\frac{(b+a\,z)\,(c-\log(d))}{a}\right) + e^{2\,e}\, E_{-\beta}\left(-\frac{(b+a\,z)\,(c+\log(d))}{a}\right)\right)}{2\,a}$$

01.20.21.0401.01

$$\int (b+a\,z)^{\beta}\, e^{p\,z} \cosh(e+c\,z)\, dz == -\frac{e^{-e-\frac{b\,(c+p)}{a}}\, (b+a\,z)^{\beta+1} \left(e^{\frac{2\,b\,c}{a}}\, E_{-\beta}\left(\frac{(c-p)\,(b+a\,z)}{a}\right) + e^{2\,e}\, E_{-\beta}\left(-\frac{(c+p)\,(b+a\,z)}{a}\right)\right)}{2\,a}$$

01.20.21.0402.01

$$\int (b+a\,z)^{\beta}\,d^{z}\cosh(c\,z)\,dz == -\frac{d^{-\frac{b}{a}}\,e^{-\frac{b\,c}{a}}\,(b+a\,z)^{\beta+1}\left(e^{\frac{2\,b\,c}{a}}\,E_{-\beta}\left(\frac{(b+a\,z)\,(c-\log(d))}{a}\right)+E_{-\beta}\left(-\frac{(b+a\,z)\,(c+\log(d))}{a}\right)\right)}{2\,a}$$

01.20.21.0403.01

$$\int (b+a\,z)^{\beta}\,e^{p\,z}\cosh(c\,z)\,dz == -\frac{e^{-\frac{b\,(c+p)}{a}}\,(b+a\,z)^{\beta+1}\left(e^{\frac{2\,b\,c}{a}}\,E_{-\beta}\left(\frac{(c-p)\,(b+a\,z)}{a}\right)+E_{-\beta}\left(-\frac{(c+p)\,(b+a\,z)}{a}\right)\right)}{2\,a}$$

01.20.21.0404.01

$$\int \frac{e^{p\,z}\cosh(c\,z)}{\sqrt{b+a\,z}}\,dz == \frac{1}{2\left(c^2-p^2\right)\sqrt{b+a\,z}}\left(e^{-\frac{b\,(c+p)}{a}}\sqrt{\pi}\right.$$
$$\left.\left((c-p)\sqrt{-\frac{(c+p)\,(b+a\,z)}{a}}\,\operatorname{erfc}\left(\sqrt{-\frac{(c+p)\,(b+a\,z)}{a}}\right)-e^{\frac{2\,b\,c}{a}}\,(c+p)\sqrt{\frac{(c-p)\,(b+a\,z)}{a}}\,\operatorname{erfc}\left(\sqrt{\frac{(c-p)\,(b+a\,z)}{a}}\right)\right)\right)$$

Arguments involving polynomials

Involving $a\,z^2+b\,z+c$

01.20.21.0405.01

$$\int \cosh\left(a\,z^2+b\,z+c\right)dz == \frac{\sqrt{\pi}}{4\sqrt{a}}\,e^{-\frac{b^2}{4\,a}-c}\left(e^{\frac{b^2}{2\,a}}\operatorname{erf}\left(\frac{b+2\,a\,z}{2\sqrt{a}}\right)+e^{2\,c}\operatorname{erfi}\left(\frac{b+2\,a\,z}{2\sqrt{a}}\right)\right)$$

Involving $a\,z^2+b\,z$

01.20.21.0406.01

$$\int \cosh\left(a\,z^2+b\,z\right)dz == \frac{\sqrt{\pi}}{4\sqrt{a}}\,e^{-\frac{b^2}{4\,a}}\left(e^{\frac{b^2}{2\,a}}\operatorname{erf}\left(\frac{b+2\,a\,z}{2\sqrt{a}}\right)+\operatorname{erfi}\left(\frac{b+2\,a\,z}{2\sqrt{a}}\right)\right)$$

Involving $a\,z^2+c$

01.20.21.0407.01

$$\int \cosh\left(a\,z^2+c\right)dz == \frac{\sqrt{\pi}\,\left(e^{-c}\operatorname{erf}\left(\sqrt{a}\,z\right)+e^{c}\operatorname{erfi}\left(\sqrt{a}\,z\right)\right)}{4\sqrt{a}}$$

Arguments involving rational functions

Involving $a\,z^2+\frac{b}{z^2}$

01.20.21.0408.01

$$\int \cosh\left(a\,z^2+\frac{b}{z^2}\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{e^{-2\sqrt{-a}\,\sqrt{-b}}\left(e^{4\sqrt{-a}\,\sqrt{-b}}\left(\operatorname{erf}\left(\sqrt{-a}\,z+\frac{\sqrt{-b}}{z}\right)-1\right)-\operatorname{erf}\left(\frac{\sqrt{-b}}{z}-\sqrt{-a}\,z\right)+1\right)}{\sqrt{-a}}+\right.$$
$$\left.\frac{e^{-2\sqrt{a}\,\sqrt{b}}\left(e^{4\sqrt{a}\,\sqrt{b}}\left(\operatorname{erf}\left(\sqrt{a}\,z+\frac{\sqrt{b}}{z}\right)-1\right)-\operatorname{erf}\left(\frac{\sqrt{b}}{z}-\sqrt{a}\,z\right)+1\right)}{\sqrt{a}}\right)$$

Involving $a\,z^2+\frac{b}{z^2}+c$

01.20.21.0409.01

$$\int \cosh\left(a\,z^2+c+\frac{b}{z^2}\right)dz == \frac{1}{8}\,e^{-c}\sqrt{\pi}\left(\frac{e^{2c-2\sqrt{-a}\,\sqrt{-b}}\left(e^{4\sqrt{-a}\,\sqrt{-b}}\left(\operatorname{erf}\left(\sqrt{-a}\,z+\frac{\sqrt{-b}}{z}\right)-1\right)-\operatorname{erf}\left(\frac{\sqrt{-b}}{z}-\sqrt{-a}\,z\right)+1\right)}{\sqrt{-a}}+\right.$$
$$\left.\frac{e^{-2\sqrt{a}\,\sqrt{b}}\left(e^{4\sqrt{a}\,\sqrt{b}}\left(\operatorname{erf}\left(\sqrt{a}\,z+\frac{\sqrt{b}}{z}\right)-1\right)-\operatorname{erf}\left(\frac{\sqrt{b}}{z}-\sqrt{a}\,z\right)+1\right)}{\sqrt{a}}\right)$$

Arguments involving algebraic functions

Involving $a\,z+b\sqrt{z}+c$

01.20.21.0410.01

$$\int \cosh\left(a\,z+b\sqrt{z}+c\right)dz == \frac{1}{4\,a^{3/2}}\left(b\sqrt{\pi}\left(-e^{\frac{b^2}{4a}-c}\operatorname{erf}\left(\frac{2\sqrt{z}\,a+b}{2\sqrt{a}}\right)-e^{c-\frac{b^2}{4a}}\operatorname{erfi}\left(\frac{2\sqrt{z}\,a+b}{2\sqrt{a}}\right)\right)+4\sqrt{a}\,\sinh\left(\sqrt{z}\,b+c+a\,z\right)\right)$$

Involving $a\,z+b\sqrt{z}$

01.20.21.0411.01

$$\int \cosh\left(a\,z+\sqrt{z}\,b\right)dz == \frac{1}{4\,a^{3/2}}\left(b\sqrt{\pi}\left(-e^{\frac{b^2}{4a}}\operatorname{erf}\left(\frac{2\sqrt{z}\,a+b}{2\sqrt{a}}\right)-e^{-\frac{b^2}{4a}}\operatorname{erfi}\left(\frac{2\sqrt{z}\,a+b}{2\sqrt{a}}\right)\right)+4\sqrt{a}\,\sinh\left(\sqrt{z}\,b+a\,z\right)\right)$$

Involving $a\,z^r+c$

01.20.21.0412.01

$$\int \cosh\left(a\,z^r+c\right)dz == -\frac{e^{-c}\,z}{2\,r}\left(e^{2\,c}\,E_{\frac{r-1}{r}}\left(-a\,z^r\right)+E_{\frac{r-1}{r}}\left(a\,z^r\right)\right)$$

01.20.21.0413.01

$$\int \cosh\left(a\, z^2 + c\right) dz == \frac{\sqrt{\pi}\ e^{-c}\left(\operatorname{erf}\left(\sqrt{a}\ z\right) + e^{2c}\operatorname{erfi}\left(\sqrt{a}\ z\right)\right)}{4\sqrt{a}}$$

01.20.21.0414.01

$$\int \cosh\left(\sqrt{z}\ a + c\right) dz == \frac{e^{-\sqrt{z}\ a - c}\left(-\sqrt{z}\ a + e^{2\left(\sqrt{z}\ a + c\right)}\left(a\sqrt{z} - 1\right) - 1\right)}{a^2}$$

Arguments involving exponential functions

01.20.21.0415.01

$$\int \cosh(a^z)\, dz == \frac{\operatorname{Chi}(a^z)}{\log(a)}$$

01.20.21.0416.01

$$\int \cosh(e^z)\, dz == \operatorname{Chi}(e^z)$$

Arguments involving trigonometric functions

Involving tan

01.20.21.0417.01

$$\int \cosh(\tan(z))\, dz == \frac{1}{2}\left(-i\cos(1)\operatorname{Chi}(i - \tan(z)) + i\cos(1)\operatorname{Chi}(\tan(z) + i) + \sin(1)\left(\operatorname{Shi}(\tan(z) + i) - \operatorname{Shi}(i - \tan(z))\right)\right)$$

01.20.21.0418.01

$$\int \cosh(a\tan(z))\, dz == \frac{1}{2}\left(-i\cos(a)\operatorname{Chi}(-a\,(\tan(z) - i)) + i\cos(a)\operatorname{Chi}(a\,(\tan(z) + i)) + \sin(a)\left(\operatorname{Shi}(a\,(\tan(z) + i)) - \operatorname{Shi}(i\,a - a\tan(z))\right)\right)$$

Involving cot

01.20.21.0419.01

$$\int \cosh(\cot(z))\, dz == \frac{1}{2}\left(i\cos(1)\operatorname{Chi}(i - \cot(z)) - i\cos(1)\operatorname{Chi}(\cot(z) + i) + \sin(1)\left(\operatorname{Shi}(i - \cot(z)) - \operatorname{Shi}(\cot(z) + i)\right)\right)$$

01.20.21.0420.01

$$\int \cosh(a\cot(z))\, dz == \frac{1}{2}\left(i\cos(a)\operatorname{Chi}(-a\,(\cot(z) - i)) - i\cos(a)\operatorname{Chi}(a\,(\cot(z) + i)) + \sin(a)\left(\operatorname{Shi}(i\,a - a\cot(z)) - \operatorname{Shi}(a\,(\cot(z) + i))\right)\right)$$

Arguments involving hyperbolic functions

Involving tanh

01.20.21.0421.01

$$\int \cosh(\tanh(z))\, dz == \frac{1}{4e}\left(-\left(1+e^2\right)\operatorname{Chi}(1-\tanh(z))+\left(1+e^2\right)\operatorname{Chi}(\tanh(z)+1)+\left(-1+e^2\right)(\operatorname{Shi}(1-\tanh(z))-\operatorname{Shi}(\tanh(z)+1))\right)$$

01.20.21.0422.01

$$\int \cosh(a\tanh(z))\, dz == \frac{1}{2}(-\cosh(a)\operatorname{Chi}(a-a\tanh(z))+\cosh(a)\operatorname{Chi}(\tanh(z)\,a+a)+\sinh(a)(\operatorname{Shi}(a-a\tanh(z))-\operatorname{Shi}(\tanh(z)\,a+a)))$$

Involving coth

01.20.21.0423.01

$$\int \cosh(\coth(z))\, dz == \frac{1}{4e}\left(-\left(1+e^2\right)\operatorname{Chi}(1-\coth(z))+\left(1+e^2\right)\operatorname{Chi}(\coth(z)+1)+\left(-1+e^2\right)(\operatorname{Shi}(1-\coth(z))-\operatorname{Shi}(\coth(z)+1))\right)$$

01.20.21.0424.01

$$\int \cosh(a\coth(z))\, dz == \frac{1}{2}(-\cosh(a)\operatorname{Chi}(a-a\coth(z))+\cosh(a)\operatorname{Chi}(\coth(z)\,a+a)+\sinh(a)(\operatorname{Shi}(a-a\coth(z))-\operatorname{Shi}(\coth(z)\,a+a)))$$

Arguments involving inverse trigonometric functions

Involving $\sin^{-1}$

01.20.21.0425.01

$$\int \cosh\left(\sin^{-1}(z)\right) dz == \frac{1}{2}\left(z\cosh\left(\sin^{-1}(z)\right)+\sqrt{1-z^2}\,\sinh\left(\sin^{-1}(z)\right)\right)$$

01.20.21.0426.01

$$\int \cosh\left(a\sin^{-1}(z)\right) dz == \frac{z\cosh\left(a\sin^{-1}(z)\right)+a\sqrt{1-z^2}\,\sinh\left(a\sin^{-1}(z)\right)}{a^2+1}$$

Involving $\cos^{-1}$

01.20.21.0427.01

$$\int \cosh\left(\cos^{-1}(z)\right) dz == \frac{1}{2}\left(z\cosh\left(\cos^{-1}(z)\right)-\sqrt{1-z^2}\,\sinh\left(\cos^{-1}(z)\right)\right)$$

01.20.21.0428.01

$$\int \cosh\left(a\cos^{-1}(z)\right) dz == \frac{z\cosh\left(a\cos^{-1}(z)\right)-a\sqrt{1-z^2}\,\sinh\left(a\cos^{-1}(z)\right)}{a^2+1}$$

Involving $\tan^{-1}$

01.20.21.0429.01

$$\int \cosh\left(\tan^{-1}(z)\right) dz ==$$
$$z \cosh\left(\tan^{-1}(z)\right) + \frac{1}{10}\left(-5\,i\,e^{\tan^{-1}(z)}\,{}_2F_1\left(-\frac{i}{2}, 1; 1-\frac{i}{2}; -e^{2\,i\tan^{-1}(z)}\right) - 5\,i\,e^{-\tan^{-1}(z)}\,{}_2F_1\left(\frac{i}{2}, 1; 1+\frac{i}{2}; -e^{2\,i\tan^{-1}(z)}\right) + \right.$$
$$\left.(2+i)\,e^{(1+2\,i)\tan^{-1}(z)}\,{}_2F_1\left(1-\frac{i}{2}, 1; 2-\frac{i}{2}; -e^{2\,i\tan^{-1}(z)}\right) - (2-i)\,e^{(-1+2\,i)\tan^{-1}(z)}\,{}_2F_1\left(1+\frac{i}{2}, 1; 2+\frac{i}{2}; -e^{2\,i\tan^{-1}(z)}\right)\right)$$

01.20.21.0430.01

$$\int \cosh\left(a\tan^{-1}(z)\right) dz ==$$
$$-\frac{1}{2\left(a^2+4\right)}\left(i\,e^{-a\tan^{-1}(z)}\left((a+2\,i)\left((a-2\,i)\left(\left(1+e^{2\,a\tan^{-1}(z)}\right)i\,z + {}_2F_1\left(\frac{i\,a}{2}, 1; 1+\frac{i\,a}{2}; -e^{2\,i\tan^{-1}(z)}\right) + e^{2\,a\tan^{-1}(z)}\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(-\frac{1}{2}(i\,a), 1; 1-\frac{i\,a}{2}; -e^{2\,i\tan^{-1}(z)}\right)\right) - a\,e^{2\,i\tan^{-1}(z)}\,{}_2F_1\left(1+\frac{i\,a}{2}, 1; 2+\frac{i\,a}{2}; -e^{2\,i\tan^{-1}(z)}\right)\right) -\right.$$
$$\left.\left.a\,(a-2\,i)\,e^{2\,(a+i)\tan^{-1}(z)}\,{}_2F_1\left(1-\frac{i\,a}{2}, 1; 2-\frac{i\,a}{2}; -e^{2\,i\tan^{-1}(z)}\right)\right)\right)$$

Involving $\cot^{-1}$

01.20.21.0431.01

$$\int \cosh\left(\cot^{-1}(z)\right) dz ==$$
$$\frac{1}{10}\,e^{-\cot^{-1}(z)}\left(5\left(1+e^{2\cot^{-1}(z)}\right)z + 5\,i\,e^{2\cot^{-1}(z)}\,{}_2F_1\left(-\frac{i}{2}, 1; 1-\frac{i}{2}; e^{2\,i\cot^{-1}(z)}\right) + 5\,i\,{}_2F_1\left(\frac{i}{2}, 1; 1+\frac{i}{2}; e^{2\,i\cot^{-1}(z)}\right) + \right.$$
$$\left.(2+i)\,e^{(2+2\,i)\cot^{-1}(z)}\,{}_2F_1\left(1-\frac{i}{2}, 1; 2-\frac{i}{2}; e^{2\,i\cot^{-1}(z)}\right) - (2-i)\,e^{2\,i\cot^{-1}(z)}\,{}_2F_1\left(1+\frac{i}{2}, 1; 2+\frac{i}{2}; e^{2\,i\cot^{-1}(z)}\right)\right)$$

01.20.21.0432.01

$$\int \cosh\left(a\cot^{-1}(z)\right) dz == \frac{1}{2\left(a^2+4\right)}\left(i\,e^{-a\cot^{-1}(z)}\left((a+2\,i)\right.\right.$$
$$\left.\left(\left(a-2\,i\right)\left(-i\left(1+e^{2\,a\cot^{-1}(z)}\right)z + {}_2F_1\left(\frac{i\,a}{2}, 1; 1+\frac{i\,a}{2}; e^{2\,i\cot^{-1}(z)}\right) + e^{2\,a\cot^{-1}(z)}\,{}_2F_1\left(-\frac{1}{2}(i\,a), 1; 1-\frac{i\,a}{2}; e^{2\,i\cot^{-1}(z)}\right)\right) + \right.\right.$$
$$\left.\left.a\,e^{2\,i\cot^{-1}(z)}\,{}_2F_1\left(1+\frac{i\,a}{2}, 1; 2+\frac{i\,a}{2}; e^{2\,i\cot^{-1}(z)}\right)\right) + a\,(a-2\,i)\,e^{2\,(a+i)\cot^{-1}(z)}\,{}_2F_1\left(1-\frac{i\,a}{2}, 1; 2-\frac{i\,a}{2}; e^{2\,i\cot^{-1}(z)}\right)\right)\right)$$

Involving $\csc^{-1}$

01.20.21.0433.01

$$\int \cosh\left(\csc^{-1}(z)\right) dz == \frac{1}{2}\,e^{-\csc^{-1}(z)}$$
$$\left(e^{2\csc^{-1}(z)}\,z + z + (1+i)\,e^{(2+i)\csc^{-1}(z)}\,{}_2F_1\left(\frac{1}{2}-\frac{i}{2}, 1; \frac{3}{2}-\frac{i}{2}; e^{2\,i\csc^{-1}(z)}\right) - (1-i)\,e^{i\csc^{-1}(z)}\,{}_2F_1\left(\frac{1}{2}+\frac{i}{2}, 1; \frac{3}{2}+\frac{i}{2}; e^{2\,i\csc^{-1}(z)}\right)\right)$$

01.20.21.0434.01

$$\int \cosh\left(a \csc^{-1}(z)\right) dz == \frac{1}{2\left(a^2+1\right)}\left(e^{-a \csc^{-1}(z)}\left((a+i)\left((a-i)\left(1+e^{2 a \csc^{-1}(z)}\right) z + 2 a\, e^{i \csc^{-1}(z)}\, i\, {}_2F_1\left(\frac{1}{2}+\frac{i a}{2}, 1; \frac{3}{2}+\frac{i a}{2}; e^{2 i \csc^{-1}(z)}\right)\right) + 2 a (1+i a)\, e^{(2 a+i) \csc^{-1}(z)}\, {}_2F_1\left(\frac{1}{2}-\frac{i a}{2}, 1; \frac{3}{2}-\frac{i a}{2}; e^{2 i \csc^{-1}(z)}\right)\right)\right)$$

Involving $\sec^{-1}$

01.20.21.0435.01

$$\int \cosh\left(\sec^{-1}(z)\right) dz == z \cosh\left(\sec^{-1}(z)\right) - \frac{1}{2}(1+i)\, e^{(-1+i) \sec^{-1}(z)}\, {}_2F_1\left(\frac{1}{2}+\frac{i}{2}, 1; \frac{3}{2}+\frac{i}{2}; -e^{2 i \sec^{-1}(z)}\right) - \frac{1}{2}(1-i)\, e^{(1+i) \sec^{-1}(z)}\, {}_2F_1\left(\frac{1}{2}-\frac{i}{2}, 1; \frac{3}{2}-\frac{i}{2}; -e^{2 i \sec^{-1}(z)}\right)$$

01.20.21.0436.01

$$\int \cosh\left(a \sec^{-1}(z)\right) dz == \frac{1}{a^2+1}\left(e^{-a \sec^{-1}(z)}\left((a+i)\left((a-i)\, e^{a \sec^{-1}(z)}\, z \cosh\left(a \sec^{-1}(z)\right) - a\, e^{i \sec^{-1}(z)}\, {}_2F_1\left(\frac{1}{2}+\frac{i a}{2}, 1; \frac{3}{2}+\frac{i a}{2}; -e^{2 i \sec^{-1}(z)}\right)\right) - a (a-i)\, e^{(2 a+i) \sec^{-1}(z)}\, {}_2F_1\left(\frac{1}{2}-\frac{i a}{2}, 1; \frac{3}{2}-\frac{i a}{2}; -e^{2 i \sec^{-1}(z)}\right)\right)\right)$$

Arguments involving inverse hyperbolic functions

Involving $\sinh^{-1}$

01.20.21.0437.01

$$\int \cosh\left(\sinh^{-1}(z)\right) dz == \frac{1}{2}\sqrt{z^2+1}\; z + \frac{1}{2}\sinh^{-1}(z)$$

01.20.21.0438.01

$$\int \cosh\left(a \sinh^{-1}(z)\right) dz == \frac{1}{2}\left(\frac{\sinh\left((a-1)\sinh^{-1}(z)\right)}{a-1} + \frac{\sinh\left((a+1)\sinh^{-1}(z)\right)}{a+1}\right)$$

Involving $\cosh^{-1}$

01.20.21.0439.01

$$\int \cosh\left(\cosh^{-1}(z)\right) dz == \frac{z^2}{2}$$

01.20.21.0440.01

$$\int \cosh\left(a \cosh^{-1}(z)\right) dz == \frac{1}{2}\left(\frac{\cosh\left((a+1)\cosh^{-1}(z)\right)}{a+1} - \frac{\cosh\left((a-1)\cosh^{-1}(z)\right)}{a-1}\right)$$

Involving $\tanh^{-1}$

01.20.21.0441.01

$$\int \cosh\left(\tanh^{-1}(z)\right) dz == \sin^{-1}(z)$$

01.20.21.0442.01

$$\int \cosh\left(a \tanh^{-1}(z)\right) dz == \frac{1}{2\left(a^2-4\right)}$$
$$\left(e^{-a \tanh^{-1}(z)}\left((a-2)\left((a+2)\left(e^{2a \tanh^{-1}(z)} z + z + e^{2a \tanh^{-1}(z)}\, {}_2F_1\left(\frac{a}{2}, 1; \frac{a}{2}+1; -e^{2 \tanh^{-1}(z)}\right) + {}_2F_1\left(-\frac{a}{2}, 1; 1-\frac{a}{2}; -e^{2 \tanh^{-1}(z)}\right)\right) - \right.\right.$$
$$\left.\left. a\, e^{2(a+1) \tanh^{-1}(z)}\, {}_2F_1\left(\frac{a}{2}+1, 1; \frac{a}{2}+2; -e^{2 \tanh^{-1}(z)}\right)\right) - a(a+2)\, e^{2 \tanh^{-1}(z)}\, {}_2F_1\left(1-\frac{a}{2}, 1; 2-\frac{a}{2}; -e^{2 \tanh^{-1}(z)}\right)\right)\right)$$

Involving $\coth^{-1}$

01.20.21.0443.01

$$\int \cosh\left(\coth^{-1}(z)\right) dz == \frac{z^2-1}{\sqrt{1-\frac{1}{z^2}}\, z}$$

01.20.21.0444.01

$$\int \cosh\left(a \coth^{-1}(z)\right) dz == \frac{1}{2\left(a^2-4\right)}$$
$$\left(e^{-a \coth^{-1}(z)}\left((a-2)\left((a+2)\left(e^{2a \coth^{-1}(z)} z + z + e^{2a \coth^{-1}(z)}\, {}_2F_1\left(\frac{a}{2}, 1; \frac{a}{2}+1; e^{2 \coth^{-1}(z)}\right) + {}_2F_1\left(-\frac{a}{2}, 1; 1-\frac{a}{2}; e^{2 \coth^{-1}(z)}\right)\right) + \right.\right.$$
$$\left.\left. a\, e^{2(a+1) \coth^{-1}(z)}\, {}_2F_1\left(\frac{a}{2}+1, 1; \frac{a}{2}+2; e^{2 \coth^{-1}(z)}\right)\right) + a(a+2)\, e^{2 \coth^{-1}(z)}\, {}_2F_1\left(1-\frac{a}{2}, 1; 2-\frac{a}{2}; e^{2 \coth^{-1}(z)}\right)\right)\right)$$

Involving csch^{-1}

01.20.21.0445.01

$$\int \cosh\left(\operatorname{csch}^{-1}(z)\right) dz == \frac{\sqrt{1+\frac{1}{z^2}}\, z\left(\log(z) - \log\left(\sqrt{z^2+1}+1\right) + \sqrt{z^2+1}\right)}{\sqrt{z^2+1}}$$

01.20.21.0446.01

$$\int \cosh\left(a \operatorname{csch}^{-1}(z)\right) dz ==$$
$$\frac{1}{2\left(a^2-1\right)}\left(e^{-a \operatorname{csch}^{-1}(z)}\left((a-1)\left((a+1)\left(1+e^{2a \operatorname{csch}^{-1}(z)}\right) z + 2a\, e^{2a \operatorname{csch}^{-1}(z) + \operatorname{csch}^{-1}(z)}\, {}_2F_1\left(\frac{a+1}{2}, 1; \frac{a+3}{2}; e^{2 \operatorname{csch}^{-1}(z)}\right)\right) + \right.\right.$$
$$\left.\left. 2a(a+1)\, e^{\operatorname{csch}^{-1}(z)}\, {}_2F_1\left(\frac{1}{2}-\frac{a}{2}, 1; \frac{3}{2}-\frac{a}{2}; e^{2 \operatorname{csch}^{-1}(z)}\right)\right)\right)$$

Involving sech^{-1}

01.20.21.0447.01

$$\int \cosh\left(\operatorname{sech}^{-1}(z)\right) dz == \log(z)$$

01.20.21.0448.01

$$\int \cosh\left(a \operatorname{sech}^{-1}(z)\right) dz == \frac{1}{2\left(a^2-1\right)}\left(e^{-a \operatorname{sech}^{-1}(z)}\left((a-1)\left((a+1)\left(1+e^{2 a \operatorname{sech}^{-1}(z)}\right)z - 2a\, e^{2 a \operatorname{sech}^{-1}(z)+\operatorname{sech}^{-1}(z)}\, {}_2F_1\left(\frac{a+1}{2}, 1; \frac{a+3}{2}; -e^{2 \operatorname{sech}^{-1}(z)}\right)\right) - 2a(a+1)\, e^{\operatorname{sech}^{-1}(z)}\, {}_2F_1\left(\frac{1}{2}-\frac{a}{2}, 1; \frac{3}{2}-\frac{a}{2}; -e^{2 \operatorname{sech}^{-1}(z)}\right)\right)\right)$$

Arguments involving polynomials or algebraic functions and power factors

Involving power

Involving $z^n \cosh(c z^r + f z)$

01.20.21.0449.01

$$\int z^n \cosh\left(c z^2 + f z\right) dz == -2^{-n-2} c^{-n-1} e^{-\frac{f^2}{4c}} (-f)^n (f+2cz)\left(e^{\frac{f^2}{2c}} \sum_{j=0}^{n}\left(\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-j-1)}\left(-\frac{4cz}{f}-2\right)^j \binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{(f+2cz)^2}{4c}\right) + \sum_{j=0}^{n}\left(-\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-j-1)}\left(-\frac{4cz}{f}-2\right)^j \binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f+2cz)^2}{4c}\right)\right) /; n \in \mathbb{N}$$

01.20.21.0450.01

$$\int z^n \cosh\left(\sqrt{z}\, c + f z\right) dz == 4^{-n-1} c^{2n} e^{-\frac{c^2}{4f}} f^{-2(n+1)}\left(e^{\frac{c^2}{2f}} \sum_{j=0}^{n}\sum_{h=0}^{j} 4^j \left(\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\left(-\frac{2\sqrt{z}\, f}{c}-1\right)^{h+j}\binom{j}{h}\binom{n}{j}\left(c\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right) - 2f\sqrt{\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\,\Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right) + \sum_{j=0}^{n}\sum_{h=0}^{j} 4^j \left(-\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\left(-\frac{2\sqrt{z}\, f}{c}-1\right)^{h+j}\binom{j}{h}\binom{n}{j}\left(c\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right) + 2\sqrt{-\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\, f\,\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right) /; n \in \mathbb{N}$$

Involving $z^n \cosh(c z^r + f z + g)$

01.20.21.0451.01

$$\int z^n \cosh(c z^2 + f z + g)\, dz ==$$

$$-2^{-n-2} c^{-n-1} e^{-\frac{f^2}{4c}-g} (-f)^n (f + 2 c z) \left(e^{\frac{f^2}{2c}} \sum_{j=0}^{n} \left(\frac{(f + 2 c z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \left(-\frac{4 c z}{f} - 2 \right)^j \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(f + 2 c z)^2}{4 c} \right) + \right.$$

$$\left. e^{2 g} \sum_{j=0}^{n} \left(-\frac{(f + 2 c z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \left(-\frac{4 c z}{f} - 2 \right)^j \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + 2 c z)^2}{4 c} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0452.01

$$\int z^n \cosh(\sqrt{z}\, c + g + f z)\, dz == 4^{-n-1} c^{2n} e^{-\frac{c^2}{4f}-g} f^{-2(n+1)} \left(e^{\frac{c^2}{2f}} \sum_{j=0}^{n} \sum_{h=0}^{j} 4^j \left(\frac{\left(c + 2 f \sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \left(-\frac{2\sqrt{z}\, f}{c} - 1 \right)^{h+j} \binom{j}{h} \binom{n}{j} \right.$$

$$\left(c\left(c + 2 f \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h + j + 1), \frac{\left(c + 2 f \sqrt{z}\right)^2}{4 f} \right) - 2 f \sqrt{\frac{\left(c + 2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h + j + 2), \frac{\left(c + 2 f \sqrt{z}\right)^2}{4 f} \right) \right) +$$

$$e^{2 g} \sum_{j=0}^{n} \sum_{h=0}^{j} 4^j \left(-\frac{\left(c + 2 f \sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \left(-\frac{2\sqrt{z}\, f}{c} - 1 \right)^{h+j} \binom{j}{h} \binom{n}{j} \left(c\left(c + 2 f \sqrt{z}\right) \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(c + 2 f \sqrt{z}\right)^2}{4 f} \right) + 2 \sqrt{-\frac{\left(c + 2 f \sqrt{z}\right)^2}{f}}\ f\, \Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(c + 2 f \sqrt{z}\right)^2}{4 f} \right) \right) \right) /; n \in \mathbb{N}$$

Arguments involving polynomials or algebraic functions and factors involving exponential functions

Involving exp

Involving $a^{d z} \cosh(c z^r + f z)$

01.20.21.0453.01

$$\int a^{d z} \cosh(c z^2 + f z)\, dz ==$$

$$\frac{1}{4c} \left(a^{-\frac{d f}{2c}} e^{-\frac{f^2 + d^2 \log^2(a)}{4c}} \sqrt{\pi} \left(\sqrt{c}\ \operatorname{erfi}\left(\frac{f + 2 c z + d \log(a)}{2\sqrt{c}} \right) - \sqrt{-c}\ e^{\frac{f^2 + d^2 \log^2(a)}{2c}} \operatorname{erfi}\left(\frac{-f - 2 c z + d \log(a)}{2\sqrt{-c}} \right) \right) \right)$$

01.20.21.0454.01

$$\int e^{d z} \cosh\left(c z^2 + f z\right) dz == \frac{e^{-\frac{d^2+2 f d+f^2}{4 c}} \sqrt{\pi} \left(\sqrt{c}\ \operatorname{erfi}\left(\frac{d+f+2 c z}{2 \sqrt{c}}\right) - \sqrt{-c}\ e^{\frac{d^2+f^2}{2 c}} \operatorname{erfi}\left(\frac{d-f-2 c z}{2 \sqrt{-c}}\right)\right)}{4 c}$$

01.20.21.0455.01

$$\int a^{d z} \cosh\left(\sqrt{z}\ c + f z\right) dz == \frac{1}{4}\left(-2 e^{-f z-c \sqrt{z}} \left(\frac{1}{f - d \log(a)} - \frac{e^{2\left(\sqrt{z}\ c+f z\right)}}{f + d \log(a)}\right) a^{d z} + \right.$$

$$\left. \frac{c\, e^{\frac{c^2}{4 f-4 d \log(a)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c-2 \sqrt{z}\ (f-d \log(a))}{2 \sqrt{d \log(a)-f}}\right)}{(d \log(a) - f)^{3/2}} - \frac{c\, e^{-\frac{c^2}{4 (f+d \log(a))}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2 \sqrt{z}\ (f+d \log(a))}{2 \sqrt{f+d \log(a)}}\right)}{(f + d \log(a))^{3/2}}\right)$$

01.20.21.0456.01

$$\int e^{d z} \cosh\left(\sqrt{z}\ c + f z\right) dz ==$$

$$\frac{1}{4}\left(\frac{c\, e^{\frac{c^2}{4 f-4 d}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2 (d-f) \sqrt{z}-c}{2 \sqrt{d-f}}\right)}{(d - f)^{3/2}} - \frac{2 e^{d z-f z-c \sqrt{z}}}{f - d} + \frac{2 e^{\sqrt{z}\ c+(d+f) z}}{d + f} - \frac{c\, e^{-\frac{c^2}{4 (d+f)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2 (d+f) \sqrt{z}}{2 \sqrt{d+f}}\right)}{(d + f)^{3/2}}\right)$$

Involving $a^{d z+e} \cosh\left(c z^r + f z\right)$

01.20.21.0457.01

$$\int a^{e+d z} \cosh\left(c z^2 + f z\right) dz ==$$

$$\frac{1}{4 c}\left(a^{e-\frac{d f}{2 c}} e^{-\frac{f^2+d^2 \log^2(a)}{4 c}} \sqrt{\pi} \left(\sqrt{c}\ \operatorname{erfi}\left(\frac{f + 2 c z + d \log(a)}{2 \sqrt{c}}\right) - \sqrt{-c}\ e^{\frac{f^2+d^2 \log^2(a)}{2 c}} \operatorname{erfi}\left(\frac{-f - 2 c z + d \log(a)}{2 \sqrt{-c}}\right)\right)\right)$$

01.20.21.0458.01

$$\int e^{e+d z} \cosh\left(c z^2 + f z\right) dz == \frac{e^{-\frac{d^2+2 f d+f^2-4 c e}{4 c}} \sqrt{\pi} \left(\sqrt{c}\ \operatorname{erfi}\left(\frac{d+f+2 c z}{2 \sqrt{c}}\right) - \sqrt{-c}\ e^{\frac{d^2+f^2}{2 c}} \operatorname{erfi}\left(\frac{d-f-2 c z}{2 \sqrt{-c}}\right)\right)}{4 c}$$

01.20.21.0459.01

$$\int a^{e+d\,z}\cosh\left(\sqrt{z}\;c+f\,z\right)dz == \frac{1}{4}\,a^{e}\left(-2\,e^{-f\,z-c\,\sqrt{z}}\left(\frac{1}{f-d\log(a)}-\frac{e^{2\left(\sqrt{z}\;c+f\,z\right)}}{f+d\log(a)}\right)a^{d\,z}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2}{4\,f-4\,d\log(a)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-c-2\sqrt{z}\;(f-d\log(a))}{2\sqrt{d\log(a)-f}}\right)}{(d\log(a)-f)^{3/2}}-\frac{c\,e^{-\frac{c^2}{4\left(f+d\log(a)\right)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\sqrt{z}\;(f+d\log(a))}{2\sqrt{f+d\log(a)}}\right)}{(f+d\log(a))^{3/2}}\right)$$

01.20.21.0460.01

$$\int e^{e+d\,z}\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{4}\,e^{e}\left(\frac{c\,e^{\frac{c^2}{4\,f-4\,d}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2\,(d-f)\,\sqrt{z}-c}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}-\frac{2\,e^{d\,z-f\,z-c\,\sqrt{z}}}{f-d}+\frac{2\,e^{\sqrt{z}\;c+(d+f)\,z}}{d+f}-\frac{c\,e^{-\frac{c^2}{4\,(d+f)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,(d+f)\,\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)$$

Involving $a^{b\,z^r}\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0461.01

$$\int a^{b\,z^2}\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{1}{4\left(c^2-b^2\log^2(a)\right)}\left(a^{\frac{b\,f^2}{2\left(c^2-b^2\log^2(a)\right)}}\sqrt{\pi}\left(e^{\frac{f^2}{4\,b\log(a)-4\,c}}\operatorname{erfi}\left(\frac{f+2\,c\,z+2\,b\,z\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)}\;-\right.\right.$$

$$\left.\left.e^{\frac{f^2}{4\,c+4\,b\log(a)}}\operatorname{erfi}\left(\frac{-f-2\,c\,z+2\,b\,z\log(a)}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\;(c+b\log(a))\right)\right)$$

01.20.21.0462.01

$$\int e^{b\,z^2}\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{4\,(b-c)\,(b+c)}$$

$$\left(e^{-\frac{2\,b\,f^2+c\,f^2}{4\left(b^2-c^2\right)}}\sqrt{\pi}\left(\sqrt{b-c}\;(b+c)\,e^{\frac{b\,f^2}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+(b-c)\sqrt{b+c}\;e^{\frac{(b+2\,c)\,f^2}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{f+2\,(b+c)\,z}{2\sqrt{b+c}}\right)\right)\right)$$

01.20.21.0463.01

$$\int a^{b\,\sqrt{z}}\cosh\left(\sqrt{z}\;c+f\,z\right)dz == \frac{\sinh\left(\sqrt{z}\;c+f\,z\right)a^{b\,\sqrt{z}}}{f}-$$

$$\frac{e^{\frac{c^2-2\,b\log(a)\,c+b^2\log^2(a)}{4\,f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-c+b\log(a)-2\,f\,\sqrt{z}}{2\sqrt{-f}}\right)(b\log(a)-c)}{4\,(-f)^{3/2}}-\frac{e^{-\frac{c^2+2\,b\log(a)\,c+b^2\log^2(a)}{4\,f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+b\log(a)+2\,f\,\sqrt{z}}{2\sqrt{f}}\right)(c+b\log(a))}{4\,f^{3/2}}$$

01.20.21.0464.01

$$\int e^{b\sqrt{z}}\cosh\left(\sqrt{z}\,c+f\,z\right)dz==$$

$$-\frac{(b-c)\,e^{\frac{b^2-2cb+c^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b-c-2f\sqrt{z}}{2\sqrt{-f}}\right)}{4(-f)^{3/2}}+\frac{e^{b\sqrt{z}}\sinh\left(\sqrt{z}\,c+f\,z\right)}{f}-\frac{(b+c)\,e^{-\frac{b^2+2cb+c^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{4f^{3/2}}$$

Involving $a^{b z^r+e}\cosh\left(c z^r+f z\right)$

01.20.21.0465.01

$$\int a^{b z^2+e}\cosh\left(c z^2+f z\right)dz==$$

$$\frac{1}{4\left(c^2-b^2\log^2(a)\right)}\left(a^{\frac{b f^2}{2\left(c^2-b^2\log^2(a)\right)}+e}\sqrt{\pi}\left(e^{\frac{f^2}{4b\log(a)-4c}}\operatorname{erfi}\left(\frac{f+2cz+2bz\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)}-\right.\right.$$

$$\left.\left.e^{\frac{f^2}{4c+4b\log(a)}}\operatorname{erfi}\left(\frac{-f-2cz+2bz\log(a)}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\;(c+b\log(a))\right)\right)$$

01.20.21.0466.01

$$\int e^{b z^2+e}\cosh\left(c z^2+f z\right)dz==\frac{1}{4(b-c)(b+c)}\left(e^{-\frac{-4eb^2+2f^2b+c\left(f^2+4ce\right)}{4\left(b^2-c^2\right)}}\sqrt{\pi}\right.$$

$$\left.\left(\sqrt{b-c}\;(b+c)\,e^{\frac{bf^2}{4(b-c)(b+c)}}\operatorname{erfi}\left(\frac{-f+2bz-2cz}{2\sqrt{b-c}}\right)+(b-c)\sqrt{b+c}\;e^{\frac{(b+2c)f^2}{4(b-c)(b+c)}}\operatorname{erfi}\left(\frac{f+2(b+c)z}{2\sqrt{b+c}}\right)\right)\right)$$

01.20.21.0467.01

$$\int a^{\sqrt{z}\,b+e}\cosh\left(\sqrt{z}\,c+f\,z\right)dz==$$

$$\frac{\sinh\left(\sqrt{z}\,c+f\,z\right)a^{\sqrt{z}\,b+e}}{f}-\frac{e^{\frac{c^2-2b\log(a)c+b^2\log^2(a)+4ef\log(a)}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-c+b\log(a)-2f\sqrt{z}}{2\sqrt{-f}}\right)(b\log(a)-c)}{4(-f)^{3/2}}-$$

$$\frac{e^{-\frac{c^2+2b\log(a)c+b^2\log^2(a)-4ef\log(a)}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+b\log(a)+2f\sqrt{z}}{2\sqrt{f}}\right)(c+b\log(a))}{4f^{3/2}}$$

01.20.21.0468.01

$$\int e^{\sqrt{z}\,b+e}\cosh\left(\sqrt{z}\,c+f\,z\right)dz==$$

$$-\frac{(b-c)\,e^{\frac{b^2-2cb+c^2+4ef}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b-c-2f\sqrt{z}}{2\sqrt{-f}}\right)}{4(-f)^{3/2}}+\frac{e^{\sqrt{z}\,b+e}\sinh\left(\sqrt{z}\,c+f\,z\right)}{f}-\frac{(b+c)\,e^{-\frac{b^2+2cb+c^2-4ef}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{4f^{3/2}}$$

Involving $a^{b z^r+d z} \cosh(c z^r + f z)$

01.20.21.0469.01

$$\int a^{b z^2+d z} \cosh\left(c z^2 + f z\right) dz == \frac{1}{4\left(c^2 - b^2 \log^2(a)\right)}\left(a^{\frac{b\left(f^2+d^2 \log^2(a)\right)}{2\left(c^2-b^2 \log^2(a)\right)}-\frac{d f}{2(c+b \log(a))}} \sqrt{\pi}\left(e^{\frac{f^2+d^2 \log^2(a)}{4 b \log(a)-4 c}} \operatorname{erfi}\left(\frac{f + 2 c z + (d + 2 b z)\log(a)}{2\sqrt{c + b\log(a)}}\right)(c - b\log(a))\sqrt{c + b\log(a)} - a^{\frac{b d f \log(a)}{b^2 \log^2(a)-c^2}} e^{\frac{f^2+d^2 \log^2(a)}{4 c+4 b \log(a)}} \operatorname{erfi}\left(\frac{-f - 2 c z + (d + 2 b z)\log(a)}{2\sqrt{b\log(a) - c}}\right)\sqrt{b\log(a) - c}\ (c + b\log(a))\right)\right)$$

01.20.21.0470.01

$$\int e^{b z^2+d z} \cosh\left(c z^2 + f z\right) dz == \frac{1}{4(b - c)(b + c)}\left(e^{-\frac{2 b\left(d^2+f d+f^2\right)+c\left(d^2-2 f d+f^2\right)}{4\left(b^2-c^2\right)}} \sqrt{\pi}\left(\sqrt{b - c}\ (b + c)\, e^{\frac{b\left(d^2+4 f d+f^2\right)}{4(b-c)(b+c)}} \operatorname{erfi}\left(\frac{d - f + 2 b z - 2 c z}{2\sqrt{b - c}}\right) + (b - c)\sqrt{b + c}\ e^{\frac{(b+2 c)\left(d^2+f^2\right)}{4(b-c)(b+c)}} \operatorname{erfi}\left(\frac{d + f + 2(b + c) z}{2\sqrt{b + c}}\right)\right)\right)$$

01.20.21.0471.01

$$\int a^{\sqrt{z}\ b+d z} \cosh\left(\sqrt{z}\ c + f z\right) dz == \frac{e^{-f z-c \sqrt{z}}\ a^{\sqrt{z}\ b+d z}}{2(d\log(a) - f)} + \frac{e^{\sqrt{z}\ c+f z}\ a^{\sqrt{z}\ b+d z}}{2(f + d\log(a))} - \frac{e^{-\frac{c^2-2 b \log(a) c+b^2 \log^2(a)}{4(d \log(a)-f)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+b \log(a)+2\sqrt{z}\ (d \log(a)-f)}{2\sqrt{d \log(a)-f}}\right)(b\log(a) - c)}{4(d\log(a) - f)^{3/2}} - \frac{e^{-\frac{c^2+2 b \log(a) c+b^2 \log^2(a)}{4(f+d \log(a))}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b \log(a)+2\sqrt{z}\ (f+d \log(a))}{2\sqrt{f+d \log(a)}}\right)(c + b\log(a))}{4(f + d\log(a))^{3/2}}$$

01.20.21.0472.01

$$\int e^{\sqrt{z}\ b+d z} \cosh\left(\sqrt{z}\ c + f z\right) dz == -\frac{(b - c)\, e^{-\frac{b^2-2 c b+c^2}{4(d-f)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c+2(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{4(d - f)^{3/2}} + \frac{e^{\sqrt{z}\ (b-c)+(d-f) z}}{2(d - f)} + \frac{e^{\sqrt{z}\ (b+c)+(d+f) z}}{2(d + f)} - \frac{(b + c)\, e^{-\frac{b^2+2 c b+c^2}{4(d+f)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{4(d + f)^{3/2}}$$

Involving $a^{b z^r+d z+e} \cosh(c z^r + f z)$

01.20.21.0473.01

$$\int a^{b z^2+d z+e} \cosh\left(c z^2+f z\right) dz == \frac{1}{4\left(c^2-b^2 \log^2(a)\right)}\left(a^{e-\frac{d f}{2(c+b \log(a))}+\frac{b\left(f^2+d^2 \log^2(a)\right)}{2\left(c^2-b^2 \log^2(a)\right)}} \sqrt{\pi}\left(e^{\frac{f^2+d^2 \log^2(a)}{4 b \log(a)-4 c}} \operatorname{erfi}\left(\frac{f+2 c z+(d+2 b z) \log(a)}{2\sqrt{c+b \log(a)}}\right)(c-b \log(a))\sqrt{c+b \log(a)}-\right.\right.$$
$$\left.\left.a^{\frac{b d f \log(a)}{b^2 \log^2(a)-c^2}} e^{\frac{f^2+d^2 \log^2(a)}{4 c+4 b \log(a)}} \operatorname{erfi}\left(\frac{-f-2 c z+(d+2 b z) \log(a)}{2\sqrt{b \log(a)-c}}\right)\sqrt{b \log(a)-c}\,(c+b \log(a))\right)\right)$$

01.20.21.0474.01

$$\int e^{b z^2+d z+e} \cosh\left(c z^2+f z\right) dz == \frac{1}{4(b-c)(b+c)}\left(e^{-\frac{-4 e b^2+2\left(d^2+f d+f^2\right) b+c\left(d^2-2 f d+f^2+4 c e\right)}{4\left(b^2-c^2\right)}} \sqrt{\pi}\right.$$
$$\left.\left(\sqrt{b-c}\,(b+c)\, e^{\frac{b\left(d^2+4 f d+f^2\right)}{4(b-c)(b+c)}} \operatorname{erfi}\left(\frac{d-f+2 b z-2 c z}{2\sqrt{b-c}}\right)+(b-c)\sqrt{b+c}\, e^{\frac{(b+2 c)\left(d^2+f^2\right)}{4(b-c)(b+c)}} \operatorname{erfi}\left(\frac{d+f+2(b+c) z}{2\sqrt{b+c}}\right)\right)\right)$$

01.20.21.0475.01

$$\int a^{\sqrt{z}\, b+e+d z} \cosh\left(\sqrt{z}\, c+f z\right) dz == \frac{e^{-f z-c\sqrt{z}}\, a^{\sqrt{z}\, b+e+d z}}{2(d \log(a)-f)}+\frac{e^{\sqrt{z}\, c+f z}\, a^{\sqrt{z}\, b+e+d z}}{2(f+d \log(a))}-$$
$$\frac{1}{4(d \log(a)-f)^{3/2}}\left(e^{-\frac{c^2-2 b \log(a) c+b^2 \log^2(a)-4 e \log(a)(d \log(a)-f)}{4(d \log(a)-f)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{-c+b \log(a)+2\sqrt{z}\,(d \log(a)-f)}{2\sqrt{d \log(a)-f}}\right)(b \log(a)-c)\right)-$$
$$\frac{1}{4(f+d \log(a))^{3/2}}\left(e^{-\frac{c^2+2 b \log(a) c+b^2 \log^2(a)-4 e \log(a)(f+d \log(a))}{4(f+d \log(a))}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c+b \log(a)+2\sqrt{z}\,(f+d \log(a))}{2\sqrt{f+d \log(a)}}\right)(c+b \log(a))\right)$$

01.20.21.0476.01

$$\int e^{\sqrt{z}\, b+e+d z} \cosh\left(\sqrt{z}\, c+f z\right) dz == -\frac{(b-c)\, e^{-\frac{b^2-2 c b+c^2-4 e(d-f)}{4(d-f)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{b-c+2(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{4(d-f)^{3/2}}+$$
$$\frac{e^{\sqrt{z}\,(b-c)+e+(d-f) z}}{2(d-f)}+\frac{e^{\sqrt{z}\,(b+c)+e+(d+f) z}}{2(d+f)}-\frac{(b+c)\, e^{-\frac{b^2+2 c b+c^2-4 e(d+f)}{4(d+f)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{4(d+f)^{3/2}}$$

Involving $a^{d z} \cosh\left(c z^r+f z+g\right)$

01.20.21.0477.01

$$\int a^{d z} \cosh\left(c z^2+f z+g\right) dz == \frac{1}{4 c}\left(a^{-\frac{d f}{2 c}} e^{-\frac{f^2+d^2 \log^2(a)}{4 c}} \sqrt{\pi}\right.$$
$$\left.\left(\sqrt{c} \operatorname{erfi}\left(\frac{f+2 c z+d \log(a)}{2\sqrt{c}}\right)(\cosh(g)+\sinh(g))-\sqrt{-c}\, e^{\frac{f^2+d^2 \log^2(a)}{2 c}} \operatorname{erfi}\left(\frac{-f-2 c z+d \log(a)}{2\sqrt{-c}}\right)(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0478.01

$$\int e^{d z} \cosh\left(c z^2 + f z + g\right) dz == \frac{1}{4 c}\left(e^{-\frac{d^2+2 f d+f^2}{4 c}} \sqrt{\pi}\left(\sqrt{c}\ \operatorname{erfi}\left(\frac{d+f+2 c z}{2\sqrt{c}}\right)(\cosh(g)+\sinh(g)) - \sqrt{-c}\ e^{\frac{d^2+f^2}{2 c}} \operatorname{erfi}\left(\frac{d-f-2 c z}{2\sqrt{-c}}\right)(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0479.01

$$\int a^{d z} \cosh\left(\sqrt{z}\ c + g + f z\right) dz == \frac{1}{4} e^{-g}\left(-2 e^{-f z - c\sqrt{z}}\left(\frac{1}{f - d\log(a)} - \frac{e^{2\left(\sqrt{z}\ c + g + f z\right)}}{f + d\log(a)}\right) a^{d z} + \frac{c\, e^{\frac{c^2}{4 f - 4 d\log(a)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c - 2\sqrt{z}\ (f - d\log(a))}{2\sqrt{d\log(a) - f}}\right)}{(d\log(a) - f)^{3/2}} - \frac{c\, e^{2 g - \frac{c^2}{4(f + d\log(a))}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c + 2\sqrt{z}\ (f + d\log(a))}{2\sqrt{f + d\log(a)}}\right)}{(f + d\log(a))^{3/2}}\right)$$

01.20.21.0480.01

$$\int e^{d z} \cosh\left(\sqrt{z}\ c + g + f z\right) dz == \frac{1}{4} e^{-g}\left(\frac{c\, e^{\frac{c^2}{4 f - 4 d}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2 (d - f)\sqrt{z} - c}{2\sqrt{d - f}}\right)}{(d - f)^{3/2}} - \frac{2 e^{d z - f z - c\sqrt{z}}}{f - d} + \frac{2 e^{\sqrt{z}\ c + 2 g + (d + f) z}}{d + f} - \frac{c\, e^{2 g - \frac{c^2}{4 (d + f)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c + 2 (d + f)\sqrt{z}}{2\sqrt{d + f}}\right)}{(d + f)^{3/2}}\right)$$

Involving $a^{d z+e} \cosh\left(c z^r + f z + g\right)$

01.20.21.0481.01

$$\int a^{e + d z} \cosh\left(c z^2 + f z + g\right) dz == \frac{1}{4 c}\left(a^{e - \frac{d f}{2 c}} e^{-\frac{f^2 + d^2 \log^2(a)}{4 c}} \sqrt{\pi}\left(\sqrt{c}\ \operatorname{erfi}\left(\frac{f + 2 c z + d\log(a)}{2\sqrt{c}}\right)(\cosh(g)+\sinh(g)) - \sqrt{-c}\ e^{\frac{f^2 + d^2 \log^2(a)}{2 c}} \operatorname{erfi}\left(\frac{-f - 2 c z + d\log(a)}{2\sqrt{-c}}\right)(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0482.01

$$\int e^{e + d z} \cosh\left(c z^2 + f z + g\right) dz == \frac{1}{4 c}\left(e^{-\frac{d^2+2 f d+f^2-4 c e}{4 c}} \sqrt{\pi}\left(\sqrt{c}\ \operatorname{erfi}\left(\frac{d+f+2 c z}{2\sqrt{c}}\right)(\cosh(g)+\sinh(g)) - \sqrt{-c}\ e^{\frac{d^2+f^2}{2 c}} \operatorname{erfi}\left(\frac{d-f-2 c z}{2\sqrt{-c}}\right)(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0483.01

$$\int a^{e+d\,z}\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == \frac{1}{4}\,a^{e}\,e^{-g}\left(-2\,e^{-f\,z-c\,\sqrt{z}}\left(\frac{1}{f-d\log(a)}-\frac{e^{2\left(\sqrt{z}\;c+g+f\,z\right)}}{f+d\log(a)}\right)a^{d\,z}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2}{4\,f-4\,d\log(a)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-c-2\sqrt{z}\;(f-d\log(a))}{2\sqrt{d\log(a)-f}}\right)}{(d\log(a)-f)^{3/2}}-\frac{c\,e^{2\,g-\frac{c^2}{4\left(f+d\log(a)\right)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\sqrt{z}\;(f+d\log(a))}{2\sqrt{f+d\log(a)}}\right)}{(f+d\log(a))^{3/2}}\right)$$

01.20.21.0484.01

$$\int e^{e+d\,z}\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$\frac{1}{4}\,e^{e-g}\left(\frac{c\,e^{\frac{c^2}{4\,f-4\,d}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2\,(d-f)\sqrt{z}-c}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}-\frac{2\,e^{d\,z-f\,z-c\,\sqrt{z}}}{f-d}+\frac{2\,e^{\sqrt{z}\;c+2\,g+(d+f)\,z}}{d+f}-\frac{c\,e^{2\,g-\frac{c^2}{4\,(d+f)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)$$

Involving $a^{b\,z^r}\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0485.01

$$\int a^{b\,z^2}\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{4\left(c^2-b^2\log^2(a)\right)}\left(a^{\frac{b\,f^2}{2\left(c^2-b^2\log^2(a)\right)}}\sqrt{\pi}\left(e^{\frac{f^2}{4\,b\log(a)-4\,c}}\operatorname{erfi}\left(\frac{f+2\,c\,z+2\,b\,z\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)}\;(\cosh(g)+\sinh(g))-\right.\right.$$

$$\left.\left.e^{\frac{f^2}{4\,c+4\,b\log(a)}}\operatorname{erfi}\left(\frac{-f-2\,c\,z+2\,b\,z\log(a)}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\;(c+b\log(a))\,(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0486.01

$$\int e^{b\,z^2}\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{4\,(b-c)\,(b+c)}\left(e^{-\frac{2\,b\,f^2+c\,f^2}{4\left(b^2-c^2\right)}}\sqrt{\pi}\left(\sqrt{b-c}\;(b+c)\,e^{\frac{b\,f^2}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)(\cosh(g)-\sinh(g))+\right.\right.$$

$$\left.\left.(b-c)\sqrt{b+c}\;e^{\frac{(b+2\,c)\,f^2}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{f+2\,(b+c)\,z}{2\sqrt{b+c}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0487.01

$$\int a^{b\sqrt{z}}\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz==$$

$$\frac{\sinh\left(\sqrt{z}\,c+g+f\,z\right)a^{b\sqrt{z}}}{f}-\frac{e^{\frac{c^2-2\,b\log(a)\,c+b^2\log^2(a)-4\,f\,g}{4\,f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-c+b\log(a)-2\,f\sqrt{z}}{2\sqrt{-f}}\right)(b\log(a)-c)}{4\,(-f)^{3/2}}-$$

$$\frac{e^{-\frac{c^2+2\,b\log(a)\,c+b^2\log^2(a)-4\,f\,g}{4\,f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+b\log(a)+2\,f\sqrt{z}}{2\sqrt{f}}\right)(c+b\log(a))}{4\,f^{3/2}}$$

01.20.21.0488.01

$$\int e^{b\sqrt{z}}\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz==$$

$$-\frac{(b-c)\,e^{\frac{b^2-2\,c\,b+c^2-4\,f\,g}{4\,f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b-c-2\,f\sqrt{z}}{2\sqrt{-f}}\right)}{4\,(-f)^{3/2}}+\frac{e^{b\sqrt{z}}\sinh\left(\sqrt{z}\,c+g+f\,z\right)}{f}-\frac{(b+c)\,e^{-\frac{b^2+2\,c\,b+c^2-4\,f\,g}{4\,f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+c+2\,f\sqrt{z}}{2\sqrt{f}}\right)}{4\,f^{3/2}}$$

Involving $a^{b\,z^r+e}\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0489.01

$$\int a^{b\,z^2+e}\cosh\left(c\,z^2+f\,z+g\right)dz==\frac{1}{4\left(c^2-b^2\log^2(a)\right)}$$

$$\left(a^{\frac{b\,f^2}{2\left(c^2-b^2\log^2(a)\right)}+e}\sqrt{\pi}\left(e^{\frac{f^2}{4\,b\log(a)-4\,c}}\operatorname{erfi}\left(\frac{f+2\,c\,z+2\,b\,z\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)}\,(\cosh(g)+\sinh(g))-\right.\right.$$

$$\left.\left.e^{\frac{f^2}{4\,c+4\,b\log(a)}}\operatorname{erfi}\left(\frac{-f-2\,c\,z+2\,b\,z\log(a)}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\,(c+b\log(a))\,(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0490.01

$$\int e^{b\,z^2+e}\cosh\left(c\,z^2+f\,z+g\right)dz==$$

$$\frac{1}{4\,(b-c)\,(b+c)}\left(e^{-\frac{-4\,e\,b^2+2\,f^2\,b+c\left(f^2+4\,c\,e\right)}{4\left(b^2-c^2\right)}}\sqrt{\pi}\left(\sqrt{b-c}\,(b+c)\,e^{\frac{b\,f^2}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)(\cosh(g)-\sinh(g))+\right.\right.$$

$$\left.\left.(b-c)\sqrt{b+c}\;e^{\frac{(b+2\,c)\,f^2}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{f+2\,(b+c)\,z}{2\sqrt{b+c}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0491.01

$$\int a^{\sqrt{z}\ b+e}\cosh\left(\sqrt{z}\ c+g+f\ z\right)dz ==$$

$$\frac{\sinh\left(\sqrt{z}\ c+g+f\ z\right)a^{\sqrt{z}\ b+e}}{f}-\frac{e^{\frac{c^2-2\,b\log(a)\,c+b^2\log^2(a)+4\,f\,(e\log(a)-g)}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+b\log(a)-2\,f\sqrt{z}}{2\sqrt{-f}}\right)(b\log(a)-c)}{4\,(-f)^{3/2}}-$$

$$\frac{e^{-\frac{c^2+2\,b\log(a)\,c+b^2\log^2(a)-4\,f\,(g+e\log(a))}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\log(a)+2\,f\sqrt{z}}{2\sqrt{f}}\right)(c+b\log(a))}{4\,f^{3/2}}$$

01.20.21.0492.01

$$\int e^{\sqrt{z}\ b+e}\cosh\left(\sqrt{z}\ c+g+f\ z\right)dz ==$$

$$-\frac{(b-c)\,e^{\frac{b^2-2\,c\,b+c^2+4\,f\,(e-g)}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c-2\,f\sqrt{z}}{2\sqrt{-f}}\right)}{4\,(-f)^{3/2}}+\frac{e^{\sqrt{z}\ b+e}\sinh\left(\sqrt{z}\ c+g+f\ z\right)}{f}-\frac{(b+c)\,e^{-\frac{b^2+2\,c\,b+c^2-4\,f\,(e+g)}{4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2\,f\sqrt{z}}{2\sqrt{f}}\right)}{4\,f^{3/2}}$$

Involving $a^{b\,z^r+d\,z}\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0493.01

$$\int a^{b\,z^2+d\,z}\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{4\left(c^2-b^2\log^2(a)\right)}$$

$$\left(a^{-\frac{d\,f}{2\,(c+b\log(a))}+\frac{b\left(f^2+d^2\log^2(a)\right)}{2\left(c^2-b^2\log^2(a)\right)}}\sqrt{\pi}\left(e^{\frac{f^2+d^2\log^2(a)}{4\,b\log(a)-4\,c}}\operatorname{erfi}\left(\frac{f+2\,c\,z+(d+2\,b\,z)\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)}\ (\cosh(g)+\sinh(g))-\right.\right.$$

$$\left.\left.a^{\frac{b\,d\,f\log(a)}{b^2\log^2(a)-c^2}}\,e^{\frac{f^2+d^2\log^2(a)}{4\,c+4\,b\log(a)}}\operatorname{erfi}\left(\frac{-f-2\,c\,z+(d+2\,b\,z)\log(a)}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\ (c+b\log(a))\,(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0494.01

$$\int e^{b\,z^2+d\,z}\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{4\,(b-c)\,(b+c)}\left(e^{-\frac{2\left(d^2+f\,d+f^2\right)b+c\left(d^2-2\,f\,d+f^2\right)}{4\left(b^2-c^2\right)}}\sqrt{\pi}\left(\sqrt{b-c}\ (b+c)\,e^{\frac{b\left(d^2+4\,f\,d+f^2\right)}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{d-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)(\cosh(g)-\sinh(g))+\right.\right.$$

$$\left.\left.(b-c)\sqrt{b+c}\ e^{\frac{(b+2\,c)\left(d^2+f^2\right)}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{d+f+2\,(b+c)\,z}{2\sqrt{b+c}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0495.01

$$\int a^{\sqrt{z}\ b+d\,z}\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{e^{-\sqrt{z}\ c-g-f\,z}\,a^{\sqrt{z}\ b+d\,z}}{2\,(d\log(a)-f)} +$$

$$\frac{e^{\sqrt{z}\ c+g+f\,z}\,a^{\sqrt{z}\ b+d\,z}}{2\,(f+d\log(a))} - \frac{e^{-\frac{c^2-2\,b\log(a)\,c+b^2\log^2(a)+4\left(d\log(a)-f\right)g}{4\left(d\log(a)-f\right)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+b\log(a)+2\sqrt{z}\ (d\log(a)-f)}{2\sqrt{d\log(a)-f}}\right)(b\log(a)-c)}{4\,(d\log(a)-f)^{3/2}} -$$

$$\frac{e^{-\frac{c^2+2\,b\log(a)\,c+b^2\log^2(a)-4\left(f+d\log(a)\right)g}{4\left(f+d\log(a)\right)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\log(a)+2\sqrt{z}\ (f+d\log(a))}{2\sqrt{f+d\log(a)}}\right)(c+b\log(a))}{4\,(f+d\log(a))^{3/2}}$$

01.20.21.0496.01

$$\int e^{\sqrt{z}\ b+d\,z}\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == -\frac{(b-c)\,e^{-\frac{b^2-2\,c\,b+c^2+4\,(d-f)\,g}{4\,(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c+2\,(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{4\,(d-f)^{3/2}} +$$

$$\frac{e^{\sqrt{z}\ (b-c)-g+(d-f)\,z}}{2\,(d-f)} + \frac{e^{\sqrt{z}\ (b+c)+g+(d+f)\,z}}{2\,(d+f)} - \frac{(b+c)\,e^{-\frac{b^2+2\,c\,b+c^2-4\,(d+f)\,g}{4\,(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2\,(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{4\,(d+f)^{3/2}}$$

Involving $a^{b\,z^r+d\,z+e}\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0497.01

$$\int a^{b\,z^2+d\,z+e}\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{4\left(c^2-b^2\log^2(a)\right)}\left(a^{e-\frac{d\,f}{2\left(c+b\log(a)\right)}+\frac{b\left(f^2+d^2\log^2(a)\right)}{2\left(c^2-b^2\log^2(a)\right)}}\sqrt{\pi}\right.$$

$$\left(e^{\frac{f^2+d^2\log^2(a)}{4\,b\log(a)-4\,c}}\operatorname{erfi}\left(\frac{f+2\,c\,z+(d+2\,b\,z)\log(a)}{2\sqrt{c+b\log(a)}}\right)(c-b\log(a))\sqrt{c+b\log(a)}\ (\cosh(g)+\sinh(g)) -\right.$$

$$\left.\left.a^{\frac{b\,d\,f\log(a)}{b^2\log^2(a)-c^2}}\,e^{\frac{f^2+d^2\log^2(a)}{4\,c+4\,b\log(a)}}\operatorname{erfi}\left(\frac{-f-2\,c\,z+(d+2\,b\,z)\log(a)}{2\sqrt{b\log(a)-c}}\right)\sqrt{b\log(a)-c}\ (c+b\log(a))\,(\cosh(g)-\sinh(g))\right)\right)$$

01.20.21.0498.01

$$\int e^{b\,z^2+d\,z+e}\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{4\,(b-c)\,(b+c)}$$

$$\left(e^{-\frac{-4\,e\,b^2+2\left(d^2+f\,d+f^2\right)b+c\left(d^2-2\,f\,d+f^2+4\,c\,e\right)}{4\left(b^2-c^2\right)}}\sqrt{\pi}\left(\sqrt{b-c}\ (b+c)\,e^{\frac{b\left(d^2+4\,f\,d+f^2\right)}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{d-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)(\cosh(g)-\sinh(g))+\right.\right.$$

$$\left.\left.(b-c)\sqrt{b+c}\ e^{\frac{(b+2\,c)\left(d^2+f^2\right)}{4\,(b-c)\,(b+c)}}\operatorname{erfi}\left(\frac{d+f+2\,(b+c)\,z}{2\sqrt{b+c}}\right)(\cosh(g)+\sinh(g))\right)\right)$$

01.20.21.0499.01

$$\int a^{\sqrt{z}\ b+e+d\,z}\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{e^{-\sqrt{z}\ c-g-f\,z}\,a^{\sqrt{z}\ b+e+d\,z}}{2\,(d\log(a)-f)}+\frac{e^{\sqrt{z}\ c+g+f\,z}\,a^{\sqrt{z}\ b+e+d\,z}}{2\,(f+d\log(a))}-$$
$$\frac{1}{4\,(d\log(a)-f)^{3/2}}\left(e^{-\frac{c^2-2\,b\log(a)\,c+b^2\log^2(a)-4\,(d\log(a)-f)\,(e\log(a)-g)}{4\,(d\log(a)-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+b\log(a)+2\sqrt{z}\ (d\log(a)-f)}{2\sqrt{d\log(a)-f}}\right)(b\log(a)-c)\right)-$$
$$\frac{1}{4\,(f+d\log(a))^{3/2}}\left(e^{-\frac{c^2+2\,b\log(a)\,c+b^2\log^2(a)-4\,(f+d\log(a))\,(g+e\log(a))}{4\,(f+d\log(a))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\log(a)+2\sqrt{z}\ (f+d\log(a))}{2\sqrt{f+d\log(a)}}\right)(c+b\log(a))\right)$$

01.20.21.0500.01

$$\int e^{\sqrt{z}\ b+e+d\,z}\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == -\frac{(b-c)\,e^{-\frac{b^2-2\,c\,b+c^2-4\,(d-f)\,(e-g)}{4\,(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c+2\,(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{4\,(d-f)^{3/2}}+$$
$$\frac{e^{\sqrt{z}\ (b-c)+e-g+(d-f)\,z}}{2\,(d-f)}+\frac{e^{\sqrt{z}\ (b+c)+e+g+(d+f)\,z}}{2\,(d+f)}-\frac{(b+c)\,e^{-\frac{b^2+2\,c\,b+c^2-4\,(d+f)\,(e+g)}{4\,(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2\,(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{4\,(d+f)^{3/2}}$$

Arguments involving polynomials or algebraic functions and factors involving exponential function and a power function

Involving exp and power

Involving $z^n\,e^{d\,z}\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0501.01

$$\int z^n\,e^{d\,z}\cosh\left(c\,z^2+f\,z\right)dz ==$$
$$-\frac{1}{4}\left(\frac{1}{\sqrt{-c}}\,e^{\frac{(d-f)^2}{4\,c}}\sum_{q=0}^{n}2^{q-n}\,(-c)^{-n-\frac{1}{2}}\,(f-d)^{n-q}\,(d-f-2\,c\,z)^{q+1}\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-f-2\,c\,z)^2}{4\,c}\right)+\right.$$
$$\left.\frac{1}{\sqrt{c}}\left(e^{-\frac{(d+f)^2}{4\,c}}\right.\right.$$
$$\left.\left.\sum_{q=0}^{n}2^{q-n}\,c^{-n-\frac{1}{2}}\,(-d-f)^{n-q}\,(d+f+2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.0502.01

$$\int z^n e^{d z} \cosh\left(\sqrt{z}\, c + f z\right) dz ==$$

$$2^{-2n-2}\left(e^{-\frac{c^2}{4(d-f)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, (-c)^{-h-k+2n}\left(2(d-f)\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2(d-f)\sqrt{-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)-\right.$$

$$\left.\left.c\left(2(d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)\right)\right)(d-f)^{-2n-2}+$$

$$e^{-\frac{c^2}{4(d+f)}}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, c^{-h-k+2n}\left(c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\left(c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\Bigg) /; n\in\mathbb{N}$$

Involving $z^n\, e^{d z+e} \cosh\left(c z^r + f z\right)$

01.20.21.0503.01

$$\int z^n\, e^{e+d z} \cosh\left(c z^2 + f z\right) dz ==$$

$$-\frac{1}{4}\left(\frac{1}{\sqrt{-c}}e^{\frac{(d-f)^2}{4c}+e}\sum_{q=0}^{n}2^{q-n}(-c)^{-n-\frac{1}{2}}(f-d)^{n-q}(d-f-2cz)^{q+1}\left(\frac{(d-f-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(d-f-2cz)^2}{4c}\right)+\right.$$

$$\frac{1}{\sqrt{c}}\left(e^{-\frac{(d+f)^2}{4c}+e}\right.$$

$$\left.\left.\sum_{q=0}^{n}2^{q-n}\, c^{-n-\frac{1}{2}}(-d-f)^{n-q}(d+f+2cz)^{q+1}\left(-\frac{(d+f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(d+f+2cz)^2}{4c}\right)\right)\right) /; n\in\mathbb{N}$$

01.20.21.0504.01

$$\int z^n e^{e+d z} \cosh\left(\sqrt{z}\, c + f z\right) dz ==$$

$$2^{-2n-2}\left(e^{-\frac{c^2}{4(d-f)}+e}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, (-c)^{-h-k+2n}\left(2(d-f)\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2(d-f)\sqrt{-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)-\right.$$

$$\left.\left.c\left(2(d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)\right)\right)(d-f)^{-2n-2}+$$

$$e^{-\frac{c^2}{4(d+f)}+e}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, c^{-h-k+2n}\left(c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\left(c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\Bigg)\Bigg/;\; n\in\mathbb{N}$$

Involving $z^n\, e^{b z^r} \cosh\left(c z^r + f z\right)$

01.20.21.0505.01

$$\int z^n\, e^{b z^2} \cosh\left(c z^2 + f z\right) dz ==$$

$$-\frac{1}{4}\left(e^{-\frac{f^2}{4(b-c)}}\left(\sum_{q=0}^{n} 2^{q-n}\, f^{n-q}\,(-f+2bz-2cz)^{q+1}\left(-\frac{(-f+2bz-2cz)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(-f+2bz-2cz)^2}{4(b-c)}\right)\right)\right.$$

$$(b-c)^{-n-1}+(b+c)^{-n-1}\, e^{-\frac{f^2}{4(b+c)}}$$

$$\left.\sum_{q=0}^{n} 2^{q-n}\,(-f)^{n-q}\,(f+2(b+c)z)^{q+1}\left(-\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right)\Big/;\; n\in\mathbb{N}$$

01.20.21.0506.01

$$\int z^n e^{\sqrt{z}\, b} \cosh\left(\sqrt{z}\, c + f z\right) dz ==$$

$$2^{-2n-2} f^{-2n-2} \left(e^{\frac{(b-c)^2}{4f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c)^{-h-k+2n} \left(b-c-2f\sqrt{z}\right)^{h+k} \left(\frac{\left(b-c-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left((b-c)\left(b-c-2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f} \right) - \right.$$

$$\left. 2f \sqrt{\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f} \right) \right) +$$

$$e^{-\frac{(b+c)^2}{4f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c)^{-h-k+2n} \left(b+c+2f\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}$$

$$\binom{n}{k} \left((b+c)\left(b+c+2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f} \right) + \right.$$

$$\left. \left. 2\sqrt{-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\ f\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f} \right) \right) \right) /; n \in \mathbb{N}$$

Involving $z^n\, e^{b z^r + e} \cosh\left(c z^r + f z\right)$

01.20.21.0507.01

$$\int z^n e^{b z^2 + e} \cosh\left(c z^2 + f z\right) dz ==$$

$$-\frac{1}{4} \left(e^{-\frac{f^2}{4(b-c)} + e} \left(\sum_{q=0}^{n} 2^{q-n} f^{n-q} (-f + 2bz - 2cz)^{q+1} \left(-\frac{(-f+2bz-2cz)^2}{b-c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-f+2bz-2cz)^2}{4(b-c)} \right) \right) \right.$$

$$(b-c)^{-n-1} + (b+c)^{-n-1} e^{-\frac{f^2}{4(b+c)} + e}$$

$$\left. \left. \sum_{q=0}^{n} 2^{q-n} (-f)^{n-q} (f + 2(b+c)z)^{q+1} \left(-\frac{(f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f+2(b+c)z)^2}{4(b+c)} \right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.0508.01

$$\int z^n e^{\sqrt{z}\,b+e} \cosh\left(\sqrt{z}\,c+f\,z\right) dz ==$$

$$2^{-2n-2} f^{-2n-2} \left(e^{\frac{(b-c)^2}{4f}+e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c)^{-h-k+2n} \left(b-c-2f\sqrt{z}\right)^{h+k} \left(\frac{\left(b-c-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left((b-c)\left(b-c-2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f} \right) - \right.$$

$$\left. 2f \sqrt{\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f} \right) \right) +$$

$$e^{-\frac{(b+c)^2}{4f}+e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c)^{-h-k+2n} \left(b+c+2f\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}$$

$$\binom{n}{k} \left((b+c)\left(b+c+2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f} \right) + \right.$$

$$\left. \left. 2\sqrt{-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f} \right) \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^n\, e^{b\,z^r+d\,z} \cosh\left(c\,z^r+f\,z\right)$

01.20.21.0509.01

$$\int z^n\, e^{b\,z^2+d\,z} \cosh\left(c\,z^2+f\,z\right) dz ==$$

$$-\frac{1}{4\sqrt{b-c}}\, e^{-\frac{(d-f)^2}{4(b-c)}} \sum_{q=0}^{n} 2^{q-n} (b-c)^{-n-\frac{1}{2}} (f-d)^{n-q} (d-f+2bz-2cz)^{q+1} \left(-\frac{(d-f+2bz-2cz)^2}{b-c} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-f+2bz-2cz)^2}{4(b-c)} \right) - \frac{1}{4\sqrt{b+c}}\, e^{-\frac{(d+f)^2}{4(b+c)}} \sum_{q=0}^{n} 2^{q-n} (b+c)^{-n-\frac{1}{2}} (-d-f)^{n-q}$$

$$(d+f+2(b+c)z)^{q+1} \left(-\frac{(d+f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f+2(b+c)z)^2}{4(b+c)} \right) /;\ n \in \mathbb{N}$$

01.20.21.0510.01

$$\int z^n e^{\sqrt{z}\,b+d\,z}\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-2(n+1)}\left(e^{-\frac{(b-c)^2}{4(d-f)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)\right)(d-f)^{-2(n+1)}+$$

$$e^{-\frac{(b+c)^2}{4(d+f)}}(d+f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0511.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{4\sqrt{b-c}}\,e^{-\frac{(d-f)^2}{4(b-c)}+e}\sum_{q=0}^{n}2^{q-n}\,(b-c)^{-n-\frac{1}{2}}\,(f-d)^{n-q}\,(d-f+2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(d-f+2\,b\,z-2\,c\,z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-f+2\,b\,z-2\,c\,z)^2}{4(b-c)}\right)-\frac{1}{4\sqrt{b+c}}\,e^{-\frac{(d+f)^2}{4(b+c)}+e}\sum_{q=0}^{n}2^{q-n}\,(b+c)^{-n-\frac{1}{2}}\,(-d-f)^{n-q}$$

$$(d+f+2(b+c)z)^{q+1}\left(-\frac{(d+f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)/;\,n\in\mathbb{N}$$

01.20.21.0512.01

$$\int z^n e^{\sqrt{z}\,b+e+d\,z}\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-2(n+1)}\,e^{e}\left(e^{-\frac{(b-c)^2}{4(d-f)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)\right)(d-f)^{-2(n+1)}+$$

$$e^{-\frac{(b+c)^2}{4(d+f)}}(d+f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{d\,z}\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0513.01

$$\int z^n\,e^{d\,z}\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{4}\left(\frac{1}{\sqrt{-c}}\,e^{\frac{(d-f)^2}{4c}-g}\sum_{q=0}^{n}2^{q-n}\,(-c)^{-n-\frac{1}{2}}\,(f-d)^{n-q}\,(d-f-2\,c\,z)^{q+1}\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-f-2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\frac{1}{\sqrt{c}}\left(e^{-\frac{(d+f)^2}{4c}+g}\right.\right.$$

$$\left.\left.\sum_{q=0}^{n}2^{q-n}\,c^{-n-\frac{1}{2}}\,(-d-f)^{n-q}\,(d+f+2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0514.01

$$\int z^n e^{d z} \cosh\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$2^{-2n-2}\left(e^{-\frac{c^2}{4(d-f)}-g}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, (-c)^{-h-k+2n}\left(2(d-f)\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2(d-f)\sqrt{-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)-\right.$$

$$\left.\left.c\left(2(d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)\right)\right)(d-f)^{-2n-2}+$$

$$e^{-\frac{c^2}{4(d+f)}+g}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, c^{-h-k+2n}\left(c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\left(c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\Bigg/; n\in\mathbb{N}$$

Involving $z^n\, e^{d z+e} \cosh\left(c\, z^r + f\, z + g\right)$

01.20.21.0515.01

$$\int z^n e^{e+d z} \cosh\left(c z^2 + f z + g\right) dz == -\frac{1}{4}$$

$$\left(\frac{1}{\sqrt{-c}} e^{\frac{(d-f)^2}{4c}+e-g} \sum_{q=0}^{n} 2^{q-n} (-c)^{-n-\frac{1}{2}} (f-d)^{n-q} (d-f-2cz)^{q+1} \left(\frac{(d-f-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d-f-2cz)^2}{4c}\right) + \right.$$

$$\frac{1}{\sqrt{c}} \left(e^{-\frac{(d+f)^2}{4c}+e+g} \right.$$

$$\left.\left. \sum_{q=0}^{n} 2^{q-n} c^{-n-\frac{1}{2}} (-d-f)^{n-q} (d+f+2cz)^{q+1} \left(-\frac{(d+f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f+2cz)^2}{4c}\right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.0516.01

$$\int z^n e^{e+d z} \cosh\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$2^{-2n-2} \left(e^{-\frac{c^2}{4(d-f)}+e-g} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c)^{-h-k+2n} \left(2(d-f)\sqrt{z} - c\right)^{h+k} \left(-\frac{\left(2(d-f)\sqrt{z} - c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\binom{k}{h}\binom{n}{k} \left(2(d-f)\sqrt{-\frac{\left(2(d-f)\sqrt{z} - c\right)^2}{d-f}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2(d-f)\sqrt{z} - c\right)^2}{4(d-f)}\right) - \right.$$

$$\left.\left.\left. c\left(2(d-f)\sqrt{z} - c\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2(d-f)\sqrt{z} - c\right)^2}{4(d-f)}\right) \right) \right) (d-f)^{-2n-2} +$$

$$e^{-\frac{c^2}{4(d+f)}+e+g} (d+f)^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k c^{-h-k+2n} \left(c + 2(d+f)\sqrt{z}\right)^{h+k} \left(-\frac{\left(c + 2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left(c\left(c + 2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c + 2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right) + \right.$$

$$\left.\left. 2\sqrt{-\frac{\left(c + 2(d+f)\sqrt{z}\right)^2}{d+f}}\ (d+f)\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c + 2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right) \right) \right) /; n \in \mathbb{N}$$

Involving $z^n e^{b z^r} \cosh(c z^r + f z + g)$

01.20.21.0517.01

$$\int z^n e^{b z^2} \cosh\left(c z^2 + f z + g\right) dz ==$$

$$-\frac{1}{4}\left(e^{-\frac{f^2}{4(b-c)}-g}\left(\sum_{q=0}^{n} 2^{q-n} f^{n-q} (-f+2bz-2cz)^{q+1}\left(-\frac{(-f+2bz-2cz)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(-f+2bz-2cz)^2}{4(b-c)}\right)\right)\right.$$

$$(b-c)^{-n-1} + (b+c)^{-n-1} e^{-\frac{f^2}{4(b+c)}+g}$$

$$\left.\sum_{q=0}^{n} 2^{q-n} (-f)^{n-q} (f+2(b+c)z)^{q+1}\left(-\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.0518.01

$$\int z^n e^{\sqrt{z}\, b} \cosh\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$2^{-2n-2} f^{-2n-2}\left(e^{\frac{(b-c)^2}{4f}-g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k (b-c)^{-h-k+2n}\left(b-c-2f\sqrt{z}\right)^{h+k}\left(\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.\left.2f\sqrt{\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+\right.$$

$$e^{-\frac{(b+c)^2}{4f}+g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k (b+c)^{-h-k+2n}\left(b+c+2f\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right) /; n \in \mathbb{N}$$

Involving $z^n\, e^{b\, z^r+e} \cosh(c\, z^r + f\, z + g)$

01.20.21.0519.01

$$\int z^n\, e^{b\, z^2+e} \cosh\left(c\, z^2 + f\, z + g\right) dz ==$$

$$-\frac{1}{4}\left(e^{-\frac{f^2}{4\,(b-c)}+e-g}\left(\sum_{q=0}^{n} 2^{q-n}\, f^{n-q}\,(-f+2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(-f+2\,b\,z-2\,c\,z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-f+2\,b\,z-2\,c\,z)^2}{4\,(b-c)}\right)\right)\right.$$

$$(b-c)^{-n-1} + (b+c)^{-n-1}\, e^{-\frac{f^2}{4\,(b+c)}+e+g}$$

$$\left.\sum_{q=0}^{n} 2^{q-n}\,(-f)^{n-q}\,(f+2\,(b+c)\,z)^{q+1}\left(-\frac{(f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,(b+c)\,z)^2}{4\,(b+c)}\right)\right) /;\ n\in\mathbb{N}$$

01.20.21.0520.01

$$\int z^n\, e^{\sqrt{z}\ b+e} \cosh\left(\sqrt{z}\ c+g+f\,z\right) dz ==$$

$$2^{-2\,n-2}\, f^{-2\,n-2}\left(e^{\frac{(b-c)^2}{4\,f}+e-g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.\left.2\,f\sqrt{\frac{\left(b-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+\right.$$

$$e^{-\frac{(b+c)^2}{4\,f}+e+g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2\,n}\left(b+c+2\,f\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right) /;\ n\in\mathbb{N}$$

Involving $z^n\, e^{b\, z^r + d\, z} \cosh(c\, z^r + f\, z + g)$

01.20.21.0521.01

$$\int z^n\, e^{b\, z^2 + d\, z} \cosh\left(c\, z^2 + f\, z + g\right) dz ==$$

$$-\frac{1}{4\sqrt{b-c}}\, e^{-\frac{(d-f)^2}{4(b-c)} - g} \sum_{q=0}^{n} 2^{q-n}\, (b-c)^{-n-\frac{1}{2}}\, (f-d)^{n-q}\, (d-f+2\,b\,z-2\,c\,z)^{q+1} \left(-\frac{(d-f+2\,b\,z-2\,c\,z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-f+2\,b\,z-2\,c\,z)^2}{4\,(b-c)}\right) - \frac{1}{4\sqrt{b+c}}\, e^{-\frac{(d+f)^2}{4(b+c)} + g} \sum_{q=0}^{n} 2^{q-n}\, (b+c)^{-n-\frac{1}{2}}\, (-d-f)^{n-q}$$

$$(d+f+2\,(b+c)\,z)^{q+1} \left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f+2\,(b+c)\,z)^2}{4\,(b+c)}\right) /;\ n \in \mathbb{N}$$

01.20.21.0522.01

$$\int z^n\, e^{\sqrt{z}\ b + d\, z} \cosh\left(\sqrt{z}\ c + g + f\, z\right) dz ==$$

$$2^{-2\,(n+1)}\, e^{-g} \left(e^{-\frac{(b-c)^2}{4(d-f)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b-c)^{-h-k+2\,n} \left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\binom{k}{h} \binom{n}{k} \left((b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right) + \right.$$

$$\left.\left.\left. 2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\ (d-f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)\right) (d-f)^{-2\,(n+1)} +$$

$$e^{2\,g - \frac{(b+c)^2}{4(d+f)}}\, (d+f)^{-2\,(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b+c)^{-h-k+2\,n} \left(b+c+2\,(d+f)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((b+c)\left(b+c+2\,(d+f)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right) + \right.$$

$$\left.\left. 2\sqrt{-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\ (d+f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\right)\right) /;\ n \in \mathbb{N}$$

Involving $z^n\, e^{b\, z^r + d\, z + e} \cosh(c\, z^r + f\, z + g)$

01.20.21.0523.01

$$\int z^n\, e^{b\, z^2 + d\, z + e} \cosh\left(c\, z^2 + f\, z + g\right) dz ==$$

$$-\frac{1}{4\sqrt{b-c}}\, e^{-\frac{(d-f)^2}{4(b-c)}+e-g} \sum_{q=0}^{n} 2^{q-n}\, (b-c)^{-n-\frac{1}{2}}\, (f-d)^{n-q}\, (d-f+2\,b\,z-2\,c\,z)^{q+1} \left(-\frac{(d-f+2\,b\,z-2\,c\,z)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-f+2\,b\,z-2\,c\,z)^2}{4\,(b-c)}\right) - \frac{1}{4\sqrt{b+c}}\, e^{-\frac{(d+f)^2}{4(b+c)}+e+g} \sum_{q=0}^{n} 2^{q-n}\, (b+c)^{-n-\frac{1}{2}}\, (-d-f)^{n-q}$$

$$(d+f+2\,(b+c)\,z)^{q+1} \left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f+2\,(b+c)\,z)^2}{4\,(b+c)}\right) /;\ n \in \mathbb{N}$$

01.20.21.0524.01

$$\int z^n\, e^{\sqrt{z}\ b+e+d\,z} \cosh\left(\sqrt{z}\ c+g+f\,z\right) dz ==$$

$$2^{-2\,(n+1)}\, e^{e-g} \left(e^{-\frac{(b-c)^2}{4\,(d-f)}} \left(\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b-c)^{-h-k+2\,n} \left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k} \left((b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right) + \right.$$

$$\left.\left.\left. 2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\ (d-f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)\right) (d-f)^{-2\,(n+1)} +$$

$$e^{2\,g-\frac{(b+c)^2}{4\,(d+f)}}\, (d+f)^{-2\,(n+1)} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b+c)^{-h-k+2\,n} \left(b+c+2\,(d+f)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left((b+c)\left(b+c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right) + \right.$$

$$\left.\left. 2\sqrt{-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\ (d+f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\right)\right) /;\ n \in \mathbb{N}$$

Involving trigonometric functions

Involving sin

Involving $\sin(c\,z)\cosh(a\,z)$

01.20.21.0525.01

$$\int \sin(c\,z)\cosh(a\,z)\,dz == \frac{a\sin(c\,z)\sinh(a\,z) - c\cos(c\,z)\cosh(a\,z)}{a^2 + c^2}$$

01.20.21.0526.01

$$\int \sin(a\,z)\cosh(a\,z)\,dz == \frac{\sin(a\,z)\sinh(a\,z) - \cos(a\,z)\cosh(a\,z)}{2\,a}$$

Involving $\sin(c\,z + d)\cosh(a\,z)$

01.20.21.0527.01

$$\int \sin(d + c\,z)\cosh(a\,z)\,dz == \frac{a\sin(d + c\,z)\sinh(a\,z) - c\cos(d + c\,z)\cosh(a\,z)}{a^2 + c^2}$$

Involving $\sin(c\,z)\cosh(a\,z + b)$

01.20.21.0528.01

$$\int \sin(c\,z)\cosh(b + a\,z)\,dz == \frac{a\sin(c\,z)\sinh(b + a\,z) - c\cos(c\,z)\cosh(b + a\,z)}{a^2 + c^2}$$

Involving $\sin(c\,z + d)\cosh(a\,z + b)$

01.20.21.0529.01

$$\int \sin(d + c\,z)\cosh(b + a\,z)\,dz == \frac{a\sin(d + c\,z)\sinh(b + a\,z) - c\cos(d + c\,z)\cosh(b + a\,z)}{a^2 + c^2}$$

Involving $\sin\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.0530.01

$$\int \sin\left(b\,z^2\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{c^2}{4\,b}\right)S\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right) + C\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}\right)}{\sqrt{b}} + \frac{\cos\left(\frac{c^2}{4\,b}\right)S\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right) - C\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}\right)}{\sqrt{-b}}\right)$$

01.20.21.0531.01

$$\int \sin\left(\sqrt{z}\ b\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,c)^{3/2}}\left(-2\sqrt{-i\,c}\ \cos\left(\sqrt{z}\ b-i\,c\,z\right)-b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}\right)S\left(\frac{b-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)-i\,C\left(\frac{b-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}\right)\right)\right)+\right.$$
$$\left.\frac{1}{(-i\,c)^{3/2}}\left(2\sqrt{-i\,c}\ \cos\left(\sqrt{z}\ b+i\,c\,z\right)+b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}\right)S\left(\frac{b+2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)-i\,C\left(\frac{b+2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}\right)\right)\right)\right)$$

Involving $\sin\left(b\,z^r+e\right)\cosh(c\,z)$

01.20.21.0532.01

$$\int \sin\left(b\,z^2+e\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{c^2}{4\,b}+e\right)S\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)+C\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}+e\right)}{\sqrt{b}}+\frac{\cos\left(\frac{c^2}{4\,b}+e\right)S\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-C\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}+e\right)}{\sqrt{-b}}\right)$$

01.20.21.0533.01

$$\int \sin\left(\sqrt{z}\ b+e\right)\cosh(c\,z)\,dz == \frac{1}{4}\left(\frac{1}{(-i\,c)^{3/2}}\left(-2\sqrt{-i\,c}\ \cos\left(\sqrt{z}\ b+e-i\,c\,z\right)-\right.\right.$$
$$\left.b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}+i\,e\right)S\left(\frac{b-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)-i\,C\left(\frac{b-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}+i\,e\right)\right)\right)+\frac{1}{(-i\,c)^{3/2}}$$
$$\left.\left(2\sqrt{-i\,c}\ \cos\left(\sqrt{z}\ b+e+i\,c\,z\right)+b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}-i\,e\right)S\left(\frac{b+2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)-i\,C\left(\frac{b+2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}-i\,e\right)\right)\right)\right)$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh(c\,z)$

01.20.21.0534.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(d-i\,c)^2}{4\,b}\right)S\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)-C\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d-i\,c)^2}{4\,b}\right)}{\sqrt{b}}+\frac{\cos\left(\frac{(d+i\,c)^2}{4\,b}\right)S\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)+C\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d+i\,c)^2}{4\,b}\right)}{\sqrt{-b}}\right)$$

01.20.21.0535.01

$$\int \sin\left(\sqrt{z}\ b + d\,z\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{(d-i\,c)^{3/2}}\left(-2\sqrt{d-i\,c}\ \cos\left(\sqrt{z}\ b + (d-i\,c)\,z\right) - b\sqrt{2\pi}\ \cos\left(\frac{b^2}{4\,(d-i\,c)}\right)S\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\pi}}\right) + b\sqrt{2\pi}\ C\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,(d-i\,c)}\right)\right) + \frac{1}{(-d-i\,c)^{3/2}}\left(2\sqrt{-d-i\,c}\ \cos\left(\sqrt{z}\ b + (d+i\,c)\,z\right) + b\sqrt{2\pi}\ \cos\left(\frac{b^2}{4\,(d+i\,c)}\right)S\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\pi}}\right) + b\sqrt{2\pi}\ C\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,(d+i\,c)}\right)\right)\right)$$

Involving $\sin\left(b\,z^r + d\,z + e\right)\cosh(c\,z)$

01.20.21.0536.01

$$\int \sin\left(b\,z^2 + d\,z + e\right)\cosh(c\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(d-i\,c)^2}{4\,b} - e\right)S\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right) - C\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right)\sin\left(\frac{(d-i\,c)^2}{4\,b} - e\right)}{\sqrt{b}} + \frac{\cos\left(\frac{(d+i\,c)^2}{4\,b} - e\right)S\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\pi}}\right) + C\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\pi}}\right)\sin\left(\frac{(d+i\,c)^2}{4\,b} - e\right)}{\sqrt{-b}}\right)$$

01.20.21.0537.01

$$\int \sin\left(\sqrt{z}\ b + e + d\,z\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{(d-i\,c)^{3/2}}\left(-2\sqrt{d-i\,c}\ \cos\left(\sqrt{z}\ b + e + (d-i\,c)\,z\right) - b\sqrt{2\pi}\ \cos\left(\frac{b^2}{4\,(d-i\,c)} - e\right)S\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\pi}}\right) + b\sqrt{2\pi}\ C\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,(d-i\,c)} - e\right)\right) + \frac{1}{(-d-i\,c)^{3/2}}\left(2\sqrt{-d-i\,c}\ \cos\left(\sqrt{z}\ b + e + (d+i\,c)\,z\right) + b\sqrt{2\pi}\ \cos\left(e - \frac{b^2}{4\,(d+i\,c)}\right)S\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\pi}}\right) - b\sqrt{2\pi}\ C\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\pi}}\right)\sin\left(e - \frac{b^2}{4\,(d+i\,c)}\right)\right)\right)$$

Involving $\sin\left(b\,z^r\right)\cosh(f\,z + g)$

01.20.21.0538.01

$$\int \sin\left(b\,z^2\right)\cosh(g + f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}$$
$$\left(\frac{\cos\left(\frac{f^2}{4\,b} - i\,g\right)S\left(\frac{-i\,f+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right) + C\left(\frac{-i\,f+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4\,b} - i\,g\right)}{\sqrt{b}} - \frac{C\left(\frac{i\,f+2\,b\,z}{\sqrt{-b}\ \sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4\,b} + i\,g\right) - \cos\left(\frac{f^2}{4\,b} + i\,g\right)S\left(\frac{i\,f+2\,b\,z}{\sqrt{-b}\ \sqrt{2\pi}}\right)}{\sqrt{-b}}\right)$$

01.20.21.0539.01

$$\int \sin\left(b\sqrt{z}\right)\cosh(g+f z)\,dz == \frac{1}{4}\left(\frac{1}{(-i f)^{3/2}}\left(-2\sqrt{-i f}\,\cos\left(\sqrt{z}\,b-i g-i f z\right)-b\sqrt{2\pi}\,\cosh\left(\frac{b^2}{4f}+g\right)S\left(\frac{b-2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)+b\right.\right.$$
$$i\sqrt{2\pi}\,C\left(\frac{b-2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4f}+g\right)\Bigg)+\frac{1}{(-i f)^{3/2}}\left(2\sqrt{-i f}\,\cos\left(\sqrt{z}\,b+i g+i f z\right)+\right.$$
$$\left.\left.b\sqrt{2\pi}\,\cosh\left(\frac{b^2}{4f}+g\right)S\left(\frac{b+2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)-b i\sqrt{2\pi}\,C\left(\frac{b+2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4f}+g\right)\right)\right)$$

Involving $\sin\left(b z^r+e\right)\cosh(f z+g)$

01.20.21.0540.01

$$\int \sin\left(b z^2+e\right)\cosh(g+f z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{f^2+4b(e-i g)}{4b}\right)S\left(\frac{-i f+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)+C\left(\frac{-i f+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)\sin\left(\frac{f^2+4b(e-i g)}{4b}\right)}{\sqrt{b}}-\right.$$
$$\left.\frac{C\left(\frac{i f+2bz}{\sqrt{-b}\,\sqrt{2\pi}}\right)\sin\left(\frac{f^2+4b(e+i g)}{4b}\right)-\cos\left(\frac{f^2+4b(e+i g)}{4b}\right)S\left(\frac{i f+2bz}{\sqrt{-b}\,\sqrt{2\pi}}\right)}{\sqrt{-b}}\right)$$

01.20.21.0541.01

$$\int \sin\left(\sqrt{z}\,b+e\right)\cosh(g+f z)\,dz == \frac{1}{4}\left(\frac{1}{(-i f)^{3/2}}\left(2\sqrt{-i f}\,\cos\left(\sqrt{z}\,b+e+i g+i f z\right)-b\sqrt{2\pi}\,\cos\left(\frac{i b^2}{4f}+e+i g\right)S\left(\frac{-b-2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)+\right.\right.$$
$$b\sqrt{2\pi}\,C\left(\frac{-b-2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)\sin\left(\frac{i b^2}{4f}+e+i g\right)\Bigg)+\frac{1}{(-i f)^{3/2}}\left(-2\sqrt{-i f}\,\cos\left(\sqrt{z}\,b+e-i g-i f z\right)-\right.$$
$$\left.\left.b\sqrt{2\pi}\,\cos\left(e-i\left(\frac{b^2}{4f}+g\right)\right)S\left(\frac{b-2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)-b\sqrt{2\pi}\,C\left(\frac{b-2 i f\sqrt{z}}{\sqrt{-i f}\,\sqrt{2\pi}}\right)\sin\left(e-i\left(\frac{b^2}{4f}+g\right)\right)\right)\right)$$

Involving $\sin\left(b z^r+d z\right)\cosh(f z+g)$

01.20.21.0542.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(d-i\,f)^2}{4\,b}+i\,g\right)S\left(\frac{d-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{d-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(d-i\,f)^2}{4\,b}+i\,g\right)}{\sqrt{b}}+\right.$$

$$\left.\frac{\cos\left(i\,g-\frac{(d+i\,f)^2}{4\,b}\right)S\left(\frac{d+i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{d+i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(i\,g-\frac{(d+i\,f)^2}{4\,b}\right)}{\sqrt{-b}}\right)$$

01.20.21.0543.01

$$\int \sin\left(\sqrt{z}\;b+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-d-i\,f)^{3/2}}\left(2\sqrt{-d-i\,f}\;\cos\left(\sqrt{z}\;b+i\,g+(d+i\,f)\,z\right)+b\sqrt{2\,\pi}\;\cos\left(\frac{b^2}{4\,(-d-i\,f)}+i\,g\right)S\left(\frac{b+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.b\sqrt{2\,\pi}\;C\left(\frac{b+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,(-d-i\,f)}+i\,g\right)\right)+$$

$$\frac{1}{(d-i\,f)^{3/2}}\left(-2\sqrt{d-i\,f}\;\cos\left(\sqrt{z}\;b-i\,g+(d-i\,f)\,z\right)-b\sqrt{2\,\pi}\;\cos\left(\frac{b^2}{4\,(d-i\,f)}+i\,g\right)S\left(\frac{b+2\,(d-i\,f)\,\sqrt{z}}{\sqrt{d-i\,f}\;\sqrt{2\,\pi}}\right)+\right.$$

$$\left.\left.b\sqrt{2\,\pi}\;C\left(\frac{b+2\,(d-i\,f)\,\sqrt{z}}{\sqrt{d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,(d-i\,f)}+i\,g\right)\right)\right)$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh(f\,z+g)$

01.20.21.0544.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(-\frac{(d+i\,f)^2}{4\,b}+e+i\,g\right)S\left(\frac{d+i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{d+i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(d+i\,f)^2}{4\,b}+e+i\,g\right)}{\sqrt{-b}}+\right.$$

$$\left.\frac{\cos\left(-\frac{(d-i\,f)^2}{4\,b}+e-i\,g\right)S\left(\frac{d-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)+C\left(\frac{d-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(d-i\,f)^2}{4\,b}+e-i\,g\right)}{\sqrt{b}}\right)$$

01.20.21.0545.01

$$\int \sin\left(\sqrt{z}\, b+e+d z\right)\cosh(g+f z)\,dz == \frac{1}{4}\left(\frac{1}{(-d-i f)^{3/2}}\left(2\sqrt{-d-i f}\,\cos\left(\sqrt{z}\, b+e+i g+(d+i f)z\right)+b\sqrt{2\pi}\,\cos\left(\frac{b^2}{4(-d-i f)}+e+i g\right)\right.\right.$$
$$\left.S\left(\frac{b+2(d+i f)\sqrt{z}}{\sqrt{-d-i f}\,\sqrt{2\pi}}\right)-b\sqrt{2\pi}\,C\left(\frac{b+2(d+i f)\sqrt{z}}{\sqrt{-d-i f}\,\sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4(-d-i f)}+e+i g\right)\right)+$$
$$\frac{1}{(d-i f)^{3/2}}\left(-2\sqrt{d-i f}\,\cos\left(\sqrt{z}\, b+e-i g+(d-i f)z\right)-b\sqrt{2\pi}\,\cos\left(-\frac{b^2}{4(d-i f)}+e-i g\right)S\left(\frac{b+2(d-i f)\sqrt{z}}{\sqrt{d-i f}\,\sqrt{2\pi}}\right)-\right.$$
$$\left.\left.b\sqrt{2\pi}\,C\left(\frac{b+2(d-i f)\sqrt{z}}{\sqrt{d-i f}\,\sqrt{2\pi}}\right)\sin\left(-\frac{b^2}{4(d-i f)}+e-i g\right)\right)\right)$$

Involving $\sin(b z)\cosh\left(c z^r\right)$

01.20.21.0546.01

$$\int \sin(b z)\cosh\left(c z^2\right)dz == -\frac{1}{2\sqrt{c^2}}\left(\sqrt{\frac{\pi}{2}}\left(-\sqrt{i c}\,\cosh\left(\frac{b^2}{4c}\right)S\left(\frac{b+2 i c z}{\sqrt{-i c}\,\sqrt{2\pi}}\right)-\right.\right.$$
$$\left.\left.\sqrt{-i c}\,\cosh\left(\frac{b^2}{4c}\right)S\left(\frac{b-2 i c z}{\sqrt{i c}\,\sqrt{2\pi}}\right)-i\left(\sqrt{-i c}\,C\left(\frac{b-2 i c z}{\sqrt{i c}\,\sqrt{2\pi}}\right)-\sqrt{i c}\,C\left(\frac{b+2 i c z}{\sqrt{-i c}\,\sqrt{2\pi}}\right)\right)\sinh\left(\frac{b^2}{4c}\right)\right)\right)$$

01.20.21.0547.01

$$\int \sin(b z)\cosh\left(c\sqrt{z}\right)dz == -\frac{1}{4(-b)^{3/2}}\left(-4\sqrt{-b}\,\cos(b z)\cosh\left(c\sqrt{z}\right)-i c\sqrt{2\pi}\,\cos\left(\frac{c^2}{4b}\right)S\left(\frac{2\sqrt{z}\, b+i c}{\sqrt{-b}\,\sqrt{2\pi}}\right)-i c\sqrt{2\pi}\,\cos\left(\frac{c^2}{4b}\right)S\left(\frac{i c-2b\sqrt{z}}{\sqrt{-b}\,\sqrt{2\pi}}\right)+\right.$$
$$\left.c i\sqrt{2\pi}\,C\left(\frac{2\sqrt{z}\, b+i c}{\sqrt{-b}\,\sqrt{2\pi}}\right)\sin\left(\frac{c^2}{4b}\right)+c i\sqrt{2\pi}\,C\left(\frac{i c-2b\sqrt{z}}{\sqrt{-b}\,\sqrt{2\pi}}\right)\sin\left(\frac{c^2}{4b}\right)\right)$$

Involving $\sin(d z+e)\cosh\left(c z^r\right)$

01.20.21.0548.01

$$\int \sin(e+d\,z)\cosh\left(c\,z^2\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{d^2}{4c}+i\,e\right)S\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)+i\,C\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}+i\,e\right)}{\sqrt{i\,c}}+\right.$$

$$\left.\frac{i\,C\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}-i\,e\right)-\cosh\left(\frac{d^2}{4c}-i\,e\right)S\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0549.01

$$\int \sin(e+d\,z)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$\frac{1}{4}\left(-\frac{1}{(-d)^{3/2}}\left(-2\,\sqrt{-d}\,\cos\left(e+d\,z+i\,c\,\sqrt{z}\right)-i\,c\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,d}+e\right)S\left(\frac{2\,\sqrt{z}\,d+i\,c}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\right.\right.$$

$$\left.C\left(\frac{2\,\sqrt{z}\,d+i\,c}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e\right)\right)-\frac{1}{(-d)^{3/2}}$$

$$\left.\left.\left(-2\,\sqrt{-d}\,\cos\left(e+d\,z-i\,c\,\sqrt{z}\right)-i\,c\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,d}+e\right)S\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\,C\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e\right)\right)\right)\right)$$

Involving $\sin\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.0550.01

$$\int \sin(b\,z^r)\cosh(c\,z^r)\,dz ==$$

$$\frac{1}{4\,r}\left(i\,z\left(\Gamma\left(\frac{1}{r},(-c-i\,b)\,z^r\right)\left((-c-i\,b)\,z^r\right)^{-1/r}-\left((i\,b-c)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(i\,b-c)\,z^r\right)+\left((c-i\,b)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(c-i\,b)\,z^r\right)-\right.\right.$$

$$\left.\left.\left((c+i\,b)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0551.01

$$\int \sin\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{S\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{i\,c-b}}+\frac{S\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0552.01

$$\int \sin\left(b\,\sqrt{z}\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$\frac{(i\,c-b)\,\sqrt{z}\,\cos\left((i\,c-b)\,\sqrt{z}\right)-\sin\left((i\,c-b)\,\sqrt{z}\right)}{(i\,c-b)^2}+\frac{\sin\left((b+i\,c)\,\sqrt{z}\right)-(b+i\,c)\,\sqrt{z}\,\cos\left((b+i\,c)\,\sqrt{z}\right)}{(b+i\,c)^2}$$

Involving $\sin\left(b\,z^r+e\right)\cosh\left(c\,z^r\right)$

01.20.21.0553.01

$$\int \sin(b\,z^r + e)\cosh(c\,z^r)\,dz == \frac{1}{4\,r}\left(i\,z\left(e^{i\,e}\,\Gamma\left(\frac{1}{r}, (-c - i\,b)\,z^r\right)((-c - i\,b)\,z^r)^{-1/r} - e^{-i\,e}\,((i\,b - c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (i\,b - c)\,z^r\right) + e^{i\,e}\,((c - i\,b)\,z^r)^{-1/r}\right.\right.$$
$$\left.\left.\Gamma\left(\frac{1}{r}, (c - i\,b)\,z^r\right) - e^{-i\,e}\,((c + i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c + i\,b)\,z^r\right)\right)\right)$$

01.20.21.0554.01

$$\int \sin\left(b\,z^2 + e\right)\cosh\left(c\,z^2\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}$$
$$\left(\frac{\cos(e)\,S\left(\sqrt{i\,c - b}\,\sqrt{\frac{2}{\pi}}\,z\right) - C\left(\sqrt{i\,c - b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)}{\sqrt{i\,c - b}} + \frac{\cos(e)\,S\left(\sqrt{-b - i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right) - C\left(\sqrt{-b - i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)}{\sqrt{-b - i\,c}}\right)$$

01.20.21.0555.01

$$\int \sin\left(\sqrt{z}\;b + e\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$
$$\frac{\sin\left(\sqrt{z}\;(b + i\,c) + e\right) - (b + i\,c)\,\sqrt{z}\;\cos\left(\sqrt{z}\;(b + i\,c) + e\right)}{(b + i\,c)^2} + \frac{(i\,c - b)\,\sqrt{z}\;\cos\left(e - (i\,c - b)\,\sqrt{z}\right) + \sin\left(e - (i\,c - b)\,\sqrt{z}\right)}{(i\,c - b)^2}$$

Involving $\sin\left(b\,z^r + d\,z\right)\cosh\left(c\,z^r\right)$

01.20.21.0556.01

$$\int \sin\left(b\,z^2 + d\,z\right)\cosh\left(c\,z^2\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4\,(i\,c - b)}\right)S\left(\frac{2\,(i\,c - b)\,z - d}{\sqrt{i\,c - b}\,\sqrt{2\,\pi}}\right) - C\left(\frac{2\,(i\,c - b)\,z - d}{\sqrt{i\,c - b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,(i\,c - b)}\right)}{\sqrt{i\,c - b}} - \right.$$
$$\left.\frac{\cos\left(-\frac{d^2}{4\,(b + i\,c)}\right)S\left(\frac{d + 2\,(b + i\,c)\,z}{\sqrt{-b - i\,c}\,\sqrt{2\,\pi}}\right) - C\left(\frac{d + 2\,(b + i\,c)\,z}{\sqrt{-b - i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4\,(b + i\,c)}\right)}{\sqrt{-b - i\,c}}\right)$$

01.20.21.0557.01

$$\int \sin\left(\sqrt{z}\;b + d\,z\right)\cosh\left(\sqrt{z}\;c\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{d^{3/2}}\left(-2\,\sqrt{d}\;\cos\left(\sqrt{z}\;(b - i\,c) + d\,z\right) - (b - i\,c)\,\sqrt{2\,\pi}\;\cos\left(\frac{(b - i\,c)^2}{4\,d}\right)S\left(\frac{b - i\,c + 2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right) - \right.\right.$$
$$(i\,c - b)\,\sqrt{2\,\pi}\;C\left(\frac{b - i\,c + 2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b - i\,c)^2}{4\,d}\right)\Bigg) + \frac{1}{(-d)^{3/2}}\left(2\,\sqrt{-d}\;\cos\left(\sqrt{z}\;(b + i\,c) + d\,z\right) + \right.$$
$$\left.\left.\left.(b + i\,c)\,\sqrt{2\,\pi}\left(\cos\left(\frac{(b + i\,c)^2}{4\,d}\right)S\left(\frac{b + i\,c + 2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right) + C\left(\frac{b + i\,c + 2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b + i\,c)^2}{4\,d}\right)\right)\right)\right)$$

Involving $\sin(b\,z^r + d\,z + e)\cosh(c\,z^r)$

01.20.21.0558.01

$$\int \sin(b\,z^2 + d\,z + e)\cosh(c\,z^2)\,dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4(i\,c-b)} + e\right) S\left(\frac{2(i\,c-b)z-d}{\sqrt{i\,c-b}\ \sqrt{2\,\pi}}\right) - C\left(\frac{2(i\,c-b)z-d}{\sqrt{i\,c-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4(i\,c-b)} + e\right)}{\sqrt{i\,c-b}} - \right.$$

$$\left.\frac{\cos\left(-\frac{d^2}{4(b+i\,c)} + e\right) S\left(\frac{d+2(b+i\,c)z}{\sqrt{-b-i\,c}\ \sqrt{2\,\pi}}\right) - C\left(\frac{d+2(b+i\,c)z}{\sqrt{-b-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4(b+i\,c)} + e\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0559.01

$$\int \sin\left(\sqrt{z}\ b + e + d\,z\right)\cosh\left(\sqrt{z}\ c\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{d^{3/2}}\left(-2\sqrt{d}\ \cos\left(\sqrt{z}\ (b-i\,c) + e + d\,z\right) - (b-i\,c)\sqrt{2\,\pi}\ \cos\left(\frac{(b-i\,c)^2}{4\,d} - e\right) S\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right) - \right.\right.$$

$$(i\,c-b)\sqrt{2\,\pi}\ C\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(b-i\,c)^2}{4\,d} - e\right)\Bigg) + \frac{1}{(-d)^{3/2}}\left(2\sqrt{-d}\ \cos\left(\sqrt{z}\ (b+i\,c) + e + d\,z\right) + \right.$$

$$\left.\left.\left.(b+i\,c)\sqrt{2\,\pi}\left(\cos\left(\frac{(-b-i\,c)^2}{4\,d} - e\right) S\left(\frac{b+i\,c+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right) + C\left(\frac{b+i\,c+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-b-i\,c)^2}{4\,d} - e\right)\right)\right)\right)\right)$$

Involving $\sin(d\,z)\cosh(c\,z^r + g)$

01.20.21.0560.01

$$\int \sin(d\,z)\cosh\left(c\,z^2 + g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}$$

$$\left(\frac{i\,C\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,c} + g\right) - \cosh\left(\frac{d^2}{4\,c} + g\right) S\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}} + \frac{\cosh\left(\frac{d^2}{4\,c} + g\right) S\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right) + i\,C\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,c} + g\right)}{\sqrt{i\,c}}\right)$$

01.20.21.0561.01

$$\int \sin(d\,z)\cosh\left(\sqrt{z}\ c + g\right)dz ==$$

$$\frac{1}{4}\left(-\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\ \cos\left(i\,g + i\,c\sqrt{z}\ + d\,z\right) - i\,c\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,d} + i\,g\right) S\left(\frac{2\sqrt{z}\ d + i\,c}{\sqrt{-d}\ \sqrt{2\,\pi}}\right) + c\,i\right.\right.$$

$$\sqrt{2\,\pi}\ C\left(\frac{2\sqrt{z}\ d + i\,c}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d} + i\,g\right)\Bigg) - \frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\ \cos\left(-i\,g - i\,c\sqrt{z}\ + d\,z\right) - \right.$$

$$\left.\left.i\,c\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,d} - i\,g\right) S\left(\frac{i\,c-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right) + c\,i\sqrt{2\,\pi}\ C\left(\frac{i\,c-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d} - i\,g\right)\right)\right)$$

Involving $\sin(d\,z+e)\cosh(c\,z^r+g)$

01.20.21.0562.01

$$\int \sin(e+d\,z)\cosh(c\,z^2+g)\,dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{d^2}{4c}+g+i\,e\right)S\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)+i\,C\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}+g+i\,e\right)}{\sqrt{i\,c}}+\right.$$

$$\left.\frac{i\,C\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}-i\,e+g\right)-\cosh\left(\frac{d^2}{4c}-i\,e+g\right)S\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0563.01

$$\int \sin(e+d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$\frac{1}{4}\left(-\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\,\cos\left(e+i\,g+d\,z+i\,c\sqrt{z}\right)-i\,c\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,d}+e+i\,g\right)S\left(\frac{2\sqrt{z}\,d+i\,c}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.c\,i\sqrt{2\,\pi}\,C\left(\frac{2\sqrt{z}\,d+i\,c}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e+i\,g\right)\right)-\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\,\cos\left(e-i\,g+d\,z-i\,c\sqrt{z}\right)-\right.$$

$$\left.\left.i\,c\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,d}+e-i\,g\right)S\left(\frac{i\,c-2\,d\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)+c\,i\sqrt{2\,\pi}\,C\left(\frac{i\,c-2\,d\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e-i\,g\right)\right)\right)$$

Involving $\sin(a\,z^r)\cosh(c\,z^r+g)$

01.20.21.0564.01

$$\int \sin(b\,z^r)\cosh(c\,z^r+g)\,dz ==$$

$$\frac{1}{4\,r}\left(i\,z\left(e^g\,\Gamma\left(\frac{1}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-1/r}-e^g\,((i\,b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-c)\,z^r\right)+e^{-g}\,((c-i\,b)\,z^r)^{-1/r}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{r},(c-i\,b)\,z^r\right)-e^{-g}\,((c+i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0565.01

$$\int \sin\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh(g)\,S\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)+i\,C\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh(g)}{\sqrt{i\,c-b}}+\right.$$

$$\left.\frac{\cosh(g)\,S\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)-i\,C\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh(g)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0566.01

$$\int \sin\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g\right)dz == \frac{(i\,c-b)\sqrt{z}\,\cos\left(\sqrt{z}\,(i\,c-b)+i\,g\right)-\sin\left(\sqrt{z}\,(i\,c-b)+i\,g\right)}{(i\,c-b)^2}+$$
$$\frac{\sin\left(\sqrt{z}\,(b+i\,c)+i\,g\right)-(b+i\,c)\sqrt{z}\,\cos\left(\sqrt{z}\,(b+i\,c)+i\,g\right)}{(b+i\,c)^2}$$

Involving $\sin\left(a\,z^r+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0567.01

$$\int \sin(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$
$$\frac{1}{4\,r}\left(i\,z\left(e^{g+i\,e}\,\Gamma\left(\frac{1}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-1/r}-e^{g-i\,e}\,((i\,b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-c)\,z^r\right)+e^{i\,e-g}\right.\right.$$
$$\left.\left.((c-i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-i\,b)\,z^r\right)-e^{-g-i\,e}\,((c+i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0568.01

$$\int \sin\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos(e+i\,g)\,S\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)-C\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e+i\,g)}{\sqrt{-b-i\,c}}+\right.$$
$$\left.\frac{\cos(e-i\,g)\,S\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)-C\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e-i\,g)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0569.01

$$\int \sin\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+g\right)dz == \frac{\sin\left(\sqrt{z}\,(b+i\,c)+e+i\,g\right)-(b+i\,c)\sqrt{z}\,\cos\left(\sqrt{z}\,(b+i\,c)+e+i\,g\right)}{(b+i\,c)^2}+$$
$$\frac{(i\,c-b)\sqrt{z}\,\cos\left(-\sqrt{z}\,(i\,c-b)+e-i\,g\right)+\sin\left(-\sqrt{z}\,(i\,c-b)+e-i\,g\right)}{(i\,c-b)^2}$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0570.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4\,(i\,c-b)}-i\,g\right)S\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,(i\,c-b)}-i\,g\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{\cos\left(-\frac{d^2}{4\,(b+i\,c)}+i\,g\right)S\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)-C\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4\,(b+i\,c)}+i\,g\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0571.01

$$\int \sin\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{d^{3/2}}\left(-2\sqrt{d}\;\cos\left(\sqrt{z}\;(b-i\,c)-i\,g\;+d\,z\right)-(b-i\,c)\sqrt{2\,\pi}\;\cos\left(\frac{(b-i\,c)^2}{4\,d}+i\,g\right)S\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\;\sqrt{2\,\pi}}\right)-\right.\right.$$

$$(i\,c-b)\sqrt{2\,\pi}\;C\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(b-i\,c)^2}{4\,d}+i\,g\right)\Bigg)+\frac{1}{(-d)^{3/2}}\left(2\sqrt{-d}\;\cos\left(\sqrt{z}\;(b+i\,c)+i\,g\;+d\,z\right)+\right.$$

$$\left.\left.(b+i\,c)\sqrt{2\,\pi}\left(\cos\left(\frac{(-b-i\,c)^2}{4\,d}-i\,g\right)S\left(\frac{b+i\,c\;+2\,d\sqrt{z}}{\sqrt{-d}\;\sqrt{2\,\pi}}\right)+C\left(\frac{b+i\,c\;+2\,d\sqrt{z}}{\sqrt{-d}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(-b-i\,c)^2}{4\,d}-i\,g\right)\right)\right)\right)$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0572.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$-\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4\,(i\,c-b)}+e-i\,g\right)S\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,(i\,c-b)}+e-i\,g\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{1}{\sqrt{-b-i\,c}}\left(\cos\left(-\frac{d^2}{4\,(b+i\,c)}+e+i\,g\right)S\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)-C\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4\,(b+i\,c)}+e+i\,g\right)\right)\right)$$

01.20.21.0573.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{d^{3/2}}\left(-2\sqrt{d}\ \cos\left(\sqrt{z}\ (b-i\,c)+e-i\,g+d\,z\right)-(b-i\,c)\sqrt{2\,\pi}\ \cos\left(\frac{(b-i\,c)^2}{4\,d}-e+i\,g\right)S\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)-\right.\right.$$
$$\left.\left.(i\,c-b)\sqrt{2\,\pi}\ C\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(b-i\,c)^2}{4\,d}-e+i\,g\right)\right)+$$
$$\frac{1}{(-d)^{3/2}}\left(2\sqrt{-d}\ \cos\left(\sqrt{z}\ (b+i\,c)+e+i\,g+d\,z\right)+(b+i\,c)\sqrt{2\,\pi}\right.$$
$$\left.\left.\left(\cos\left(\frac{(-b-i\,c)^2}{4\,d}-e-i\,g\right)S\left(\frac{b+i\,c+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)+C\left(\frac{b+i\,c+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-b-i\,c)^2}{4\,d}-e-i\,g\right)\right)\right)\right)$$

Involving $\sin(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0574.01

$$\int \sin(d\,z)\cosh\left(c\,z^2+f\,z\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{(i\,f-d)^2}{4\,c}\right)S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+i\,C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f-d)^2}{4\,c}\right)}{\sqrt{i\,c}}+\right.$$
$$\left.\frac{i\,C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(d+i\,f)^2}{4\,c}\right)-\cosh\left(\frac{(d+i\,f)^2}{4\,c}\right)S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0575.01

$$\int \sin(d\,z)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$
$$-\frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left(-2\sqrt{i\,f-d}\ \cos\left(i\,c\sqrt{z}\ +(i\,f-d)\,z\right)-i\,c\sqrt{2\,\pi}\left(\cos\left(\frac{c^2}{4\,(i\,f-d)}\right)S\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)+\right.\right.\right.$$
$$\left.\left.\left.C\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(i\,f-d)}\right)\right)\right)+\frac{1}{(-d-i\,f)^{3/2}}\left(-2\sqrt{-d-i\,f}\ \cos\left(i\,c\sqrt{z}\ +(d+i\,f)\,z\right)-\right.$$
$$\left.\left.i\,c\sqrt{2\,\pi}\left(\cos\left(\frac{c^2}{4\,(d+i\,f)}\right)S\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)-C\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(d+i\,f)}\right)\right)\right)\right)$$

Involving $\sin(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0576.01

$$\int \sin(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(d+i\,f)^2}{4\,c}+e\right)-\cos\left(\frac{i\,(d+i\,f)^2}{4\,c}+e\right)S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}}+\right.$$

$$\left.\frac{\cos\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e\right)S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e\right)}{\sqrt{i\,c}}\right)$$

01.20.21.0577.01

$$\int \sin(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$-\frac{1}{4}\left(\frac{1}{(-d-i\,f)^{3/2}}\left(-2\sqrt{-d-i\,f}\;\cos\left(e+(d+i\,f)\,z+i\,c\,\sqrt{z}\right)-i\,c\,\sqrt{2\,\pi}\left(\cos\left(\frac{c^2}{4\,(d+i\,f)}+e\right)S\left(\frac{2\sqrt{z}\;(d+i\,f)+i\,c}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.C\left(\frac{2\sqrt{z}\;(d+i\,f)+i\,c}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(d+i\,f)}+e\right)\right)\right)+\frac{1}{(i\,f-d)^{3/2}}\left(-2\sqrt{i\,f-d}\;\cos\left(e-(i\,f-d)\,z-i\,c\,\sqrt{z}\right)-\right.$$

$$\left.\left.i\,c\,\sqrt{2\,\pi}\left(\cos\left(-\frac{c^2}{4\,(i\,f-d)}+e\right)S\left(\frac{2\sqrt{z}\;(i\,f-d)+i\,c}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)-C\left(\frac{2\sqrt{z}\;(i\,f-d)+i\,c}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{c^2}{4\,(i\,f-d)}+e\right)\right)\right)\right)$$

Involving $\sin\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0578.01

$$\int \sin\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(-b-i\,c)}\right)-\cos\left(-\frac{f^2}{4\,(-b-i\,c)}\right)S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-b-i\,c}}+\right.$$

$$\left.\frac{\cos\left(\frac{f^2}{4\,(i\,c-b)}\right)S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(i\,c-b)}\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0579.01

$$\int \sin\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+f\,z\right)dz == \frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left(2\sqrt{-i\,f}\,\cos\left(\sqrt{z}\,(b+i\,c)+i\,f\,z\right)+\right.\right.$$
$$(b+i\,c)\sqrt{2\,\pi}\left(\cosh\left(\frac{(b+i\,c)^2}{4\,f}\right)S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-i\,C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+i\,c)^2}{4\,f}\right)\right)-$$
$$\frac{1}{(i\,f)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\left(\cosh\left(\frac{(i\,c-b)^2}{4\,f}\right)S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)+i\,C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c-b)^2}{4\,f}\right)\right)-\right.$$
$$\left.\left.\left.2\sqrt{i\,f}\,\cos\left(\sqrt{z}\,(i\,c-b)+i\,f\,z\right)\right)\right)\right)$$

Involving $\sin\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0580.01

$$\int \sin\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(-b-i\,c)}+e\right)-\cos\left(-\frac{f^2}{4\,(-b-i\,c)}+e\right)S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-b-i\,c}}+\right.$$
$$\left.\frac{\cos\left(-\frac{f^2}{4\,(i\,c-b)}+e\right)S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(i\,c-b)}+e\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0581.01

$$\int \sin\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left(2\sqrt{-i\,f}\,\cos\left(\sqrt{z}\,(b+i\,c)+e+i\,f\,z\right)+(b+i\,c)\sqrt{2\,\pi}\left(\cos\left(\frac{i\,(b+i\,c)^2}{4\,f}+e\right)S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$
$$\left.\left.\left.C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(b+i\,c)^2}{4\,f}+e\right)\right)\right)-\frac{1}{(i\,f)^{3/2}}$$
$$\left((b-i\,c)\sqrt{2\,\pi}\left(\cos\left(-\frac{i\,(i\,c-b)^2}{4\,f}+e\right)S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(i\,c-b)^2}{4\,f}+e\right)\right)-\right.$$
$$\left.\left.2\sqrt{i\,f}\,\cos\left(-\sqrt{z}\,(i\,c-b)+e-i\,f\,z\right)\right)\right)$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0582.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(-d-i\,f)^2}{4\,(-b-i\,c)}\right)S\left(\frac{-d-i\,f+2\,(-b-i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-d-i\,f+2\,(-b-i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(-d-i\,f)^2}{4\,(-b-i\,c)}\right)}{\sqrt{-b-i\,c}}+\right.$$

$$\left.\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}\right)S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0583.01

$$\int \sin\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{4}\left(-\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\,\sqrt{2\,\pi}\left(\cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}\right)S\left(\frac{-b+i\,c\;+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)-C\left(\frac{-b+i\,c\;+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)\right.\right.\right.$$

$$\left.\left.\left.\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}\right)\right)-2\,\sqrt{i\,f-d}\;\cos\left(\sqrt{z}\;(i\,c-b)+(i\,f-d)\,z\right)\right)-\right.$$

$$\frac{1}{(-d-i\,f)^{3/2}}\left(-2\,\sqrt{-d-i\,f}\;\cos\left(\sqrt{z}\;(b+i\,c)+(d+i\,f)\,z\right)-(b+i\,c)\,\sqrt{2\,\pi}\;\cos\left(\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)\right.$$

$$\left.\left.S\left(\frac{b+i\,c\;+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)-(b+i\,c)\,\sqrt{2\,\pi}\;C\left(\frac{b+i\,c\;+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)\right)\right)$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0584.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(-d-i\,f)^2}{4\,(-b-i\,c)}+e\right)S\left(\frac{-d-i\,f+2\,(-b-i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-d-i\,f+2\,(-b-i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(-d-i\,f)^2}{4\,(-b-i\,c)}+e\right)}{\sqrt{-b-i\,c}}+\right.$$

$$\left.\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}+e\right)S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}+e\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0585.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(-\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\left(\cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e\right)S\left(\frac{-b+i\,c+2\,(i\,f-d)\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)-\right.\right.\right.$$
$$\left.\left.\left.C\left(\frac{-b+i\,c+2\,(i\,f-d)\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e\right)\right)-2\sqrt{i\,f-d}\ \cos\left(-\sqrt{z}\ (i\,c-b)+e-(i\,f-d)\,z\right)\right)-$$
$$\frac{1}{(-d-i\,f)^{3/2}}\left(-2\sqrt{-d-i\,f}\ \cos\left(\sqrt{z}\ (b+i\,c)+e+(d+i\,f)\,z\right)-(b+i\,c)\sqrt{2\,\pi}\ \cos\left(e-\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)\right.$$
$$\left.S\left(\frac{b+i\,c+2\,(d+i\,f)\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)+(b+i\,c)\sqrt{2\,\pi}\ C\left(\frac{b+i\,c+2\,(d+i\,f)\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(e-\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)\right)\Bigg)$$

Involving $\sin(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0586.01

$$\int \sin(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{(i\,f-d)^2}{4\,c}+g\right)S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+i\,C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f-d)^2}{4\,c}+g\right)}{\sqrt{i\,c}}+\right.$$
$$\left.\frac{i\,C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(d+i\,f)^2}{4\,c}+g\right)-\cosh\left(\frac{(d+i\,f)^2}{4\,c}+g\right)S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0587.01

$$\int \sin(d\,z)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == -\frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left(-2\sqrt{i\,f-d}\ \cos\left(i\,g+i\,c\sqrt{z}\ +(i\,f-d)\,z\right)-\right.\right.$$
$$\left.\left.i\,c\sqrt{2\,\pi}\left(\cos\left(\frac{c^2}{4\,(i\,f-d)}+i\,g\right)S\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)+C\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(i\,f-d)}+i\,g\right)\right)\right)+$$
$$\frac{1}{(-d-i\,f)^{3/2}}\left(-2\sqrt{-d-i\,f}\ \cos\left(i\,g+i\,c\sqrt{z}\ +(d+i\,f)\,z\right)-\right.$$
$$\left.\left.i\,c\sqrt{2\,\pi}\left(\cos\left(i\,g+\frac{c^2}{4\,(d+i\,f)}\right)S\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)-C\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(i\,g+\frac{c^2}{4\,(d+i\,f)}\right)\right)\right)\right)$$

Involving $\sin(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0588.01

$$\int \sin(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(d+i\,f)^2}{4\,c}+e+i\,g\right)-\cos\left(\frac{i\,(d+i\,f)^2}{4\,c}+e+i\,g\right)S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}}+\right.$$
$$\left.\frac{\cos\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e-i\,g\right)S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e-i\,g\right)}{\sqrt{i\,c}}\right)$$

01.20.21.0589.01

$$\int \sin(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == -\frac{1}{4}\left(\frac{1}{(-d-i\,f)^{3/2}}\left(-2\sqrt{-d-i\,f}\;\cos\left(e+i\,g+(d+i\,f)\,z+i\,c\,\sqrt{z}\right)-i\,c\,\sqrt{2\,\pi}\right.\right.$$
$$\left.\left(\cos\left(\frac{c^2}{4\,(d+i\,f)}+e+i\,g\right)S\left(\frac{2\,\sqrt{z}\;(d+i\,f)+i\,c}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)-C\left(\frac{2\,\sqrt{z}\;(d+i\,f)+i\,c}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(d+i\,f)}+e+i\,g\right)\right)\right)+$$
$$\frac{1}{(i\,f-d)^{3/2}}\left(-2\sqrt{i\,f-d}\;\cos\left(e-i\,g-(i\,f-d)\,z-i\,c\,\sqrt{z}\right)-i\,c\,\sqrt{2\,\pi}\right.$$
$$\left.\left.\left(\cos\left(-\frac{c^2}{4\,(i\,f-d)}+e-i\,g\right)S\left(\frac{2\,\sqrt{z}\;(i\,f-d)+i\,c}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)-C\left(\frac{2\,\sqrt{z}\;(i\,f-d)+i\,c}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{c^2}{4\,(i\,f-d)}+e-i\,g\right)\right)\right)\right)$$

Involving $\sin\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0590.01

$$\int \sin\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(-b-i\,c)}+i\,g\right)-\cos\left(-\frac{f^2}{4\,(-b-i\,c)}+i\,g\right)S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-b-i\,c}}+\right.$$
$$\left.\frac{\cos\left(\frac{f^2}{4\,(i\,c-b)}+i\,g\right)S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(i\,c-b)}+i\,g\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0591.01

$$\int \sin\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left(2\sqrt{-i\,f}\,\cos\left(\sqrt{z}\,(b+i\,c)+i\,g+i\,f\,z\right)+\right.\right.$$
$$(b+i\,c)\sqrt{2\,\pi}\left(\cosh\left(\frac{(b+i\,c)^2}{4\,f}+g\right)S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-i\,C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+i\,c)^2}{4\,f}+g\right)\right)\Bigg)-$$
$$\frac{1}{(i\,f)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\left(\cosh\left(\frac{(i\,c-b)^2}{4\,f}+g\right)S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)+i\,C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c-b)^2}{4\,f}+g\right)\right)-\right.$$
$$\left.\left.2\sqrt{i\,f}\,\cos\left(\sqrt{z}\,(i\,c-b)+i\,g+i\,f\,z\right)\right)\right)$$

Involving $\sin\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0592.01

$$\int \sin\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$
$$-\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(-b-i\,c)}+e+i\,g\right)-\cos\left(-\frac{f^2}{4\,(-b-i\,c)}+e+i\,g\right)S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-b-i\,c}}+\right.$$
$$\left.\frac{\cos\left(-\frac{f^2}{4\,(i\,c-b)}+e-i\,g\right)S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(i\,c-b)}+e-i\,g\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0593.01

$$\int \sin\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left(2\sqrt{-i\,f}\,\cos\left(\sqrt{z}\,(b+i\,c)+e+i\,g+i\,f\,z\right)+(b+i\,c)\sqrt{2\,\pi}\right.\right.$$
$$\left.\left(\cos\left(\frac{i\,(b+i\,c)^2}{4\,f}+e+i\,g\right)S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(b+i\,c)^2}{4\,f}+e+i\,g\right)\right)\right)-$$
$$\frac{1}{(i\,f)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\left(\cos\left(-\frac{i\,(i\,c-b)^2}{4\,f}+e-i\,g\right)S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)-\right.\right.$$
$$\left.\left.C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(i\,c-b)^2}{4\,f}+e-i\,g\right)\right)-2\sqrt{i\,f}\,\cos\left(-\sqrt{z}\,(i\,c-b)+e-i\,g-i\,f\,z\right)\right)\Bigg)$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0594.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(i\,g-\frac{(d+i\,f)^2}{4\,(b+i\,c)}\right)-\cos\left(i\,g-\frac{(d+i\,f)^2}{4\,(b+i\,c)}\right)S\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)}{\sqrt{-b-i\,c}}+\right.$$

$$\left.\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}-i\,g\right)S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}-i\,g\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0595.01

$$\int \sin\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$\frac{1}{4}\left(-\frac{1}{(-d-i\,f)^{3/2}}\left(-2\sqrt{-d-i\,f}\;\cosh\left(g-i\,(d+i\,f)\,z-i\,(b+i\,c)\,\sqrt{z}\right)-(b+i\,c)\,\sqrt{2\,\pi}\;\cos\left(i\,g-\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)\right.\right.$$

$$\left.S\left(\frac{b+i\,c+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)+(b+i\,c)\,\sqrt{2\,\pi}\;C\left(\frac{b+i\,c+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(i\,g-\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)\right)-$$

$$\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\,\sqrt{2\,\pi}\left(\cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}-i\,g\right)S\left(\frac{-b+i\,c+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.\left.C\left(\frac{-b+i\,c+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}-i\,g\right)\right)-2\sqrt{i\,f-d}\;\cos\left(-\sqrt{z}\;(i\,c-b)-i\,g\;-(i\,f-d)\,z\right)\right)\right)$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0596.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz == -\frac{1}{2}\sqrt{\frac{\pi}{2}}$$

$$\left(\frac{1}{\sqrt{-b-i\,c}}\left(C\left(\frac{d+i\,f\;+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(d+i\,f)^2}{4\,(b+i\,c)}+e+i\,g\right)-\cos\left(-\frac{(d+i\,f)^2}{4\,(b+i\,c)}+e+i\,g\right)S\left(\frac{d+i\,f\;+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\;\sqrt{2\,\pi}}\right)\right)+\right.$$

$$\left.\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}+e-i\,g\right)S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\;\sqrt{2\,\pi}}\right)-C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}+e-i\,g\right)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0597.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{8}\,i\,e^{-g-i\,e}\,\sqrt{\pi}\left(\frac{e^{\frac{(f-i\,d)^2}{4\,c-4\,i\,b}+2\,i\,e}\;i\,\text{erf}\left(\frac{d+i\,f+2\,b\,z+2\,i\,c\,z}{2\,\sqrt{i\,b-c}}\right)}{\sqrt{i\,b-c}}+\frac{e^{-\frac{(f+i\,d)^2}{-4\,c-4\,i\,b}}\,\text{erfi}\left(\frac{f+i\,d+2\,c\,z+2\,i\,b\,z}{2\,\sqrt{-c-i\,b}}\right)}{\sqrt{-c-i\,b}}+\right.$$

$$\left.\frac{e^{\frac{(f+i\,d)^2}{-4\,c-4\,i\,b}+2\,g+2\,i\,e}\,\text{erfi}\left(\frac{f+i\,d+2\,c\,z+2\,i\,b\,z}{2\,\sqrt{c+i\,b}}\right)}{\sqrt{c+i\,b}}-\frac{e^{\frac{i\,(d+i\,f)^2}{4\,(b+i\,c)}+2\,g}\,\text{erfi}\left(\frac{f-i\,d-2\,i\,b\,z+2\,c\,z}{2\,\sqrt{c-i\,b}}\right)}{\sqrt{c-i\,b}}\right)$$

01.20.21.0598.01

$$\int \sin\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$\frac{1}{4}\left(-\frac{1}{(-d-i\,f)^{3/2}}\left(-2\,\sqrt{-d-i\,f}\;\cos\left(\sqrt{z}\;(b+i\,c)+e+i\,g+(d+i\,f)\,z\right)-(b+i\,c)\,\sqrt{2\,\pi}\left(\cos\left(-\frac{(b+i\,c)^2}{4\,(d+i\,f)}+e+i\,g\right)\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{b+i\,c+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)-C\left(\frac{b+i\,c+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(b+i\,c)^2}{4\,(d+i\,f)}+e+i\,g\right)\right)\right)-\right.$$

$$\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\,\sqrt{2\,\pi}\left(\cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e-i\,g\right)S\left(\frac{-b+i\,c+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)-C\left(\frac{-b+i\,c+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)\right.\right.$$

$$\left.\left.\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e-i\,g\right)\right)-2\,\sqrt{i\,f-d}\;\cos\left(-\sqrt{z}\;(i\,c-b)+e-i\,g-(i\,f-d)\,z\right)\right)\right)$$

01.20.21.0599.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{8}\,i\left(e^{-g-i\,e}\left(-\frac{(c+i\,b)\,e^{-\frac{(b-i\,c)^2}{4\,f+4\,i\,d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i\,b+2\,(f+i\,d)\,\sqrt{z}}{2\sqrt{-f-i\,d}}\right)}{(-f-i\,d)^{3/2}}+\frac{(c+i\,b)\,e^{\frac{(b-i\,c)^2}{4\,f+4\,i\,d}+2\,g+2\,i\,e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i\,b+2\,(f+i\,d)\,\sqrt{z}}{2\sqrt{f+i\,d}}\right)}{(f+i\,d)^{3/2}}+\right.\right.$$

$$\left.\left.\frac{1}{d-i\,f}\left(4\,i\,e^{g+i\,e}\left(\cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)+i\sin\left(\sqrt{z}\ b+e+d\,z\right)\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)\right)\right)-$$

$$e^{i\,e-g}\left(\frac{4\,e^{g-i\,e}\cos\left(\sqrt{z}\ (b+i\,c)+e+i\,g\ +(d+i\,f)\,z\right)}{i\,d-f}+\frac{(i\,b-c)\,e^{\frac{(b+i\,c)^2}{4\,i\,d-4\,f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c-i\,b+2\,(f-i\,d)\,\sqrt{z}}{2\sqrt{i\,d-f}}\right)}{(i\,d-f)^{3/2}}+\right.$$

$$\left.\left.\frac{(c-i\,b)\,e^{-\frac{(b+i\,c)^2}{4\,i\,d-4\,f}+2\,g-2\,i\,e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c-i\,b+2\,(f-i\,d)\,\sqrt{z}}{2\sqrt{f-i\,d}}\right)}{(f-i\,d)^{3/2}}\right)\right)$$

Involving powers of sin

Involving $\sin^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.0600.01

$$\int \sin^{\mu}(c\,z)\cosh(a\,z)\,dz == \frac{1}{2\left(a^2+c^2\,\mu^2\right)}\left(e^{-a\,z}\left(1-e^{2\,i\,c\,z}\right)^{-\mu}\sin^{\mu}(c\,z)\right.$$

$$\left.\left((i\,c\,\mu-a)\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,1+\frac{i\,a}{2\,c}-\frac{\mu}{2};\,e^{2\,i\,c\,z}\right)+e^{2\,a\,z}\,(a+i\,c\,\mu)\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(2-\frac{i\,a}{c}-\mu\right);\,e^{2\,i\,c\,z}\right)\right)\right)$$

01.20.21.0601.01

$$\int \sin^{m}(c\,z)\cosh(a\,z)\,dz == \binom{m}{\frac{m}{2}}\frac{(1-m \bmod 2)\sinh(a\,z)}{2^m\,a}+$$

$$2^{-m-1}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left((-a+2\,i\,c\,k-i\,c\,m)\left(-e^{i\,m\,\pi-(a+c\,i\,(m-2\,k))\,z}\,(a+2\,i\,c\,k-i\,c\,m)-e^{-a\,z-2\,i\,c\,k\,z+i\,c\,m\,z}\,(a+c\,i\,(m-2\,k))+\right.\right.$$

$$\left.\left.e^{-i\,c\,z\,m+i\,\pi\,m+a\,z+2\,i\,c\,k\,z}\,(a+c\,i\,(m-2\,k))\right)-e^{(a-2\,i\,c\,k+i\,c\,m)\,z}\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)$$

$$\binom{m}{k}\Big/\left((-a+2\,i\,c\,k-i\,c\,m)\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0602.01

$$\int \sin^2(z)\cosh(z)\,dz == \frac{1}{10}\left(-2\cosh(z)\sin(2\,z)-(\cos(2\,z)-5)\sinh(z)\right)$$

01.20.21.0603.01

$$\int \sin^3(z)\cosh(z)\,dz == \frac{1}{40}\left(3\left(\cos(3z)-5\cos(z)\right)\cosh(z)-\left(\sin(3z)-15\sin(z)\right)\sinh(z)\right)$$

Involving $\sin^{\mu}(c\,z+d)\cosh(a\,z)$

01.20.21.0604.01

$$\int \sin^{\mu}(d+c\,z)\cosh(a\,z)\,dz == \frac{1}{2\left(a^2+c^2\,\mu^2\right)} e^{-a\,z}\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}\sin^{\mu}(d+c\,z)\left(e^{2\,a\,z}\,(a+i\,c\,\mu)\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(2-\frac{i\,a}{c}-\mu\right);\,e^{2\,i\,(d+c\,z)}\right)-(a-i\,c\,\mu)\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{1}{2}\left(2+\frac{i\,a}{c}-\mu\right);\,e^{2\,i\,(d+c\,z)}\right)\right)$$

01.20.21.0605.01

$$\int \sin^m(d+c\,z)\cosh(a\,z)\,dz == \frac{2^{-m}\sinh(a\,z)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{a}+2^{-m-1}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\left((-a+2\,i\,c\,k-i\,c\,m)\left(-e^{d\,i\,(2\,k-m)-(a+c\,i\,(m-2\,k))\,z+i\,m\,\pi}\,(a+2\,i\,c\,k-i\,c\,m)-e^{-2\,d\,i\,k-2\,i\,c\,z\,k+i\,d\,m-a\,z+i\,c\,m\,z}\,(a+c\,i\,(m-2\,k))+e^{2\,i\,d\,k+2\,i\,c\,z\,k-i\,d\,m+a\,z-i\,c\,m\,z+i\,m\,\pi}\,(a+c\,i\,(m-2\,k))\right)-e^{d\,i\,(m-2\,k)+(a-2\,i\,c\,k+i\,c\,m)\,z}\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)\binom{m}{k}\right)\Big/\left((-a+2\,i\,c\,k-i\,c\,m)\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)\,/;\,m\in\mathbb{N}^+$$

Involving $\sin^{\mu}(c\,z)\cosh(a\,z+b)$

01.20.21.0606.01

$$\int \sin^{\mu}(c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2\left(a^2+c^2\,\mu^2\right)} e^{-b-a\,z}\left(1-e^{2\,i\,c\,z}\right)^{-\mu}\sin^{\mu}(c\,z)\left(e^{2\,(b+a\,z)}\,(a+i\,c\,\mu)\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(2-\frac{i\,a}{c}-\mu\right);\,e^{2\,i\,c\,z}\right)-(a-i\,c\,\mu)\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{1}{2}\left(2+\frac{i\,a}{c}-\mu\right);\,e^{2\,i\,c\,z}\right)\right)$$

01.20.21.0607.01

$$\int \sin^m(c\,z)\cosh(b+a\,z)\,dz == \frac{2^{-m}\sinh(b+a\,z)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{a}+2^{-m-1}\,i^{-m}\,e^{-b}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\left((-a+2\,i\,c\,k-i\,c\,m)\left(-e^{i\,m\,\pi-(a+c\,i\,(m-2\,k))\,z}\,(a+2\,i\,c\,k-i\,c\,m)-e^{-a\,z-2\,i\,c\,k\,z+i\,c\,m\,z}\,(a+c\,i\,(m-2\,k))+e^{2\,b+a\,z+2\,i\,c\,k\,z-i\,c\,m\,z+i\,m\,\pi}\,(a+c\,i\,(m-2\,k))\right)-e^{2\,b+(a-2\,i\,c\,k+i\,c\,m)\,z}\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)\binom{m}{k}\right)\Big/\left((-a+2\,i\,c\,k-i\,c\,m)\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)\,/;\,m\in\mathbb{N}^+$$

Involving $\sin^{\mu}(c\,z+d)\cosh(a\,z+b)$

01.20.21.0608.01

$$\int \sin^{\mu}(d+c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2\left(a^2+c^2\,\mu^2\right)} e^{-b-a\,z}\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}\sin^{\mu}(d+c\,z)\left(e^{2\,(b+a\,z)}\,(a+i\,c\,\mu)\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(2-\frac{i\,a}{c}-\mu\right);\,e^{2\,i\,(d+c\,z)}\right)-(a-i\,c\,\mu)\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{1}{2}\left(2+\frac{i\,a}{c}-\mu\right);\,e^{2\,i\,(d+c\,z)}\right)\right)$$

01.20.21.0609.01

$$\int \sin^{m}(d+c\,z)\cosh(b+a\,z)\,dz == \frac{2^{-m}\sinh(b+a\,z)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{a} + 2^{-m-1}\,i^{-m}\,e^{-b}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\left((-a+2\,i\,c\,k-i\,c\,m)\left(-e^{d\,i\,(2\,k-m)-(a+c\,i\,(m-2\,k))\,z+i\,m\,\pi}\,(a+2\,i\,c\,k-i\,c\,m)-e^{-2\,d\,i\,k-2\,i\,c\,z\,k+i\,d\,m-a\,z+i\,c\,m\,z}\,(a+c\,i\,(m-2\,k))+e^{2\,b+2\,i\,d\,k-i\,d\,m+a\,z+2\,i\,c\,k\,z-i\,c\,m\,z+i\,m\,\pi}\,(a+c\,i\,(m-2\,k))\right)-e^{2\,b+d\,i\,(m-2\,k)+(a-2\,i\,c\,k+i\,c\,m)\,z}\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)\binom{m}{k}\right)\Big/((-a+2\,i\,c\,k-i\,c\,m)\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k)))\;/;\;m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh(c\,z)$

01.20.21.0610.01

$$\int \sin^{m}\left(b\,z^2\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} + 2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-S\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}+\frac{m\,\pi}{2}\right)\right)+\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(-\frac{c^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+S\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(-\frac{c^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)\right)\right)\;/;\;m\in\mathbb{N}^+$$

01.20.21.0611.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} + 2^{-m-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$
$$\left(\frac{1}{(-i\,c)^{3/2}}\left(b\sqrt{2\,\pi}\;(m-2\,s)\left(\cos\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}-\frac{m\,\pi}{2}\right)C\left(\frac{-b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)+S\left(\frac{-b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)\right.\right.\right.$$
$$\left.\left.\left.\sin\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}-\frac{m\,\pi}{2}\right)\right)-2\sqrt{-i\,c}\;\sin\left(-\frac{\pi\,m}{2}+i\,c\,z-(2\,b\,s-b\,m)\sqrt{z}\right)\right)+$$
$$\frac{1}{(-i\,c)^{3/2}}\left(2\sqrt{-i\,c}\;\sin\left(-\frac{\pi\,m}{2}-i\,c\,z+(b\,m-2\,b\,s)\sqrt{z}\right)-b\sqrt{2\,\pi}\;(m-2\,s)\left(\cos\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+\frac{m\,\pi}{2}\right)\right.\right.$$
$$\left.\left.C\left(\frac{b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)+S\left(\frac{b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+\frac{m\,\pi}{2}\right)\right)\right)\Big/;\; m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+e\right)\cosh(c\,z)$

01.20.21.0612.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$
$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$
$$\left.\left.S\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(-\frac{c^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.S\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)\sin\left(-\frac{c^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)\right)\Big/;\; m\in\mathbb{N}^+$$

01.20.21.0613.01

$$\int \sin^m\left(\sqrt{z}\ b+e\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{(-i\,c)^{3/2}}\left(b\sqrt{2\pi}\ (m-2\,s)\left(\cos\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s-\frac{m\,\pi}{2}\right)C\left(\frac{-b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\pi}}\right)+\right.\right.\right.$$
$$\left.\left.\left.S\left(\frac{-b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\pi}}\right)\sin\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s-\frac{m\,\pi}{2}\right)\right)-\right.$$
$$\left.2\sqrt{-i\,c}\ \sin\left(e\,m-\frac{\pi\,m}{2}-2\,e\,s+i\,c\,z-(2\,b\,s-b\,m)\sqrt{z}\right)\right)+$$
$$\frac{1}{(-i\,c)^{3/2}}\left(2\sqrt{-i\,c}\ \sin\left(e\,m-\frac{\pi\,m}{2}-2\,e\,s-i\,c\,z+(b\,m-2\,b\,s)\sqrt{z}\right)-\right.$$
$$b\sqrt{2\pi}\ (m-2\,s)\left(\cos\left(-\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\pi}}\right)-\right.$$
$$\left.\left.\left.S\left(\frac{b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\ \sqrt{2\pi}}\right)\sin\left(-\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s-\frac{m\,\pi}{2}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh(c\,z)$

01.20.21.0614.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\pi}\ \sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$
$$\left.\left.S\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\pi}\ \sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+\frac{m\,\pi}{2}\right)\right)+\right.$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\pi}\ \sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.S\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\pi}\ \sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0615.01

$$\int \sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)}{c}+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,c+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\right.\right.$$
$$\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-(2\,b\,k-b\,m)$$
$$\sqrt{2\,\pi}\ S\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)+$$
$$\left.2\sqrt{-i\,c+2\,d\,k-d\,m}\ \sin\left(-\frac{\pi\,m}{2}+(-i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\right)\right)+\frac{1}{(i\,c+2\,d\,k-d\,m)^{3/2}}$$
$$\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\ \cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$
$$(2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)+$$
$$\left.\left.2\sqrt{i\,c+2\,d\,k-d\,m}\ \sin\left(-\frac{\pi\,m}{2}+(i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.0616.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c}+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$
$$\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$
$$\left.S\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\ \sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.S\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\ \sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0617.01

$$\int \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh(c\,z)\,dz == \frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)}{c} +$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,c+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\ \cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$
$$C\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(2\,b\,k-b\,m)\sqrt{2\,\pi}$$
$$S\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+$$
$$\left.2\sqrt{-i\,c+2\,d\,k-d\,m}\ \sin\left(2\,e\,k-e\,m+(-i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\ -\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{(i\,c+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\ \cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.$$
$$C\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(2\,b\,k-b\,m)\sqrt{2\,\pi}$$
$$S\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+$$
$$\left.\left.2\sqrt{i\,c+2\,d\,k-d\,m}\ \sin\left(2\,e\,k-e\,m+(i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\ -\frac{m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r\right)\cosh(f\,z+g)$

01.20.21.0618.01

$$\int \sin^m\left(b\,z^2\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cosh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$
$$\left.i\,S\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,s-b\,m}}\right)\sinh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g+\frac{i\,m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g-\frac{i\,m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\ \sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.i\,S\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\ \sqrt{b\,m-2\,b\,s}}\right)\sinh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0619.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} +$$

$$2^{-m-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{(-i\,f)^{3/2}}\left(\sqrt{2\,\pi}\;(b\,m-2\,b\,s)\cosh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\sqrt{2\,\pi}\;(2\,b\,s-b\,m)\,S\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g+\frac{i\,m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{-i\,f}\;\sinh\left(g+f\,z+i\,(2\,b\,s-b\,m)\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(-i\,f)^{3/2}}\left(\sqrt{2\,\pi}\;(2\,b\,s-b\,m)\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g-\frac{i\,m\,\pi}{2}\right)C\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)-\right.$$

$$i\sqrt{2\,\pi}\;(b\,m-2\,b\,s)\,S\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g-\frac{i\,m\,\pi}{2}\right)-$$

$$\left.\left.2\,i\sqrt{-i\,f}\;\sinh\left(g+f\,z+i\,(b\,m-2\,b\,s)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+e\right)\cosh(f\,z+g)$

01.20.21.0620.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cosh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g+e\,i\,(2\,s-m)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.i\,S\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)\sinh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g+e\,i\,(2\,s-m)+\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)-\frac{i\,m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.i\,S\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)\sinh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0621.01

$$\int \sin^m\left(\sqrt{z}\ b+e\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} + 2^{-m-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$
$$\left(\frac{1}{(-i\,f)^{3/2}}\left(\sqrt{2\pi}\ (b\,m-2\,b\,s)\cosh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g-i\,e\,m+2\,i\,e\,s+\frac{i\,m\,\pi}{2}\right)C\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\pi}}\right)-\right.\right.$$
$$i\sqrt{2\pi}\ (2\,b\,s-b\,m)\,S\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\pi}}\right)\sinh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g-i\,e\,m+2\,i\,e\,s+\frac{i\,m\,\pi}{2}\right)-$$
$$\left.2\,i\sqrt{-i\,f}\ \sinh\left(g-i\,e\,m+2\,i\,e\,s+f\,z+i\,(2\,b\,s-b\,m)\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)+$$
$$\frac{1}{(-i\,f)^{3/2}}\left(\sqrt{2\pi}\ (2\,b\,s-b\,m)\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g+i\,e\,m-2\,i\,e\,s-\frac{i\,m\,\pi}{2}\right)C\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\pi}}\right)-\right.$$
$$i\sqrt{2\pi}\ (b\,m-2\,b\,s)\,S\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\pi}}\right)\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g+i\,e\,m-2\,i\,e\,s-\frac{i\,m\,\pi}{2}\right)-$$
$$\left.\left.2\,i\sqrt{-i\,f}\ \sinh\left(g+i\,e\,m-2\,i\,e\,s+f\,z+i\,(b\,m-2\,b\,s)\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh(f\,z+g)$

01.20.21.0622.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} + 2^{-m-\frac{1}{2}}\sqrt{\pi}$$
$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}-i\,g\ +\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\pi}\ \sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$
$$\left.S\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\pi}\ \sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}-i\,g\ +\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+g-\frac{i\,m\,\pi}{2}\right)C\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\pi}\ \sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.i\,S\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\pi}\ \sqrt{b\,m-2\,b\,s}}\right)\sinh\left(-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+g-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0623.01

$$\int \sin^m\left(\sqrt{z}\ b + d\,z\right)\cosh(g + f\,z)\,dz ==$$

$$\frac{2^{-m}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sinh(g + f\,z)}{f} + 2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f + 2\,d\,k - d\,m)^{3/2}}\left((b\,m - 2\,b\,k)\sqrt{2\,\pi}\right.\right.$$

$$\cos\left(\frac{(2\,b\,k - b\,m)^2}{4\,(-i\,f + 2\,d\,k - d\,m)} + i\,g + \frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k - b\,m + 2\,(-i\,f + 2\,d\,k - d\,m)\sqrt{z}}{\sqrt{-i\,f + 2\,d\,k - d\,m}\ \sqrt{2\,\pi}}\right) - (2\,b\,k - b\,m)$$

$$\sqrt{2\,\pi}\ S\left(\frac{2\,b\,k - b\,m + 2\,(-i\,f + 2\,d\,k - d\,m)\sqrt{z}}{\sqrt{-i\,f + 2\,d\,k - d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,b\,k - b\,m)^2}{4\,(-i\,f + 2\,d\,k - d\,m)} + i\,g + \frac{m\,\pi}{2}\right) -$$

$$\left.2\,i\sqrt{-i\,f + 2\,d\,k - d\,m}\ \sinh\left(g + i\,(-i\,f + 2\,d\,k - d\,m)\,z + i\,(2\,b\,k - b\,m)\sqrt{z} - \frac{i\,m\,\pi}{2}\right)\right) +$$

$$\frac{1}{(i\,f + 2\,d\,k - d\,m)^{3/2}}\left((b\,m - 2\,b\,k)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(2\,b\,k - b\,m)^2}{4\,(i\,f + 2\,d\,k - d\,m)} + g + \frac{i\,m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k - b\,m + 2\,(i\,f + 2\,d\,k - d\,m)\sqrt{z}}{\sqrt{i\,f + 2\,d\,k - d\,m}\ \sqrt{2\,\pi}}\right) +$$

$$i\,(2\,b\,k - b\,m)\sqrt{2\,\pi}\ S\left(\frac{2\,b\,k - b\,m + 2\,(i\,f + 2\,d\,k - d\,m)\sqrt{z}}{\sqrt{i\,f + 2\,d\,k - d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\,b\,k - b\,m)^2}{4\,(i\,f + 2\,d\,k - d\,m)} + g + \frac{i\,m\,\pi}{2}\right) +$$

$$\left.\left.2\,i\sqrt{i\,f + 2\,d\,k - d\,m}\ \sinh\left(g - i\,(i\,f + 2\,d\,k - d\,m)\,z - i\,(2\,b\,k - b\,m)\sqrt{z} + \frac{i\,m\,\pi}{2}\right)\right)\right) /;\ m \in \mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r + d\,z + e\right)\cosh(f\,z + g)$

01.20.21.0624.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} + 2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$

$$\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}-i\,g\,+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}-i\,g\,+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)-\frac{i\,m\,\pi}{2}\right)\right.$$

$$C\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+i\,S\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\sinh\left(-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\, m\in\mathbb{N}^+$$

01.20.21.0625.01

$$\int \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh(g+f\,z)\,dz == \frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)}{f}+2^{-m-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\ \sinh\left(g+2\,i\,e\,k-i\,e\,m+i\,(-i\,f+2\,d\,k-d\,m)\,z+i\,(2\,b\,k-b\,m)\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\,\cosh\left(\frac{i\,(2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+$$

$$i\,(2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)$$

$$\sinh\left(\frac{i\,(2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)+2\,i\sqrt{i\,f+2\,d\,k-d\,m}$$

$$\left.\left.\sinh\left(g-2\,i\,e\,k+i\,e\,m-i\,(i\,f+2\,d\,k-d\,m)\,z-i\,(2\,b\,k-b\,m)\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z)\cosh(c\,z^r)$

01.20.21.0626.01

$$\int \sin^m(b\,z)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,(1-m \bmod 2)}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}+\frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}+\frac{i\,m\,\pi}{2}\right)\Bigg)+\frac{1}{\sqrt{-i\,c}}\left(\cosh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}-\frac{i\,m\,\pi}{2}\right)\right.$$

$$\left.\left.C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0627.01

$$\int \sin^m(b\,z)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,b\,k-b\,m)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\,\sqrt{2\,\pi}\,S\left(\frac{-i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}-\frac{m\,\pi}{2}\right)-$$

$$\left.2\,\sqrt{2\,b\,k-b\,m}\,\sin\left(\frac{m\,\pi}{2}+i\,c\,\sqrt{z}-(2\,b\,k-b\,m)\,z\right)\right)+\frac{1}{(2\,b\,k-b\,m)^{3/2}}$$

$$\left(-i\,c\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}-\frac{m\,\pi}{2}\right)C\left(\frac{i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\,S\left(\frac{i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\right.$$

$$\left.\left.\sin\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}-\frac{m\,\pi}{2}\right)-2\,\sqrt{2\,b\,k-b\,m}\,\sin\left(\frac{m\,\pi}{2}-i\,c\,\sqrt{z}-(2\,b\,k-b\,m)\,z\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}\;/;\,m\in\mathbb{N}^+$$

Involving $\sin^m(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.0628.01

$$\int \sin^m(e+d\,z)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0629.01

$$\int \sin^m(e+d\,z)\cosh\left(\sqrt{z}\;c\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\,\sqrt{2\,\pi}\;S\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\,\sqrt{2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+2\,i\,e\,k-i\,e\,m+i\,(2\,d\,k-d\,m)\,z-\frac{i\,m\,\pi}{2}\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$

$$\left(-i\,c\,\sqrt{2\,\pi}\,\cosh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$c\,\sqrt{2\,\pi}\;S\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\,\sqrt{2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c-2\,i\,e\,k+i\,e\,m-i\,(2\,d\,k-d\,m)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\;c\right)-c\,\sqrt{z}\;\sinh\left(\sqrt{z}\;c\right)\right)}{c^2}\ /;\ m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh(c\,z^r)$

01.20.21.0630.01

$$\int \sin^m(b\,z^r)\cosh(c\,z^r)\,dz == -\frac{(-1)^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r},\,-c\,z^r\right)(-c\,z^r)^{-1/r}+(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,z^r\right)\right)(1-m \bmod 2)}{r} -$$

$$\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+\right.$$

$$(-1)^m\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0631.01

$$\int \sin^m\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,(1-m \bmod 2)}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{m\,\pi}{2}\right)C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)+\right.\right.$$

$$\left.S\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin\left(\frac{m\,\pi}{2}\right)\right)+\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}$$

$$\left.\left(\cos\left(\frac{m\,\pi}{2}\right)C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)+S\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin\left(\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0632.01

$$\int \sin^m\left(\sqrt{z}\,b\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(-i\,c+b\,(2\,k-m))^2}\left(\cos\left(\sqrt{z}\,(-i\,c+b\,(2\,k-m))+\frac{m\,\pi}{2}\right)+(-i\,c+b\,(2\,k-m))\right.\right.$$

$$\left.\sqrt{z}\,\sin\left(\sqrt{z}\,(-i\,c+b\,(2\,k-m))+\frac{m\,\pi}{2}\right)\right)+\frac{1}{(i\,c+b\,(2\,k-m))^2}$$

$$\left.\left(\cos\left(\sqrt{z}\,(i\,c+b\,(2\,k-m))+\frac{m\,\pi}{2}\right)+(i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sin\left(\sqrt{z}\,(i\,c+b\,(2\,k-m))+\frac{m\,\pi}{2}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}\,/;\,m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+e)\cosh(c\,z^r)$

01.20.21.0633.01

$$\int \sin^m(b\,z^r+e)\cosh(c\,z^r)\,dz == -\frac{(-1)^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$

$$\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{1}{r},(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+\right.$$

$$(-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{-2\,i\,e\,k+i\,e\,m}\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-2\,i\,e\,k+i\,e\,m}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0634.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,(1-m \bmod 2)}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\,\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+$$

$$2^{-m-\frac{1}{2}}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{m\,\pi}{2}-e\,(2\,k-m)\right)C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)+\right.\right.$$

$$S\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin\left(\frac{m\,\pi}{2}-e\,(2\,k-m)\right)\Big)+\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right.$$

$$\left.\left.C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-S\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin\left(e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0635.01

$$\int \sin^m\left(\sqrt{z}\,b+e\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(-i\,c+b\,(2\,k-m))^2}\left(\cos\left(\sqrt{z}\,(-i\,c+b\,(2\,k-m))-e\,(m-2\,k)+\frac{m\,\pi}{2}\right)+\right.\right.$$

$$(-i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sin\left(\sqrt{z}\,(-i\,c+b\,(2\,k-m))-e\,(m-2\,k)+\frac{m\,\pi}{2}\right)\Big)+$$

$$\frac{1}{(i\,c+b\,(2\,k-m))^2}\left(\cos\left(-\sqrt{z}\,(i\,c+b\,(2\,k-m))+e\,(m-2\,k)-\frac{m\,\pi}{2}\right)-\right.$$

$$\left.\left.(i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sin\left(-\sqrt{z}\,(i\,c+b\,(2\,k-m))+e\,(m-2\,k)-\frac{m\,\pi}{2}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r\right)$

01.20.21.0636.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,\left(1-m \bmod 2\right)}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0637.01

$$\int \sin^m\left(\sqrt{z}\;b+d\,z\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\,\cos\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)\right.\right.$$
$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-(-i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}$$
$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)+$$
$$\left.2\,\sqrt{2\,d\,k-d\,m}\,\sin\left(-\frac{\pi\,m}{2}+(2\,d\,k-d\,m)\,z+(-i\,c+2\,b\,k-b\,m)\,\sqrt{z}\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$
$$\left((-i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\,\cos\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$
$$(i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}\,S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)-$$
$$\left.\left.2\,\sqrt{2\,d\,k-d\,m}\,\sin\left(\frac{\pi\,m}{2}-(2\,d\,k-d\,m)\,z-(i\,c+2\,b\,k-b\,m)\,\sqrt{z}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}\left(1-m \bmod 2\right)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}\Big/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

01.20.21.0638.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)(1-m \bmod 2)}{\sqrt{i\,c}} + 2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$
$$\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.$$
$$\left.\left.i\,S\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right) /;\ m\in\mathbb{N}^+$$

01.20.21.0639.01

$$\int \sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(c\,\sqrt{z}\,\right)dz ==$$
$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\,\cos\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$
$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}$$
$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+$$
$$\left.2\,\sqrt{2\,d\,k-d\,m}\,\sin\left(2\,e\,k-e\,m+(2\,d\,k-d\,m)\,z+(-i\,c+2\,b\,k-b\,m)\,\sqrt{z}\,-\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\,\cos\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}-2\,e\,k+e\,m+\frac{m\,\pi}{2}\right)\right.$$
$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-(i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}$$
$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}-2\,e\,k+e\,m+\frac{m\,\pi}{2}\right)-$$
$$\left.\left.2\,\sqrt{2\,d\,k-d\,m}\,\sin\left(-2\,e\,k+e\,m-(2\,d\,k-d\,m)\,z-(i\,c+2\,b\,k-b\,m)\,\sqrt{z}\,+\frac{m\,\pi}{2}\right)\right)\right)-$$
$$\frac{2^{1-m}\,\binom{m}{\frac{m}{2}}\,(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\,\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\,\right)\right)}{c^2} /;\ m\in\mathbb{N}^+$$

Involving $\sin^m(d\,z)\cosh(c\,z^r+g)$

01.20.21.0640.01

$$\int \sin^m(d\,z)\cosh\left(c\,z^2+g\right)dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}+i\,g+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}+i\,g+\frac{m\,\pi}{2}\right)\right)+\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g+\frac{i\,m\,\pi}{2}\right)\right.$$

$$\left.\left.C\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-i\,S\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0641.01

$$\int \sin^m(d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\,S\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g-\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{2\,d\,k-d\,m}\,\sinh\left(\sqrt{z}\,c+g+i\,(2\,d\,k-d\,m)\,z-\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\,\cosh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\,S\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\sqrt{2\,d\,k-d\,m}\,\sinh\left(\sqrt{z}\,c+g-i\,(2\,d\,k-d\,m)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\,c+g\right)-c\sqrt{z}\,\sinh\left(\sqrt{z}\,c+g\right)\right)}{c^2}/;\,m\in\mathbb{N}^+$$

Involving $\sin^m(d\,z+e)\cosh(c\,z^r+g)$

01.20.21.0642.01

$$\int \sin^m(e+d\,z)\cosh\left(c\,z^2+g\right)dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}-i\,g\,+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}-i\,g\,+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0643.01

$$\int \sin^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g\,+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-i\,c\sqrt{2\,\pi}\;S\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g\,+\right.$$

$$\left.2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)-2\,i\sqrt{2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+g+2\,i\,e\,k-i\,e\,m+i\,(2\,d\,k-d\,m)\,z-\frac{i\,m\,\pi}{2}\right)\Big)+$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\;\cosh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\;S\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\sqrt{2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+g-2\,i\,e\,k+i\,e\,m-i\,(2\,d\,k-d\,m)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\;c+g\right)-c\sqrt{z}\;\sinh\left(\sqrt{z}\;c+g\right)\right)}{c^2}\Big/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh(c\,z^r+g)$

01.20.21.0644.01

$$\int \sin^m(b\,z^r)\cosh(c\,z^r+g)\,dz == -\frac{1}{r}\left((-1)^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+e^{-g}\,(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)(1-m \bmod 2)\right)-$$

$$\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^g\,\Gamma\left(\frac{1}{r},(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+\right.$$

$$(-1)^m\,e^{-g}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^g\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-g}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0645.01

$$\int \sin^m\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(i\,g+\frac{m\,\pi}{2}\right)C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)+\right.\right.$$

$$\left.S\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin\left(i\,g+\frac{m\,\pi}{2}\right)\right)+\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}$$

$$\left.\left(\cosh\left(g+\frac{i\,m\,\pi}{2}\right)C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-i\,S\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh\left(g+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0646.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(i\,c+b\,(2\,k-m))^2}\left(\cos\left(i\,g+\frac{m\,\pi}{2}+(i\,c+b\,(2\,k-m))\sqrt{z}\right)+(i\,c+b\,(2\,k-m))\sqrt{z}\right.\right.$$

$$\left.\sin\left(i\,g+\frac{m\,\pi}{2}+(i\,c+b\,(2\,k-m))\sqrt{z}\right)\right)+\frac{1}{(-i\,c+b\,(2\,k-m))^2}\left(\cosh\left(g+i\,(-i\,c+b\,(2\,k-m))\sqrt{z}+\right.\right.$$

$$\left.\left.\left.\frac{i\,m\,\pi}{2}\right)-i\,(-i\,c+b\,(2\,k-m))\sqrt{z}\,\sinh\left(g+i\,(-i\,c+b\,(2\,k-m))\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\ c+g\right)-c\sqrt{z}\ \sinh\left(\sqrt{z}\ c+g\right)\right)}{c^2}/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+e)\cosh(c\,z^r+g)$

01.20.21.0647.01

$$\int \sin^m(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$
$$-\frac{1}{r}\left((-1)^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+e^{-g}\,(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)(1-m \bmod 2)\right)-$$
$$\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{g+2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{1}{r},(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+(-1)^m\right.$$
$$e^{-g+2\,i\,e\,k-i\,e\,m}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{g-2\,i\,e\,k+i\,e\,m}\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$
$$\left.\Gamma\left(\frac{1}{r},(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-g-2\,i\,e\,k+i\,e\,m}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0648.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz == \frac{2^{-m-\frac{1}{2}}\,\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+$$
$$2^{-m-\frac{1}{2}}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-\right.\right.$$
$$\left.S\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin\left(-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-\right.$$
$$\left.\left.i\,S\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh\left(g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0649.01

$$\int \sin^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$
$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(i\,c+b\,(2\,k-m))^2}\left(\cos\left(-i\,g+e\,(m-2\,k)-\frac{m\,\pi}{2}-(i\,c+b\,(2\,k-m))\,\sqrt{z}\right)-\right.\right.$$
$$(i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sin\left(-i\,g+e\,(m-2\,k)-\frac{m\,\pi}{2}-(i\,c+b\,(2\,k-m))\,\sqrt{z}\right)+$$
$$\frac{1}{(-i\,c+b\,(2\,k-m))^2}\left(\cosh\left(g-i\,e\,(m-2\,k)+i\,(-i\,c+b\,(2\,k-m))\,\sqrt{z}+\frac{i\,m\,\pi}{2}\right)-\right.$$
$$\left.\left.\left.i\,(-i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sinh\left(g-i\,e\,(m-2\,k)+i\,(-i\,c+b\,(2\,k-m))\,\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)-$$
$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\;c+g\right)-c\,\sqrt{z}\,\sinh\left(\sqrt{z}\;c+g\right)\right)}{c^2}\;/;\,m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r + d\,z)\cosh(c\,z^r + g)$

01.20.21.0650.01

$$\int \sin^m(b\,z^2 + d\,z)\cosh(c\,z^2 + g)\,dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right) - S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)}{\sqrt{i\,c}} + 2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-i\,c + 2\,b\,k - b\,m}}\left(\cos\left(\frac{(2\,d\,k - d\,m)^2}{4\,(-i\,c + 2\,b\,k - b\,m)} + i\,g + \frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k - d\,m + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right) + \right.\right.$$

$$\left.S\left(\frac{2\,d\,k - d\,m + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,d\,k - d\,m)^2}{4\,(-i\,c + 2\,b\,k - b\,m)} + i\,g + \frac{m\,\pi}{2}\right)\right) +$$

$$\frac{1}{\sqrt{i\,c + 2\,b\,k - b\,m}}\left(\cosh\left(\frac{i\,(2\,d\,k - d\,m)^2}{4\,(i\,c + 2\,b\,k - b\,m)} + g + \frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,d\,k - d\,m + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right) - \right.$$

$$\left.\left.i\,S\left(\frac{2\,d\,k - d\,m + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\,d\,k - d\,m)^2}{4\,(i\,c + 2\,b\,k - b\,m)} + g + \frac{i\,m\,\pi}{2}\right)\right)\right) /;\, m \in \mathbb{N}^+$$

01.20.21.0651.01

$$\int \sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+i\,g+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+i\,g+\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{2\,d\,k-d\,m}\ \sinh\left(g+i\,(2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$

$$\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+\right.$$

$$i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\sqrt{2\,d\,k-d\,m}\ \sinh\left(g-i\,(2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(\cosh\left(\sqrt{z}\ c+g\right)-c\sqrt{z}\ \sinh\left(\sqrt{z}\ c+g\right)\right)}{c^2}\ /;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0652.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+g\right)dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)}{\sqrt{i\,c}}+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)$$

$$\left.\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}$$

$$\left(\cosh\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0653.01

$$\int \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}-i\,g\ +2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$
$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$
$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}-i\,g\ +2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)-$$
$$\left.2\,i\sqrt{2\,d\,k-d\,m}\ \sinh\left(g+2\,i\,e\,k-i\,e\,m+i\,(2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)+$$
$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)\right.$$
$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$
$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)+$$
$$\left.\left.2\,i\sqrt{2\,d\,k-d\,m}\ \sinh\left(g-2\,i\,e\,k+i\,e\,m-i\,(2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)\right)-$$
$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(\cosh\left(\sqrt{z}\ c+g\right)-c\sqrt{z}\ \sinh\left(\sqrt{z}\ c+g\right)\right)}{c^2}\ /;\ m\in\mathbb{N}^+$$

Involving $\sin^m(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0654.01

$$\int \sin^m(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}\right)\right)}{\sqrt{i\,c}}+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$
$$\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sin\left(\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+\frac{m\,\pi}{2}\right)\right)+\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+\frac{i\,m\,\pi}{2}\right)\right.$$
$$\left.\left.C\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0655.01

$$\int \sin^m(d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\;i\sinh\left(\sqrt{z}\;c+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\;S\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+i\,(-i\,f+2\,d\,k-d\,m)\,z-\frac{i\,m\,\pi}{2}\right)\right)+\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}$$

$$\left(-i\,c\sqrt{2\,\pi}\;\cosh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\;S\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c-i\,(i\,f+2\,d\,k-d\,m)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sin^m(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0656.01

$$\int \sin^m(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4c}\right)C\left(\frac{f+2cz}{\sqrt{ic}\ \sqrt{2\pi}}\right)+S\left(\frac{f+2cz}{\sqrt{ic}\ \sqrt{2\pi}}\right)\sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}}+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-ic}}\left(\cos\left(-\frac{i(-if+2dk-dm)^2}{4c}+e(2k-m)-\frac{m\pi}{2}\right)C\left(\frac{-if+2dk-dm-2icz}{\sqrt{-ic}\ \sqrt{2\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-if+2dk-dm-2icz}{\sqrt{-ic}\ \sqrt{2\pi}}\right)\sin\left(-\frac{i(-if+2dk-dm)^2}{4c}+e(2k-m)-\frac{m\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{ic}}\left(\cosh\left(\frac{(if+2dk-dm)^2}{4c}-ie(2k-m)+\frac{im\pi}{2}\right)C\left(\frac{if+2dk-dm+2icz}{\sqrt{ic}\ \sqrt{2\pi}}\right)-\right.$$

$$\left.\left.iS\left(\frac{if+2dk-dm+2icz}{\sqrt{ic}\ \sqrt{2\pi}}\right)\sinh\left(\frac{(if+2dk-dm)^2}{4c}-ie(2k-m)+\frac{im\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0657.01

$$\int \sin^m(e+d\,z)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{1}{(if)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\pi}\left(\cosh\left(\frac{c^2}{4f}\right)C\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\ \sqrt{2\pi}}\right)-iS\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\ \sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4f}\right)\right)+\right.\right.$$

$$\left.2\sqrt{if}\ i\sinh\left(\sqrt{z}\ c+fz\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-if+2dk-dm)^{3/2}}\right.$$

$$\left(ci\sqrt{2\pi}\ \cos\left(\frac{c^2}{4(-if+2dk-dm)}+2ek-em-\frac{m\pi}{2}\right)C\left(\frac{-ic+2(-if+2dk-dm)\sqrt{z}}{\sqrt{-if+2dk-dm}\ \sqrt{2\pi}}\right)-\right.$$

$$ic\sqrt{2\pi}\ S\left(\frac{-ic+2(-if+2dk-dm)\sqrt{z}}{\sqrt{-if+2dk-dm}\ \sqrt{2\pi}}\right)\sin\left(\frac{c^2}{4(-if+2dk-dm)}+2ek-em-\frac{m\pi}{2}\right)-2i$$

$$\left.\sqrt{-if+2dk-dm}\ \sinh\left(\sqrt{z}\ c+2iek-iem+i(-if+2dk-dm)z-\frac{im\pi}{2}\right)\right)+\frac{1}{(if+2dk-dm)^{3/2}}$$

$$\left(-ic\sqrt{2\pi}\ \cosh\left(-\frac{ic^2}{4(if+2dk-dm)}-2iek+iem+\frac{im\pi}{2}\right)C\left(\frac{ic+2(if+2dk-dm)\sqrt{z}}{\sqrt{if+2dk-dm}\ \sqrt{2\pi}}\right)-\right.$$

$$c\sqrt{2\pi}\ S\left(\frac{ic+2(if+2dk-dm)\sqrt{z}}{\sqrt{if+2dk-dm}\ \sqrt{2\pi}}\right)\sinh\left(-\frac{ic^2}{4(if+2dk-dm)}-2iek+iem+\frac{im\pi}{2}\right)+$$

$$\left.\left.2i\sqrt{if+2dk-dm}\ \sinh\left(\sqrt{z}\ c-2iek+iem-i(if+2dk-dm)z+\frac{im\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh(c\,z^r+f\,z)$

01.20.21.0658.01

$$\int \sin^m(b\,z^2)\cosh(c\,z^2+f\,z)\,dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4c}\right)C\left(\frac{f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right)+S\left(\frac{f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right)\sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}}+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-ic+2bk-bm}}\left(\cos\left(\frac{f^2}{4(-ic+2bk-bm)}-\frac{m\pi}{2}\right)\right.\right.$$

$$\left.C\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\,\sqrt{2\pi}}\right)-S\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\,\sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4(-ic+2bk-bm)}-\frac{m\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{ic+2bk-bm}}\left(\cosh\left(-\frac{if^2}{4(ic+2bk-bm)}+\frac{im\pi}{2}\right)C\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\,\sqrt{2\pi}}\right)-\right.$$

$$\left.\left.iS\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\,\sqrt{2\pi}}\right)\sinh\left(-\frac{if^2}{4(ic+2bk-bm)}+\frac{im\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0659.01

$$\int \sin^m(b\sqrt{z})\cosh(\sqrt{z}\,c+f\,z)\,dz == \frac{1}{(if)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\pi}\left(\cosh\left(\frac{c^2}{4f}\right)C\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)-iS\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4f}\right)\right)+2\sqrt{if}\;i\sinh(\sqrt{z}\,c+fz)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-if)^{3/2}}\left((ic-2bk+bm)\sqrt{2\pi}\,\cos\left(\frac{i(-ic+2bk-bm)^2}{4f}+\frac{m\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\,\sqrt{2\pi}}\right)-(-ic+2bk-bm)\sqrt{2\pi}\,S\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\,\sqrt{2\pi}}\right)$$

$$\left.\sin\left(\frac{i(-ic+2bk-bm)^2}{4f}+\frac{m\pi}{2}\right)-2i\sqrt{-if}\,\sinh\left(fz+i(-ic+2bk-bm)\sqrt{z}-\frac{im\pi}{2}\right)\right)+\frac{1}{(if)^{3/2}}$$

$$\left((-ic-2bk+bm)\sqrt{2\pi}\,\cosh\left(\frac{(ic+2bk-bm)^2}{4f}+\frac{im\pi}{2}\right)C\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)+\right.$$

$$i(ic+2bk-bm)\sqrt{2\pi}\,S\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(ic+2bk-bm)^2}{4f}+\frac{im\pi}{2}\right)+$$

$$\left.\left.2\sqrt{if}\;i\sinh\left(fz-i(ic+2bk-bm)\sqrt{z}+\frac{im\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+e)\cosh(c\,z^r+f\,z)$

01.20.21.0660.01

$$\int \sin^m(b\,z^2+e)\cosh(c\,z^2+f\,z)\,dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4c}\right)C\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)+S\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)\sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}}+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-ic+2bk-bm}}\left(\cos\left(\frac{f^2}{4(-ic+2bk-bm)}+e(2k-m)-\frac{m\pi}{2}\right)C\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4(-ic+2bk-bm)}+e(2k-m)-\frac{m\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{ic+2bk-bm}}\left(\cosh\left(-\frac{if^2}{4(ic+2bk-bm)}-ie(2k-m)+\frac{im\pi}{2}\right)C\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)-\right.$$

$$\left.\left.iS\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)\sinh\left(-\frac{if^2}{4(ic+2bk-bm)}-ie(2k-m)+\frac{im\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0661.01

$$\int \sin^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+2\sqrt{i\,f}\ \ i\sinh\left(\sqrt{z}\ c+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+$$

$$\left.2\sqrt{-i\,f}\ \sin\left(2\,e\,k-e\,m-i\,f\,z+(-i\,c+2\,b\,k-b\,m)\sqrt{z}\ -\frac{m\,\pi}{2}\right)\right)+\frac{1}{(i\,f)^{3/2}}$$

$$\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)+\right.$$

$$i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}-2\,i\,e\,k+i\,e\,m+\right.$$

$$\left.\left.\left.\frac{i\,m\,\pi}{2}\right)+2\sqrt{i\,f}\ \ i\sinh\left(-2\,e\,i\,k+i\,e\,m+f\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0662.01

$$\int \sin^m\left(b z^2 + d z\right) \cosh\left(c z^2 + f z\right) dz ==$$

$$\frac{2^{-m-\frac{1}{2}} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \left(i \cosh\left(\frac{f^2}{4c}\right) C\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right) + S\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right) \sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}} + 2^{-m-\frac{1}{2}} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{k+m} \binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-ic+2bk-bm}} \left(\cos\left(\frac{(-if+2dk-dm)^2}{4(-ic+2bk-bm)} + \frac{m\pi}{2}\right) C\left(\frac{-if+2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right) + S\left(\frac{-if+2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right) \sin\left(\frac{(-if+2dk-dm)^2}{4(-ic+2bk-bm)} + \frac{m\pi}{2}\right)\right) + \frac{1}{\sqrt{ic+2bk-bm}} \left(\cos\left(\frac{(if+2dk-dm)^2}{4(ic+2bk-bm)} + \frac{m\pi}{2}\right) C\left(\frac{if+2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right) + S\left(\frac{if+2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right) \sin\left(\frac{(if+2dk-dm)^2}{4(ic+2bk-bm)} + \frac{m\pi}{2}\right)\right)\right) /; m \in \mathbb{N}^+$$

01.20.21.0663.01

$$\int \sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)-$$

$$\left.2\sqrt{i\,f+2\,d\,k-d\,m}\ \sin\left(\frac{\pi\,m}{2}-(i\,f+2\,d\,k-d\,m)\,z-(i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+\frac{m\,\pi}{2}\right)+$$

$$\left.\left.2\sqrt{-i\,f+2\,d\,k-d\,m}\ \sin\left(-\frac{1}{2}\pi\,m+(-i\,f+2\,d\,k-d\,m)\,z+(-i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0664.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4c}\right)C\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)+S\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)\sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}}+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{ic+2bk-bm}}\left(\cos\left(\frac{(if+2dk-dm)^2}{4(ic+2bk-bm)}-e(2k-m)+\frac{m\pi}{2}\right)\right.\right.$$
$$C\left(\frac{if+2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)+S\left(\frac{if+2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)$$
$$\left.\sin\left(\frac{(if+2dk-dm)^2}{4(ic+2bk-bm)}-e(2k-m)+\frac{m\pi}{2}\right)\right)+\frac{1}{\sqrt{-ic+2bk-bm}}$$
$$\left(\cos\left(-\frac{(-if+2dk-dm)^2}{4(-ic+2bk-bm)}+e(2k-m)-\frac{m\pi}{2}\right)C\left(\frac{-if+2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)-\right.$$
$$\left.\left.S\left(\frac{-if+2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)\sin\left(-\frac{(-if+2dk-dm)^2}{4(-ic+2bk-bm)}+e(2k-m)-\frac{m\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0665.01

$$\int \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\,\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\,\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+f\,z\right)\right)+2^{-m-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+$$

$$\left.2\sqrt{-i\,f+2\,d\,k-d\,m}\ \sin\left(2\,e\,k-e\,m+(-i\,f+2\,d\,k-d\,m)\,z+(-i\,c+2\,b\,k-b\,m)\sqrt{z}-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}-2\,e\,k+e\,m+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}-2\,e\,k+e\,m+\frac{m\,\pi}{2}\right)-$$

$$\left.\left.2\sqrt{i\,f+2\,d\,k-d\,m}\ \sin\left(-2\,e\,k+e\,m-(i\,f+2\,d\,k-d\,m)\,z-(i\,c+2\,b\,k-b\,m)\sqrt{z}+\frac{m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0666.01

$$\int \sin^m(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+i\,g+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+i\,g+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0667.01

$$\int \sin^m(d\,z)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\ S\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g-\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\ \sinh\left(\sqrt{z}\ c+g+i\,(-i\,f+2\,d\,k-d\,m)\,z-\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\ \cosh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\ \sinh\left(\sqrt{z}\ c+g-i\,(i\,f+2\,d\,k-d\,m)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0668.01

$$\int \sin^m(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(-\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0669.01

$$\int \sin^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+2\sqrt{i\,f}\;i\sinh\left(\sqrt{z}\;c+g+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)-i\,c\sqrt{2\,\pi}\;S\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)$$

$$\sin\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)-2\,i\sqrt{-i\,f+2\,d\,k-d\,m}$$

$$\left.\sinh\left(\sqrt{z}\;c+g+2\,i\,e\,k-i\,e\,m+i\,(-i\,f+2\,d\,k-d\,m)\,z-\frac{i\,m\,\pi}{2}\right)\right)+\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}$$

$$\left(-i\,c\sqrt{2\,\pi}\;\cosh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\;S\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+g-2\,i\,e\,k+i\,e\,m-i\,(i\,f+2\,d\,k-d\,m)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh(c\,z^r+f\,z+g)$

01.20.21.0670.01

$$\int \sin^m\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{f^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(-\frac{i\,f^2}{4\,(i\,c+2\,b\,k-b\,m)}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,f+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,f^2}{4\,(i\,c+2\,b\,k-b\,m)}+g+\frac{i\,m\,\pi}{2}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0671.01

$$\int \sin^m\left(b\,\sqrt{z}\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\,\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\,\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\,\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+\right.\right.$$

$$\left.\left.2\,\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\left(\frac{1}{(-i\,f)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\ \cos\left(\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}+i\,g+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$(-i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}\ S\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}+i\,g+\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\,\sqrt{-i\,f}\ \sinh\left(g+f\,z+i\,(-i\,c+2\,b\,k-b\,m)\,\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(i\,f)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\ \cosh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\,\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)+\right.$$

$$i\,(i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\,\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}+g+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,\sqrt{i\,f}\ i\sinh\left(g+f\,z-i\,(i\,c+2\,b\,k-b\,m)\,\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.0672.01

$$\int \sin^m(b\,z^2+e)\cosh(c\,z^2+f\,z+g)\,dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{f^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g\ +e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g\ +e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(-\frac{i\,f^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,f+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,f^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0673.01

$$\int \sin^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+2\sqrt{i\,f}\ \ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}-i\,g\ +2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}-i\,g\ +2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{-i\,f}\ \sinh\left(g+2\,i\,e\,k-i\,e\,m+f\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(i\,f)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)\right.$$

$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)+i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\sqrt{i\,f}\ \ i\sinh\left(g-2\,i\,e\,k+i\,e\,m+f\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0674.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+i\,g+\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+i\,g+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g+\frac{i\,m\,\pi}{2}\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0675.01

$$\int \sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+i\,g+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+i\,g+\frac{m\,\pi}{2}\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\ \sinh\left(g+i\,(-i\,f+2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)\right.$$

$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g+\frac{i\,m\,\pi}{2}\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\ \sinh\left(g-i\,(i\,f+2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0676.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\right.$$

$$\left(\cos\left(-\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.S\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right.$$

$$C\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)$$

$$\left.\left.\sinh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0677.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,i\,b\,k+i\,b\,m}\left(e^{-\frac{(f+2\,i\,d\,k-i\,d\,m)^2}{4\,c+8\,i\,b\,k-4\,i\,b\,m}+g-2\,i\,e\,m+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\right.\right.$$

$$\left(e^{2\left(\frac{(f+2\,i\,d\,k-i\,d\,m)^2}{4\,c+8\,i\,b\,k-4\,i\,b\,m}-g+i\,e\,m\right)}\sqrt{-c-2\,i\,b\,k+i\,b\,m}\ \operatorname{erfi}\left(\frac{-f-2\,c\,z-2\,k\,(i\,d+2\,i\,b\,z)+m\,(i\,d+2\,i\,b\,z)}{2\sqrt{-c-2\,i\,b\,k+i\,b\,m}}\right)-\right.$$

$$\left.\left.e^{4\,i\,e\,k+i\,m\,\pi}\sqrt{c+2\,i\,b\,k-i\,b\,m}\ \operatorname{erfi}\left(\frac{f+2\,c\,z+2\,k\,(i\,d+2\,i\,b\,z)-m\,(i\,d+2\,i\,b\,z)}{2\sqrt{c+2\,i\,b\,k-i\,b\,m}}\right)\right)\right)+$$

$$\frac{e^{\frac{(f-2\,i\,d\,k+i\,d\,m)^2}{-4\,c+8\,i\,b\,k-4\,i\,b\,m}+g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\operatorname{erfi}\left(\frac{f+2\,c\,z-2\,k\,(i\,d+2\,i\,b\,z)+m\,(i\,d+2\,i\,b\,z)}{2\sqrt{c+b\,i\,(m-2\,k)}}\right)}{\sqrt{c+b\,i\,(m-2\,k)}}-\frac{1}{c+b\,i\,(m-2\,k)}$$

$$\left.\left.\left(e^{-\frac{(f-2\,i\,d\,k+i\,d\,m)^2}{-4\,c+8\,i\,b\,k-4\,i\,b\,m}-g+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\sqrt{-c+2\,i\,b\,k-i\,b\,m}\ \operatorname{erfi}\left(\frac{-f-2\,c\,z+2\,k\,(i\,d+2\,i\,b\,z)-m\,(i\,d+2\,i\,b\,z)}{2\sqrt{-c+2\,i\,b\,k-i\,b\,m}}\right)\right)\right)-\right.$$

$$\frac{1}{c}\left(2^{-m-2}\,e^{-\frac{f^2+4\,c\,g}{4\,c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\ e^{\frac{f^2}{2\,c}}\operatorname{erfi}\left(\frac{\sqrt{-c}\ (f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\ e^{2\,g}\operatorname{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m\bmod 2)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0678.01

$$\int \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(\right.\right.\right.$$

$$\left.-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\ +2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+$$

$$(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)$$

$$\sin\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\ +2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)-2\,i\sqrt{-i\,f+2\,d\,k-d\,m}$$

$$\left.\sinh\left(g+2\,i\,e\,k-i\,e\,m+i\,(-i\,f+2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)\right.$$

$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+$$

$$i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)$$

$$\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m+\frac{i\,m\,\pi}{2}\right)+2\,i\sqrt{i\,f+2\,d\,k-d\,m}$$

$$\left.\left.\sinh\left(g-2\,i\,e\,k+i\,e\,m-i\,(i\,f+2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0679.01

$$\int \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g-i\,e\,(2k-m)-\frac{i\,m\,\pi}{2}}\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,i\,(2k-m))+2\,(g+e\,i\,(2k-m))+(f+d\,i\,(2k-m))\,z}}{f+d\,i\,(2k-m)}-\right.\right.$$

$$\frac{1}{(f+d\,i\,(2k-m))^{3/2}}\left((-1)^m\,e^{2\,(g+e\,i\,(2k-m))-\frac{(c+b\,i\,(2k-m))^2}{4\,(f+d\,i\,(2k-m))}}\,(c+b\,i\,(2k-m))\,\sqrt{\pi}\right.$$

$$\left.\operatorname{erfi}\left(\frac{c+b\,i\,(2k-m)+2\,(f+d\,i\,(2k-m))\,\sqrt{z}}{2\,\sqrt{f+d\,i\,(2k-m)}}\right)\right)+\frac{2\,e^{\sqrt{z}\ (-c-i\,b\,(2k-m))+(i\,d\,(m-2k)-f)\,z}}{i\,d\,(m-2k)-f}-$$

$$\left.\left(e^{-\frac{(-c-i\,b\,(2k-m))^2}{4\,(i\,d\,(m-2k)-f)}}\,(c+b\,i\,(2k-m))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,i\,(2k-m)+2\,(f+d\,i\,(2k-m))\,\sqrt{z}}{2\,\sqrt{i\,d\,(m-2k)-f}}\right)\right)\Big/$$

$$(i\,d\,(m-2k)-f)^{3/2}\Bigg)+e^{-g-i\,e\,(m-2k)+\frac{i\,m\,\pi}{2}}\left(\frac{2\,e^{\sqrt{z}\ (-c-i\,b\,(m-2k))+(i\,d\,(2k-m)-f)\,z}}{i\,d\,(2k-m)-f}-\right.$$

$$\left.\left(e^{-\frac{(-c-i\,b\,(m-2k))^2}{4\,(i\,d\,(2k-m)-f)}}\,(c+b\,i\,(m-2k))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,i\,(m-2k)+2\,(f+d\,i\,(m-2k))\,\sqrt{z}}{2\,\sqrt{i\,d\,(2k-m)-f}}\right)\right)\Big/$$

$$(i\,d\,(2k-m)-f)^{3/2}+\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,i\,(m-2k))+2\,(g+e\,i\,(m-2k))+(f+d\,i\,(m-2k))\,z}}{f+d\,i\,(m-2k)}-\frac{1}{(f+d\,i\,(m-2k))^{3/2}}\left((-1)^m\right.$$

$$\left.\left.\left.e^{2\,(g+e\,i\,(m-2k))-\frac{(c+b\,i\,(m-2k))^2}{4\,(f+d\,i\,(m-2k))}}\,(c+b\,i\,(m-2k))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,i\,(m-2k)+2\,(f+d\,i\,(m-2k))\,\sqrt{z}}{2\,\sqrt{f+d\,i\,(m-2k)}}\right)\right)\right)\right)-$$

$$2^{-m-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4\,f}}\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2\,f\,\sqrt{z}}{2\,\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{2\,g-\frac{c^2}{4\,f}}\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2\,f\,\sqrt{z}}{2\,\sqrt{f}}\right)}{f^{3/2}}-\frac{4\,e^g\sinh\left(\sqrt{z}\ c+g+f\,z\right)}{f}\right)$$

$$(1-m \bmod 2)\ /;\ m\in\mathbb{N}^+$$

Involving products of sin

Involving $\sin(a\,z)\sin(b\,z)\cosh(c\,z)$

01.20.21.0680.01

$$\int \sin(a\,z)\sin(b\,z)\cosh(c\,z)\,dz ==$$

$$\frac{1}{2}\left(\frac{(a-b)\cosh(c\,z)\sin((a-b)\,z)+c\cos((a-b)\,z)\sinh(c\,z)}{a^2-2\,b\,a+b^2+c^2}-\frac{(a+b)\cosh(c\,z)\sin((a+b)\,z)+c\cos((a+b)\,z)\sinh(c\,z)}{a^2+2\,b\,a+b^2+c^2}\right)$$

Involving rational functions of sin

Involving $\frac{\cosh(c\,z)}{a+b\sin(d\,z)}$

01.20.21.0681.01

$$\int \frac{\cosh(c\,z)}{a+b\sin(d\,z)}\,dz == \frac{i\,e^{i\,d\,z-c\,z}}{2\,b\,\sqrt{a^2-b^2}}\left(\frac{1}{c-i\,d}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1+\frac{i\,c}{d},\,1;\,2+\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1+\frac{i\,c}{d},\,1;\,2+\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-\frac{1}{c+i\,d}\,e^{2\,c\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{i\,c}{d},\,1;\,2-\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1-\frac{i\,c}{d},\,1;\,2-\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

Involving $(a+b\sin(d\,z))^{-n}\cosh(c\,z)$

01.20.21.0682.01

$$\int \frac{\cosh(c\,z)}{(a+b\sin(d\,z))^2}\,dz == \frac{1}{2\,b\left(a^2-b^2\right)^{3/2}}$$

$$\left(i\left(\frac{1}{c-i\,d}\left(e^{i\,d\,z-c\,z}\left(-{}_2F_1\left(1+\frac{i\,c}{d},\,2;\,2+\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)a^2+{}_2F_1\left(1+\frac{i\,c}{d},\,2;\,2+\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)a^2+\right.\right.\right.$$

$$\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1+\frac{i\,c}{d},\,1;\,2+\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)a+$$

$$\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(1+\frac{i\,c}{d},\,1;\,2+\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)a-\sqrt{a^2-b^2}$$

$${}_2F_1\left(1+\frac{i\,c}{d},\,2;\,2+\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)a-\sqrt{a^2-b^2}\;{}_2F_1\left(1+\frac{i\,c}{d},\,2;\,2+\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)a+$$

$$\left.\left.\left.b^2\,{}_2F_1\left(1+\frac{i\,c}{d},\,2;\,2+\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)-b^2\,{}_2F_1\left(1+\frac{i\,c}{d},\,2;\,2+\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$

$$\frac{1}{c+i\,d}\left(e^{(c+i\,d)\,z}\left({}_2F_1\left(1-\frac{i\,c}{d},\,2;\,2-\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)a^2-{}_2F_1\left(1-\frac{i\,c}{d},\,2;\,2-\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)a^2+\right.\right.$$

$$\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{i\,c}{d},\,1;\,2-\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)a+\sqrt{a^2-b^2}$$

$${}_2F_1\left(1-\frac{i\,c}{d},\,2;\,2-\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)a+\sqrt{a^2-b^2}\;{}_2F_1\left(1-\frac{i\,c}{d},\,2;\,2-\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)a-$$

$$a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{i\,c}{d},\,1;\,2-\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)-$$

$$\left.\left.\left.\left.\left.b^2\,{}_2F_1\left(1-\frac{i\,c}{d},\,2;\,2-\frac{i\,c}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+b^2\,{}_2F_1\left(1-\frac{i\,c}{d},\,2;\,2-\frac{i\,c}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)\right)$$

Involving $\frac{\cosh(c\,z)}{a+b\sin^2(d\,z)}$

01.20.21.0683.01

$$\int \frac{\cosh(c\,z)}{a+b\sin^2(d\,z)}\,dz ==$$
$$\frac{1}{2\sqrt{a}\;b\sqrt{a+b}}\left(\frac{1}{c+2\,i\,d}\left(e^{-(c+2\,i\,d)\,z}\left(\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},\,1;\,2-\frac{i\,c}{2\,d};\,\frac{b\,e^{-2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},\,1;\,2-\frac{i\,c}{2\,d};\,\frac{b\,e^{-2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-$$
$$\frac{1}{c-2\,i\,d}\left(e^{(c-2\,i\,d)\,z}\left(\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},\,1;\,2+\frac{i\,c}{2\,d};\,\frac{b\,e^{-2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left.\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},\,1;\,2+\frac{i\,c}{2\,d};\,\frac{b\,e^{-2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)$$

Involving $\left(a+b\sin^2(d\,z)\right)^{-n}$ $\cosh(c\,z)$

01.20.21.0684.01

$$\int \frac{\cosh(c\,z)}{\left(a+b\sin^2(d\,z)\right)^2}\,dz == \frac{1}{4\,a^{3/2}\,b\,(a+b)^{3/2}}$$
$$\left(-\frac{1}{2\,i\,d-c}\left(e^{2\,i\,d\,z-c\,z}\left((2\,a+b)\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},\,1;\,2+\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.\right.$$
$$(2\,a+b)\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},\,1;\,2+\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+$$
$$2\sqrt{a}\left(\left(2\,a^{3/2}-2\sqrt{a+b}\;a+2\,b\sqrt{a}\;-b\sqrt{a+b}\right){}_2F_1\left(1+\frac{i\,c}{2\,d},\,2;\,2+\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)-\right.$$
$$\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\;a+2\,b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{i\,c}{2\,d},\,2;\,2+\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)-$$
$$\frac{1}{c+2\,i\,d}\left(e^{(c+2\,i\,d)\,z}\left((2\,a+b)\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},\,1;\,2-\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$(2\,a+b)\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},\,1;\,2-\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+$$
$$2\sqrt{a}\left(\left(2\,a^{3/2}-2\sqrt{a+b}\;a+2\,b\sqrt{a}\;-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,c}{2\,d},\,2;\,2-\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)-\right.$$
$$\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\;a+2\,b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,c}{2\,d},\,2;\,2-\frac{i\,c}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)$$

Involving $\frac{\sin(e\,z)\cosh(c\,z)}{a+b\sin(d\,z)}$

01.20.21.0685.01

$$\int \frac{\sin(e\,z)\cosh(c\,z)}{a+b\sin(d\,z)}\,dz ==$$
$$-\frac{1}{4}i\left(\frac{1}{b\sqrt{a^2-b^2}\,(-c-i\,e+i\,d)}\left(i\,e^{(-c-i\,e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(-c-i\,e)}{d};\right.\right.\right.\right.$$
$$\left.\left.\left.\left.-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(-c-i\,e)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-i\,e+i\,d)}\left(i\,e^{(c-i\,e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\frac{1}{b\sqrt{a^2-b^2}\,(-c+i\,d+i\,e)}$$
$$\left(i\,e^{(-c+i\,d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+i\,d+i\,e)}\left(i\,e^{(c+i\,d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(c+i\,e)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(c+i\,e)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\sin(e\,z)\cosh(c\,z)\,(a+b\sin(d\,z))^{-n}$

01.20.21.0686.01

$$\int \frac{\sin(e\,z)\cosh(c\,z)}{(a+b\sin(d\,z))^2}\,dz ==$$
$$-\frac{1}{4}i\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(-c+i\,d+i\,e)}\left(i\,e^{(-c+i\,d+i\,e)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\right.\right.\right.\right.$$
$$\left.\left.\left.\left.-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.$$
$$\left.\left.\left(a^2+\sqrt{a^2-b^2}\,a-b^2\right){}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,2;\,2-\frac{i\,(i\,e-c)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(-c+i\,d\,+i\,e\,)}{d},\,2;\,2-\frac{i\,(i\,e-c)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+i\,d\,+i\,e\,)}\Bigg(i\,e^{(c+i\,d\,+i\,e\,)\,z}\Bigg(-a\left(a+\sqrt{a^2-b^2}\,\right){}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,)}{d},\,1;\,2-\frac{i\,(c+i\,e\,)}{d};\right.$$

$$\left.-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+a\left(a-\sqrt{a^2-b^2}\,\right){}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,)}{d},\,1;\,2-\frac{i\,(c+i\,e\,)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,)}{d},\,2;\,2-\frac{i\,(c+i\,e\,)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+$$

$$\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,)}{d},\,2;\,2-\frac{i\,(c+i\,e\,)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(-c-i\,e+i\,d\,)}\Bigg(i\,e^{(-c-i\,e+i\,d\,)\,z}\Bigg(-a\left(a+\sqrt{a^2-b^2}\,\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,)}{d},\,1;\,2-\frac{i\,(-c-i\,e)}{d};\right.$$

$$\left.-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+a\left(a-\sqrt{a^2-b^2}\,\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,)}{d},\,1;\,2-\frac{i\,(-c-i\,e)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,)}{d},\,2;\,2-\frac{i\,(-c-i\,e)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+$$

$$\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,)}{d},\,2;\,2-\frac{i\,(-c-i\,e)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-i\,e+i\,d\,)}\Bigg(i\,e^{(c-i\,e+i\,d\,)\,z}\Bigg(-a\left(a+\sqrt{a^2-b^2}\,\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\right.$$

$$\left.-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+a\left(a-\sqrt{a^2-b^2}\,\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,)}{d},\,2;\,2-\frac{i\,(c-i\,e)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+$$

$$\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,)}{d},\,2;\,2-\frac{i\,(c-i\,e)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\sin(e\,z)\cosh(c\,z)}{a+b\sin^2(d\,z)}$

01.20.21.0687.01

$$\int \frac{\sin(e\,z)\cosh(c\,z)}{a+b\sin^2(d\,z)}\,dz ==$$
$$-\frac{1}{4}i\left(\left(e^{(-c-2id-ie)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1+\frac{i(-c-ie)}{2d},1;2+\frac{i(-c-ie)}{2d};-\frac{be^{-2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1+\frac{i(-c-ie)}{2d},1;2+\frac{i(-c-ie)}{2d};-\frac{be^{-2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-c-2id-ie)\right)+\frac{1}{\sqrt{a}\,b\sqrt{a+b}\,(c-2id-ie)}$$
$$\left(e^{(c-2id-ie)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1+\frac{i(c-ie)}{2d},1;2+\frac{i(c-ie)}{2d};-\frac{be^{-2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$\left.\left.\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1+\frac{i(c-ie)}{2d},1;2+\frac{i(c-ie)}{2d};-\frac{be^{-2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)-$$
$$\left(e^{(-c-2id+ie)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1+\frac{i(ie-c)}{2d},1;2+\frac{i(ie-c)}{2d};-\frac{be^{-2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$\left.\left.\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1+\frac{i(ie-c)}{2d},1;2+\frac{i(ie-c)}{2d};-\frac{be^{-2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-c-2id+ie)\right)-\frac{1}{\sqrt{a}\,b\sqrt{a+b}\,(c-2id+ie)}$$
$$\left(e^{(c-2id+ie)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1+\frac{i(c+ie)}{2d},1;2+\frac{i(c+ie)}{2d};-\frac{be^{-2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$\left.\left.\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1+\frac{i(c+ie)}{2d},1;2+\frac{i(c+ie)}{2d};-\frac{be^{-2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)$$

Involving $\sin(e\,z)\cosh(c\,z)\left(a+b\sin^2(d\,z)\right)^{-n}$

01.20.21.0688.01

$$\int \frac{\sin(e\,z)\cosh(c\,z)}{\left(a+b\sin^2(d\,z)\right)^2}\,dz == -\frac{1}{4}i$$
$$\left(\left(e^{(-c-ie+2id)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-c-ie)}{2d},1;2-\frac{i(-c-ie)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-c-ie)}{2d},1;2-\frac{i(-c-ie)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-c-ie)}{2d},2;2-\frac{i(-c-ie)}{2d};\right.\right.$$
$$\left.\left.-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-c-ie)}{2d},\right.\right.$$

$$2;2-\frac{i(-c-ie)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-c-ie+2id)\right)+$$
$$\Bigg(e^{(c-ie+2id)z}\Bigg((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(c-ie)}{2d},1;2-\frac{i(c-ie)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(c-ie)}{2d},1;2-\frac{i(c-ie)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\Bigg(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c-ie)}{2d},2;2-\frac{i(c-ie)}{2d};\right.$$
$$\left.-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c-ie)}{2d},\right.$$
$$\left.2;2-\frac{i(c-ie)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\Bigg)\Bigg)\Bigg)\Big/\left(2a^{3/2}b(a+b)^{3/2}(c-ie+2id)\right)-$$
$$\Bigg(e^{(-c+2id+ie)z}\Bigg((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},1;2-\frac{i(ie-c)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},1;2-\frac{i(ie-c)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\Bigg(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},2;2-\frac{i(ie-c)}{2d};\right.$$
$$\left.-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},\right.$$
$$\left.2;2-\frac{i(ie-c)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\Bigg)\Bigg)\Bigg)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-c+2id+ie)\right)-$$
$$\Bigg(e^{(c+2id+ie)z}\Bigg((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(c+ie)}{2d},1;2-\frac{i(c+ie)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(c+ie)}{2d},1;2-\frac{i(c+ie)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\Bigg(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c+ie)}{2d},2;2-\frac{i(c+ie)}{2d};\right.$$
$$\left.-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c+ie)}{2d},\right.$$
$$\left.2;2-\frac{i(c+ie)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\Bigg)\Bigg)\Bigg)\Big/\left(2a^{3/2}b(a+b)^{3/2}(c+2id+ie)\right)\Bigg)$$

Involving algebraic functions of sin

Involving $(a+b\sin(dz))^{\beta}\cosh(cz)$

01.20.21.0689.01

$$\int (a+b\sin(d\,z))^{\beta}\cosh(c\,z)\,dz == \frac{1}{2\left(c^2+d^2\,\beta^2\right)}e^{-c\,z}\left(1+\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)^{-\beta}\left(1-\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}$$
$$\left(a-\frac{1}{2}\,i\,b\,e^{-i\,d\,z}\left(-1+e^{2\,i\,d\,z}\right)\right)^{\beta}\left(e^{2\,c\,z}\,(c+i\,d\,\beta)\,F_1\left(-\frac{i\,c}{d}-\beta;-\beta,-\beta;1-\frac{i\,c}{d}-\beta;\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}},\frac{i\,b\,e^{i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)-\right.$$
$$\left.(c-i\,d\,\beta)\,F_1\left(\frac{i\,c}{d}-\beta;-\beta,-\beta;1+\frac{i\,c}{d}-\beta;\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}},\frac{i\,b\,e^{i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)\right)$$

Involving $\left(a+b\sin^2(d\,z)\right)^{\beta}\cosh(c\,z)$

01.20.21.0690.01

$$\int \left(a+b\sin^2(d\,z)\right)^{\beta}\cosh(c\,z)\,dz ==$$
$$\frac{1}{2\left(c^2+4\,d^2\,\beta^2\right)}e^{-c\,z}\left(1-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(1-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(a-\frac{1}{4}\,b\,e^{-2\,i\,d\,z}\left(-1+e^{2\,i\,d\,z}\right)^2\right)^{\beta}$$
$$\left(e^{2\,c\,z}\,(c+2\,i\,d\,\beta)\,F_1\left(-\frac{i\,c}{2\,d}-\beta;-\beta,-\beta;1-\frac{i\,c}{2\,d}-\beta;\frac{b\,e^{2\,i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-\right.$$
$$\left.(c-2\,i\,d\,\beta)\,F_1\left(\frac{i\,c}{2\,d}-\beta;-\beta,-\beta;1+\frac{i\,c}{2\,d}-\beta;\frac{b\,e^{2\,i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)$$

Involving $\sin(e\,z)\cosh(c\,z)\,(a+b\sin(d\,z))^{\beta}$

01.20.21.0691.01

$$\int (a+b\sin(d\,z))^{\beta}\sin(e\,z)\cosh(c\,z)\,dz == -\frac{1}{4}\,i\left(1-\frac{i\,b\,e^{-i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)^{-\beta}\left(1+\frac{i\,b\,e^{-i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}(a+b\sin(d\,z))^{\beta}$$
$$\left(\frac{e^{(-c-i\,e)\,z}}{c+i\,e\,-i\,d\,\beta}F_1\left(-\frac{i\,(c+i\,e\,-i\,d\,\beta)}{d};-\beta,-\beta;-\frac{\beta\,d-d+(c+i\,e)\,i}{d};-\frac{i\,b\,e^{-i\,d\,z}}{a+\sqrt{a^2-b^2}},-\frac{i\,b\,e^{-i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)+\right.$$
$$\frac{e^{(i\,e-c)\,z}}{-c+i\,e\,+i\,d\,\beta}F_1\left(\frac{i\,(i\,e-c)}{d}-\beta;-\beta,-\beta;1+\frac{i\,(i\,e-c)}{d}-\beta;-\frac{i\,b\,e^{-i\,d\,z}}{a+\sqrt{a^2-b^2}},-\frac{i\,b\,e^{-i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)+$$
$$\frac{e^{(c+i\,e)\,z}}{c+i\,e\,+i\,d\,\beta}F_1\left(\frac{i\,(c+i\,e)}{d}-\beta;-\beta,-\beta;1+\frac{i\,(c+i\,e)}{d}-\beta;-\frac{i\,b\,e^{-i\,d\,z}}{a+\sqrt{a^2-b^2}},-\frac{i\,b\,e^{-i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)-$$
$$\left.\frac{e^{(c-i\,e)\,z}}{c-i\,e+i\,d\,\beta}F_1\left(\frac{i\,(c-i\,e)}{d}-\beta;-\beta,-\beta;1+\frac{i\,(c-i\,e)}{d}-\beta;-\frac{i\,b\,e^{-i\,d\,z}}{a+\sqrt{a^2-b^2}},-\frac{i\,b\,e^{-i\,d\,z}}{a-\sqrt{a^2-b^2}}\right)\right)$$

Involving $\sin(e\,z)\cosh(c\,z)\left(a+b\sin^2(d\,z)\right)^{\beta}$

01.20.21.0692.01

$$\int \left(a+b\sin^2(d\,z)\right)^{\beta}\sin(e\,z)\cosh(c\,z)\,dz ==$$
$$-\frac{1}{4}i\left(1-\frac{b\,e^{-2i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(1-\frac{b\,e^{-2i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(a-\frac{1}{4}b\,e^{2i\,d\,z}\left(-1+e^{-2i\,d\,z}\right)^2\right)^{\beta}$$
$$\left(\frac{e^{(-c-i\,e)\,z}}{c+i\,e-2\,i\,d\,\beta}F_1\left(-\frac{i\,(c+i\,e-2\,i\,d\,\beta)}{2\,d};-\beta,-\beta;1-\frac{i\,(c+i\,e)}{2\,d}-\beta;\frac{b\,e^{-2i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{-2i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+\right.$$
$$\frac{e^{(c+i\,e)\,z}}{c+i\,e+2\,i\,d\,\beta}F_1\left(\frac{i\,(c+i\,e)}{2\,d}-\beta;-\beta,-\beta;1+\frac{i\,(c+i\,e)}{2\,d}-\beta;\frac{b\,e^{-2i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{-2i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-$$
$$\frac{e^{(c-i\,e)\,z}}{c-i\,e+2\,i\,d\,\beta}F_1\left(\frac{i\,(c-i\,e)}{2\,d}-\beta;-\beta,-\beta;1+\frac{i\,(c-i\,e)}{2\,d}-\beta;\frac{b\,e^{-2i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{-2i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-$$
$$\left.\frac{e^{(i\,e-c)\,z}}{c-i\,e-2\,i\,d\,\beta}F_1\left(\frac{i\,(i\,e-c)}{2\,d}-\beta;-\beta,-\beta;1+\frac{i\,(i\,e-c)}{2\,d}-\beta;\frac{b\,e^{-2i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{-2i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)$$

Involving cos

Involving $\cos(c\,z+d)\cosh(a\,z)$

01.20.21.0693.01

$$\int \cos(c\,z)\cosh(a\,z)\,dz == \frac{c\cosh(a\,z)\sin(c\,z)+a\cos(c\,z)\sinh(a\,z)}{a^2+c^2}$$

01.20.21.0694.01

$$\int \cos(a\,z)\cosh(a\,z)\,dz == \frac{\cosh(a\,z)\sin(a\,z)+\cos(a\,z)\sinh(a\,z)}{2\,a}$$

Involving $\cos(c\,z+d)\cosh(a\,z)$

01.20.21.0695.01

$$\int \cos(d+c\,z)\cosh(a\,z)\,dz == \frac{c\cosh(a\,z)\sin(d+c\,z)+a\cos(d+c\,z)\sinh(a\,z)}{a^2+c^2}$$

Involving $\cos(c\,z)\cosh(a\,z+b)$

01.20.21.0696.01

$$\int \cos(c\,z)\cosh(b+a\,z)\,dz == \frac{c\cosh(b+a\,z)\sin(c\,z)+a\cos(c\,z)\sinh(b+a\,z)}{a^2+c^2}$$

Involving $\cos(c\,z+d)\cosh(a\,z+b)$

01.20.21.0697.01

$$\int \cos(d+c\,z)\cosh(b+a\,z)\,dz == \frac{c\cosh(b+a\,z)\sin(d+c\,z)+a\cos(d+c\,z)\sinh(b+a\,z)}{a^2+c^2}$$

Involving $\cos^m(b\,z^r)\cosh(c\,z)$

01.20.21.0698.01

$$\int \cos\left(b\,z^2\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{c^2}{4\,b}\right)C\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}\right)}{\sqrt{b}}-\frac{\cos\left(\frac{c^2}{4\,b}\right)C\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}\right)}{\sqrt{-b}}\right)$$

01.20.21.0699.01

$$\int \cos\left(\sqrt{z}\;b\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-i\,c)^{3/2}}\left(2\sqrt{-i\,c}\;\sin\left(\sqrt{z}\;b-i\,c\,z\right)-b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}\right)C\left(\frac{b-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{b-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}\right)\right)\right)+\right.$$
$$\left.\frac{1}{(-i\,c)^{3/2}}\left(-2\sqrt{-i\,c}\;\sin\left(\sqrt{z}\;b+i\,c\,z\right)-b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}\right)C\left(\frac{b+2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{b+2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}\right)\right)\right)\right)$$

Involving $\cos^m(b\,z^r+e)\cosh(c\,z)$

01.20.21.0700.01

$$\int \cos\left(b\,z^2+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{c^2}{4\,b}+e\right)C\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{-i\,c+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}+e\right)}{\sqrt{b}}-\frac{\cos\left(\frac{c^2}{4\,b}+e\right)C\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,c+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,b}+e\right)}{\sqrt{-b}}\right)$$

01.20.21.0701.01

$$\int \cos\left(\sqrt{z}\;b+e\right)\cosh(c\,z)\,dz == \frac{1}{4}\left(\frac{1}{(-i\,c)^{3/2}}\left(2\sqrt{-i\,c}\;\sin\left(\sqrt{z}\;b+e-i\,c\,z\right)-\right.\right.$$
$$\left.b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}+i\,e\right)C\left(\frac{b-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{b-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}+i\,e\right)\right)\right)+\frac{1}{(-i\,c)^{3/2}}$$
$$\left.\left(-2\sqrt{-i\,c}\;\sin\left(\sqrt{z}\;b+e+i\,c\,z\right)-b\sqrt{2\,\pi}\left(\cosh\left(\frac{b^2}{4\,c}-i\,e\right)C\left(\frac{b+2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{b+2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}-i\,e\right)\right)\right)\right)$$

Involving $\cos(b\,z^r+d\,z)\cosh(c\,z)$

01.20.21.0702.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(d-i\,c)^2}{4\,b}\right)C\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)+S\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d-i\,c)^2}{4\,b}\right)}{\sqrt{b}}-\frac{\cos\left(\frac{(d+i\,c)^2}{4\,b}\right)C\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-S\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d+i\,c)^2}{4\,b}\right)}{\sqrt{-b}}\right)$$

01.20.21.0703.01

$$\int \cos\left(\sqrt{z}\ b+d\,z\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{(d-i\,c)^{3/2}}\left(-b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,(d-i\,c)}\right)C\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\,\pi}}\right)-b\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,(d-i\,c)}\right)+\right.\right.$$
$$\left.2\sqrt{d-i\,c}\ \sin\left(\sqrt{z}\ b+(d-i\,c)\,z\right)\right)-\frac{1}{(-d-i\,c)^{3/2}}\left(b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,(d+i\,c)}\right)C\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\,\pi}}\right)-\right.$$
$$\left.\left.b\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,(d+i\,c)}\right)+2\sqrt{-d-i\,c}\ \sin\left(\sqrt{z}\ b+(d+i\,c)\,z\right)\right)\right)$$

Involving $\cos\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.0704.01

$$\int \cos\left(b\,z^2+d\,z+e\right)\cosh(c\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(d-i\,c)^2}{4\,b}-e\right)C\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)+S\left(\frac{d-i\,c+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d-i\,c)^2}{4\,b}-e\right)}{\sqrt{b}}-\right.$$
$$\left.\frac{\cos\left(\frac{(d+i\,c)^2}{4\,b}-e\right)C\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-S\left(\frac{d+i\,c+2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d+i\,c)^2}{4\,b}-e\right)}{\sqrt{-b}}\right)$$

01.20.21.0705.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{(d-i\,c)^{3/2}}\left(-b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,(d-i\,c)}-e\right)C\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\,\pi}}\right)-b\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d-i\,c)\sqrt{z}}{\sqrt{d-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,(d-i\,c)}-e\right)+\right.\right.$$
$$\left.2\sqrt{d-i\,c}\ \sin\left(\sqrt{z}\ b+e+(d-i\,c)\,z\right)\right)-\frac{1}{(-d-i\,c)^{3/2}}\left(b\sqrt{2\,\pi}\ \cos\left(e-\frac{b^2}{4\,(d+i\,c)}\right)C\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\,\pi}}\right)+\right.$$
$$\left.\left.b\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d+i\,c)\sqrt{z}}{\sqrt{-d-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(e-\frac{b^2}{4\,(d+i\,c)}\right)+2\sqrt{-d-i\,c}\ \sin\left(\sqrt{z}\ b+e+(d+i\,c)\,z\right)\right)\right)$$

Involving $\cos\left(b\,z^r\right)\cosh(f\,z+g)$

01.20.21.0706.01

$$\int \cos\left(b\,z^2\right)\cosh(g+f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}$$
$$\left(\frac{\cos\left(\frac{f^2}{4\,b}-i\,g\right)C\left(\frac{-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,b}-i\,g\right)}{\sqrt{b}}-\frac{\cos\left(\frac{f^2}{4\,b}+i\,g\right)C\left(\frac{i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,b}+i\,g\right)}{\sqrt{-b}}\right)$$

01.20.21.0707.01

$$\int \cos\left(b\,\sqrt{z}\right)\cosh(g+f\,z)\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left(-b\,\sqrt{2\,\pi}\,\cosh\left(\frac{b^2}{4\,f}+g\right)C\left(\frac{b-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)+2\,\sqrt{-i\,f}\,\sin\left(\sqrt{z}\,\,b-i\,g\,-i\,f\,z\right)-i\,b\,\sqrt{2\,\pi}\right.\right.$$
$$\left.S\left(\frac{b-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,f}+g\right)\right)-\frac{1}{(-i\,f)^{3/2}}\left(b\,\sqrt{2\,\pi}\,\cosh\left(\frac{b^2}{4\,f}+g\right)C\left(\frac{b+2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)+\right.$$
$$\left.\left.2\,\sqrt{-i\,f}\,\sin\left(\sqrt{z}\,\,b+i\,g\,+i\,f\,z\right)+b\,i\,\sqrt{2\,\pi}\,S\left(\frac{b+2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,f}+g\right)\right)\right)$$

Involving $\cos\left(b\,z^r+e\right)\cosh(f\,z+g)$

01.20.21.0708.01

$$\int \cos\left(b\,z^2+e\right)\cosh(g+f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{f^2}{4\,b}+e-i\,g\right)C\left(\frac{-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{-i\,f+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,b}+e-i\,g\right)}{\sqrt{b}}-\right.$$
$$\left.\frac{\cos\left(\frac{f^2}{4\,b}+e+i\,g\right)C\left(\frac{i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,b}+e+i\,g\right)}{\sqrt{-b}}\right)$$

01.20.21.0709.01

$$\int \cos\left(\sqrt{z}\, b + e\right) \cosh(g + f\, z)\, dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-i\, f)^{3/2}}\left(-b\sqrt{2\pi}\, \cos\left(-\frac{i\, b^2}{4\, f} + e - i\, g\right) C\left(\frac{b - 2\, i\, f\sqrt{z}}{\sqrt{-i\, f}\ \sqrt{2\pi}}\right) + b\sqrt{2\pi}\, S\left(\frac{b - 2\, i\, f\sqrt{z}}{\sqrt{-i\, f}\ \sqrt{2\pi}}\right) \sin\left(-\frac{i\, b^2}{4\, f} + e - i\, g\right) + 2\sqrt{-i\, f}\, \sin\left(\sqrt{z}\, b + e - i\, g - i\, f\, z\right)\right) - \frac{1}{(-i\, f)^{3/2}}\left(b\sqrt{2\pi}\, \cos\left(\frac{i\, b^2}{4\, f} + e + i\, g\right) C\left(\frac{b + 2\, i\, f\sqrt{z}}{\sqrt{-i\, f}\ \sqrt{2\pi}}\right) + b\sqrt{2\pi}\, S\left(\frac{b + 2\, i\, f\sqrt{z}}{\sqrt{-i\, f}\ \sqrt{2\pi}}\right) \sin\left(\frac{i\, b^2}{4\, f} + e + i\, g\right) + 2\sqrt{-i\, f}\, \sin\left(\sqrt{z}\, b + e + i\, g + i\, f\, z\right)\right)\right)$$

Involving $\cos\left(b\, z^r + d\, z\right) \cosh(f\, z + g)$

01.20.21.0710.01

$$\int \cos\left(b\, z^2 + d\, z\right) \cosh(g + f\, z)\, dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(d - i\, f)^2}{4\, b} + i\, g\right) C\left(\frac{d - i\, f + 2\, b\, z}{\sqrt{b}\ \sqrt{2\pi}}\right) + S\left(\frac{d - i\, f + 2\, b\, z}{\sqrt{b}\ \sqrt{2\pi}}\right) \sin\left(\frac{(d - i\, f)^2}{4\, b} + i\, g\right)}{\sqrt{b}} - \frac{\cos\left(-\frac{(d + i\, f)^2}{4\, b} + i\, g\right) C\left(\frac{d + i\, f + 2\, b\, z}{\sqrt{-b}\ \sqrt{2\pi}}\right) + S\left(\frac{d + i\, f + 2\, b\, z}{\sqrt{-b}\ \sqrt{2\pi}}\right) \sin\left(-\frac{(d + i\, f)^2}{4\, b} + i\, g\right)}{\sqrt{-b}}\right)$$

01.20.21.0711.01

$$\int \cos\left(\sqrt{z}\, b + d\, z\right) \cosh(g + f\, z)\, dz ==$$

$$\frac{1}{4}\left(\frac{1}{(d - i\, f)^{3/2}}\left(-b\sqrt{2\pi}\, \cos\left(\frac{b^2}{4\,(d - i\, f)} + i\, g\right) C\left(\frac{b + 2\,(d - i\, f)\sqrt{z}}{\sqrt{d - i\, f}\ \sqrt{2\pi}}\right) - b\sqrt{2\pi}\, S\left(\frac{b + 2\,(d - i\, f)\sqrt{z}}{\sqrt{d - i\, f}\ \sqrt{2\pi}}\right) \sin\left(\frac{b^2}{4\,(d - i\, f)} + i\, g\right) + 2\sqrt{d - i\, f}\, \sin\left(\sqrt{z}\, b - i\, g + (d - i\, f)\, z\right)\right) - \frac{1}{(-d - i\, f)^{3/2}}\left(b\sqrt{2\pi}\, \cos\left(-\frac{b^2}{4\,(d + i\, f)} + i\, g\right) C\left(\frac{b + 2\,(d + i\, f)\sqrt{z}}{\sqrt{-d - i\, f}\ \sqrt{2\pi}}\right) + b\sqrt{2\pi}\, S\left(\frac{b + 2\,(d + i\, f)\sqrt{z}}{\sqrt{-d - i\, f}\ \sqrt{2\pi}}\right) \sin\left(-\frac{b^2}{4\,(d + i\, f)} + i\, g\right) + 2\sqrt{-d - i\, f}\, \sin\left(\sqrt{z}\, b + i\, g + (d + i\, f)\, z\right)\right)\right)$$

Involving $\cos\left(b\, z^r + d\, z + e\right) \cosh(f\, z + g)$

01.20.21.0712.01

$$\int \cos\left(b z^2+d z+e\right)\cosh(g+f z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(-\frac{(d-i f)^2}{4b}+e-i g\right)C\left(\frac{d-i f+2 b z}{\sqrt{b}\ \sqrt{2\pi}}\right)-S\left(\frac{d-i f+2 b z}{\sqrt{b}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(d-i f)^2}{4b}+e-i g\right)}{\sqrt{b}}-\right.$$

$$\left.\frac{\cos\left(-\frac{(d+i f)^2}{4b}+e+i g\right)C\left(\frac{d+i f+2 b z}{\sqrt{-b}\ \sqrt{2\pi}}\right)+S\left(\frac{d+i f+2 b z}{\sqrt{-b}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(d+i f)^2}{4b}+e+i g\right)}{\sqrt{-b}}\right)$$

01.20.21.0713.01

$$\int \cos\left(\sqrt{z}\ b+e+d z\right)\cosh(g+f z)\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{(d-i f)^{3/2}}\left(-b\sqrt{2\pi}\ \cos\left(-\frac{b^2}{4(d-i f)}+e-i g\right)C\left(\frac{b+2(d-i f)\sqrt{z}}{\sqrt{d-i f}\ \sqrt{2\pi}}\right)+b\sqrt{2\pi}\right.\right.$$

$$\left.S\left(\frac{b+2(d-i f)\sqrt{z}}{\sqrt{d-i f}\ \sqrt{2\pi}}\right)\sin\left(-\frac{b^2}{4(d-i f)}+e-i g\right)+2\sqrt{d-i f}\ \sin\left(\sqrt{z}\ b+e-i g+(d-i f)z\right)\right)-$$

$$\frac{1}{(-d-i f)^{3/2}}\left(b\sqrt{2\pi}\ \cos\left(-\frac{b^2}{4(d+i f)}+e+i g\right)C\left(\frac{b+2(d+i f)\sqrt{z}}{\sqrt{-d-i f}\ \sqrt{2\pi}}\right)+\right.$$

$$\left.\left.b\sqrt{2\pi}\ S\left(\frac{b+2(d+i f)\sqrt{z}}{\sqrt{-d-i f}\ \sqrt{2\pi}}\right)\sin\left(-\frac{b^2}{4(d+i f)}+e+i g\right)+2\sqrt{-d-i f}\ \sin\left(\sqrt{z}\ b+e+i g+(d+i f)z\right)\right)\right)$$

Involving $\cos(b z)\cosh\left(c z^r\right)$

01.20.21.0714.01

$$\int \cos(b z)\cosh\left(c z^2\right)dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{b^2}{4c}\right)C\left(\frac{2 i c z-b}{\sqrt{i c}\ \sqrt{2\pi}}\right)-i S\left(\frac{2 i c z-b}{\sqrt{i c}\ \sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4c}\right)}{\sqrt{i c}}-\frac{\cosh\left(\frac{b^2}{4c}\right)C\left(\frac{b+2 i c z}{\sqrt{-i c}\ \sqrt{2\pi}}\right)+i S\left(\frac{b+2 i c z}{\sqrt{-i c}\ \sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4c}\right)}{\sqrt{-i c}}\right)$$

01.20.21.0715.01

$$\int \cos(d z)\cosh\left(c\sqrt{z}\right)dz == -\frac{1}{4(-d)^{3/2}}\left(c i\sqrt{2\pi}\ \cos\left(\frac{c^2}{4d}\right)C\left(\frac{i c-2 d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)-i c\sqrt{2\pi}\ \cos\left(\frac{c^2}{4d}\right)C\left(\frac{d\left(2\sqrt{z}\ d+i c\right)}{(-d)^{3/2}\sqrt{2\pi}}\right)+\right.$$

$$\left.c i\sqrt{2\pi}\ S\left(\frac{i c-2 d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{c^2}{4d}\right)-i c\sqrt{2\pi}\ S\left(\frac{d\left(2\sqrt{z}\ d+i c\right)}{(-d)^{3/2}\sqrt{2\pi}}\right)\sin\left(\frac{c^2}{4d}\right)+4\sqrt{-d}\ \cosh\left(c\sqrt{z}\right)\sin(d z)\right)$$

Involving $\cos(d\,z+e)\cosh(c\,z^r)$

01.20.21.0716.01

$$\int \cos(e+d\,z)\cosh(c\,z^2)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{d^2}{4c}+i\,e\right)C\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-i\,S\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}+i\,e\right)}{\sqrt{i\,c}}-\right.$$
$$\left.\frac{\cosh\left(\frac{d^2}{4c}-i\,e\right)C\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}-i\,e\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0717.01

$$\int \cos(e+d\,z)\cosh\left(c\,\sqrt{z}\right)dz ==$$
$$-\frac{1}{4\,(-d)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,d}+e\right)C\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)-i\,c\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,d}+e\right)C\left(\frac{d\left(2\,\sqrt{z}\,d+i\,c\right)}{(-d)^{3/2}\,\sqrt{2\,\pi}}\right)+\right.$$
$$\left.c\,i\,\sqrt{2\,\pi}\,S\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e\right)-i\,c\,\sqrt{2\,\pi}\,S\left(\frac{d\left(2\,\sqrt{z}\,d+i\,c\right)}{(-d)^{3/2}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e\right)+4\,\sqrt{-d}\,\cosh\left(c\,\sqrt{z}\right)\sin(e+d\,z)\right)$$

Involving $\cos(b\,z^r)\cosh(c\,z^r)$

01.20.21.0718.01

$$\int \cos(b\,z^r)\cosh(c\,z^r)\,dz ==$$
$$-\frac{1}{4\,r}\left(z\left(\Gamma\left(\frac{1}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-1/r}+((i\,b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-c)\,z^r\right)+((c-i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-i\,b)\,z^r\right)+\right.\right.$$
$$\left.\left.((c+i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0719.01

$$\int \cos\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{i\,c-b}}+\frac{C\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0720.01

$$\int \cos\left(b\,\sqrt{z}\right)\cosh\left(\sqrt{z}\,c\right)dz ==$$
$$\frac{\cos\left(\sqrt{z}\,(i\,c-b)\right)+(i\,c-b)\,\sqrt{z}\,\sin\left(\sqrt{z}\,(i\,c-b)\right)}{(i\,c-b)^2}+\frac{\cos\left(\sqrt{z}\,(b+i\,c)\right)+(b+i\,c)\,\sqrt{z}\,\sin\left(\sqrt{z}\,(b+i\,c)\right)}{(b+i\,c)^2}$$

Involving $\cos(b\,z^r+e)\cosh(c\,z^r)$

01.20.21.0721.01

$$\int \cos(b\,z^r + e)\cosh(c\,z^r)\,dz == -\frac{1}{4\,r}\left(z\left(e^{i\,e}\,\Gamma\left(\frac{1}{r}, (-c - i\,b)\,z^r\right)((-c - i\,b)\,z^r)^{-1/r} + e^{-i\,e}\,((i\,b - c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (i\,b - c)\,z^r\right) + e^{i\,e}\,((c - i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c - i\,b)\,z^r\right) + e^{-i\,e}\,((c + i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c + i\,b)\,z^r\right)\right)\right)$$

01.20.21.0722.01

$$\int \cos\left(b\,z^2 + e\right)\cosh\left(c\,z^2\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos(e)\,C\left(\sqrt{-b - i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right) + S\left(\sqrt{-b - i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)}{\sqrt{-b - i\,c}} + \frac{\cos(e)\,C\left(\sqrt{i\,c - b}\,\sqrt{\frac{2}{\pi}}\,z\right) + S\left(\sqrt{i\,c - b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)}{\sqrt{i\,c - b}}\right)$$

01.20.21.0723.01

$$\int \cos\left(\sqrt{z}\,b + e\right)\cosh\left(\sqrt{z}\,c\right)dz == \frac{\cos\left(-\sqrt{z}\,(i\,c - b) + e\right) - (i\,c - b)\,\sqrt{z}\,\sin\left(-\sqrt{z}\,(i\,c - b) + e\right)}{(i\,c - b)^2} + \frac{\cos\left(e + (b + i\,c)\,\sqrt{z}\right) + (b + i\,c)\,\sqrt{z}\,\sin\left(e + (b + i\,c)\,\sqrt{z}\right)}{(b + i\,c)^2}$$

Involving $\cos\left(b\,z^r + d\,z\right)\cosh\left(c\,z^r\right)$

01.20.21.0724.01

$$\int \cos\left(b\,z^2 + d\,z\right)\cosh\left(c\,z^2\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4\,(i\,c - b)}\right)C\left(\frac{2\,(i\,c - b)\,z - d}{\sqrt{i\,c - b}\,\sqrt{2\,\pi}}\right) + S\left(\frac{2\,(i\,c - b)\,z - d}{\sqrt{i\,c - b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,(i\,c - b)}\right)}{\sqrt{i\,c - b}} - \frac{\cos\left(-\frac{d^2}{4\,(b + i\,c)}\right)C\left(\frac{d + 2\,(b + i\,c)\,z}{\sqrt{-b - i\,c}\,\sqrt{2\,\pi}}\right) + S\left(\frac{d + 2\,(b + i\,c)\,z}{\sqrt{-b - i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4\,(b + i\,c)}\right)}{\sqrt{-b - i\,c}}\right)$$

01.20.21.0725.01

$$\int \cos\left(\sqrt{z}\,b + d\,z\right)\cosh\left(\sqrt{z}\,c\right)dz == \frac{1}{4}\left(\frac{1}{d^{3/2}}\left((i\,c - b)\,\sqrt{2\,\pi}\,\cos\left(\frac{(b - i\,c)^2}{4\,d}\right)C\left(\frac{b - i\,c + 2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right) - (b - i\,c)\,\sqrt{2\,\pi}\,S\left(\frac{b - i\,c + 2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b - i\,c)^2}{4\,d}\right) + 2\,\sqrt{d}\,\sin\left(\sqrt{z}\,(b - i\,c) + d\,z\right)\right) - \frac{1}{(-d)^{3/2}}\left((b + i\,c)\,\sqrt{2\,\pi}\,\cos\left(\frac{(b + i\,c)^2}{4\,d}\right)C\left(\frac{b + i\,c + 2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right) + (-b - i\,c)\,\sqrt{2\,\pi}\,S\left(\frac{b + i\,c + 2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b + i\,c)^2}{4\,d}\right) + 2\,\sqrt{-d}\,\sin\left(\sqrt{z}\,(b + i\,c) + d\,z\right)\right)\right)$$

Involving $\cos(b\,z^r + d\,z + e)\cosh(c\,z^r)$

01.20.21.0726.01

$$\int \cos\left(b\,z^2 + d\,z + e\right)\cosh\left(c\,z^2\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4\,(i\,c-b)} + e\right)C\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right) + S\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,(i\,c-b)} + e\right)}{\sqrt{i\,c-b}} - \right.$$

$$\left.\frac{\cos\left(-\frac{d^2}{4\,(b+i\,c)} + e\right)C\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right) + S\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4\,(b+i\,c)} + e\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0727.01

$$\int \cos\left(\sqrt{z}\;b + e + d\,z\right)\cosh\left(\sqrt{z}\;c\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{d^{3/2}}\left((i\,c-b)\,\sqrt{2\,\pi}\;\cos\left(\frac{(b-i\,c)^2}{4\,d} - e\right)C\left(\frac{b-i\,c+2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right) - (b-i\,c)\,\sqrt{2\,\pi}\;S\left(\frac{b-i\,c+2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b-i\,c)^2}{4\,d} - e\right) + \right.\right.$$

$$\left.2\,\sqrt{d}\;\sin\left(\sqrt{z}\;(b-i\,c) + e + d\,z\right)\right) - \frac{1}{(-d)^{3/2}}\left((b+i\,c)\,\sqrt{2\,\pi}\;\cos\left(\frac{(b+i\,c)^2}{4\,d} - e\right)C\left(\frac{b+i\,c+2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right) + \right.$$

$$\left.\left.(-b-i\,c)\,\sqrt{2\,\pi}\;S\left(\frac{b+i\,c+2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b+i\,c)^2}{4\,d} - e\right) + 2\,\sqrt{-d}\;\sin\left(\sqrt{z}\;(b+i\,c) + e + d\,z\right)\right)\right)$$

Involving $\cos(d\,z)\cosh(c\,z^r + g)$

01.20.21.0728.01

$$\int \cos(d\,z)\cosh\left(c\,z^2 + g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}$$

$$\left(\frac{\cosh\left(\frac{d^2}{4\,c} + g\right)C\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right) - i\,S\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,c} + g\right)}{\sqrt{i\,c}} - \frac{\cosh\left(\frac{d^2}{4\,c} + g\right)C\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right) + i\,S\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,c} + g\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0729.01

$$\int \cos(d\,z)\cosh\left(\sqrt{z}\;c + g\right)dz ==$$

$$-\frac{1}{4\,(-d)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,d} - i\,g\right)C\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right) - i\,c\,\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,d} + i\,g\right)C\left(\frac{d\left(2\,\sqrt{z}\;d + i\,c\right)}{(-d)^{3/2}\,\sqrt{2\,\pi}}\right) - i\,c\,\sqrt{2\,\pi}\right.$$

$$\left.S\left(\frac{d\left(2\,\sqrt{z}\;d + i\,c\right)}{(-d)^{3/2}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d} + i\,g\right) + c\,i\,\sqrt{2\,\pi}\;S\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d} - i\,g\right) + 4\,\sqrt{-d}\;\cosh\left(\sqrt{z}\;c + g\right)\sin(d\,z)\right)$$

Involving $\cos(d\,z+e)\cosh(c\,z^r+g)$

01.20.21.0730.01

$$\int \cos(e+d\,z)\cosh(c\,z^2+g)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{d^2}{4c}+g+i\,e\right)C\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-i\,S\left(\frac{2\,i\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}+g+i\,e\right)}{\sqrt{i\,c}}-\right.$$

$$\left.\frac{\cosh\left(\frac{d^2}{4c}-i\,e+g\right)C\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{d+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4c}-i\,e+g\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0731.01

$$\int \cos(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz == -\frac{1}{4\,(-d)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,d}+e-i\,g\right)C\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)-\right.$$

$$i\,c\,\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,d}+e+i\,g\right)C\left(\frac{d\left(2\,\sqrt{z}\;d+i\,c\right)}{(-d)^{3/2}\,\sqrt{2\,\pi}}\right)-i\,c\,\sqrt{2\,\pi}\;S\left(\frac{d\left(2\,\sqrt{z}\;d+i\,c\right)}{(-d)^{3/2}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e+i\,g\right)+$$

$$\left.c\,i\,\sqrt{2\,\pi}\;S\left(\frac{i\,c-2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,d}+e-i\,g\right)+4\,\sqrt{-d}\;\cosh\left(\sqrt{z}\;c+g\right)\sin(e+d\,z)\right)$$

Involving $\cos(a\,z^r)\cosh(c\,z^r+g)$

01.20.21.0732.01

$$\int \cos(b\,z^r)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{1}{4\,r}\left(z\left(e^g\,\Gamma\left(\frac{1}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-1/r}+e^g\,((i\,b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-c)\,z^r\right)+e^{-g}\,((c-i\,b)\,z^r)^{-1/r}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{r},(c-i\,b)\,z^r\right)+e^{-g}\,((c+i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0733.01

$$\int \cos\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh(g)\,C\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\;z\right)+i\,S\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\;z\right)\sinh(g)}{\sqrt{-b-i\,c}}+\right.$$

$$\left.\frac{\cosh(g)\,C\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\;z\right)-i\,S\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\;z\right)\sinh(g)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0734.01

$$\int \cos\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g\right)dz == \frac{\cos\left(\sqrt{z}\,(i\,c-b)+i\,g\right)+(i\,c-b)\sqrt{z}\,\sin\left(\sqrt{z}\,(i\,c-b)+i\,g\right)}{(i\,c-b)^2}+$$
$$\frac{\cos\left(\sqrt{z}\,(b+i\,c)+i\,g\right)-(-b-i\,c)\sqrt{z}\,\sin\left(\sqrt{z}\,(b+i\,c)+i\,g\right)}{(b+i\,c)^2}$$

Involving $\cos(a\,z^r+e)\cosh(c\,z^r+g)$

01.20.21.0735.01

$$\int \cos(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$
$$-\frac{1}{4\,r}\left(z\left(e^{g+i\,e}\,\Gamma\left(\frac{1}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-1/r}+e^{g-i\,e}\,((i\,b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-c)\,z^r\right)+\right.\right.$$
$$\left.\left.e^{i\,e-g}\,((c-i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-i\,b)\,z^r\right)+e^{-g-i\,e}\,((c+i\,b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0736.01

$$\int \cos\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos(e+i\,g)\,C\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)+S\left(\sqrt{-b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e+i\,g)}{\sqrt{-b-i\,c}}+\right.$$
$$\left.\frac{\cos(e-i\,g)\,C\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)+S\left(\sqrt{i\,c-b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e-i\,g)}{\sqrt{i\,c-b}}\right)$$

01.20.21.0737.01

$$\int \cos\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+g\right)dz == \frac{\cos\left(-\sqrt{z}\,(i\,c-b)+e-i\,g\right)-(i\,c-b)\sqrt{z}\,\sin\left(-\sqrt{z}\,(i\,c-b)+e-i\,g\right)}{(i\,c-b)^2}+$$
$$\frac{\cos\left(e+i\,g+(b+i\,c)\sqrt{z}\right)-(-b-i\,c)\sqrt{z}\,\sin\left(e+i\,g+(b+i\,c)\sqrt{z}\right)}{(b+i\,c)^2}$$

Involving $\cos(b\,z^r+d\,z)\cosh(c\,z^r+g)$

01.20.21.0738.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4\,(i\,c-b)}-i\,g\right)C\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,(i\,c-b)}-i\,g\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{\cos\left(-\frac{d^2}{4\,(b+i\,c)}+i\,g\right)C\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4\,(b+i\,c)}+i\,g\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0739.01

$$\int \cos\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{d^{3/2}}\left((i\,c-b)\,\sqrt{2\,\pi}\;\cos\left(\frac{(b-i\,c)^2}{4\,d}+i\,g\right)C\left(\frac{b-i\,c+2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)-(b-i\,c)\,\sqrt{2\,\pi}\;S\left(\frac{b-i\,c+2\,d\,\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b-i\,c)^2}{4\,d}+i\,g\right)+\right.\right.$$

$$\left.2\,\sqrt{d}\;\sin\left(\sqrt{z}\;(b-i\,c)-i\,g+d\,z\right)\right)-\frac{1}{(-d)^{3/2}}\left((b+i\,c)\,\sqrt{2\,\pi}\;\cos\left(\frac{(b+i\,c)^2}{4\,d}-i\,g\right)C\left(\frac{b+i\,c+2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)+\right.$$

$$\left.\left.(-b-i\,c)\,\sqrt{2\,\pi}\;S\left(\frac{b+i\,c+2\,d\,\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(b+i\,c)^2}{4\,d}-i\,g\right)+2\,\sqrt{-d}\;\sin\left(\sqrt{z}\;(b+i\,c)+i\,g+d\,z\right)\right)\right)$$

Involving $\cos\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0740.01

$$\int \cos\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{d^2}{4\,(i\,c-b)}+e-i\,g\right)C\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,(i\,c-b)\,z-d}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,(i\,c-b)}+e-i\,g\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{\cos\left(-\frac{d^2}{4\,(b+i\,c)}+e+i\,g\right)C\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{d^2}{4\,(b+i\,c)}+e+i\,g\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0741.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{d^{3/2}}\left((i\,c-b)\sqrt{2\,\pi}\ \cos\left(\frac{(b-i\,c)^2}{4\,d}-e+i\,g\right)C\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)-(b-i\,c)\sqrt{2\,\pi}\right.\right.$$
$$\left.S\left(\frac{b-i\,c+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(b-i\,c)^2}{4\,d}-e+i\,g\right)+2\sqrt{d}\ \sin\left(\sqrt{z}\ (b-i\,c)+e-i\,g+d\,z\right)\right)-$$
$$\frac{1}{(-d)^{3/2}}\left((b+i\,c)\sqrt{2\,\pi}\ \cos\left(\frac{(b+i\,c)^2}{4\,d}-e-i\,g\right)C\left(\frac{b+i\,c+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)+\right.$$
$$\left.\left.(-b-i\,c)\sqrt{2\,\pi}\ S\left(\frac{b+i\,c+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(b+i\,c)^2}{4\,d}-e-i\,g\right)+2\sqrt{-d}\ \sin\left(\sqrt{z}\ (b+i\,c)+e+i\,g+d\,z\right)\right)\right)$$

Involving $\cos(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0742.01

$$\int \cos(d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{(i\,f-d)^2}{4\,c}\right)C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f-d)^2}{4\,c}\right)}{\sqrt{i\,c}}-\right.$$
$$\left.\frac{\cosh\left(\frac{(d+i\,f)^2}{4\,c}\right)C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)+i\,S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(d+i\,f)^2}{4\,c}\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0743.01

$$\int \cos(d\,z)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,(i\,f-d)}\right)C\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)+c\,i\sqrt{2\,\pi}\ S\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(i\,f-d)}\right)+\right.\right.$$
$$\left.2\sqrt{i\,f-d}\ \sin\left(i\,c\sqrt{z}+(i\,f-d)\,z\right)\right)-\frac{1}{(-d-i\,f)^{3/2}}\left(c\,i\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,(d+i\,f)}\right)C\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)+$$
$$\left.\left.c\,i\sqrt{2\,\pi}\ S\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(d+i\,f)}\right)+2\sqrt{-d-i\,f}\ \sin\left(i\,c\sqrt{z}+(d+i\,f)\,z\right)\right)\right)$$

Involving $\cos(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0744.01

$$\int \cos(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e\right)C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e\right)}{\sqrt{i\,c}}-\right.$$

$$\left.\frac{\cos\left(\frac{i\,(d+i\,f)^2}{4\,c}+e\right)C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(d+i\,f)^2}{4\,c}+e\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0745.01

$$\int \cos(e+d\,z)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left(-i\,c\,\sqrt{2\,\pi}\ \cos\left(-\frac{c^2}{4\,(i\,f-d)}+e\right)C\left(\frac{2\,\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)-i\,c\,\sqrt{2\,\pi}\ S\left(\frac{2\,\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\right.\right.$$

$$\left.\sin\left(-\frac{c^2}{4\,(i\,f-d)}+e\right)-2\,\sqrt{i\,f-d}\ \sin\left(e-(i\,f-d)\,z-i\,c\,\sqrt{z}\right)\right)-$$

$$\frac{1}{(-d-i\,f)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,(d+i\,f)}+e\right)C\left(\frac{2\,\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)+\right.$$

$$\left.\left.c\,i\,\sqrt{2\,\pi}\ S\left(\frac{2\,\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(d+i\,f)}+e\right)+2\,\sqrt{-d-i\,f}\ \sin\left(e+(d+i\,f)\,z+i\,c\,\sqrt{z}\right)\right)\right)$$

Involving $\cos\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0746.01

$$\int \cos\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{f^2}{4\,(i\,c-b)}\right)C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\ \sqrt{2\,\pi}}\right)-S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(i\,c-b)}\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{\cos\left(\frac{f^2}{4\,(b+i\,c)}\right)C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(b+i\,c)}\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0747.01

$$\int \cos\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(i\,f)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\,\cosh\left(\frac{(i\,c-b)^2}{4\,f}\right)C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)+2\sqrt{i\,f}\,\sin\left(\sqrt{z}\,(i\,c-b)+i\,f\,z\right)+\right.\right.$$
$$(i\,c-b)\,i\sqrt{2\,\pi}\,S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c-b)^2}{4\,f}\right)\Bigg)+$$
$$\frac{1}{(-i\,f)^{3/2}}\left((-b-i\,c)\sqrt{2\,\pi}\,\cosh\left(\frac{(b+i\,c)^2}{4\,f}\right)C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-2\sqrt{-i\,f}\,\sin\left(\sqrt{z}\,(b+i\,c)+i\,f\,z\right)-\right.$$
$$\left.\left.i\,(b+i\,c)\sqrt{2\,\pi}\,S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+i\,c)^2}{4\,f}\right)\right)\right)$$

Involving $\cos\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0748.01

$$\int \cos\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(-\frac{f^2}{4\,(i\,c-b)}+e\right)C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(i\,c-b)}+e\right)}{\sqrt{i\,c-b}}-\right.$$
$$\left.\frac{\cos\left(\frac{f^2}{4\,(b+i\,c)}+e\right)C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(b+i\,c)}+e\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0749.01

$$\int \cos\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left((-b-i\,c)\sqrt{2\,\pi}\,\cos\left(\frac{i\,(b+i\,c)^2}{4\,f}+e\right)C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-(b+i\,c)\sqrt{2\,\pi}\right.\right.$$
$$\left.S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(b+i\,c)^2}{4\,f}+e\right)-2\sqrt{-i\,f}\,\sin\left(\sqrt{z}\,(b+i\,c)+e+i\,f\,z\right)\right)+$$
$$\frac{1}{(i\,f)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\,\cos\left(e-\frac{i\,(i\,c-b)^2}{4\,f}\right)C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)-\right.$$
$$\left.\left.(i\,c-b)\sqrt{2\,\pi}\,S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)\sin\left(e-\frac{i\,(i\,c-b)^2}{4\,f}\right)-2\sqrt{i\,f}\,\sin\left(-\sqrt{z}\,(i\,c-b)+e-i\,f\,z\right)\right)\right)$$

Involving $\cos(b\,z^r + d\,z)\cosh(c\,z^r + f\,z)$

01.20.21.0750.01

$$\int \cos(b\,z^2 + d\,z)\cosh(c\,z^2 + f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}\right)C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{\cos\left(\frac{(d+i\,f)^2}{4\,(b+i\,c)}\right)C\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)-S\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(d+i\,f)^2}{4\,(b+i\,c)}\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0751.01

$$\int \cos\left(\sqrt{z}\;b + d\,z\right)\cosh\left(\sqrt{z}\;c + f\,z\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\,\sqrt{2\,\pi}\;\cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}\right)C\left(\frac{-b+i\,c\;+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)-(i\,c-b)\,\sqrt{2\,\pi}\right.\right.$$

$$\left.S\left(\frac{-b+i\,c\;+2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}\right)+2\,\sqrt{i\,f-d}\;\sin\left(\sqrt{z}\;(i\,c-b)+(i\,f-d)\,z\right)\right)-$$

$$\frac{1}{(-d-i\,f)^{3/2}}\left((b+i\,c)\,\sqrt{2\,\pi}\;\cos\left(\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)C\left(\frac{b+i\,c\;+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.(b+i\,c)\,\sqrt{2\,\pi}\;S\left(\frac{b+i\,c\;+2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)+2\,\sqrt{-d-i\,f}\;\sin\left(\sqrt{z}\;(b+i\,c)+(d+i\,f)\,z\right)\right)\right)$$

Involving $\cos(b\,z^r + d\,z + e)\cosh(c\,z^r + f\,z)$

01.20.21.0752.01

$$\int \cos(b\,z^2 + d\,z + e)\cosh(c\,z^2 + f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}+e\right)C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}+e\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{\cos\left(-\frac{(d+i\,f)^2}{4\,(b+i\,c)}+e\right)C\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(d+i\,f)^2}{4\,(b+i\,c)}+e\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0753.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-d-i\,f)^{3/2}}\left(-(b+i\,c)\sqrt{2\,\pi}\ \cos\left(-\frac{(b+i\,c)^2}{4\,(d+i\,f)}+e\right)C\left(\frac{b+i\,c+2\,(d+i\,f)\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)-(b+i\,c)\sqrt{2\,\pi}\right.\right.$$
$$\left.S\left(\frac{b+i\,c+2\,(d+i\,f)\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(b+i\,c)^2}{4\,(d+i\,f)}+e\right)-2\sqrt{-d-i\,f}\ \sin\left(\sqrt{z}\ (b+i\,c)+e+(d+i\,f)\,z\right)\right)+$$
$$\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\ \cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e\right)C\left(\frac{-b+i\,c+2\,(i\,f-d)\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)-(i\,c-b)\sqrt{2\,\pi}\right.$$
$$\left.\left.S\left(\frac{-b+i\,c+2\,(i\,f-d)\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e\right)-2\sqrt{i\,f-d}\ \sin\left(-\sqrt{z}\ (i\,c-b)+e-(i\,f-d)\,z\right)\right)\right)$$

Involving $\cos(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0754.01

$$\int \cos(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh\left(\frac{(i\,f-d)^2}{4\,c}+g\right)C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f-d)^2}{4\,c}+g\right)}{\sqrt{i\,c}}-\right.$$
$$\left.\frac{\cosh\left(\frac{(d+i\,f)^2}{4\,c}+g\right)C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)+i\,S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(d+i\,f)^2}{4\,c}+g\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0755.01

$$\int \cos(d\,z)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,(i\,f-d)}+i\,g\right)C\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)+c\,i\sqrt{2\,\pi}\ S\left(\frac{2\sqrt{z}\ (i\,f-d)+i\,c}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sin\left(\frac{c^2}{4\,(i\,f-d)}+i\,g\right)+2\sqrt{i\,f-d}\ \sin\left(i\,g+i\,c\sqrt{z}+(i\,f-d)\,z\right)\right)-$$
$$\frac{1}{(-d-i\,f)^{3/2}}\left(c\,i\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,(d+i\,f)}+i\,g\right)C\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)+\right.$$
$$\left.\left.c\,i\sqrt{2\,\pi}\ S\left(\frac{2\sqrt{z}\ (d+i\,f)+i\,c}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(d+i\,f)}+i\,g\right)+2\sqrt{-d-i\,f}\ \sin\left(i\,g+i\,c\sqrt{z}+(d+i\,f)\,z\right)\right)\right)$$

Involving $\cos(d\,z+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.0756.01

$$\int \cos(e+d\,z)\cosh(c\,z^2+f\,z+g)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e-i\,g\right)C\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{-d+i\,f+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(i\,f-d)^2}{4\,c}+e-i\,g\right)}{\sqrt{i\,c}}-\frac{\cos\left(\frac{i\,(d+i\,f)^2}{4\,c}+e+i\,g\right)C\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+i\,f+2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(d+i\,f)^2}{4\,c}+e+i\,g\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.0757.01

$$\int \cos(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == \frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left(-i\,c\,\sqrt{2\,\pi}\;\cos\left(-\frac{c^2}{4\,(i\,f-d)}+e-i\,g\right)C\left(\frac{2\,\sqrt{z}\;(i\,f-d)+i\,c}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)-i\,c\,\sqrt{2\,\pi}\;S\left(\frac{2\,\sqrt{z}\;(i\,f-d)+i\,c}{\sqrt{i\,f-d}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{c^2}{4\,(i\,f-d)}+e-i\,g\right)-2\,\sqrt{i\,f-d}\;\sin\left(e-i\,g-(i\,f-d)\,z-i\,c\,\sqrt{z}\right)\right)-\frac{1}{(-d-i\,f)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,(d+i\,f)}+e+i\,g\right)C\left(\frac{2\,\sqrt{z}\;(d+i\,f)+i\,c}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\;S\left(\frac{2\,\sqrt{z}\;(d+i\,f)+i\,c}{\sqrt{-d-i\,f}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(d+i\,f)}+e+i\,g\right)+2\,\sqrt{-d-i\,f}\;\sin\left(e+i\,g+(d+i\,f)\,z+i\,c\,\sqrt{z}\right)\right)\right)$$

Involving $\cos(b\,z^r)\cosh(c\,z^r+f\,z+g)$

01.20.21.0758.01

$$\int \cos\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{f^2}{4\,(i\,c-b)}+i\,g\right)C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(i\,c-b)}+i\,g\right)}{\sqrt{i\,c-b}}-\frac{\cos\left(\frac{f^2}{4\,(b+i\,c)}+i\,g\right)C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(b+i\,c)}+i\,g\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0759.01

$$\int \cos\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{(i\,f)^{3/2}}\left((b-i\,c)\sqrt{2\,\pi}\,\cosh\left(\frac{(i\,c-b)^2}{4\,f}+g\right)C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)+(i\,c-b)\,i\sqrt{2\,\pi}\right.\right.$$

$$\left.S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c-b)^2}{4\,f}+g\right)+2\sqrt{i\,f}\;i\sinh\left(g+f\,z-i\,(i\,c-b)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,f)^{3/2}}\left((-b-i\,c)\sqrt{2\,\pi}\,\cosh\left(\frac{(b+i\,c)^2}{4\,f}+g\right)C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,(b+i\,c)\sqrt{2\,\pi}\;S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+i\,c)^2}{4\,f}+g\right)-2\,i\sqrt{-i\,f}\;\sinh\left(g+f\,z-i\,(b+i\,c)\sqrt{z}\right)\right)\right)$$

Involving $\cos\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0760.01

$$\int \cos\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(-\frac{f^2}{4\,(i\,c-b)}+e-i\,g\right)C\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{f^2}{4\,(i\,c-b)}+e-i\,g\right)}{\sqrt{i\,c-b}}-\right.$$

$$\left.\frac{\cos\left(\frac{f^2}{4\,(b+i\,c)}+e+i\,g\right)C\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(b+i\,c)}+e+i\,g\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0761.01

$$\int \cos\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left((-b-i\,c)\sqrt{2\pi}\ \cos\left(\frac{i\,(b+i\,c)^2}{4\,f}+e+i\,g\right)C\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\pi}}\right)-(b+i\,c)\sqrt{2\pi}\right.\right.$$
$$\left.S\left(\frac{b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\pi}}\right)\sin\left(\frac{i\,(b+i\,c)^2}{4\,f}+e+i\,g\right)-2\sqrt{-i\,f}\ \sin\left(\sqrt{z}\ (b+i\,c)+e+i\,g+i\,f\,z\right)\right)+$$
$$\frac{1}{(i\,f)^{3/2}}\left((b-i\,c)\sqrt{2\pi}\ \cos\left(-\frac{i\,(i\,c-b)^2}{4\,f}+e-i\,g\right)C\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\pi}}\right)-\right.$$
$$\left.\left.(i\,c-b)\sqrt{2\pi}\ S\left(\frac{-b+i\,c+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\pi}}\right)\sin\left(-\frac{i\,(i\,c-b)^2}{4\,f}+e-i\,g\right)-2\sqrt{i\,f}\ \sin\left(-\sqrt{z}\ (i\,c-b)+e-i\,g-i\,f\,z\right)\right)\right)$$

Involving $\cos\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0762.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}-i\,g\right)C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\ \sqrt{2\pi}}\right)+S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\ \sqrt{2\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)}-i\,g\right)}{\sqrt{i\,c-b}}-\right.$$
$$\left.\frac{\cos\left(i\,g-\frac{(d+i\,f)^2}{4\,(b+i\,c)}\right)C\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\ \sqrt{2\pi}}\right)+S\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\ \sqrt{2\pi}}\right)\sin\left(i\,g-\frac{(d+i\,f)^2}{4\,(b+i\,c)}\right)}{\sqrt{-b-i\,c}}\right)$$

01.20.21.0763.01

$$\int \cos\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\sqrt{2\pi}\ \cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}-i\,g\right)C\left(\frac{-b+i\,c+2\,(i\,f-d)\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\pi}}\right)-(i\,c-b)\sqrt{2\pi}\right.\right.$$
$$\left.S\left(\frac{-b+i\,c+2\,(i\,f-d)\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}-i\,g\right)+2\sqrt{i\,f-d}\ \sin\left(\sqrt{z}\ (i\,c-b)+i\,g+(i\,f-d)\,z\right)\right)-$$
$$\frac{1}{(-d-i\,f)^{3/2}}\left((b+i\,c)\sqrt{2\pi}\ \cos\left(i\,g-\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)C\left(\frac{b+i\,c+2\,(d+i\,f)\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\pi}}\right)+(b+i\,c)\sqrt{2\pi}\right.$$
$$\left.\left.S\left(\frac{b+i\,c+2\,(d+i\,f)\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\pi}}\right)\sin\left(i\,g-\frac{(b+i\,c)^2}{4\,(d+i\,f)}\right)+2\sqrt{-d-i\,f}\ \ i\sinh\left(g-i\,(d+i\,f)\,z-i\,(b+i\,c)\sqrt{z}\right)\right)\right)$$

Involving $\cos(b\,z^r + d\,z + e)\cosh(c\,z^r + f\,z + g)$

01.20.21.0764.01

$$\int \cos(b\,z^2 + d\,z + e)\cosh(c\,z^2 + f\,z + g)\,dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cos\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)} + e - i\,g\right)C\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right) + S\left(\frac{-d+i\,f+2\,(i\,c-b)\,z}{\sqrt{i\,c-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f-d)^2}{4\,(i\,c-b)} + e - i\,g\right)}{\sqrt{i\,c-b}} - \frac{1}{\sqrt{-b-i\,c}}\right.$$

$$\left.\left(\cos\left(-\frac{(d+i\,f)^2}{4\,(b+i\,c)} + e + i\,g\right)C\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right) + S\left(\frac{d+i\,f+2\,(b+i\,c)\,z}{\sqrt{-b-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(d+i\,f)^2}{4\,(b+i\,c)} + e + i\,g\right)\right)\right)$$

01.20.21.0765.01

$$\int \cos(b\,z^2 + d\,z + e)\cosh(c\,z^2 + f\,z + g)\,dz ==$$

$$\frac{1}{8}\,e^{-g-i\,e}\sqrt{\pi}\left(\frac{e^{2\,i\,e-\frac{i\,(d+i\,f)^2}{4\,(b+i\,c)}}\,i\,\operatorname{erf}\left(\frac{d+i\,f+2\,b\,z+2\,i\,c\,z}{2\sqrt{i\,b-c}}\right)}{\sqrt{i\,b-c}} + \frac{e^{\frac{i\,(d+i\,f)^2}{4\,(b+i\,c)}+2\,g}\,\operatorname{erfi}\left(\frac{f-i\,d-2\,i\,b\,z+2\,c\,z}{2\sqrt{c-i\,b}}\right)}{\sqrt{c-i\,b}} + \right.$$

$$\left.\frac{e^{\frac{(f+i\,d)^2}{-4\,c-4\,i\,b}+2\,g+2\,i\,e}\,\operatorname{erfi}\left(\frac{f+i\,d+2\,c\,z+2\,i\,b\,z}{2\sqrt{c+i\,b}}\right)}{\sqrt{c+i\,b}} - \frac{e^{-\frac{(f+i\,d)^2}{-4\,c-4\,i\,b}}\,\operatorname{erfi}\left(\frac{f+i\,d+2\,c\,z+2\,i\,b\,z}{2\sqrt{-c-i\,b}}\right)}{\sqrt{-c-i\,b}}\right)$$

01.20.21.0766.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-d-i\,f)^{3/2}}\left(-(b+i\,c)\,\sqrt{2\,\pi}\ \cos\left(-\frac{(b+i\,c)^2}{4\,(d+i\,f)}+e+i\,g\right)C\left(\frac{b+i\,c\ +2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$(b+i\,c)\,\sqrt{2\,\pi}\ S\left(\frac{b+i\,c\ +2\,(d+i\,f)\,\sqrt{z}}{\sqrt{-d-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(b+i\,c)^2}{4\,(d+i\,f)}+e+i\,g\right)-$$

$$\left.2\,\sqrt{-d-i\,f}\ \sin\left(\sqrt{z}\ (b+i\,c)+e+i\,g\ +(d+i\,f)\,z\right)\right)+$$

$$\frac{1}{(i\,f-d)^{3/2}}\left((b-i\,c)\,\sqrt{2\,\pi}\ \cos\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e-i\,g\right)C\left(\frac{-b+i\,c\ +2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)-(i\,c-b)\,\sqrt{2\,\pi}\right.$$

$$\left.S\left(\frac{-b+i\,c\ +2\,(i\,f-d)\,\sqrt{z}}{\sqrt{i\,f-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c-b)^2}{4\,(i\,f-d)}+e-i\,g\right)-2\,\sqrt{i\,f-d}\ \sin\left(-\sqrt{z}\ (i\,c-b)+e-i\,g-(i\,f-d)\,z\right)\right)$$

01.20.21.0767.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{8}\left(-\frac{(c+i\,b)\,e^{\frac{(c+i\,b)^2}{4\,(f+i\,d)}-g-i\,e}\ \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i\,b+2\,(f+i\,d)\,\sqrt{z}}{2\,\sqrt{-f-i\,d}}\right)}{(-f-i\,d)^{3/2}}+\frac{4\,i\,\sin\left(e+i\,g\ -i\,(i\,d-f)\,z-i\,(i\,b-c)\,\sqrt{z}\right)}{i\,d-f}+\right.$$

$$\frac{4\,i\,\sin\left(e-i\,g-i\,(f+i\,d)\,z-i\,(c+i\,b)\,\sqrt{z}\right)}{f+i\,d}-\frac{(i\,b-c)\,e^{-\frac{(i\,b-c)^2}{4\,(i\,d-f)}-g+i\,e}\ \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+i\,b+2\,(i\,d-f)\,\sqrt{z}}{2\,\sqrt{i\,d-f}}\right)}{(i\,d-f)^{3/2}}-$$

$$\left.\frac{(c-i\,b)\,e^{-\frac{(c-i\,b)^2}{4\,(f-i\,d)}+g-i\,e}\ \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c-i\,b+2\,(f-i\,d)\,\sqrt{z}}{2\,\sqrt{f-i\,d}}\right)}{(f-i\,d)^{3/2}}-\frac{(c+i\,b)\,e^{-\frac{(c+i\,b)^2}{4\,(f+i\,d)}+g+i\,e}\ \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i\,b+2\,(f+i\,d)\,\sqrt{z}}{2\,\sqrt{f+i\,d}}\right)}{(f+i\,d)^{3/2}}\right)$$

Involving powers of cos

Involving $\cos^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.0768.01

$$\int \cos^{\mu}(c\,z)\cosh(a\,z)\,dz == \frac{1}{2\left(a^2+c^2\,\mu^2\right)}\left(e^{-a\,z}\left(1+e^{2\,i\,c\,z}\right)^{-\mu}\cos^{\mu}(c\,z)\right.$$
$$\left.\left((i\,c\,\mu-a)\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,1+\frac{i\,a}{2\,c}-\frac{\mu}{2};\,-e^{2\,i\,c\,z}\right)+e^{2\,a\,z}\,(a+i\,c\,\mu)\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(2-\frac{i\,a}{c}-\mu\right);\,-e^{2\,i\,c\,z}\right)\right)\right)$$

01.20.21.0769.01

$$\int \cos^{m}(c\,z)\cosh(a\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(a\,z)}{2^m\,a}+$$
$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\left((-a+2\,i\,c\,k-i\,c\,m)\left(-e^{-(a+c\,i\,(m-2\,k))\,z}\,(a+2\,i\,c\,k-i\,c\,m)-e^{-a\,z-2\,i\,c\,k\,z+i\,c\,m\,z}\,(a+c\,i\,(m-2\,k))+\right.\right.\right.$$
$$\left.\left.\left.e^{a\,z+2\,i\,c\,k\,z-i\,c\,m\,z}\,(a+c\,i\,(m-2\,k))\right)-e^{(a-2\,i\,c\,k+i\,c\,m)\,z}\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)\binom{m}{k}\right)\Big/$$
$$\left((-a+2\,i\,c\,k-i\,c\,m)\,(a+2\,i\,c\,k-i\,c\,m)\,(a+c\,i\,(m-2\,k))\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0770.01

$$\int \cos^{2}(z)\cosh(z)\,dz == \frac{1}{10}\left(2\cosh(z)\sin(2\,z)+(\cos(2\,z)+5)\sinh(z)\right)$$

01.20.21.0771.01

$$\int \cos^{3}(z)\cosh(z)\,dz == \frac{1}{40}\left(3\cosh(z)\,(5\sin(z)+\sin(3\,z))+(15\cos(z)+\cos(3\,z))\sinh(z)\right)$$

Involving $\cos^{\mu}(c\,z+d)\cosh(a\,z)$

01.20.21.0772.01

$$\int \cos^{\mu}(d+c\,z)\cosh(a\,z)\,dz == \frac{1}{2}\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}\cos^{\mu}(d+c\,z)$$
$$\left(\frac{e^{a\,z}}{a-i\,c\,\mu}\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,1-\frac{i\,a}{2\,c}-\frac{\mu}{2};\,-e^{2\,i\,(d+c\,z)}\right)-\frac{e^{-a\,z}}{a+i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,1+\frac{i\,a}{2\,c}-\frac{\mu}{2};\,-e^{2\,i\,(d+c\,z)}\right)\right)$$

01.20.21.0773.01

$$\int \cos^{m}(d+c\,z)\cosh(a\,z)\,dz == \frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(a\,z)}{a}+$$
$$2^{-m}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(\frac{i\cosh((a-2\,i\,c\,j+i\,c\,m)\,z)\sin(d\,m-2\,d\,j)}{a-2\,i\,c\,j+i\,c\,m}+\frac{i\cosh((a+2\,i\,c\,j-i\,c\,m)\,z)\sin(2\,d\,j-d\,m)}{a+2\,i\,c\,j-i\,c\,m}+\right.$$
$$\left.\frac{\cos(2\,d\,j-d\,m)\sinh((a-2\,i\,c\,j+i\,c\,m)\,z)}{a-2\,i\,c\,j+i\,c\,m}+\frac{\cos(2\,d\,j-d\,m)\sinh((a+2\,i\,c\,j-i\,c\,m)\,z)}{a+2\,i\,c\,j-i\,c\,m}\right)/;\,m\in\mathbb{N}^+$$

Involving $\cos^{\mu}(c\,z)\cosh(a\,z+b)$

01.20.21.0774.01

$$\int \cos^{\mu}(c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2}e^{-b}\left(1+e^{2\,i\,c\,z}\right)^{-\mu}\cos^{\mu}(c\,z)$$
$$\left(\frac{e^{2\,b+a\,z}}{a-i\,c\,\mu}\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,1-\frac{i\,a}{2\,c}-\frac{\mu}{2};\,-e^{2\,i\,c\,z}\right)-\frac{e^{-a\,z}}{a+i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,1+\frac{i\,a}{2\,c}-\frac{\mu}{2};\,-e^{2\,i\,c\,z}\right)\right)$$

01.20.21.0775.01

$$\int \cos^{m}(c\,z)\cosh(b+a\,z)\,dz == \frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(b+a\,z)}{a}+$$
$$2^{-m}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(\frac{\cosh((a-2\,i\,c\,j+i\,c\,m)\,z)\sinh(b)}{a-2\,i\,c\,j+i\,c\,m}+\frac{\cosh((a+2\,i\,c\,j-i\,c\,m)\,z)\sinh(b)}{a+2\,i\,c\,j-i\,c\,m}+\right.$$
$$\left.\frac{\cosh(b)\sinh((a-2\,i\,c\,j+i\,c\,m)\,z)}{a-2\,i\,c\,j+i\,c\,m}+\frac{\cosh(b)\sinh((a+2\,i\,c\,j-i\,c\,m)\,z)}{a+2\,i\,c\,j-i\,c\,m}\right)/;\,m\in\mathbb{N}^{+}$$

Involving $\cos^{\mu}(c\,z+d)\cosh(a\,z+b)$

01.20.21.0776.01

$$\int \cos^{\mu}(d+c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2}e^{-b}\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}\cos^{\mu}(d+c\,z)$$
$$\left(\frac{e^{2\,b+a\,z}}{a-i\,c\,\mu}\,{}_2F_1\left(-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,1-\frac{i\,a}{2\,c}-\frac{\mu}{2};\,-e^{2\,i\,(d+c\,z)}\right)-\frac{e^{-a\,z}}{a+i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(a+i\,c\,\mu)}{2\,c},\,-\mu;\,1+\frac{i\,a}{2\,c}-\frac{\mu}{2};\,-e^{2\,i\,(d+c\,z)}\right)\right)$$

01.20.21.0777.01

$$\int \cos^{m}(d+c\,z)\cosh(b+a\,z)\,dz ==$$
$$\frac{2^{-m}\,(1-m \bmod 2)\sinh(b+a\,z)}{a}\binom{m}{\frac{m}{2}}+2^{-m}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(\frac{\cosh((a-2\,i\,c\,j+i\,c\,m)\,z)\sinh(b-2\,i\,d\,j+i\,d\,m)}{a-2\,i\,c\,j+i\,c\,m}+\right.$$
$$\frac{\cosh((a+2\,i\,c\,j-i\,c\,m)\,z)\sinh(b+2\,i\,d\,j-i\,d\,m)}{a+2\,i\,c\,j-i\,c\,m}+\frac{\cosh(b-2\,i\,d\,j+i\,d\,m)\sinh((a-2\,i\,c\,j+i\,c\,m)\,z)}{a-2\,i\,c\,j+i\,c\,m}+$$
$$\left.\frac{\cosh(b+2\,i\,d\,j-i\,d\,m)\sinh((a+2\,i\,c\,j-i\,c\,m)\,z)}{a+2\,i\,c\,j-i\,c\,m}\right)/;\,m\in\mathbb{N}^{+}$$

Involving $\cos^{m}\left(b\,z^{r}\right)\cosh(c\,z)$

01.20.21.0778.01

$$\int \cos^m\left(b\,z^2\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}\right)C\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}\right)\right)+\frac{1}{\sqrt{b\,m-2\,b\,s}}$$

$$\left.\left.\left(\cos\left(\frac{c^2}{4\,(b\,m-2\,b\,s)}\right)C\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)-S\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{c^2}{4\,(b\,m-2\,b\,s)}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0779.01

$$\int \cos^m\left(b\,\sqrt{z}\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(-i\,c)^{3/2}}\left(b\,\sqrt{2\,\pi}\,(m-2\,s)\left(\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,c}\right)C\left(\frac{-b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.i\,S\left(\frac{-b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,c}\right)\right)-2\,\sqrt{-i\,c}\,\sin\left(i\,c\,z-(2\,b\,s-b\,m)\,\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,c)^{3/2}}\left(2\,\sqrt{-i\,c}\,\sin\left((b\,m-2\,b\,s)\,\sqrt{z}-i\,c\,z\right)-b\,\sqrt{2\,\pi}\,(m-2\,s)\left(\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,c}\right)C\left(\right.\right.\right.$$

$$\left.\left.\left.\frac{b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{b\,(m-2\,s)-2\,i\,c\,\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,c}\right)\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh(c\,z)$

01.20.21.0780.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)\right)C\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$
$$\left.S\left(\frac{-i\,c+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{c^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)\right)\right)+$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(-\frac{c^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)C\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.S\left(\frac{-i\,c+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(-\frac{c^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0781.01

$$\int \cos^m\left(\sqrt{z}\,b+e\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(-i\,c)^{3/2}}\left(b\sqrt{2\,\pi}\,(m-2\,s)\left(\cos\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s\right)C\left(\frac{-b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$
$$\left.S\left(\frac{-b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s\right)\right)-2\sqrt{-i\,c}$$
$$\left.\sin\left(e\,m-2\,e\,s+i\,c\,z-(2\,b\,s-b\,m)\sqrt{z}\right)\right)+\frac{1}{(-i\,c)^{3/2}}\left(2\sqrt{-i\,c}\,\sin\left(e\,m-2\,e\,s-i\,c\,z+(b\,m-2\,b\,s)\sqrt{z}\right)-\right.$$
$$b\sqrt{2\,\pi}\,(m-2\,s)\left(\cos\left(-\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s\right)C\left(\frac{b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)-\right.$$
$$\left.\left.\left.\left.S\left(\frac{b\,(m-2\,s)-2\,i\,c\sqrt{z}}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(b\,m-2\,b\,s)^2}{4\,c}+e\,m-2\,e\,s\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z\right)\cosh(c\,z)$

01.20.21.0782.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}\right)C\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.S\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}\right)C\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0783.01

$$\int \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh(c\,z)\,dz == \frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)}{c} + 2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\frac{1}{(-i\,c+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\,\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}\right)C\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$(2\,b\,k-b\,m)\sqrt{2\,\pi}\,S\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}\right)+$$

$$\left.2\sqrt{-i\,c+2\,d\,k-d\,m}\,\sin\left((-i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\right)\right)+\frac{1}{(i\,c+2\,d\,k-d\,m)^{3/2}}$$

$$\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\,\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}\right)C\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$(2\,b\,k-b\,m)\sqrt{2\,\pi}\,S\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}\right)+$$

$$\left.\left.2\sqrt{i\,c+2\,d\,k-d\,m}\,\sin\left((i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.0784.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(-\frac{1}{2}\right)^m}{c} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)\right)C\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,c-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(-i\,c-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)C\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{-i\,c+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(-i\,c+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0785.01

$$\int \cos^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)}{c}+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,c+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\right.\right.$$

$$\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+(2\,b\,k-b\,m)$$

$$\sqrt{2\,\pi}\;S\left(\frac{2\,b\,k-b\,m+2\,(-i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)+$$

$$\left.2\sqrt{-i\,c+2\,d\,k-d\,m}\;\sin\left(2\,e\,k-e\,m+(-i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\right)\right)+\frac{1}{(i\,c+2\,d\,k-d\,m)^{3/2}}$$

$$\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\;\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+\right.$$

$$(2\,b\,k-b\,m)\sqrt{2\,\pi}\;S\left(\frac{2\,b\,k-b\,m+2\,(i\,c+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,c+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)+$$

$$\left.\left.2\sqrt{i\,c+2\,d\,k-d\,m}\;\sin\left(2\,e\,k-e\,m+(i\,c+2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r\right)\cosh(f\,z+g)$

01.20.21.0786.01

$$\int \cos^m\left(b\,z^2\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cosh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g\right)C\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$
$$\left.i\,S\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sinh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g\right)\right)+\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g\right)\right.$$
$$\left.\left.C\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+i\,S\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sinh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0787.01

$$\int \cos^m\left(b\,\sqrt{z}\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} + 2^{-m-1}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(-i\,f)^{3/2}}\left(\sqrt{2\,\pi}\,(b\,m-2\,b\,s)\cosh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g\right)C\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-i\,\sqrt{2\,\pi}\,(2\,b\,s-b\,m)\right.\right.$$
$$\left.S\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g\right)-2\,i\,\sqrt{-i\,f}\,\sinh\left(g+f\,z+i\,(2\,b\,s-b\,m)\,\sqrt{z}\right)\right)+$$
$$\frac{1}{(-i\,f)^{3/2}}\left(\sqrt{2\,\pi}\,(2\,b\,s-b\,m)\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g\right)C\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)-\right.$$
$$i\,\sqrt{2\,\pi}\,(b\,m-2\,b\,s)\,S\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g\right)-$$
$$\left.\left.2\,i\,\sqrt{-i\,f}\,\sinh\left(g+f\,z+i\,(b\,m-2\,b\,s)\,\sqrt{z}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh(f\,z+g)$

01.20.21.0788.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cosh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g+e\,i\,(2\,s-m)\right)C\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.i\,S\left(\frac{-i\,f+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sinh\left(\frac{i\,f^2}{4\,(2\,b\,s-b\,m)}+g+e\,i\,(2\,s-m)\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)\right)C\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.i\,S\left(\frac{-i\,f+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sinh\left(\frac{i\,f^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0789.01

$$\int \cos^m\left(\sqrt{z}\;b+e\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} +$$

$$2^{-m-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(-i\,f)^{3/2}}\left(\sqrt{2\,\pi}\;(b\,m-2\,b\,s)\cosh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g-i\,e\,m+2\,i\,e\,s\right)C\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,\sqrt{2\,\pi}\;(2\,b\,s-b\,m)\,S\left(\frac{-b\,m+2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,b\,s-b\,m)^2}{4\,f}+g-i\,e\,m+2\,i\,e\,s\right)-$$

$$\left.2\,i\,\sqrt{-i\,f}\;\sinh\left(g-i\,e\,m+2\,i\,e\,s+f\,z+i\,(2\,b\,s-b\,m)\,\sqrt{z}\right)\right)+\frac{1}{(-i\,f)^{3/2}}$$

$$\left(\sqrt{2\,\pi}\;(2\,b\,s-b\,m)\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g+i\,e\,m-2\,i\,e\,s\right)C\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)-\right.$$

$$i\,\sqrt{2\,\pi}\;(b\,m-2\,b\,s)\,S\left(\frac{b\,m-2\,b\,s-2\,i\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,f}+g+i\,e\,m-2\,i\,e\,s\right)-$$

$$\left.\left.2\,i\,\sqrt{-i\,f}\;\sinh\left(g+i\,e\,m-2\,i\,e\,s+f\,z+i\,(b\,m-2\,b\,s)\,\sqrt{z}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z\right)\cosh(f\,z+g)$

01.20.21.0790.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+i\,g\right)C\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.S\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}+i\,g\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(g-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}\right)C\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.i\,S\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sinh\left(g-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0791.01

$$\int \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)}{f}+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\right.\right.$$

$$\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+i\,g\right)C\left(\frac{2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-(2\,b\,k-b\,m)$$

$$\sqrt{2\,\pi}\;S\left(\frac{2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+i\,g\right)-$$

$$\left.2\,i\,\sqrt{-i\,f+2\,d\,k-d\,m}\;\sinh\left(g+i\,(-i\,f+2\,d\,k-d\,m)\,z+i\,(2\,b\,k-b\,m)\,\sqrt{z}\right)\right)+\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}$$

$$\left(\left((b\,m-2\,b\,k)\sqrt{2\,\pi}\;\cosh\left(\frac{i\,(2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g\right)C\left(\frac{2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+\right.\right.$$

$$i\,(2\,b\,k-b\,m)\sqrt{2\,\pi}\;S\left(\frac{2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g\right)+$$

$$\left.\left.2\,i\,\sqrt{i\,f+2\,d\,k-d\,m}\;\sinh\left(g-i\,(i\,f+2\,d\,k-d\,m)\,z-i\,(2\,b\,k-b\,m)\,\sqrt{z}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh(f\,z+g)$

01.20.21.0792.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(-\frac{1}{2}\right)^m}{f} + 2^{-m-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}-i\,g+e\,(2\,s-m)\right)C\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$
$$\left.S\left(\frac{-i\,f-d\,m+2\,d\,s+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(-i\,f-d\,m+2\,d\,s)^2}{4\,(2\,b\,s-b\,m)}-i\,g+e\,(2\,s-m)\right)\right)+$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cosh\left(-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)\right)C\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.i\,S\left(\frac{-i\,f+d\,m-2\,d\,s+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sinh\left(-\frac{i\,(-i\,f+d\,m-2\,d\,s)^2}{4\,(b\,m-2\,b\,s)}+g-i\,e\,(2\,s-m)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0793.01

$$\int \cos^m\left(\sqrt{z}\, b+e+d\, z\right)\cosh(g+f\, z)\, dz == \frac{2^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\, z)}{f} +$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\, f+2\, d\, k-d\, m)^{3/2}}\left((b\, m-2\, b\, k)\sqrt{2\,\pi}\,\cos\left(-\frac{(2\, b\, k-b\, m)^2}{4\,(-i\, f+2\, d\, k-d\, m)}-i\, g\,+2\, e\, k-e\, m\right)\right.\right.$$

$$C\left(\frac{2\, b\, k-b\, m+2\,(-i\, f+2\, d\, k-d\, m)\sqrt{z}}{\sqrt{-i\, f+2\, d\, k-d\, m}\,\sqrt{2\,\pi}}\right)+(2\, b\, k-b\, m)\sqrt{2\,\pi}$$

$$S\left(\frac{2\, b\, k-b\, m+2\,(-i\, f+2\, d\, k-d\, m)\sqrt{z}}{\sqrt{-i\, f+2\, d\, k-d\, m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\, b\, k-b\, m)^2}{4\,(-i\, f+2\, d\, k-d\, m)}-i\, g\,+2\, e\, k-e\, m\right)-$$

$$\left.2\, i\,\sqrt{-i\, f+2\, d\, k-d\, m}\,\sinh\left(g+2\, i\, e\, k-i\, e\, m+i\,(-i\, f+2\, d\, k-d\, m)\, z+i\,(2\, b\, k-b\, m)\sqrt{z}\right)\right)+$$

$$\frac{1}{(i\, f+2\, d\, k-d\, m)^{3/2}}\left((b\, m-2\, b\, k)\sqrt{2\,\pi}\,\cosh\left(\frac{i\,(2\, b\, k-b\, m)^2}{4\,(i\, f+2\, d\, k-d\, m)}+g-2\, i\, e\, k+i\, e\, m\right)\right.$$

$$C\left(\frac{2\, b\, k-b\, m+2\,(i\, f+2\, d\, k-d\, m)\sqrt{z}}{\sqrt{i\, f+2\, d\, k-d\, m}\,\sqrt{2\,\pi}}\right)+i\,(2\, b\, k-b\, m)\sqrt{2\,\pi}$$

$$S\left(\frac{2\, b\, k-b\, m+2\,(i\, f+2\, d\, k-d\, m)\sqrt{z}}{\sqrt{i\, f+2\, d\, k-d\, m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\, b\, k-b\, m)^2}{4\,(i\, f+2\, d\, k-d\, m)}+g-2\, i\, e\, k+i\, e\, m\right)+$$

$$\left.\left.2\, i\,\sqrt{i\, f+2\, d\, k-d\, m}\,\sinh\left(g-2\, i\, e\, k+i\, e\, m-i\,(i\, f+2\, d\, k-d\, m)\, z-i\,(2\, b\, k-b\, m)\sqrt{z}\right)\right)\right) /;\ m\in\mathbb{N}^+$$

Involving $\cos^m(b\, z)\cosh\left(c\, z^r\right)$

01.20.21.0794.01

$$\int \cos^m(b\,z)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,(1-m \bmod 2)}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{\cosh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-i\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}\right)}{\sqrt{i\,c}}+\right.$$

$$\left.\frac{\cosh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,b\,k-b\,m)^2}{4\,c}\right)}{\sqrt{-i\,c}}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0795.01

$$\int \cos^m(b\,z)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(2\,b\,k-b\,m)^{3/2}}\left(-i\,c\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}\right)C\left(\frac{i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\right.\right.$$

$$\left.S\left(\frac{i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}\right)+2\sqrt{2\,b\,k-b\,m}\,\sin\left(i\,c\,\sqrt{z}+(2\,b\,k-b\,m)\,z\right)\right)+$$

$$\frac{1}{(2\,b\,k-b\,m)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}\right)C\left(\frac{-i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-i\,c\,\sqrt{2\,\pi}\right.$$

$$\left.\left.S\left(\frac{-i\,c+2\,(2\,b\,k-b\,m)\,\sqrt{z}}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,b\,k-b\,m)}\right)-2\sqrt{2\,b\,k-b\,m}\,\sin\left(i\,c\,\sqrt{z}-(2\,b\,k-b\,m)\,z\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}/;\,m\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.0796.01

$$\int \cos^m(e+d\,z)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,(1-m \bmod 2)}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(e\,(2\,k-m)-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$S\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sin\left(e\,(2\,k-m)-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}\right)\Bigg)+\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}-i\,e\,(2\,k-m)\right)\right.$$

$$\left.\left.C\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-i\,S\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}-i\,e\,(2\,k-m)\right)\right)\right)\Bigg/;\ m\in\mathbb{N}^+$$

01.20.21.0797.01

$$\int \cos^m(e+d\,z)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(c\,i\,\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\,\sqrt{2\,\pi}\,S\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)-$$

$$\left.2\,i\,\sqrt{2\,d\,k-d\,m}\,\sinh\left(\sqrt{z}\,c+2\,i\,e\,k-i\,e\,m+i\,(2\,d\,k-d\,m)\,z\right)\right)+$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(-i\,c\,\sqrt{2\,\pi}\,\cosh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m\right)C\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$c\,\sqrt{2\,\pi}\,S\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m\right)+$$

$$\left.\left.2\,i\,\sqrt{2\,d\,k-d\,m}\,\sinh\left(\sqrt{z}\,c-2\,i\,e\,k+i\,e\,m-i\,(2\,d\,k-d\,m)\,z\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}\Bigg/;\ m\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r)\cosh(c\,z^r)$

01.20.21.0798.01

$$\int \cos^m(b\,z^r)\cosh(c\,z^r)\,dz == -\frac{2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r},\,-c\,z^r\right)(-c\,z^r)^{-1/r}+(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,z^r\right)\right)(1-m \bmod 2)}{r} -$$

$$\frac{1}{r}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+\right.$$

$$((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0799.01

$$\int \cos^m\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\,\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)(1-m \bmod 2)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{-i\,c+2\,b\,k-b\,m}}+\frac{C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{i\,c+2\,b\,k-b\,m}}\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0800.01

$$\int \cos^m\left(b\,\sqrt{z}\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\left(\cos\left((-i\,c+b\,(2\,k-m))\,\sqrt{z}\right)+(-i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sin\left((-i\,c+b\,(2\,k-m))\,\sqrt{z}\right)\right)\Big/(-i\,c+b\,(2\,k-m))^2+\right.$$

$$\left.\frac{\cos\left((i\,c+b\,(2\,k-m))\,\sqrt{z}\right)+(i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sin\left((i\,c+b\,(2\,k-m))\,\sqrt{z}\right)}{(i\,c+b\,(2\,k-m))^2}\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh\left(c\,z^r\right)$

01.20.21.0801.01

$$\int \cos^m(b\,z^r+e)\cosh(c\,z^r)\,dz == -\frac{2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)(1-m \bmod 2)}{r} -$$

$$\frac{1}{r}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{1}{r},(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+\right.$$

$$e^{2\,i\,e\,k-i\,e\,m}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{i\,e\,m-2\,i\,e\,k}\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{i\,e\,m-2\,i\,e\,k}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0802.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)(1-m \bmod 2)}{\sqrt{i\,c}} +$$

$$2^{-m-\frac{1}{2}}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos(e\,(2\,k-m))\,C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-\right.\right.$$

$$\left.S\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e\,(2\,k-m))\right)+\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}$$

$$\left.\left(\cos(e\,(2\,k-m))\,C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-S\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e\,(2\,k-m))\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0803.01

$$\int \cos^m\left(\sqrt{z}\,b+e\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,c+b\,(2\,k-m))^2}\left(\cos\left(\sqrt{z}\,(-i\,c+b\,(2\,k-m))-e\,(m-2\,k)\right)+(-i\,c+b\,(2\,k-m))\right.\right.$$

$$\left.\sqrt{z}\,\sin\left(\sqrt{z}\,(-i\,c+b\,(2\,k-m))-e\,(m-2\,k)\right)\right)+\frac{1}{(i\,c+b\,(2\,k-m))^2}$$

$$\left.\left(\cos\left(-\sqrt{z}\,(i\,c+b\,(2\,k-m))+e\,(m-2\,k)\right)-(i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sin\left(-\sqrt{z}\,(i\,c+b\,(2\,k-m))+e\,(m-2\,k)\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}\;/;\,m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r\right)$

01.20.21.0804.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)dz == \frac{2^{-m-\frac{1}{2}}\,i\,\sqrt{\pi}\,\left(1-m \bmod 2\right)}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}\right)\right)+$$
$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0805.01

$$\int \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh\left(c\,\sqrt{z}\right)dz == 2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$
$$\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\,\cos\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}\right)C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$
$$(-i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}\,S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}\right)+$$
$$\left.2\,\sqrt{2\,d\,k-d\,m}\,\sin\left((2\,d\,k-d\,m)\,z+(-i\,c+2\,b\,k-b\,m)\,\sqrt{z}\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$
$$\left((-i\,c-2\,b\,k+b\,m)\,\sqrt{2\,\pi}\,\cos\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$
$$(i\,c+2\,b\,k-b\,m)\,\sqrt{2\,\pi}\,S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}\right)+$$
$$\left.\left.2\,\sqrt{2\,d\,k-d\,m}\,\sin\left((2\,d\,k-d\,m)\,z+(i\,c+2\,b\,k-b\,m)\,\sqrt{z}\right)\right)\right)-$$
$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}\left(1-m \bmod 2\right)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

01.20.21.0806.01

$$\int \cos^m\left(b z^2+d z+e\right)\cosh\left(c z^2\right) dz == \frac{2^{-m-\frac{1}{2}} i \sqrt{\pi}\binom{m}{\frac{m}{2}} C\left(\frac{c\sqrt{\frac{2}{\pi}}\, z}{\sqrt{i c}}\right)(1-m \bmod 2)}{\sqrt{i c}} + 2^{-m-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i c+2 b k-b m}}\left(\cos\left(e(2k-m)-\frac{(2dk-dm)^2}{4(-ic+2bk-bm)}\right)C\left(\frac{2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\,\sqrt{2\pi}}\right)-\right.\right.$$
$$\left.S\left(\frac{2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\,\sqrt{2\pi}}\right)\sin\left(e(2k-m)-\frac{(2dk-dm)^2}{4(-ic+2bk-bm)}\right)\right)+$$
$$\frac{1}{\sqrt{ic+2bk-bm}}\left(\cos\left(\frac{(2dk-dm)^2}{4(ic+2bk-bm)}-e(2k-m)\right)C\left(\frac{2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\,\sqrt{2\pi}}\right)+\right.$$
$$\left.\left.S\left(\frac{2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\,\sqrt{2\pi}}\right)\sin\left(\frac{(2dk-dm)^2}{4(ic+2bk-bm)}-e(2k-m)\right)\right)\right) /; m\in\mathbb{N}^+$$

01.20.21.0807.01

$$\int \cos^m\left(\sqrt{z}\, b+e+d z\right)\cosh\left(c\sqrt{z}\right) dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(2dk-dm)^{3/2}}\left((ic-2bk+bm)\sqrt{2\pi}\,\cos\left(-\frac{(-ic+2bk-bm)^2}{4(2dk-dm)}+2ek-em\right)\right.\right.$$
$$C\left(\frac{-ic+2bk-bm+2(2dk-dm)\sqrt{z}}{\sqrt{2dk-dm}\,\sqrt{2\pi}}\right)+(-ic+2bk-bm)\sqrt{2\pi}$$
$$S\left(\frac{-ic+2bk-bm+2(2dk-dm)\sqrt{z}}{\sqrt{2dk-dm}\,\sqrt{2\pi}}\right)\sin\left(-\frac{(-ic+2bk-bm)^2}{4(2dk-dm)}+2ek-em\right)+$$
$$\left.2\sqrt{2dk-dm}\,\sin\left(2ek-em+(2dk-dm)z+(-ic+2bk-bm)\sqrt{z}\right)\right)+\frac{1}{(2dk-dm)^{3/2}}$$
$$\left((-ic-2bk+bm)\sqrt{2\pi}\,\cos\left(\frac{(ic+2bk-bm)^2}{4(2dk-dm)}-2ek+em\right)C\left(\frac{ic+2bk-bm+2(2dk-dm)\sqrt{z}}{\sqrt{2dk-dm}\,\sqrt{2\pi}}\right)-\right.$$
$$(ic+2bk-bm)\sqrt{2\pi}\,S\left(\frac{ic+2bk-bm+2(2dk-dm)\sqrt{z}}{\sqrt{2dk-dm}\,\sqrt{2\pi}}\right)\sin\left(\frac{(ic+2bk-bm)^2}{4(2dk-dm)}-2ek+em\right)-$$
$$\left.\left.2\sqrt{2dk-dm}\,\sin\left(-2ek+em-(2dk-dm)z-(ic+2bk-bm)\sqrt{z}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\sqrt{z}\right)-c\sqrt{z}\,\sinh\left(c\sqrt{z}\right)\right)}{c^2} /; m\in\mathbb{N}^+$$

Involving $\cos^m(d z)\cosh\left(c z^r+g\right)$

01.20.21.0808.01

$$\int \cos^m(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-i\,c}}\left(\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)+i\,S\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g\right)\right)+\right.$$

$$\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0809.01

$$\int \cos^m(d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g\right)C\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\;S\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g\right)-$$

$$\left.2\,i\sqrt{2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+g+i\,(2\,d\,k-d\,m)\,z\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$

$$\left(-i\,c\sqrt{2\,\pi}\;\cosh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g\right)C\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-c\sqrt{2\,\pi}\;S\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\right.$$

$$\left.\left.\sinh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g\right)+2\,i\sqrt{2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+g-i\,(2\,d\,k-d\,m)\,z\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\;c+g\right)-c\sqrt{z}\;\sinh\left(\sqrt{z}\;c+g\right)\right)}{c^2}\ /;\ m\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.0810.01

$$\int \cos^m(e+d\,z)\cosh\left(c\,z^2+g\right)dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}-i\,g+e\,(2\,k-m)\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sin\left(-\frac{i\,(2\,d\,k-d\,m)^2}{4\,c}-i\,g+e\,(2\,k-m)\right)\right)+\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)\right)\right.$$
$$\left.\left.C\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)-i\,S\left(\frac{2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0811.01

$$\int \cos^m(e+d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\,\cos\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m\right)C\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$
$$i\,c\sqrt{2\,\pi}\,S\left(\frac{-i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m\right)-$$
$$\left.2\,i\sqrt{2\,d\,k-d\,m}\,\sinh\left(\sqrt{z}\,c+g+2\,i\,e\,k-i\,e\,m+i\,(2\,d\,k-d\,m)\,z\right)\right)+$$
$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\,\cosh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)C\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)-\right.$$
$$c\sqrt{2\,\pi}\,S\left(\frac{i\,c+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)+$$
$$\left.\left.2\,i\sqrt{2\,d\,k-d\,m}\,\sinh\left(\sqrt{z}\,c+g-2\,i\,e\,k+i\,e\,m-i\,(2\,d\,k-d\,m)\,z\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\,c+g\right)-c\sqrt{z}\,\sinh\left(\sqrt{z}\,c+g\right)\right)}{c^2}/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0812.01

$$\int \cos^m(b\,z^r)\cosh(c\,z^r+g)\,dz == -\frac{2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{1}{r},\,-c\,z^r\right)(-c\,z^r)^{-1/r}+e^{-g}\,(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$

$$\frac{1}{r}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^g\,\Gamma\left(\frac{1}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+\right.$$

$$e^{-g}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^g\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-g}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0813.01

$$\int \cos^m\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\left(\cosh(g)\,C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)+i\,S\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh(g)\right)\Big/\left(\sqrt{-i\,c+2\,b\,k-b\,m}\right)+\right.$$

$$\left.\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh(g)\,C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-i\,S\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh(g)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0814.01

$$\int \cos^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(i\,c+b\,(2\,k-m))^2}\left(\cos\left(i\,g+(i\,c+b\,(2\,k-m))\sqrt{z}\right)+(i\,c+b\,(2\,k-m))\sqrt{z}\right.\right.$$

$$\left.\sin\left(i\,g+(i\,c+b\,(2\,k-m))\sqrt{z}\right)\right)+\frac{1}{(-i\,c+b\,(2\,k-m))^2}$$

$$\left.\left(\cosh\left(g+i\,(-i\,c+b\,(2\,k-m))\sqrt{z}\right)-i\,(-i\,c+b\,(2\,k-m))\sqrt{z}\,\sinh\left(g+i\,(-i\,c+b\,(2\,k-m))\sqrt{z}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\;c+g\right)-c\sqrt{z}\,\sinh\left(\sqrt{z}\;c+g\right)\right)}{c^2}\;/;\,m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0815.01

$$\int \cos^m(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{1}{r}\left((-1)^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{1}{r},\,-c\,z^r\right)(-c\,z^r)^{-1/r}+e^{-g}\,(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,z^r\right)\right)(1-m \bmod 2)\right)-$$

$$\frac{1}{r}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{g+2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{1}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}+\right.$$

$$e^{-g+2\,i\,e\,k-i\,e\,m}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{g-2\,i\,e\,k+i\,e\,m}\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-g-2\,i\,e\,k+i\,e\,m}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0816.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,c}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos(-i\,g+e\,(2\,k-m))\,C\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-S\left(\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\right.\right.$$

$$\left.\sin(-i\,g+e\,(2\,k-m))\right)+\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh(g-i\,e\,(2\,k-m))\,C\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)-\right.$$

$$\left.\left.i\,S\left(\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh(g-i\,e\,(2\,k-m))\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0817.01

$$\int \cos^m\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(i\,c+b\,(2\,k-m))^2}\left(\cos\left(-i\,g+e\,(m-2\,k)-(i\,c+b\,(2\,k-m))\,\sqrt{z}\right)-(i\,c+b\,(2\,k-m))\right.\right.$$

$$\left.\sqrt{z}\,\sin\left(-i\,g+e\,(m-2\,k)-(i\,c+b\,(2\,k-m))\,\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,c+b\,(2\,k-m))^2}\left(\cosh\left(g-i\,e\,(m-2\,k)+i\,(-i\,c+b\,(2\,k-m))\,\sqrt{z}\right)-\right.$$

$$\left.\left.i\,(-i\,c+b\,(2\,k-m))\,\sqrt{z}\,\sinh\left(g-i\,e\,(m-2\,k)+i\,(-i\,c+b\,(2\,k-m))\,\sqrt{z}\right)\right)\right)-$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\,c+g\right)-c\,\sqrt{z}\,\sinh\left(\sqrt{z}\,c+g\right)\right)}{c^2}\;/;\,m\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r + d\,z)\cosh(c\,z^r + g)$

01.20.21.0818.01

$$\int \cos^m(b\,z^2 + d\,z)\cosh(c\,z^2 + g)\,dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right) - S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)}{\sqrt{i\,c}} +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c + 2\,b\,k - b\,m}}\left(\cos\left(\frac{(2\,d\,k - d\,m)^2}{4\,(-i\,c + 2\,b\,k - b\,m)} + i\,g\right)C\left(\frac{2\,d\,k - d\,m + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right) + \right.\right.$$

$$\left.S\left(\frac{2\,d\,k - d\,m + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,d\,k - d\,m)^2}{4\,(-i\,c + 2\,b\,k - b\,m)} + i\,g\right)\right) +$$

$$\frac{1}{\sqrt{i\,c + 2\,b\,k - b\,m}}\left(\cosh\left(\frac{i\,(2\,d\,k - d\,m)^2}{4\,(i\,c + 2\,b\,k - b\,m)} + g\right)C\left(\frac{2\,d\,k - d\,m + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right) - \right.$$

$$\left.\left.i\,S\left(\frac{2\,d\,k - d\,m + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\,d\,k - d\,m)^2}{4\,(i\,c + 2\,b\,k - b\,m)} + g\right)\right)\right) /;\ m \in \mathbb{N}^+$$

01.20.21.0819.01

$$\int \cos^m\left(\sqrt{z}\;b + d\,z\right)\cosh\left(\sqrt{z}\;c + g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(2\,d\,k - d\,m)^{3/2}}\left((i\,c - 2\,b\,k + b\,m)\sqrt{2\,\pi}\,\cos\left(\frac{(-i\,c + 2\,b\,k - b\,m)^2}{4\,(2\,d\,k - d\,m)} + i\,g\right)\right.\right.$$

$$C\left(\frac{-i\,c + 2\,b\,k - b\,m + 2\,(2\,d\,k - d\,m)\sqrt{z}}{\sqrt{2\,d\,k - d\,m}\,\sqrt{2\,\pi}}\right) - (-i\,c + 2\,b\,k - b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c + 2\,b\,k - b\,m + 2\,(2\,d\,k - d\,m)\sqrt{z}}{\sqrt{2\,d\,k - d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,c + 2\,b\,k - b\,m)^2}{4\,(2\,d\,k - d\,m)} + i\,g\right) -$$

$$\left.2\,i\,\sqrt{2\,d\,k - d\,m}\,\sinh\left(g + i\,(2\,d\,k - d\,m)\,z + i\,(-i\,c + 2\,b\,k - b\,m)\sqrt{z}\right)\right) + \frac{1}{(2\,d\,k - d\,m)^{3/2}}$$

$$\left((-i\,c - 2\,b\,k + b\,m)\sqrt{2\,\pi}\,\cosh\left(\frac{i\,(i\,c + 2\,b\,k - b\,m)^2}{4\,(2\,d\,k - d\,m)} + g\right)C\left(\frac{i\,c + 2\,b\,k - b\,m + 2\,(2\,d\,k - d\,m)\sqrt{z}}{\sqrt{2\,d\,k - d\,m}\,\sqrt{2\,\pi}}\right) + \right.$$

$$i\,(i\,c + 2\,b\,k - b\,m)\sqrt{2\,\pi}\,S\left(\frac{i\,c + 2\,b\,k - b\,m + 2\,(2\,d\,k - d\,m)\sqrt{z}}{\sqrt{2\,d\,k - d\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c + 2\,b\,k - b\,m)^2}{4\,(2\,d\,k - d\,m)} + g\right) +$$

$$\left.\left.2\,i\,\sqrt{2\,d\,k - d\,m}\,\sinh\left(g - i\,(2\,d\,k - d\,m)\,z - i\,(i\,c + 2\,b\,k - b\,m)\sqrt{z}\right)\right)\right) -$$

$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\left(\cosh\left(\sqrt{z}\;c + g\right) - c\,\sqrt{z}\,\sinh\left(\sqrt{z}\;c + g\right)\right)}{c^2} /;\ m \in \mathbb{N}^+$$

Involving $\cos^m(b\,z^r + d\,z + e)\cosh(c\,z^r + g)$

01.20.21.0820.01

$$\int \cos^m\left(b\,z^2 + d\,z + e\right)\cosh\left(c\,z^2 + g\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{\sqrt{i\,c}}\left(i\cosh(g)\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,c}}\right)\sinh(g)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g\,+e\,(2\,k-m)\right)C\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g\,+e\,(2\,k-m)\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0821.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m\right)\right.\right.$$
$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$
$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}-i\,g+2\,e\,k-e\,m\right)-$$
$$\left.2\,i\sqrt{2\,d\,k-d\,m}\ \sinh\left(g+2\,i\,e\,k-i\,e\,m+i\,(2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)+$$
$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)\right.$$
$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$
$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(2\,d\,k-d\,m)\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)+$$
$$\left.\left.2\,i\sqrt{2\,d\,k-d\,m}\ \sinh\left(g-2\,i\,e\,k+i\,e\,m-i\,(2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)-$$
$$\frac{2^{1-m}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(\cosh\left(\sqrt{z}\ c+g\right)-c\sqrt{z}\ \sinh\left(\sqrt{z}\ c+g\right)\right)}{c^2}\ /;\ m\in\mathbb{N}^+$$

Involving $\cos^m(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0822.01

$$\int \cos^m(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}\right)\right)}{\sqrt{i\,c}}+2^{-m-\frac{1}{2}}\sqrt{\pi}$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cosh\left(\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,c}\right)C\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)+i\,S\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,c}\right)\right)+\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-\right.\right.$$
$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}\right)\right)\right)\ /;\ m\in\mathbb{N}^+$$

01.20.21.0823.01

$$\int \cos^m(d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$
$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+2\sqrt{i\,f}\;\;i\sinh\left(\sqrt{z}\;c+f\,z\right)\right)+$$
$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}\right)C\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)-\right.\right.$$
$$i\,c\sqrt{2\,\pi}\;S\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}\right)-$$
$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+i\,(-i\,f+2\,d\,k-d\,m)\,z\right)\right)+$$
$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,(i\,f+2\,d\,k-d\,m)}\right)C\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$
$$c\,i\sqrt{2\,\pi}\;S\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(i\,f+2\,d\,k-d\,m)}\right)+$$
$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\;\sinh\left(c\sqrt{z}\;-i\,(i\,f+2\,d\,k-d\,m)\,z\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0824.01

$$\int \cos^m(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\;\sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}\right)\right)}{\sqrt{i\,c}}+$$
$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(-\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+e\,(2\,k-m)\right)C\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)-\right.\right.$$
$$S\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+e\,(2\,k-m)\right)\Big)+$$
$$\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}-i\,e\,(2\,k-m)\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\;\sqrt{2\,\pi}}\right)-\right.$$
$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}-i\,e\,(2\,k-m)\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0825.01

$$\int \cos^m(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\;i\sinh\left(\sqrt{z}\;c+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\;\cos\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\;S\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c+2\,i\,e\,k-i\,e\,m+i\,(-i\,f+2\,d\,k-d\,m)\,z\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\;\cosh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m\right)C\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\;S\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m\right)+$$

$$\left.\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\;\sinh\left(\sqrt{z}\;c-2\,i\,e\,k+i\,e\,m-i\,(i\,f+2\,d\,k-d\,m)\,z\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r)\cosh(c\,z^r+f\,z)$

01.20.21.0826.01

$$\int \cos^m(b\,z^2)\cosh(c\,z^2+f\,z)\,dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4c}\right)C\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)+S\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)\sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}}+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\left(\cos\left(\frac{f^2}{4(-ic+2bk-bm)}\right)C\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)-\right.\right.$$
$$\left.S\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4(-ic+2bk-bm)}\right)\right)\Big/\left(\sqrt{-ic+2bk-bm}\right)+$$
$$\frac{1}{\sqrt{ic+2bk-bm}}\left(\cos\left(\frac{f^2}{4(ic+2bk-bm)}\right)C\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)-\right.$$
$$\left.\left.S\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4(ic+2bk-bm)}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.0827.01

$$\int \cos^m(b\sqrt{z})\cosh(\sqrt{z}\,c+f\,z)\,dz == \frac{1}{(if)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$
$$\left(c\sqrt{2\pi}\left(\cosh\left(\frac{c^2}{4f}\right)C\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)-iS\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4f}\right)\right)+2\sqrt{if}\;i\sinh(\sqrt{z}\,c+fz)\right)+$$
$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-if)^{3/2}}\left((ic-2bk+bm)\sqrt{2\pi}\cos\left(\frac{i(-ic+2bk-bm)^2}{4f}\right)C\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\sqrt{2\pi}}\right)-\right.\right.$$
$$(-ic+2bk-bm)\sqrt{2\pi}\;S\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\sqrt{2\pi}}\right)\sin\left(\frac{i(-ic+2bk-bm)^2}{4f}\right)-$$
$$\left.2i\sqrt{-if}\;\sinh\left(fz+i(-ic+2bk-bm)\sqrt{z}\right)\right)+$$
$$\frac{1}{(if)^{3/2}}\left((-ic-2bk+bm)\sqrt{2\pi}\cosh\left(\frac{(ic+2bk-bm)^2}{4f}\right)C\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)+\right.$$
$$i(ic+2bk-bm)\sqrt{2\pi}\;S\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)\sinh\left(\frac{(ic+2bk-bm)^2}{4f}\right)+$$
$$\left.\left.2\sqrt{if}\;i\sinh\left(fz-i(ic+2bk-bm)\sqrt{z}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r+e)\cosh(c\,z^r+f\,z)$

01.20.21.0828.01

$$\int \cos^m\left(b z^2+e\right)\cosh\left(c z^2+f z\right) dz == \frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4c}\right)C\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)+S\left(\frac{f+2cz}{\sqrt{ic}\sqrt{2\pi}}\right)\sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}}+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-ic+2bk-bm}}\left(\cos\left(\frac{f^2}{4(-ic+2bk-bm)}+e(2k-m)\right)C\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-if+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4(-ic+2bk-bm)}+e(2k-m)\right)\right)+$$

$$\frac{1}{\sqrt{ic+2bk-bm}}\left(\cos\left(\frac{f^2}{4(ic+2bk-bm)}+e(2k-m)\right)C\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)-\right.$$

$$\left.\left.S\left(\frac{if+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\sqrt{2\pi}}\right)\sin\left(\frac{f^2}{4(ic+2bk-bm)}+e(2k-m)\right)\right)\right)\Big/; m\in\mathbb{N}^+$$

01.20.21.0829.01

$$\int \cos^m\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+f z\right) dz ==$$

$$\frac{1}{(if)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\pi}\left(\cosh\left(\frac{c^2}{4f}\right)C\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)-iS\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4f}\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{if}\,i\sinh\left(\sqrt{z}\,c+f z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\frac{1}{(-if)^{3/2}}\left((ic-2bk+bm)\sqrt{2\pi}\cos\left(-\frac{i(-ic+2bk-bm)^2}{4f}+2ek-em\right)C\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\sqrt{2\pi}}\right)+\right.\right.$$

$$(-ic+2bk-bm)\sqrt{2\pi}\,S\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\sqrt{2\pi}}\right)\sin\left(-\frac{i(-ic+2bk-bm)^2}{4f}+2ek-em\right)-$$

$$\left.2i\sqrt{-if}\,\sinh\left(2iek-iem+fz+i(-ic+2bk-bm)\sqrt{z}\right)\right)+\frac{1}{(if)^{3/2}}$$

$$\left(\left(-ic-2bk+bm\right)\sqrt{2\pi}\cosh\left(\frac{(ic+2bk-bm)^2}{4f}-2iek+iem\right)C\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)+\right.$$

$$i(ic+2bk-bm)\sqrt{2\pi}\,S\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\sqrt{2\pi}}\right)\sinh\left(\frac{(ic+2bk-bm)^2}{4f}-2iek+iem\right)+$$

$$\left.\left.2\sqrt{if}\,i\sinh\left(-2eik+iem+fz-i(ic+2bk-bm)\sqrt{z}\right)\right)\right)\Big/; m\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r + d\,z)\cosh(c\,z^r + f\,z)$

01.20.21.0830.01

$$\int \cos^m(b\,z^2 + d\,z)\cosh(c\,z^2 + f\,z)\,dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}\right)C\left(\frac{f + 2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right) + S\left(\frac{f + 2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}\right)\right)\right) +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}{}'\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c + 2\,b\,k - b\,m}}\left(\cos\left(\frac{(-i\,f + 2\,d\,k - d\,m)^2}{4\,(-i\,c + 2\,b\,k - b\,m)}\right)C\left(\frac{-i\,f + 2\,d\,k - d\,m + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\ \sqrt{2\,\pi}}\right) + \right.\right.$$

$$\left.\left.S\left(\frac{-i\,f + 2\,d\,k - d\,m + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,f + 2\,d\,k - d\,m)^2}{4\,(-i\,c + 2\,b\,k - b\,m)}\right)\right) +$$

$$\frac{1}{\sqrt{i\,c + 2\,b\,k - b\,m}}\left(\cos\left(\frac{(i\,f + 2\,d\,k - d\,m)^2}{4\,(i\,c + 2\,b\,k - b\,m)}\right)C\left(\frac{i\,f + 2\,d\,k - d\,m + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\ \sqrt{2\,\pi}}\right) + \right.$$

$$\left.\left.S\left(\frac{i\,f + 2\,d\,k - d\,m + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,f + 2\,d\,k - d\,m)^2}{4\,(i\,c + 2\,b\,k - b\,m)}\right)\right)\right)\Big/;\ m \in \mathbb{N}^+$$

01.20.21.0831.01

$$\int \cos^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left(\left(i\,c-2\,b\,k+b\,m\right)\sqrt{2\,\pi}\ \cos\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}\right)C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}\right)+$$

$$\left.2\sqrt{-i\,f+2\,d\,k-d\,m}\ \sin\left(\sqrt{z}\ (-i\,c+2\,b\,k-b\,m)+(-i\,f+2\,d\,k-d\,m)\,z\right)\right)+\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}$$

$$\left(\left(-i\,c-2\,b\,k+b\,m\right)\sqrt{2\,\pi}\ \cos\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}\right)+$$

$$\left.\left.\left.2\sqrt{i\,f+2\,d\,k-d\,m}\ \sin\left(\sqrt{z}\ (i\,c+2\,b\,k-b\,m)+(i\,f+2\,d\,k-d\,m)\,z\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0832.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4c}\right)C\left(\frac{f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right)+S\left(\frac{f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right)\sinh\left(\frac{f^2}{4c}\right)\right)}{\sqrt{ic}}+2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{-ic+2bk-bm}}\left(\cos\left(-\frac{(-if+2dk-dm)^2}{4(-ic+2bk-bm)}+e(2k-m)\right)C\left(\frac{-if+2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\,\sqrt{2\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-if+2dk-dm+2(-ic+2bk-bm)z}{\sqrt{-ic+2bk-bm}\,\sqrt{2\pi}}\right)\sin\left(-\frac{(-if+2dk-dm)^2}{4(-ic+2bk-bm)}+e(2k-m)\right)\right)+$$

$$\frac{1}{\sqrt{ic+2bk-bm}}\left(\cosh\left(\frac{i(if+2dk-dm)^2}{4(ic+2bk-bm)}-ie(2k-m)\right)C\left(\frac{if+2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\,\sqrt{2\pi}}\right)-\right.$$

$$\left.\left.iS\left(\frac{if+2dk-dm+2(ic+2bk-bm)z}{\sqrt{ic+2bk-bm}\,\sqrt{2\pi}}\right)\sinh\left(\frac{i(if+2dk-dm)^2}{4(ic+2bk-bm)}-ie(2k-m)\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0833.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}\right)\right)+2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\ \sinh\left(2\,i\,e\,k-i\,e\,m+i\,(-i\,f+2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m\right)\right.$$

$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}-2\,i\,e\,k+i\,e\,m\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\ \sinh\left(-2\,i\,e\,k+i\,e\,m-i\,(i\,f+2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\cos^m(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0834.01

$$\int \cos^m(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cosh\left(\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+g\right)C\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.i\,S\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,c}+g\right)\right)+\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g\right)\right.$$

$$\left.\left.C\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0835.01

$$\int \cos^m(d\,z)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)\right)+2^{-m-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left(c\,i\sqrt{2\,\pi}\cos\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\right)C\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\ S\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\ \sinh\left(\sqrt{z}\ c+g+i\,(-i\,f+2\,d\,k-d\,m)\,z\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left(-i\,c\sqrt{2\,\pi}\cosh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g\right)C\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g\right)+$$

$$\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\ \sinh\left(\sqrt{z}\ c+g-i\,(i\,f+2\,d\,k-d\,m)\,z\right)\right)\Bigg)/;\ m\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0836.01

$$\int \cos^m(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c}}\left(\cos\left(-\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}-i\,g\,+e\,(2\,k-m)\right)C\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,d\,k-d\,m-2\,i\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(-i\,f+2\,d\,k-d\,m)^2}{4\,c}-i\,g\,+e\,(2\,k-m)\right)\right)+$$

$$\frac{1}{\sqrt{i\,c}}\left(\cosh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,i\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,f+2\,d\,k-d\,m)^2}{4\,c}+g-i\,e\,(2\,k-m)\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0837.01

$$\int \cos^m(e+d\,z)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left(c\,i\sqrt{2\,\pi}\ \cos\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\,+2\,e\,k-e\,m\right)C\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$i\,c\sqrt{2\,\pi}\ S\left(\frac{-i\,c+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{c^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\,+2\,e\,k-e\,m\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\ \sinh\left(\sqrt{z}\ c+g+2\,i\,e\,k-i\,e\,m+i\,(-i\,f+2\,d\,k-d\,m)\,z\right)\right)+\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}$$

$$\left(-i\,c\sqrt{2\,\pi}\ \cosh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)C\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$c\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,c^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\ \sinh\left(\sqrt{z}\ c+g-2\,i\,e\,k+i\,e\,m-i\,(i\,f+2\,d\,k-d\,m)\,z\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r)\cosh(c\,z^r + f\,z + g)$

01.20.21.0838.01

$$\int \cos^m(b\,z^2)\cosh(c\,z^2 + f\,z + g)\,dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c} - g\right)C\left(\frac{f + 2\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right) + S\left(\frac{f + 2\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c} - g\right)\right)\right) +$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}{}'\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c + 2\,b\,k - b\,m}}\left(\cos\left(\frac{f^2}{4\,(-i\,c + 2\,b\,k - b\,m)} - i\,g\right)C\left(\frac{-i\,f + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right) -\right.\right.$$

$$\left.\left.S\left(\frac{-i\,f + 2\,(-i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{-i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(-i\,c + 2\,b\,k - b\,m)} - i\,g\right)\right) +\right.$$

$$\left.\frac{1}{\sqrt{i\,c + 2\,b\,k - b\,m}}\left(\cosh\left(-\frac{i\,f^2}{4\,(i\,c + 2\,b\,k - b\,m)} + g\right)C\left(\frac{i\,f + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right) -\right.\right.$$

$$\left.\left.i\,S\left(\frac{i\,f + 2\,(i\,c + 2\,b\,k - b\,m)\,z}{\sqrt{i\,c + 2\,b\,k - b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,f^2}{4\,(i\,c + 2\,b\,k - b\,m)} + g\right)\right)\right) /;\ m \in \mathbb{N}^+$$

01.20.21.0839.01

$$\int \cos^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\pi}\left(\cosh\left(\frac{c^2}{4f}-g\right)C\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)-iS\left(\frac{c+2f\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4f}-g\right)\right)+2\sqrt{if}\;i\sinh\left(\sqrt{z}\,c+g+fz\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-if)^{3/2}}\left((ic-2bk+bm)\sqrt{2\pi}\,\cos\left(\frac{i(-ic+2bk-bm)^2}{4f}+ig\right)C\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\,\sqrt{2\pi}}\right)-\right.\right.$$

$$(-ic+2bk-bm)\sqrt{2\pi}\,S\left(\frac{-ic+2bk-bm-2if\sqrt{z}}{\sqrt{-if}\,\sqrt{2\pi}}\right)\sin\left(\frac{i(-ic+2bk-bm)^2}{4f}+ig\right)-$$

$$\left.2i\sqrt{-if}\,\sinh\left(g+fz+i(-ic+2bk-bm)\sqrt{z}\right)\right)+$$

$$\frac{1}{(if)^{3/2}}\left((-ic-2bk+bm)\sqrt{2\pi}\,\cosh\left(\frac{(ic+2bk-bm)^2}{4f}+g\right)C\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)+\right.$$

$$i(ic+2bk-bm)\sqrt{2\pi}\,S\left(\frac{ic+2bk-bm+2if\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(ic+2bk-bm)^2}{4f}+g\right)+$$

$$\left.\left.2\sqrt{if}\;i\sinh\left(g+fz-i(ic+2bk-bm)\sqrt{z}\right)\right)\right)/;\, m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0840.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{f^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)\right)C\left(\frac{-i\,f+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{f^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(-\frac{i\,f^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)\right)C\left(\frac{i\,f+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{i\,f^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0841.01

$$\int \cos^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+2\sqrt{i\,f}\ \ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}-i\,g\ +2\,e\,k-e\,m\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m-2\,i\,f\sqrt{z}}{\sqrt{-i\,f}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{i\,(-i\,c+2\,b\,k-b\,m)^2}{4\,f}-i\,g\ +2\,e\,k-e\,m\right)-$$

$$\left.2\,i\sqrt{-i\,f}\ \sinh\left(g+2\,i\,e\,k-i\,e\,m+f\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)+\frac{1}{(i\,f)^{3/2}}$$

$$\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}+g-2\,i\,e\,k+i\,e\,m\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)+\right.$$

$$i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,i\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(i\,c+2\,b\,k-b\,m)^2}{4\,f}+g-2\,i\,e\,k+i\,e\,m\right)+$$

$$\left.\left.2\sqrt{i\,f}\ \ i\sinh\left(g-2\,i\,e\,k+i\,e\,m+f\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0842.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+2^{-m-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\left(\cos\left(\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+i\,g\right)C\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}+i\,g\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0843.01

$$\int \cos^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)\right)+2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left(\left(i\,c-2\,b\,k+b\,m\right)\sqrt{2\,\pi}\ \cos\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+i\,g\right)C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)$$

$$\sin\left(\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}+i\,g\right)-2\,i\sqrt{-i\,f+2\,d\,k-d\,m}$$

$$\left.\sinh\left(g+i\,(-i\,f+2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)+\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}$$

$$\left(\left(-i\,c-2\,b\,k+b\,m\right)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g\right)C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+\right.$$

$$i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}\ S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\ \sinh\left(g-i\,(i\,f+2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0844.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(2^{-m-\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$2^{-m-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,b\,k-b\,m}}\right.$$

$$\left(\cos\left(-\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)\right)C\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.S\left(\frac{-i\,f+2\,d\,k-d\,m+2\,(-i\,c+2\,b\,k-b\,m)\,z}{\sqrt{-i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,f+2\,d\,k-d\,m)^2}{4\,(-i\,c+2\,b\,k-b\,m)}-i\,g+e\,(2\,k-m)\right)\right)+$$

$$\frac{1}{\sqrt{i\,c+2\,b\,k-b\,m}}\left(\cosh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)\right)C\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,S\left(\frac{i\,f+2\,d\,k-d\,m+2\,(i\,c+2\,b\,k-b\,m)\,z}{\sqrt{i\,c+2\,b\,k-b\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,f+2\,d\,k-d\,m)^2}{4\,(i\,c+2\,b\,k-b\,m)}+g-i\,e\,(2\,k-m)\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0845.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{-c-2\,i\,b\,k+i\,b\,m}\left(e^{-\frac{(f+2\,i\,d\,k-i\,d\,m)^2}{4\,c+8\,i\,b\,k-4\,i\,b\,m}+g-2\,i\,e\,m+e\,i\,(m-2\,k)}\left(e^{2\left(\frac{(f+2\,i\,d\,k-i\,d\,m)^2}{4\,c+8\,i\,b\,k-4\,i\,b\,m}-g+i\,e\,m\right)}\right.\right.\right.$$

$$\left.\sqrt{-c-2\,i\,b\,k+i\,b\,m}\ \operatorname{erfi}\left(\frac{-f-2\,c\,z-2\,k\,(i\,d+2\,i\,b\,z)+m\,(i\,d+2\,i\,b\,z)}{2\sqrt{-c-2\,i\,b\,k+i\,b\,m}}\right)-\right.$$

$$\left.\left.e^{4\,i\,e\,k}\sqrt{c+2\,i\,b\,k-i\,b\,m}\ \operatorname{erfi}\left(\frac{f+2\,c\,z+2\,k\,(i\,d+2\,i\,b\,z)-m\,(i\,d+2\,i\,b\,z)}{2\sqrt{c+2\,i\,b\,k-i\,b\,m}}\right)\right)\right)+$$

$$\frac{e^{\frac{(f-2\,i\,d\,k+i\,d\,m)^2}{-4\,c+8\,i\,b\,k-4\,i\,b\,m}+g+e\,i\,(m-2\,k)}\operatorname{erfi}\left(\frac{f+2\,c\,z-2\,k\,(i\,d+2\,i\,b\,z)+m\,(i\,d+2\,i\,b\,z)}{2\sqrt{c+b\,i\,(m-2\,k)}}\right)}{\sqrt{c+b\,i\,(m-2\,k)}}-\frac{1}{c+b\,i\,(m-2\,k)}$$

$$\left.\left.\left(e^{-\frac{(f-2\,i\,d\,k+i\,d\,m)^2}{-4\,c+8\,i\,b\,k-4\,i\,b\,m}-g+e\,i\,(2\,k-m)}\sqrt{-c+2\,i\,b\,k-i\,b\,m}\ \operatorname{erfi}\left(\frac{-f-2\,c\,z+2\,k\,(i\,d+2\,i\,b\,z)-m\,(i\,d+2\,i\,b\,z)}{2\sqrt{-c+2\,i\,b\,k-i\,b\,m}}\right)\right)\right)-\right.$$

$$\frac{1}{c}\left(2^{-m-2}\,e^{-\frac{f^2+4\,c\,g}{4\,c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\ e^{\frac{f^2}{2\,c}}\operatorname{erfi}\left(\frac{\sqrt{-c}\ (f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\ e^{2\,g}\operatorname{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0846.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(c\sqrt{2\,\pi}\left(\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)-i\,S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)+2\sqrt{i\,f}\ i\sinh\left(\sqrt{z}\ c+g+f\,z\right)\right)+$$

$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{(-i\,f+2\,d\,k-d\,m)^{3/2}}\left((i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cos\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\ +2\,e\,k-e\,m\right)\right.\right.$$

$$C\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+(-i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{-i\,c+2\,b\,k-b\,m+2\,(-i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{-i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-i\,c+2\,b\,k-b\,m)^2}{4\,(-i\,f+2\,d\,k-d\,m)}-i\,g\ +2\,e\,k-e\,m\right)-$$

$$\left.2\,i\sqrt{-i\,f+2\,d\,k-d\,m}\ \sinh\left(g+2\,i\,e\,k-i\,e\,m+i\,(-i\,f+2\,d\,k-d\,m)\,z+i\,(-i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)+$$

$$\frac{1}{(i\,f+2\,d\,k-d\,m)^{3/2}}\left((-i\,c-2\,b\,k+b\,m)\sqrt{2\,\pi}\ \cosh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)\right.$$

$$C\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)+i\,(i\,c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$S\left(\frac{i\,c+2\,b\,k-b\,m+2\,(i\,f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,f+2\,d\,k-d\,m}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{i\,(i\,c+2\,b\,k-b\,m)^2}{4\,(i\,f+2\,d\,k-d\,m)}+g-2\,i\,e\,k+i\,e\,m\right)+$$

$$\left.\left.2\,i\sqrt{i\,f+2\,d\,k-d\,m}\ \sinh\left(g-2\,i\,e\,k+i\,e\,m-i\,(i\,f+2\,d\,k-d\,m)\,z-i\,(i\,c+2\,b\,k-b\,m)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.0847.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-g-i\,e\,(2k-m)}\left(\frac{2\,e^{\sqrt{z}\ (c+b\,i\,(2k-m))+2\,(g+e\,i\,(2k-m))+(f+d\,i\,(2k-m))\,z}}{f+d\,i\,(2k-m)}-\frac{1}{(f+d\,i\,(2k-m))^{3/2}}\right.\right.$$

$$\left.\left(e^{2\,(g+e\,i\,(2k-m))-\frac{(c+b\,i\,(2k-m))^2}{4\,(f+d\,i\,(2k-m))}}\,(c+b\,i\,(2k-m))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,i\,(2k-m)+2\,(f+d\,i\,(2k-m))\,\sqrt{z}}{2\,\sqrt{f+d\,i\,(2k-m)}}\right)\right)+$$

$$\frac{2\,e^{\sqrt{z}\ (-c-i\,b\,(2k-m))+(i\,d\,(m-2k)-f)\,z}}{i\,d\,(m-2k)-f}-\left(e^{-\frac{(-c-i\,b\,(2k-m))^2}{4\,(i\,d\,(m-2k)-f)}}\,(c+b\,i\,(2k-m))\,\sqrt{\pi}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{c+b\,i\,(2k-m)+2\,(f+d\,i\,(2k-m))\,\sqrt{z}}{2\,\sqrt{i\,d\,(m-2k)-f}}\right)\right)\Big/(i\,d\,(m-2k)-f)^{3/2}\right)+$$

$$e^{-g-i\,e\,(m-2k)}\left(\frac{2\,e^{\sqrt{z}\ (-c-i\,b\,(m-2k))+(i\,d\,(2k-m)-f)\,z}}{i\,d\,(2k-m)-f}-\left(e^{-\frac{(-c-i\,b\,(m-2k))^2}{4\,(i\,d\,(2k-m)-f)}}\,(c+b\,i\,(m-2k))\,\sqrt{\pi}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{c+b\,i\,(m-2k)+2\,(f+d\,i\,(m-2k))\,\sqrt{z}}{2\,\sqrt{i\,d\,(2k-m)-f}}\right)\right)\Big/(i\,d\,(2k-m)-f)^{3/2}+\right.$$

$$\frac{2\,e^{\sqrt{z}\ (c+b\,i\,(m-2k))+2\,(g+e\,i\,(m-2k))+(f+d\,i\,(m-2k))\,z}}{f+d\,i\,(m-2k)}-\frac{1}{(f+d\,i\,(m-2k))^{3/2}}$$

$$\left.\left.\left.\left(e^{2\,(g+e\,i\,(m-2k))-\frac{(c+b\,i\,(m-2k))^2}{4\,(f+d\,i\,(m-2k))}}\,(c+b\,i\,(m-2k))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,i\,(m-2k)+2\,(f+d\,i\,(m-2k))\,\sqrt{z}}{2\,\sqrt{f+d\,i\,(m-2k)}}\right)\right)\right)\right)-$$

$$2^{-m-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4\,f}}\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2\,f\,\sqrt{z}}{2\,\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{2\,g-\frac{c^2}{4\,f}}\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2\,f\,\sqrt{z}}{2\,\sqrt{f}}\right)}{f^{3/2}}-\frac{4\,e^{g}\sinh\left(\sqrt{z}\ c+g+f\,z\right)}{f}\right)$$

$$(1-m \bmod 2)\ /;\ m\in\mathbb{N}^+$$

Involving products of cos

Involving $\cos(a\,z)\cos(b\,z)\cosh(c\,z)$

01.20.21.0848.01

$$\int \cos(a\,z)\cos(b\,z)\cosh(c\,z)\,dz ==$$

$$\frac{1}{2}\left(\frac{(a-b)\cosh(c\,z)\sin((a-b)\,z)+c\cos((a-b)\,z)\sinh(c\,z)}{a^2-2\,b\,a+b^2+c^2}+\frac{(a+b)\cosh(c\,z)\sin((a+b)\,z)+c\cos((a+b)\,z)\sinh(c\,z)}{a^2+2\,b\,a+b^2+c^2}\right)$$

Involving rational functions of cos

Involving $\frac{\cosh(c\,z)}{a+b\cos(d\,z)}$

01.20.21.0849.01

$$\int \frac{\cosh(c\,z)}{a+b\cos(d\,z)}\,dz ==$$
$$\frac{1}{2\,b\sqrt{a^2-b^2}}\,e^{(i\,d-c)\,z}\left(\frac{1}{c+i\,d}\left(e^{2\,c\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c+i\,d)}{d},\,1;\,2-\frac{i\,c}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(-\frac{i\,(c+i\,d)}{d},\,1;\,2-\frac{i\,c}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\frac{1}{c-i\,d}\left(\left(a+\sqrt{a^2-b^2}\right)\right.$$
$$\left.\left.{}_2F_1\left(1+\frac{i\,c}{d},\,1;\,2+\frac{i\,c}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1+\frac{i\,c}{d},\,1;\,2+\frac{i\,c}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

Involving $(a+b\cos(d\,z))^{-n}\cosh(c\,z)$

01.20.21.0850.01

$$\int \frac{\cosh(c\,z)}{(a+b\cos(d\,z))^2}\,dz ==$$
$$\frac{1}{2}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(i\,d-c)}\left(e^{(i\,d-c)\,z}\left(\left(-a^2-\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(1+\frac{i\,c}{d},2;2+\frac{i\,c}{d};\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.\right.\right.$$
$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(1+\frac{i\,c}{d},2;2+\frac{i\,c}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+a\left(a+\sqrt{a^2-b^2}\;\right){}_2F_1\left(-\frac{i\,(i\,d-c)}{d},\right.\right.\right.$$
$$\left.\left.\left.1;2+\frac{i\,c}{d};\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(-\frac{i\,(i\,d-c)}{d},1;2+\frac{i\,c}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+i\,d)}\left(e^{(c+i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\;\right){}_2F_1\left(-\frac{i\,(c+i\,d)}{d},1;2-\frac{i\,c}{d};\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$
$$\left.\left.a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(-\frac{i\,(c+i\,d)}{d},1;2-\frac{i\,c}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.$$
$$\left.\left.\left(-a^2-\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(c+i\,d)}{d},2;2-\frac{i\,c}{d};\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.\right.$$
$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(c+i\,d)}{d},2;2-\frac{i\,c}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\frac{\cosh(c\,z)}{a+b\cos^2(d\,z)}$

01.20.21.0851.01

$$\int \frac{\cosh(c\,z)}{a+b\cos^2(d\,z)}\,dz ==$$
$$\frac{1}{2\sqrt{a}\;b\sqrt{a+b}}\left(-\frac{1}{2\,i\,d-c}\left(e^{(2\,i\,d-c)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},1;2+\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},1;2+\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-$$
$$\frac{1}{c+2\,i\,d}\left(e^{(c+2\,i\,d)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},1;2-\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},1;2-\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)$$

Involving $\left(a+b\cos^2(d\,z)\right)^{-n}\cosh(c\,z)$

01.20.21.0852.01

$$\int \frac{\cosh(c\,z)}{\left(b\cos^2(d\,z)+a\right)^2}\,dz == \frac{1}{4\,a^{3/2}\,b\,(a+b)^{3/2}}$$

$$\left(-\frac{1}{2\,i\,d-c}\left(e^{(2\,i\,d-c)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},1;2+\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,c}{2\,d},1;2+\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{i\,c}{2\,d},2;2+\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{i\,c}{2\,d},2;2+\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)-$$
$$\frac{1}{c+2\,i\,d}\left(e^{(c+2\,i\,d)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},1;2-\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,c}{2\,d},1;2-\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,c}{2\,d},2;2-\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,c}{2\,d},2;2-\frac{i\,c}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\frac{\cos(e\,z)\cosh(c\,z)}{a+b\cos(d\,z)}$

01.20.21.0853.01

$$\int \frac{\cos(e\,z)\cosh(c\,z)}{a+b\cos(d\,z)}\,dz ==$$

$$\frac{1}{4}\left(\left(e^{(-c+i\,d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$${}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg/\left(b\sqrt{a^2-b^2}\,(-c+i\,d+i\,e)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+i\,d+i\,e)}\left(e^{(c+i\,d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(c+i\,e)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(c+i\,e)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\left(e^{(-c-i\,e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(-c-i\,e)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$${}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(-c-i\,e)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg/\left(b\sqrt{a^2-b^2}\,(-c-i\,e+i\,d)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-i\,e+i\,d)}\left(e^{(c-i\,e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\cos(e\,z)\cosh(c\,z)\,(a+b\cos(d\,z))^{-n}$

01.20.21.0854.01

$$\int \frac{\cos(e\,z)\cosh(c\,z)}{(a+b\cos(d\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\left(e^{(-c+i\,d+i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$${}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,1;\,2-\frac{i\,(i\,e-c)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,2;\right.\right.$$
$$\left.\left.2-\frac{i\,(i\,e-c)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(-\frac{i\,(-c+i\,d+i\,e)}{d},\,2;\,2-\frac{i\,(i\,e-c)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i(-c+id+ie)}{d},2;2-\frac{i(ie-c)}{d};\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(-\frac{i(-c+id+ie)}{d},2;2-\frac{i(ie-c)}{d};-\frac{be^{idz}}{a+\sqrt{a^2-b^2}}\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(-c+id+ie)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+id+ie)}\left(e^{(c+id+ie)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(c+id+ie)}{d},1;2-\frac{i(c+ie)}{d};\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(c+id+ie)}{d},1;2-\frac{i(c+ie)}{d};-\frac{be^{idz}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i(c+id+ie)}{d},2;2-\frac{i(c+ie)}{d};\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(-\frac{i(c+id+ie)}{d},2;2-\frac{i(c+ie)}{d};-\frac{be^{idz}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i(c+id+ie)}{d},2;2-\frac{i(c+ie)}{d};\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(-\frac{i(c+id+ie)}{d},2;2-\frac{i(c+ie)}{d};-\frac{be^{idz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$\left(e^{(-c-ie+id)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-c-ie+id)}{d},1;2-\frac{i(-c-ie)}{d};\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-c-ie+id)}{d},1;2-\frac{i(-c-ie)}{d};-\frac{be^{idz}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i(-c-ie+id)}{d},2;2-\frac{i(-c-ie)}{d};\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(-\frac{i(-c-ie+id)}{d},2;2-\frac{i(-c-ie)}{d};-\frac{be^{idz}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i(-c-ie+id)}{d},2;2-\frac{i(-c-ie)}{d};\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(-\frac{i(-c-ie+id)}{d},2;2-\frac{i(-c-ie)}{d};-\frac{be^{idz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(-c-ie+id)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-i\,e+i\,d)}\left(e^{(c-i\,e+i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,1;\,2-\frac{i\,(c-i\,e)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,2;\,2-\frac{i\,(c-i\,e)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,2;\,2-\frac{i\,(c-i\,e)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,2;\,2-\frac{i\,(c-i\,e)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(-\frac{i\,(c-i\,e+i\,d)}{d},\,2;\,2-\frac{i\,(c-i\,e)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)$$

Involving $\frac{\cos(e\,z)\cosh(c\,z)}{a+b\cos^2(d\,z)}$

01.20.21.0855.01

$$\int \frac{\cos(e\,z)\cosh(c\,z)}{a+b\cos^2(d\,z)}\,dz ==$$
$$\frac{1}{4}\left(-\left(e^{(-c+2id+ie)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},1;2-\frac{i(ie-c)}{2d};-\frac{b\,e^{2idz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},1;2-\frac{i(ie-c)}{2d};-\frac{b\,e^{2idz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-c+2id+ie)\right)-\left(e^{(c+2id+ie)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(c+ie)}{2d},1;2-\frac{i(c+ie)}{2d};-\frac{b\,e^{2idz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{i(c+ie)}{2d},1;2-\frac{i(c+ie)}{2d};-\frac{b\,e^{2idz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(c+2id+ie)\right)-$$
$$\left(e^{(-c-ie+2id)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-c-ie)}{2d},1;2-\frac{i(-c-ie)}{2d};-\frac{b\,e^{2idz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-c-ie)}{2d},1;2-\frac{i(-c-ie)}{2d};-\frac{b\,e^{2idz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-c-ie+2id)\right)-\left(e^{(c-ie+2id)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(c-ie)}{2d},1;2-\frac{i(c-ie)}{2d};-\frac{b\,e^{2idz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{i(c-ie)}{2d},1;2-\frac{i(c-ie)}{2d};-\frac{b\,e^{2idz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(c-ie+2id)\right)\Bigg)$$

Involving $\cos(e\,z)\cosh(c\,z)\left(a+b\cos^2(d\,z)\right)^{-n}$

01.20.21.0856.01

$$\int \frac{\cos(e\,z)\cosh(c\,z)}{\left(a+b\cos^2(d\,z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(-\left(e^{(-c+2id+ie)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},1;2-\frac{i(ie-c)}{2d};-\frac{b\,e^{2idz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},1;2-\frac{i(ie-c)}{2d};-\frac{b\,e^{2idz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(ie-c)}{2d},2;2-\frac{i(ie-c)}{2d};\right.\right.$$
$$\left.\left.-\frac{b\,e^{2idz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)\right.$$

$$ {}_2F_1\left(1-\frac{i\,(i\,e-c)}{2\,d},\,2;\,2-\frac{i\,(i\,e-c)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-c+2\,i\,d+i\,e)\right)-\Bigg(e^{(c+2\,i\,d+i\,e)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)\right.$$

$$ {}_2F_1\left(1-\frac{i\,(c+i\,e)}{2\,d},\,1;\,2-\frac{i\,(c+i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(c+i\,e)}{2\,d},\,1;\,2-\frac{i\,(c+i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(c+i\,e)}{2\,d},\,2;\,2-\frac{i\,(c+i\,e)}{2\,d};\right.\right.$$

$$\left.-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$$ {}_2F_1\left(1-\frac{i\,(c+i\,e)}{2\,d},\,2;\,2-\frac{i\,(c+i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(c+2\,i\,d+i\,e)\right)-\Bigg(e^{(-c-i\,e+2\,i\,d)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)\right.$$

$$ {}_2F_1\left(1-\frac{i\,(-c-i\,e)}{2\,d},\,1;\,2-\frac{i\,(-c-i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(-c-i\,e)}{2\,d},\,1;\,2-\frac{i\,(-c-i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(-c-i\,e)}{2\,d},\,2;\,2-\frac{i\,(-c-i\,e)}{2\,d};\right.\right.$$

$$\left.-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$$ {}_2F_1\left(1-\frac{i\,(-c-i\,e)}{2\,d},\,2;\,2-\frac{i\,(-c-i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-c-i\,e+2\,i\,d)\right)-\Bigg(e^{(c-i\,e+2\,i\,d)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)\right.$$

$$ {}_2F_1\left(1-\frac{i\,(c-i\,e)}{2\,d},\,1;\,2-\frac{i\,(c-i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(c-i\,e)}{2\,d},\,1;\,2-\frac{i\,(c-i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(c-i\,e)}{2\,d},\,2;\,2-\frac{i\,(c-i\,e)}{2\,d};\right.\right.$$

$$\left.-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1$$

$$\left(1-\frac{i\,(c-i\,e)}{2\,d},\,2;\,2-\frac{i\,(c-i\,e)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/\Big(2\,a^{3/2}\,b\,(a+b)^{3/2}\Big)$$

Involving algebraic functions of cos

Involving $(a + b \cos(d z))^{\beta} \cosh(c z)$

01.20.21.0857.01

$$\int (a + b \cos(d z))^{\beta} \cosh(c z)\, dz == \frac{1}{2\left(c^2 + d^2 \beta^2\right)} e^{-c z} \left(\frac{e^{i d z} b}{a - \sqrt{a^2 - b^2}} + 1\right)^{-\beta} \left(\frac{e^{i d z} b}{a + \sqrt{a^2 - b^2}} + 1\right)^{-\beta}$$
$$\left(a + \frac{1}{2} b \left(e^{-i d z} + e^{i d z}\right)\right)^{\beta} \left(e^{2 c z} (c + i d \beta) F_1\left(-\frac{i c}{d} - \beta; -\beta, -\beta; 1 - \frac{i c}{d} - \beta; -\frac{b e^{i d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{i d z}}{\sqrt{a^2 - b^2} - a}\right) - \right.$$
$$\left. (c - i d \beta) F_1\left(\frac{i c}{d} - \beta; -\beta, -\beta; 1 + \frac{i c}{d} - \beta; -\frac{b e^{i d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{i d z}}{\sqrt{a^2 - b^2} - a}\right)\right)$$

Involving $\left(a + b \cos^2(d z)\right)^{\beta} \cosh(c z)$

01.20.21.0858.01

$$\int \left(a + b \cos^2(d z)\right)^{\beta} \cosh(c z)\, dz ==$$
$$\frac{1}{2\left(c^2 + 4 d^2 \beta^2\right)} e^{c z} \left(\frac{e^{2 i d z} b}{2 a - 2 \sqrt{a + b}\, \sqrt{a} + b} + 1\right)^{-\beta} \left(\frac{e^{2 i d z} b}{2 a + 2 \sqrt{a + b}\, \sqrt{a} + b} + 1\right)^{-\beta} \left(\frac{1}{4} b e^{-2 i d z} \left(1 + e^{2 i d z}\right)^2 + a\right)^{\beta}$$
$$\left((c + 2 i d \beta) F_1\left(-\frac{i c}{2 d} - \beta; -\beta, -\beta; 1 - \frac{i c}{2 d} - \beta; -\frac{b e^{2 i d z}}{2 a + 2 \sqrt{a + b}\, \sqrt{a} + b}, -\frac{b e^{2 i d z}}{2 a - 2 \sqrt{a + b}\, \sqrt{a} + b}\right) - \right.$$
$$\left. e^{-2 c z} (c - 2 i d \beta) F_1\left(\frac{i c}{2 d} - \beta; -\beta, -\beta; 1 + \frac{i c}{2 d} - \beta; -\frac{b e^{2 i d z}}{2 a + 2 \sqrt{a + b}\, \sqrt{a} + b}, -\frac{b e^{2 i d z}}{2 a - 2 \sqrt{a + b}\, \sqrt{a} + b}\right)\right)$$

Involving $\cos(e z) \cosh(c z) (a + b \cos(d z))^{\beta}$

01.20.21.0859.01

$$\int (a+b\cos(d\,z))^{\beta}\cos(e\,z)\cosh(c\,z)\,dz == \frac{1}{4}\left(\frac{e^{i\,d\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{i\,d\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-i\,d\,z}\left(1+e^{2\,i\,d\,z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(c+i\,e)\,z}}{c+i\,e-i\,d\,\beta}\,F_1\left(-\frac{i\,(c+i\,e-i\,d\,\beta)}{d};-\beta,-\beta;-\frac{i\,(c+i\,d+i\,e-i\,d\,\beta)}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\frac{e^{(c-i\,e)\,z}}{c-i\,e-i\,d\,\beta}\,F_1\left(-\frac{i\,(c-i\,e-i\,d\,\beta)}{d};-\beta,-\beta;-\frac{i\,(c-i\,e+i\,d-i\,d\,\beta)}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\frac{e^{(-c-i\,e)\,z}}{c+i\,e+i\,d\,\beta}\,F_1\left(\frac{i\,(c+i\,e+i\,d\,\beta)}{d};-\beta,-\beta;-\frac{i\,(-c-i\,e+i\,d-i\,d\,\beta)}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\left.\frac{e^{(i\,e-c)\,z}}{c-i\,e+i\,d\,\beta}\,F_1\left(-\frac{i\,(-c+i\,e-i\,d\,\beta)}{d};-\beta,-\beta;-\frac{i\,(-c+i\,d+i\,e-i\,d\,\beta)}{d};-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $\cos(e\,z)\cosh(c\,z)\left(a+b\cos^2(d\,z)\right)^{\beta}$

01.20.21.0860.01

$$\int \left(a+b\cos^2(d\,z)\right)^{\beta}\cos(e\,z)\cosh(c\,z)\,dz ==$$
$$\frac{1}{4}\left(\frac{e^{2\,i\,d\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,i\,d\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,i\,d\,z}\left(1+e^{2\,i\,d\,z}\right)^2+a\right)^{\beta}$$
$$\left(\frac{e^{(i\,e-c)\,z}}{-c+i\,e-2\,i\,d\,\beta}\,F_1\left(-\frac{i\,(-c+i\,e-2\,i\,d\,\beta)}{2\,d};-\beta,-\beta;1-\frac{i\,(i\,e-c)}{2\,d}-\beta;-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\right.\right.$$
$$-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\Bigg)+\frac{e^{(c+i\,e)\,z}}{c+i\,e-2\,i\,d\,\beta}\,F_1\left(-\frac{i\,(c+i\,e-2\,i\,d\,\beta)}{2\,d};-\beta,-\beta;1-\frac{i\,(c+i\,e)}{2\,d}-\beta;\right.$$
$$-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\Bigg)+\frac{e^{(c-i\,e)\,z}}{c-i\,e-2\,i\,d\,\beta}\,F_1\left(-\frac{i\,(c-i\,e-2\,i\,d\,\beta)}{2\,d};\right.$$
$$-\beta,-\beta;1-\frac{i\,(c-i\,e)}{2\,d}-\beta;-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\Bigg)-\frac{e^{(-c-i\,e)\,z}}{c+i\,e+2\,i\,d\,\beta}$$
$$\left.\left.F_1\left(\frac{i\,(c+i\,e+2\,i\,d\,\beta)}{2\,d};-\beta,-\beta;\frac{i\,(c+i\,e+2\,d\,i\,(\beta-1))}{2\,d};-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,i\,d\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)$$

Involving rational functions of sin and cos

Involving $\cosh(d\,z)\,(a\sin(e\,z)+b\cos(e\,z))^{-n}$

01.20.21.0861.01

$$\int \frac{\cosh(d\,z)}{a\sin(e\,z)+b\cos(e\,z)}\,dz == \frac{1}{b+i\,a}$$
$$\left(\frac{e^{(d+i\,e)\,z}}{d+i\,e}\,{}_2F_1\left(-\frac{i\,(d+i\,e)}{2\,e},\,1;\,-\frac{i\,(d+3\,i\,e)}{2\,e};\,\frac{(a+i\,b)\,e^{2\,i\,e\,z}}{a-i\,b}\right)-\frac{e^{(i\,e-d)\,z}}{d-i\,e}\,{}_2F_1\left(\frac{e+i\,d}{2\,e},\,1;\,\frac{i\,(d-3\,i\,e)}{2\,e};\,\frac{(a+i\,b)\,e^{2\,i\,e\,z}}{a-i\,b}\right)\right)$$

01.20.21.0862.01

$$\int \frac{\cosh(d\,z)}{(a\sin(e\,z)+b\cos(e\,z))^2}\,dz ==$$
$$-\frac{2}{(a-i\,b)^2}\left(\frac{e^{(d+2\,i\,e)\,z}}{d+2\,i\,e}\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+i\,b)\,e^{2\,i\,e\,z}}{a-i\,b}\right)-\frac{e^{(2\,i\,e-d)\,z}}{d-2\,i\,e}\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+i\,b)\,e^{2\,i\,e\,z}}{a-i\,b}\right)\right)$$

Involving $\cosh(d\,z)\,(a+b\sin(e\,z)+c\cos(e\,z))^{-n}$

01.20.21.0863.01

$$\int \frac{\cosh(d\,z)}{a+b\sin(e\,z)+c\cos(e\,z)}\,dz ==$$
$$\frac{1}{2\,(c+i\,b)\,\sqrt{a^2-b^2-c^2}}\left(\frac{1}{d+i\,e}\left(e^{(d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2-c^2}\right)\,{}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,1;\,2-\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2-c^2}\;-a\right)\,{}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,1;\,2-\frac{i\,d}{e};\,\frac{i\,(b+i\,c)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)\right)\right)-$$
$$\frac{1}{d-i\,e}\left(e^{(i\,e-d)\,z}\left(\left(a+\sqrt{a^2-b^2-c^2}\right)\,{}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2-c^2}\;-a\right)\,{}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,\frac{i\,(b+i\,c)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)\right)\right)\right)$$

01.20.21.0864.01

$$\int \frac{\cosh(d\,z)}{(a+b\sin(e\,z)+c\cos(e\,z))^2}\,dz ==$$
$$\frac{1}{2}\left(\left(e^{(i\,e-d)\,z}\left({}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a^2+\right.\right.\right.$$
$$\left.\left.\left.\left(a-\sqrt{a^2-b^2-c^2}\right)\,{}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,1;\,2+\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a+\right.\right.\right.$$
$$\left.\left.\left.\sqrt{a^2-b^2-c^2}\;{}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)a+\right.\right.\right.$$

$$\sqrt{a^2-b^2-c^2}\ {}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a-a\left(a+\sqrt{a^2-b^2-c^2}\right)$$

$${}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,1;\,2+\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)-b^2\,{}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)-$$

$$c^2\,{}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)+b^2\,{}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)+$$

$$c^2\,{}_2F_1\left(-\frac{i\,(i\,e-d)}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((-c-i\,b)\left(a^2-b^2-c^2\right)^{3/2}(i\,e-d)\right)+$$

$$\left(e^{(d+i\,e)\,z}\left({}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)a^2-{}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)\right.\right.$$

$$a^2+\left(a-\sqrt{a^2-b^2-c^2}\right){}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,1;\,2-\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a+$$

$$\sqrt{a^2-b^2-c^2}\ {}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)a+$$

$$\sqrt{a^2-b^2-c^2}\ {}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2-b^2-c^2}\right){}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,1;\,2-\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)-$$

$$b^2\,{}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)-c^2\,{}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)+$$

$$b^2\,{}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)+$$

$$\left.\left.c^2\,{}_2F_1\left(-\frac{i\,(d+i\,e)}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)\right)\right)\Bigg/\left((-c-i\,b)\left(a^2-b^2-c^2\right)^{3/2}(d+i\,e)\right)\Bigg)$$

Involving $\cosh(d\,z)\left(a\sin^2(e\,z)+b\cos^2(e\,z)\right)^{-n}$

01.20.21.0865.01

$$\int \frac{\cosh(d\,z)}{a\sin^2(e\,z)+b\cos^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(-\left(i\,e^{(2\,i\,e-d)\,z}\left(\left(\sqrt{-a}+i\sqrt{b}\right)^2{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)-\left(\sqrt{-a}-i\sqrt{b}\right)^2\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(\sqrt{-a}\,\sqrt{b}\,(b-a)\,(2\,i\,e-d)\right)-$$

$$\frac{1}{\sqrt{-a}\,\sqrt{b}\,(b-a)\,(d+2\,i\,e)}\left(i\,e^{(d+2\,i\,e)\,z}\left(\left(\sqrt{-a}+i\sqrt{b}\right)^2{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)-\right.\right.$$

$$\left.\left.\left.\left(\sqrt{-a}-i\sqrt{b}\right)^2{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)$$

01.20.21.0866.01

$$\int \frac{\cosh(d\,z)}{\left(a\sin^2(e\,z)+b\cos^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left(i\,e^{(2\,i\,e-d)\,z}\left((-a-b)\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{-a}+i\sqrt{b}\right)^2-\left(\sqrt{-a}-i\sqrt{b}\right)^2(-a-b)\right.\right.\right.$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)-2\,i\sqrt{-a}\,\sqrt{b}\left({}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)\right.$$

$$\left.\left.\left.\left(\sqrt{-a}+i\sqrt{b}\right)^2+\left(\sqrt{-a}-i\sqrt{b}\right)^2{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)\Big/$$

$$\left(2\,(-a)^{3/2}\,b^{3/2}\,(b-a)\,(2\,i\,e-d)\right)-\left(i\,e^{(d+2\,i\,e)\,z}\left((-a-b)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)\right.\right.$$

$$\left(\sqrt{-a}+i\sqrt{b}\right)^2-\left(\sqrt{-a}-i\sqrt{b}\right)^2(-a-b)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)-$$

$$2\,i\sqrt{-a}\,\sqrt{b}\left({}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{-a}+i\sqrt{b}\right)^2+\right.$$

$$\left.\left.\left.\left(\sqrt{-a}-i\sqrt{b}\right)^2{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(b-a)\,e^{2\,i\,e\,z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)\Big/\left(2\,(-a)^{3/2}\,b^{3/2}\,(b-a)\,(d+2\,i\,e)\right)\Bigg)$$

Involving $\cosh(d\,z)\left(a+b\sin^2(e\,z)+c\cos^2(e\,z)\right)^{-n}$

01.20.21.0867.01

$$\int \frac{\cosh(d\,z)}{a+b\sin^2(e\,z)+c\cos^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(\left(e^{(2\,i\,e-d)\,z}\left(\left(2\,a+b+c+2\sqrt{(a+b)\,(a+c)}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c-2\sqrt{(a+b)\,(a+c)}}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{(a+b)\,(a+c)}\;(c-b)\,(2\,i\,e-d)\right)+\left(e^{(d+2\,i\,e)\,z}\left(\left(2\,a+b+c+2\sqrt{(a+b)\,(a+c)}\right)\right.\right.$$

$${}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}}\right)+\left(-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}\right)$$

$$\left.\left.{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c-2\sqrt{(a+b)\,(a+c)}}\right)\right)\right)\Bigg/\left(\sqrt{(a+b)\,(a+c)}\;(c-b)\,(d+2\,i\,e)\right)$$

01.20.21.0868.01

$$\int \frac{\cosh(d\,z)}{\left(a+b\sin^2(e\,z)+c\cos^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left((c-b)\,e^{(2ie-d)z}\left(2\sqrt{(a+b)(a+c)}\left({}_2F_1\left(1+\frac{id}{2e},2;2+\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)\Big/\left(2a+b+c+2\sqrt{(a+b)(a+c)}\right)-{}_2F_1\left(1+\frac{id}{2e},2;2+\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)\Big/\left(-2a-b-c+2\sqrt{(a+b)(a+c)}\right)\right)+\left((2a+b+c)\,{}_2F_1\left(1+\frac{id}{2e},1;2+\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)\Big/\left(2a+b+c+2\sqrt{(a+b)(a+c)}\right)-\left((2a+b+c)\,{}_2F_1\left(1+\frac{id}{2e},1;2+\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)\Big/\left(2a+b+c-2\sqrt{(a+b)(a+c)}\right)\right)\Big/\left(2\left((a+b)(a+c)\right)^{3/2}(2ie-d)\right)-\left((c-b)\,e^{(d+2ie)z}\left(2\sqrt{(a+b)(a+c)}\left(\frac{{}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)}{2a+b+c+2\sqrt{(a+b)(a+c)}}-{}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)\Big/\left(-2a-b-c+2\sqrt{(a+b)(a+c)}\right)\right)+\left((2a+b+c)\,{}_2F_1\left(1-\frac{id}{2e},1;2-\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)\Big/\left(2a+b+c+2\sqrt{(a+b)(a+c)}\right)-\left((2a+b+c)\,{}_2F_1\left(1-\frac{id}{2e},1;2-\frac{id}{2e};\frac{(c-b)\,e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)\Big/\left(2a+b+c-2\sqrt{(a+b)(a+c)}\right)\right)\Big/\left(2\left((a+b)(a+c)\right)^{3/2}(d+2ie)\right)\right)\right)$$

Involving $\cosh(d\,z)\left(a\sin^2(e\,z)+b\sin(2\,e\,z)+c\cos^2(e\,z)\right)^{-n}$

01.20.21.0869.01

$$\int \frac{\cosh(d\,z)}{a\sin^2(e\,z)+b\sin(2\,e\,z)+c\cos^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(-\left(\left(-a-2\,i\,b+c\right)e^{(2\,i\,e-d)\,z}\left(\left(a+c+2\sqrt{a\,c-b^2}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-a-c+2\sqrt{a\,c-b^2}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\sqrt{a\,c-b^2}}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{a\,c-b^2}\left(-a-c+2\sqrt{a\,c-b^2}\right)\left(a+c+2\sqrt{a\,c-b^2}\right)(2\,i\,e-d)\right)-$$

$$\left(\left(-a-2\,i\,b+c\right)e^{(d+2\,i\,e)\,z}\left(\left(a+c+2\sqrt{a\,c-b^2}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)+\right.\right.$$

$$\left.\left.\left(-a-c+2\sqrt{a\,c-b^2}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\sqrt{a\,c-b^2}}\right)\right)\right)\Bigg/$$

$$\left.\left(\sqrt{a\,c-b^2}\left(-a-c+2\sqrt{a\,c-b^2}\right)\left(a+c+2\sqrt{a\,c-b^2}\right)(d+2\,i\,e)\right)\right)$$

01.20.21.0870.01

$$\int \frac{\cosh(d\,z)}{\left(a\sin^2(e\,z)+b\sin(2\,e\,z)+c\cos^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\left(\left(-a-2\,i\,b+c\right)e^{(2\,i\,e-d)\,z}\left(-4\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)b^2+\right.\right.\right.$$

$$4\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\sqrt{a\,c-b^2}}\right)b^2+(-a-c)\left(a+c+2\sqrt{a\,c-b^2}\right)$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)+(-a-c)\left(-a-c+2\sqrt{a\,c-b^2}\right)$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\sqrt{a\,c-b^2}}\right)+4\,a\,c\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)+$$

$$2\,a\sqrt{a\,c-b^2}\;{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)+2\,c\sqrt{a\,c-b^2}$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)-4\,a\,c\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\sqrt{a\,c-b^2}}\right)+$$

$$2a\sqrt{ac-b^2}\ {}_2F_1\left(1+\frac{id}{2e},2;2+\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c-2\sqrt{ac-b^2}}\right)+$$

$$2c\sqrt{ac-b^2}\ {}_2F_1\left(1+\frac{id}{2e},2;2+\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c-2\sqrt{ac-b^2}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(ac-b^2\right)^{3/2}\left(-a-c+2\sqrt{ac-b^2}\right)\left(a+c+2\sqrt{ac-b^2}\right)(2ie-d)\right)+$$

$$\left((-a-2ib+c)e^{(d+2ie)z}\left(-4\,{}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)b^2+\right.\right.$$

$$4\,{}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c-2\sqrt{ac-b^2}}\right)b^2+(-a-c)\left(a+c+2\sqrt{ac-b^2}\right)$$

$${}_2F_1\left(1-\frac{id}{2e},1;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)+(-a-c)\left(-a-c+2\sqrt{ac-b^2}\right)$$

$${}_2F_1\left(1-\frac{id}{2e},1;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c-2\sqrt{ac-b^2}}\right)+4ac\,{}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)+$$

$$2a\sqrt{ac-b^2}\ {}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)+2c\sqrt{ac-b^2}$$

$${}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)-4ac\,{}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c-2\sqrt{ac-b^2}}\right)+$$

$$2a\sqrt{ac-b^2}\ {}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c-2\sqrt{ac-b^2}}\right)+$$

$$2c\sqrt{ac-b^2}\ {}_2F_1\left(1-\frac{id}{2e},2;2-\frac{id}{2e};\frac{(-a-2ib+c)e^{2iez}}{-a-c-2\sqrt{ac-b^2}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left.\left.\left(2\left(ac-b^2\right)^{3/2}\left(-a-c+2\sqrt{ac-b^2}\right)\left(a+c+2\sqrt{ac-b^2}\right)(d+2ie)\right)\right)\right)$$

Involving algebraic functions of sin and cos

Involving $\cosh(dz)(a\sin(ez)+b\cos(ez))^{\beta}$

01.20.21.0871.01

$$\int \cosh(d\,z)\,(a\sin(e\,z)+b\cos(e\,z))^{\beta}\,dz ==$$
$$\frac{1}{2}\left(-\frac{1}{d+i\,e\,\beta}\left(2^{-\beta}\,e^{-d\,z}\left(\frac{e^{2\,i\,e\,z}\,(b-i\,a)}{b+i\,a}+1\right)^{-\beta}\left(e^{-i\,e\,z}\left(b\left(1+e^{2\,i\,e\,z}\right)-i\,a\left(-1+e^{2\,i\,e\,z}\right)\right)\right)^{\beta}\right.\right.$$
$${}_2F_1\left(-\frac{i\,(-d-i\,e\,\beta)}{2\,e},\,-\beta;\,\frac{1}{2}\left(2+\frac{i\,d}{e}-\beta\right);\,\frac{(b-i\,a)\,e^{2\,i\,e\,z}}{-b-i\,a}\right)-\frac{1}{i\,e\,\beta-d}\left(2^{-\beta}\,e^{d\,z}\left(\frac{e^{2\,i\,e\,z}\,(b-i\,a)}{b+i\,a}+1\right)^{-\beta}\right.$$
$$\left.\left.\left.\left(e^{-i\,e\,z}\left(b\left(1+e^{2\,i\,e\,z}\right)-i\,a\left(-1+e^{2\,i\,e\,z}\right)\right)\right)^{\beta}\,{}_2F_1\left(-\frac{i\,(d-i\,e\,\beta)}{2\,e},\,-\beta;\,\frac{1}{2}\left(2-\frac{i\,d}{e}-\beta\right);\,\frac{(b-i\,a)\,e^{2\,i\,e\,z}}{-b-i\,a}\right)\right)\right)$$

Involving $\cosh(d\,z)\,(a+b\sin(e\,z)+c\cos(e\,z))^{\beta}$

01.20.21.0872.01

$$\int \cosh(d\,z)\,(a+b\sin(e\,z)+c\cos(e\,z))^{\beta}\,dz == \frac{1}{2}\left(-\frac{1}{d+i\,e\,\beta}\right.$$
$$\left(2^{-\beta}\,e^{-d\,z}\left(1-\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{i\,e\,z}\,(c-i\,b)}{a+\sqrt{a^2-b^2-c^2}}+1\right)^{-\beta}\left(e^{-i\,e\,z}\left(2\,e^{i\,e\,z}\,a+c\,e^{2\,i\,e\,z}+c-i\,b\left(-1+e^{2\,i\,e\,z}\right)\right)\right)^{\beta}\right.$$
$$\left.F_1\left(\frac{i\,d}{e}-\beta;\,-\beta,\,-\beta;\,1+\frac{i\,d}{e}-\beta;\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}},\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)\right)-\frac{1}{i\,e\,\beta-d}$$
$$\left(2^{-\beta}\,e^{d\,z}\left(1-\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{i\,e\,z}\,(c-i\,b)}{a+\sqrt{a^2-b^2-c^2}}+1\right)^{-\beta}\left(e^{-i\,e\,z}\left(2\,e^{i\,e\,z}\,a+c\,e^{2\,i\,e\,z}+c-i\,b\left(-1+e^{2\,i\,e\,z}\right)\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(-\frac{i\,d}{e}-\beta;\,-\beta,\,-\beta;\,1-\frac{i\,d}{e}-\beta;\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}},\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}-a}\right)\right)\right)$$

Involving $\cosh(d\,z)\left(a\sin^2(e\,z)+b\cos^2(e\,z)\right)^{\beta}$

01.20.21.0873.01

$$\int \cosh(d\,z)\left(a\sin^2(e\,z)+b\cos^2(e\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d+2\,i\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(b-a)\,e^{2\,i\,e\,z}}{-a-b+2\sqrt{a\,b}}\right)^{-\beta}\left(\frac{e^{2\,i\,e\,z}\,(b-a)}{a+b+2\sqrt{a\,b}}+1\right)^{-\beta}\left(e^{-2\,i\,e\,z}\left(b\left(1+e^{2\,i\,e\,z}\right)^2-a\left(-1+e^{2\,i\,e\,z}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1+\frac{i\,d}{2\,e}-\beta;-\frac{(b-a)\,e^{2\,i\,e\,z}}{a+b+2\sqrt{a\,b}},\frac{(b-a)\,e^{2\,i\,e\,z}}{-a-b+2\sqrt{a\,b}}\right)\right)-$$
$$\frac{1}{2\,i\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(b-a)\,e^{2\,i\,e\,z}}{-a-b+2\sqrt{a\,b}}\right)^{-\beta}\left(\frac{e^{2\,i\,e\,z}\,(b-a)}{a+b+2\sqrt{a\,b}}+1\right)^{-\beta}\left(e^{-2\,i\,e\,z}\left(b\left(1+e^{2\,i\,e\,z}\right)^2-a\left(-1+e^{2\,i\,e\,z}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(-\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1-\frac{i\,d}{2\,e}-\beta;-\frac{(b-a)\,e^{2\,i\,e\,z}}{a+b+2\sqrt{a\,b}},\frac{(b-a)\,e^{2\,i\,e\,z}}{-a-b+2\sqrt{a\,b}}\right)\right)\right)$$

Involving $\cosh(d\,z)\left(a+b\sin^2(e\,z)+c\cos^2(e\,z)\right)^{\beta}$

01.20.21.0874.01

$$\int \cosh(d\,z)\left(a+b\sin^2(e\,z)+c\cos^2(e\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d+2\,i\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,i\,e\,z}\,(c-b)}{2\,a+b+c+2\sqrt{(a+b)\,(a+c)}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,i\,e\,z}\left(-b\left(-1+e^{2\,i\,e\,z}\right)^2+4\,a\,e^{2\,i\,e\,z}+c\left(1+e^{2\,i\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.F_1\left(\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1+\frac{i\,d}{2\,e}-\beta;\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c-2\sqrt{(a+b)\,(a+c)}},\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}}\right)\right)-$$
$$\frac{1}{2\,i\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,i\,e\,z}\,(c-b)}{2\,a+b+c+2\sqrt{(a+b)\,(a+c)}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,i\,e\,z}\left(-b\left(-1+e^{2\,i\,e\,z}\right)^2+4\,a\,e^{2\,i\,e\,z}+c\left(1+e^{2\,i\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1-\frac{i\,d}{2\,e}-\beta;\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c-2\sqrt{(a+b)\,(a+c)}},\frac{(c-b)\,e^{2\,i\,e\,z}}{-2\,a-b-c+2\sqrt{(a+b)\,(a+c)}}\right)\right)\right)$$

Involving $\cosh(d\,z)\left(a\sin^2(e\,z)+b\sin(2\,e\,z)+c\cos^2(e\,z)\right)^{\beta}$

01.20.21.0875.01

$$\int \cosh(d\,z)\left(a\sin^2(e\,z)+b\sin(2\,e\,z)+c\cos^2(e\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d+2\,i\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)^{-\beta}\left(\frac{e^{2\,i\,e\,z}\,(-a-2\,i\,b+c)}{a+c+2\sqrt{a\,c-b^2}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,i\,e\,z}\left(\left(1+e^{2\,i\,e\,z}\right)\left(c\left(1+e^{2\,i\,e\,z}\right)-2\,i\,b\left(-1+e^{2\,i\,e\,z}\right)\right)-a\left(-1+e^{2\,i\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.F_1\left(\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1+\frac{i\,d}{2\,e}-\beta;-\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{a+c+2\sqrt{a\,c-b^2}},\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)\right)-$$
$$\frac{1}{2\,i\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)^{-\beta}\left(\frac{e^{2\,i\,e\,z}\,(-a-2\,i\,b+c)}{a+c+2\sqrt{a\,c-b^2}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,i\,e\,z}\left(\left(1+e^{2\,i\,e\,z}\right)\left(c\left(1+e^{2\,i\,e\,z}\right)-2\,i\,b\left(-1+e^{2\,i\,e\,z}\right)\right)-a\left(-1+e^{2\,i\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1-\frac{i\,d}{2\,e}-\beta;-\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{a+c+2\sqrt{a\,c-b^2}},\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\sqrt{a\,c-b^2}}\right)\right)\right)$$

Involving tan

01.20.21.0876.01

$$\int \tan(b\,z)\cosh(c\,z)\,dz ==$$
$$\frac{1}{2\left(c^3+4\,b^2\,c\right)}\left(i\,e^{-c\,z}\left((c+2\,i\,b)\left((c-2\,i\,b)\left(e^{2\,c\,z}\,{}_2F_1\left(-\frac{i\,c}{2\,b},1;1-\frac{i\,c}{2\,b};-e^{2\,i\,b\,z}\right)-{}_2F_1\left(\frac{i\,c}{2\,b},1;1+\frac{i\,c}{2\,b};-e^{2\,i\,b\,z}\right)\right)+\right.\right.$$
$$\left.\left.c\,e^{2\,i\,b\,z}\,{}_2F_1\left(1+\frac{i\,c}{2\,b},1;2+\frac{i\,c}{2\,b};-e^{2\,i\,b\,z}\right)\right)-c\,(c-2\,i\,b)\,e^{2\,(c+i\,b)\,z}\,{}_2F_1\left(1-\frac{i\,c}{2\,b},1;2-\frac{i\,c}{2\,b};-e^{2\,i\,b\,z}\right)\right)\right)$$

Involving cot

01.20.21.0877.01

$$\int \cot(b\,z)\cosh(c\,z)\,dz == -\frac{1}{2\left(c^3+4\,b^2\,c\right)}$$
$$\left(i\,e^{-c\,z}\left(c\,(c-2\,i\,b)\,e^{2\,(c+i\,b)\,z}\,{}_2F_1\left(1-\frac{i\,c}{2\,b},1;2-\frac{i\,c}{2\,b};e^{2\,i\,b\,z}\right)-(c+2\,i\,b)\left(c\,e^{2\,i\,b\,z}\,{}_2F_1\left(1+\frac{i\,c}{2\,b},1;2+\frac{i\,c}{2\,b};e^{2\,i\,b\,z}\right)-\right.\right.$$
$$\left.\left.(c-2\,i\,b)\left(e^{2\,c\,z}\,{}_2F_1\left(-\frac{i\,c}{2\,b},1;1-\frac{i\,c}{2\,b};e^{2\,i\,b\,z}\right)-{}_2F_1\left(\frac{i\,c}{2\,b},1;1+\frac{i\,c}{2\,b};e^{2\,i\,b\,z}\right)\right)\right)\right)$$

Involving csc

01.20.21.0878.01

$$\int \csc(b\,z)\cosh(c\,z)\,dz == \frac{1}{(c+i\,b)(b+i\,c)}\left(e^{-(c-i\,b)z}\left((c-i\,b)\,e^{2cz}\,{}_2F_1\left(\frac{b-i\,c}{2\,b},\,1;\,\frac{3}{2}-\frac{i\,c}{2\,b};\,e^{2ibz}\right)-(c+i\,b)\,{}_2F_1\left(\frac{b+i\,c}{2\,b},\,1;\,\frac{3}{2}+\frac{i\,c}{2\,b};\,e^{2ibz}\right)\right)\right)$$

Involving sec

01.20.21.0879.01

$$\int \sec(b\,z)\cosh(c\,z)\,dz == \frac{1}{c^2+b^2}\left(e^{-(c-i\,b)z}\left((c-i\,b)\,e^{2cz}\,{}_2F_1\left(\frac{b-i\,c}{2\,b},\,1;\,\frac{3}{2}-\frac{i\,c}{2\,b};\,-e^{2ibz}\right)-(c+i\,b)\,{}_2F_1\left(\frac{b+i\,c}{2\,b},\,1;\,\frac{3}{2}+\frac{i\,c}{2\,b};\,-e^{2ibz}\right)\right)\right)$$

Involving trigonometric and a power functions

Involving sin and power

Involving $z^{\alpha-1}\sin(c\,z)\cosh(a\,z)$

01.20.21.0880.01

$$\int z^{\alpha-1}\sin(c\,z)\cosh(a\,z)\,dz == \frac{1}{4}\,i\,z^{\alpha}\left(\Gamma(\alpha,\,-(a+i\,c)\,z)\,(-(a+i\,c)\,z)^{-\alpha}-((a+i\,c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+i\,c)\,z)-(-(a-i\,c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a-i\,c)\,z)+((a-i\,c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a-i\,c)\,z)\right)$$

01.20.21.0881.01

$$\int z^{n}\sin(c\,z)\cosh(a\,z)\,dz == \frac{1}{4}\,i\,n!\left((-a-i\,c)^{-n-1}\,e^{(a+i\,c)\,z}\sum_{k=0}^{n}\frac{(-(a+i\,c)\,z)^{k}}{k!}-(a+i\,c)^{-n-1}\,e^{-(a+i\,c)\,z}\sum_{k=0}^{n}\frac{((a+i\,c)\,z)^{k}}{k!}-(i\,c-a)^{-n-1}\,e^{(a-i\,c)\,z}\sum_{k=0}^{n}\frac{(-(a-i\,c)\,z)^{k}}{k!}+(a-i\,c)^{-n-1}\,e^{i\,c\,z-a\,z}\sum_{k=0}^{n}\frac{((a-i\,c)\,z)^{k}}{k!}\right)/;\,n\in\mathbb{N}$$

01.20.21.0882.01

$$\int z^{-n}\sin(c\,z)\cosh(a\,z)\,dz == \frac{i}{4\left(a^2+c^2\right)(n-1)!}\left(e^{-(a+i\,c)\,z}\left(-(a+i\,c)\,e^{2az}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(i\,c-a)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(i\,c-a)^{n}+(-1)^{n}\,e^{(a+i\,c)\,z}\left((i\,c-a)^{n}\,(a+i\,c)\,\mathrm{Ei}((a-i\,c)\,z)-(a-i\,c)\,(a+i\,c)^{n}\,\mathrm{Ei}(-(a+i\,c)\,z)\right)+(a+i\,c)^{n}\,(a-i\,c)\,(n-1)!\sum_{k=1}^{n-1}\frac{(a+i\,c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)+e^{-2az}\left((a-i\,c)\,e^{3az+icz}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(-a-i\,c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(-a-i\,c)^{n}+(-1)^{n}\,e^{2az}\left((a-i\,c)^{n}\,(a+i\,c)\,\mathrm{Ei}(i\,c\,z-a\,z)-(-a-i\,c)^{n}\,(a-i\,c)\,\mathrm{Ei}((a+i\,c)\,z)\right)-(a-i\,c)^{n}\,(a+i\,c)\,e^{(a+i\,c)\,z}\,(n-1)!\sum_{k=1}^{n-1}\frac{(a-i\,c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)\right)/;\,n\in\mathbb{N}^{+}$$

Involving $z^{\alpha-1}\sin(c\,z+d)\cosh(a\,z)$

01.20.21.0883.01

$$\int z^{\alpha-1}\sin(d+c\,z)\cosh(a\,z)\,dz == \frac{1}{4}z^{\alpha}\left(-(a-i\,c)^2\,z^2\right)^{-\alpha}\left(-(a+i\,c)^2\,z^2\right)^{-\alpha}\left(i\left((-(a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a-i\,c)\,z)\,(\cos(d)+i\sin(d))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+\left(-(a-i\,c)^2\,z^2\right)^{\alpha}\right.\right.$$
$$\left.\left(((a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,-(a+i\,c)\,z)\,(\cos(d)+i\sin(d))-(-(a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a+i\,c)\,z)\,(\cos(d)-i\sin(d))\right)\right)-$$
$$i\,((a-i\,c)\,z)^{\alpha}\left(-(a+i\,c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,-(a-i\,c)\,z)\,(\cos(d)-i\sin(d))\Big)$$

Involving $z^{\alpha-1}\sin(c\,z)\cosh(a\,z+b)$

01.20.21.0884.01

$$\int z^{\alpha-1}\sin(c\,z)\cosh(b+a\,z)\,dz == \frac{1}{4}z^{\alpha}\left(-(a-i\,c)^2\,z^2\right)^{-\alpha}\left(-(a+i\,c)^2\,z^2\right)^{-\alpha}$$
$$\left(i\left((-(a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a-i\,c)\,z)\,(\cosh(b)-\sinh(b))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+\left(-(a-i\,c)^2\,z^2\right)^{\alpha}\right.\right.$$
$$\left.\left(((a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,-(a+i\,c)\,z)\,(\cosh(b)+\sinh(b))-(-(a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a+i\,c)\,z)\,(\cosh(b)-\sinh(b))\right)\right)-$$
$$i\,((a-i\,c)\,z)^{\alpha}\left(-(a+i\,c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,-(a-i\,c)\,z)\,(\cosh(b)+\sinh(b))\Big)$$

Involving $z^{\alpha-1}\sin(c\,z+d)\cosh(a\,z+b)$

01.20.21.0885.01

$$\int z^{\alpha-1}\sin(d+c\,z)\cosh(b+a\,z)\,dz == \frac{1}{4}z^{\alpha}\left(-(a-i\,c)^2\,z^2\right)^{-\alpha}\left(-(a+i\,c)^2\,z^2\right)^{-\alpha}$$
$$\left(i\left((-(a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a-i\,c)\,z)\,(\cos(d)+i\sin(d))\,(\cosh(b)-\sinh(b))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+\right.\right.$$
$$\left(-(a-i\,c)^2\,z^2\right)^{\alpha}\left(((a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,-(a+i\,c)\,z)\,(\cos(d)+i\sin(d))\,(\cosh(b)+\sinh(b))-\right.$$
$$\left.\left.(-(a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a+i\,c)\,z)\,(\cos(d)-i\sin(d))\,(\cosh(b)-\sinh(b))\right)\right)-$$
$$i\,((a-i\,c)\,z)^{\alpha}\left(-(a+i\,c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,-(a-i\,c)\,z)\,(\cos(d)-i\sin(d))\,(\cosh(b)+\sinh(b))\Big)$$

Involving $z^{n}\sin\left(b\,z^{r}\right)\cosh(c\,z)$

01.20.21.0886.01

$$\int z^n \sin\left(b\,z^2\right) \cosh(c\,z)\,dz ==$$

$$-\frac{1}{8}\,i\left(e^{-\frac{i\,c^2}{4\,b}}\left(\sum_{j=0}^{n} 2^{j-n}\,c^{n-j}\,(-c-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-c-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-c-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+\right.$$

$$e^{-\frac{i\,c^2}{4\,b}}\left(\sum_{j=0}^{n} 2^{j-n}\,(-c)^{n-j}\,(c-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(c-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(c-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}-$$

$$(i\,b)^{-n-1}\,e^{\frac{i\,c^2}{4\,b}}\sum_{j=0}^{n} 2^{j-n}\,c^{n-j}\,(2\,i\,b\,z-c)^{j+1}\left(\frac{i\,(2\,i\,b\,z-c)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(2\,i\,b\,z-c)^2}{4\,b}\right)-$$

$$\left.(i\,b)^{-n-1}\,e^{\frac{i\,c^2}{4\,b}}\sum_{j=0}^{n} 2^{j-n}\,(-c)^{n-j}\,(c+2\,i\,b\,z)^{j+1}\left(\frac{i\,(c+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(c+2\,i\,b\,z)^2}{4\,b}\right)\right)/;\, n\in\mathbb{N}$$

01.20.21.0887.01

$$\int z^n \sin\left(\sqrt{z}\, b\right) \cosh(c\, z)\, dz == i\, 2^{-2\,n-3}\, c^{-2\,(n+1)}$$

$$\left(e^{-\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2\,n} \left(-2\,\sqrt{z}\, c - i\, b\right)^{h+j} \left(\frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\, b \left(-2\,\sqrt{z}\, c - i\, b\right) \right. \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{4\,c} \right) - 2\,c \sqrt{\frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{4\,c} \right) \right) -$$

$$e^{-\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2\,n} \left(i\, b - 2\,c\,\sqrt{z}\right)^{h+j} \left(\frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(i\, b \left(i\, b - 2\,c\,\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{4\,c} \right) - 2\,c \sqrt{\frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{4\,c} \right) \right) +$$

$$e^{\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2\,n} \left(2\,c\,\sqrt{z} - i\, b\right)^{h+j} \left(-\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2\,c \sqrt{-\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{c}} \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{4\,c} \right) - i\, b \left(2\,c\,\sqrt{z} - i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{4\,c} \right) \right) -$$

$$e^{\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2\,n} \left(2\,\sqrt{z}\, c + i\, b\right)^{h+j} \left(-\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\, i \left(2\,\sqrt{z}\, c + i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{4\,c} \right) + \right.$$

$$\left. 2 \sqrt{-\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{c}}\ c\, \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{4\,c} \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^n \sin\left(b\, z^r + e\right) \cosh(c\, z)$

01.20.21.0888.01

$$\int z^n \sin\left(b z^2 + e\right) \cosh(c z)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{i c^2}{4 b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} c^{n-j} (-c - 2 i b z)^{j+1} \left(-\frac{i (-c - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-c - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + \right.$$

$$e^{-\frac{i c^2}{4 b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (-c)^{n-j} (c - 2 i b z)^{j+1} \left(-\frac{i (c - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (c - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} -$$

$$(i b)^{-n-1} e^{\frac{i c^2}{4 b} + i e} \sum_{j=0}^{n} 2^{j-n} c^{n-j} (2 i b z - c)^{j+1} \left(\frac{i (2 i b z - c)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b z - c)^2}{4 b} \right) -$$

$$\left. (i b)^{-n-1} e^{\frac{i c^2}{4 b} + i e} \sum_{j=0}^{n} 2^{j-n} (-c)^{n-j} (c + 2 i b z)^{j+1} \left(\frac{i (c + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (c + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0889.01

$$\int z^n \sin\left(\sqrt{z}\, b + e\right) \cosh(c\, z)\, dz == i\, 2^{-2n-3}\, c^{-2(n+1)}$$

$$\left(e^{-\frac{b^2}{4c} - i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2n} \left(-2\sqrt{z}\, c - i\, b\right)^{h+j} \left(\frac{\left(-2\sqrt{z}\, c - i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\, b \left(-2\sqrt{z}\, c - i\, b\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-2\sqrt{z}\, c - i\, b\right)^2}{4c} \right) - 2c \sqrt{\frac{\left(-2\sqrt{z}\, c - i\, b\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\sqrt{z}\, c - i\, b\right)^2}{4c} \right) \right) -$$

$$e^{i e - \frac{b^2}{4c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2n} \left(i\, b - 2c\sqrt{z}\right)^{h+j} \left(\frac{\left(i\, b - 2c\sqrt{z}\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(i\, b \left(i\, b - 2c\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\, b - 2c\sqrt{z}\right)^2}{4c} \right) - 2c \sqrt{\frac{\left(i\, b - 2c\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\, b - 2c\sqrt{z}\right)^2}{4c} \right) \right) + e^{\frac{b^2}{4c} - i e}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2n} \left(2c\sqrt{z} - i\, b\right)^{h+j} \left(-\frac{\left(2c\sqrt{z} - i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2c \sqrt{-\frac{\left(2c\sqrt{z} - i\, b\right)^2}{c}} \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2c\sqrt{z} - i\, b\right)^2}{4c} \right) - i\, b \left(2c\sqrt{z} - i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2c\sqrt{z} - i\, b\right)^2}{4c} \right) \right) -$$

$$e^{\frac{b^2}{4c} + i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2n} \left(2\sqrt{z}\, c + i\, b\right)^{h+j} \left(-\frac{\left(2\sqrt{z}\, c + i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\, i \left(2\sqrt{z}\, c + i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\sqrt{z}\, c + i\, b\right)^2}{4c} \right) + \right.$$

$$\left. 2 \sqrt{-\frac{\left(2\sqrt{z}\, c + i\, b\right)^2}{c}}\ c\, \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\sqrt{z}\, c + i\, b\right)^2}{4c} \right) \right) \Big/ ;\ n \in \mathbb{N}$$

Involving $z^n \sin\left(b\, z^r + d\, z\right) \cosh(c\, z)$

01.20.21.0890.01

$$\int z^n \sin\left(b z^2 + d z\right) \cosh(c z)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{i (-c-i d)^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (c + i d)^{n-j} (-c - i d - 2 i b z)^{j+1} \left(-\frac{i (-c - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\right.\right.\right.$$

$$\left.\left.\left. \frac{j+1}{2}, -\frac{i (-c - i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i (c-i d)^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d - c)^{n-j} (c - i d - 2 i b z)^{j+1} \left(-\frac{i (c - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (c - i d - 2 i b z)^2}{4 b} \right) \right)$$

$$(-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{i (i d-c)^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (c - i d)^{n-j} (-c + i d + 2 i b z)^{j+1}$$

$$\left(\frac{i (-c + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (-c + i d + 2 i b z)^2}{4 b} \right) - (i b)^{-n-1} e^{\frac{i (c+i d)^2}{4 b}}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} (-c - i d)^{n-j} (c + i d + 2 i b z)^{j+1} \left(\frac{i (c + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (c + i d + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0891.01

$$\int z^n \sin\left(\sqrt{z}\, b + d z\right) \cosh(c z)\, dz ==$$

$$i 2^{-2n-3} \left(-e^{\frac{b^2}{4 (i d-c)}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n} \left(2 \sqrt{z}\, (i d - c) + i b\right)^{h+j} \left(-\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{i d - c} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left(b i \left(2 \sqrt{z}\, (i d - c) + i b\right) \Gamma\left(\frac{1}{2} (h + j + 1), -\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{4 (i d - c)} \right) + \right.$$

$$\left.\left.\left. 2 \sqrt{-\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{i d - c}}\, (i d - c) \Gamma\left(\frac{1}{2} (h + j + 2), -\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{4 (i d - c)} \right) \right) \right) (i d - c)^{-2(n+1)} -$$

$$(c + i d)^{-2(n+1)} e^{\frac{b^2}{4 (c+i d)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n} \left(2 \sqrt{z}\, (c + i d) + i b\right)^{h+j} \left(-\frac{\left(2 \sqrt{z}\, (c + i d) + i b\right)^2}{c + i d} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{c+i\,d}}\,(c+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)\right)+$$

$$(c+i\,d)^{-2(n+1)}\,e^{\frac{b^2}{4(-c-i\,d)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{-c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-c-i\,d)\sqrt{-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{-c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(-c-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(-c-i\,d)}\right)\right)+$$

$$(c-i\,d)^{-2(n+1)}\,e^{\frac{b^2}{4(c-i\,d)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(c-i\,d)\sqrt{-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(c-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(c-i\,d)}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n \sin\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.0892.01

$$\int z^n \sin\left(b z^2 + d z + e\right) \cosh(c z)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{i (-c-i d)^2}{4 b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (c + i d)^{n-j} (-c - i d - 2 i b z)^{j+1} \left(-\frac{i (-c - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-c - i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i (c-i d)^2}{4 b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (i d - c)^{n-j} (c - i d - 2 i b z)^{j+1} \left(-\frac{i (c - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (c - i d - 2 i b z)^2}{4 b} \right) \right)$$

$$(-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{i (i d - c)^2}{4 b} + i e} \sum_{j=0}^{n} 2^{j-n} (c - i d)^{n-j} (-c + i d + 2 i b z)^{j+1}$$

$$\left(\frac{i (-c + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (-c + i d + 2 i b z)^2}{4 b} \right) - (i b)^{-n-1} e^{\frac{i (c + i d)^2}{4 b} + i e}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} (-c - i d)^{n-j} (c + i d + 2 i b z)^{j+1} \left(\frac{i (c + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (c + i d + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0893.01

$$\int z^n \sin\left(\sqrt{z}\, b + e + d z\right) \cosh(c z)\, dz ==$$

$$i 2^{-2n-3} \left(-e^{\frac{b^2}{4 (i d - c)} + i e} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n} \left(2 \sqrt{z}\, (i d - c) + i b\right)^{h+j} \left(-\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{i d - c} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left(b i \left(2 \sqrt{z}\, (i d - c) + i b\right) \Gamma\left(\frac{1}{2} (h + j + 1), -\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{4 (i d - c)} \right) + \right.$$

$$\left.\left.\left. 2 \sqrt{-\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{i d - c}}\, (i d - c) \Gamma\left(\frac{1}{2} (h + j + 2), -\frac{\left(2 \sqrt{z}\, (i d - c) + i b\right)^2}{4 (i d - c)} \right) \right) \right) (i d - c)^{-2(n+1)} -$$

$$(c + i d)^{-2(n+1)} e^{\frac{b^2}{4 (c + i d)} + i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n} \left(2 \sqrt{z}\, (c + i d) + i b\right)^{h+j} \left(-\frac{\left(2 \sqrt{z}\, (c + i d) + i b\right)^2}{c + i d} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{c+i\,d}}\,(c+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)\right)+(c+i\,d)^{-2\,(n+1)}$$

$$e^{\frac{b^2}{4\,(-c-i\,d)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^{h+j}\left(-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{-c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-c-i\,d)\sqrt{-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{-c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(-c-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(-c-i\,d)}\right)\right)+$$

$$(c-i\,d)^{-2\,(n+1)}\,e^{\frac{b^2}{4\,(c-i\,d)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^{h+j}\left(-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(c-i\,d)\sqrt{-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(c-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(c-i\,d)}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n \sin\left(b\,z^r\right) \cosh(f\,z+g)$

01.20.21.0894.01

$$\int z^n \sin\left(b z^2\right) \cosh(g + f z)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{i f^2}{4 b} - g} \left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (-f - 2 i b z)^{j+1} \left(-\frac{i (-f - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-f - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + \right.$$

$$e^{-\frac{i f^2}{4 b} + g} \left(\sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f - 2 i b z)^{j+1} \left(-\frac{i (f - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (f - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} -$$

$$(i b)^{-n-1} e^{\frac{i f^2}{4 b} - g} \sum_{j=0}^{n} 2^{j-n} f^{n-j} (2 i b z - f)^{j+1} \left(\frac{i (2 i b z - f)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b z - f)^2}{4 b} \right) -$$

$$\left. (i b)^{-n-1} e^{\frac{i f^2}{4 b} + g} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f + 2 i b z)^{j+1} \left(\frac{i (f + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (f + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0895.01

$$\int z^n \sin\left(\sqrt{z}\, b\right) \cosh(g + f z)\, dz == i\, 2^{-2n-3}\, f^{-2(n+1)}$$

$$\left(e^{-\frac{b^2}{4f}-g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2n} \left(-2\sqrt{z}\, f - i\, b\right)^{h+j} \left(\frac{\left(-2\sqrt{z}\, f - i\, b\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\, b \left(-2\sqrt{z}\, f - i\, b\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-2\sqrt{z}\, f - i\, b\right)^2}{4f} \right) - 2f \sqrt{\frac{\left(-2\sqrt{z}\, f - i\, b\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-2\sqrt{z}\, f - i\, b\right)^2}{4f} \right) \right) -$$

$$e^{-\frac{b^2}{4f}-g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2n} \left(i\, b - 2f\sqrt{z}\right)^{h+j} \left(\frac{\left(i\, b - 2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(i\, b \left(i\, b - 2f\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(i\, b - 2f\sqrt{z}\right)^2}{4f} \right) - 2f \sqrt{\frac{\left(i\, b - 2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(i\, b - 2f\sqrt{z}\right)^2}{4f} \right) \right) + e^{\frac{b^2}{4f}+g}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2n} \left(2f\sqrt{z} - i\, b\right)^{h+j} \left(-\frac{\left(2f\sqrt{z} - i\, b\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2f \sqrt{-\frac{\left(2f\sqrt{z} - i\, b\right)^2}{f}} \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2f\sqrt{z} - i\, b\right)^2}{4f} \right) - i\, b \left(2f\sqrt{z} - i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2f\sqrt{z} - i\, b\right)^2}{4f} \right) \right) -$$

$$e^{\frac{b^2}{4f}+g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2n} \left(2\sqrt{z}\, f + i\, b\right)^{h+j} \left(-\frac{\left(2\sqrt{z}\, f + i\, b\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\, i \left(2\sqrt{z}\, f + i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2\sqrt{z}\, f + i\, b\right)^2}{4f} \right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(2\sqrt{z}\, f + i\, b\right)^2}{f}}\ f\, \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2\sqrt{z}\, f + i\, b\right)^2}{4f} \right) \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^n \sin\left(b\, z^r + e\right) \cosh(f\, z + g)$

01.20.21.0896.01

$$\int z^n \sin\left(b z^2+e\right)\cosh(g+f z)\,dz ==$$

$$-\frac{1}{8}i\left(e^{-\frac{i f^2}{4b}-g-i e}\left(\sum_{j=0}^{n} 2^{j-n} f^{n-j}(-f-2 i b z)^{j+1}\left(-\frac{i(-f-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-f-2 i b z)^2}{4b}\right)\right)(-i b)^{-n-1}+\right.$$

$$e^{-\frac{i f^2}{4b}+g-i e}\left(\sum_{j=0}^{n} 2^{j-n}(-f)^{n-j}(f-2 i b z)^{j+1}\left(-\frac{i(f-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(f-2 i b z)^2}{4b}\right)\right)(-i b)^{-n-1}-$$

$$(i b)^{-n-1} e^{\frac{i f^2}{4b}-g+i e}\sum_{j=0}^{n} 2^{j-n} f^{n-j}(2 i b z-f)^{j+1}\left(\frac{i(2 i b z-f)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(2 i b z-f)^2}{4b}\right)-$$

$$\left.(i b)^{-n-1} e^{\frac{i f^2}{4b}+g+i e}\sum_{j=0}^{n} 2^{j-n}(-f)^{n-j}(f+2 i b z)^{j+1}\left(\frac{i(f+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(f+2 i b z)^2}{4b}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.0897.01

$$\int z^n \sin\left(\sqrt{z}\ b+e\right)\cosh(g+f z)\,dz ==$$

$$i\,2^{-2n-3} f^{-2(n+1)}\left(e^{-\frac{b^2}{4f}-g-i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-i b)^{-h-j+2n}\left(-2\sqrt{z}\ f-i b\right)^{h+j}\left(\frac{\left(-2\sqrt{z}\ f-i b\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i b\left(-2\sqrt{z}\ f-i b\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-2\sqrt{z}\ f-i b\right)^2}{4f}\right)-\right.$$

$$\left.2 f\sqrt{\frac{\left(-2\sqrt{z}\ f-i b\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-2\sqrt{z}\ f-i b\right)^2}{4f}\right)\right)-$$

$$e^{-\frac{b^2}{4f}-g+i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i b)^{-h-j+2n}\left(i b-2 f\sqrt{z}\right)^{h+j}\left(\frac{\left(i b-2 f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i b\left(i b-2 f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(i b-2 f\sqrt{z}\right)^2}{4f}\right)-2 f\sqrt{\frac{\left(i b-2 f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(i b-2 f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{\frac{b^2}{4f}+g-ie}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-ib)^{-h-j+2n}\left(2f\sqrt{z}-ib\right)^{h+j}\left(-\frac{\left(2f\sqrt{z}-ib\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2f\sqrt{-\frac{\left(2f\sqrt{z}-ib\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2f\sqrt{z}-ib\right)^2}{4f}\right)-\right.$$

$$\left.ib\left(2f\sqrt{z}-ib\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2f\sqrt{z}-ib\right)^2}{4f}\right)\right)-$$

$$e^{\frac{b^2}{4f}+g+ie}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(ib)^{-h-j+2n}\left(2\sqrt{z}\,f+ib\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(bi\left(2\sqrt{z}\,f+ib\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{4f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{4f}\right)\right)\text{/; }n\in\mathbb{N}$$

Involving $z^n \sin\left(b\,z^r+d\,z\right)\cosh(f\,z+g)$

01.20.21.0898.01

$$\int z^n \sin\left(b z^2 + d z\right) \cosh(g + f z)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{i (f+i d)^2}{4 b} - g} \left(\sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d - 2 i b z)^{j+1} \left(-\frac{i (-f - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-f - i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + e^{-\frac{i (f-i d)^2}{4 b} + g} \right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j} (f - i d - 2 i b z)^{j+1} \left(-\frac{i (f - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (f - i d - 2 i b z)^2}{4 b} \right) \right)$$

$$(-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{i (i d - f)^2}{4 b} - g} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j} (-f + i d + 2 i b z)^{j+1}$$

$$\left(\frac{i (-f + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (-f + i d + 2 i b z)^2}{4 b} \right) - (i b)^{-n-1} e^{\frac{i (f+i d)^2}{4 b} + g}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2 i b z)^{j+1} \left(\frac{i (f + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (f + i d + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0899.01

$$\int z^n \sin\left(\sqrt{z}\, b + d z\right) \cosh(g + f z)\, dz ==$$

$$i 2^{-2n-3} \left(-e^{\frac{b^2}{4 (i d - f)} - g} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n} \left(2 \sqrt{z}\, (i d - f) + i b \right)^{h+j} \left(-\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{i d - f} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left(b i \left(2 \sqrt{z}\, (i d - f) + i b \right) \Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{4 (i d - f)} \right) + 2 \sqrt{-\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{i d - f}} \right.$$

$$\left.\left. (i d - f) \Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{4 (i d - f)} \right) \right) \right) (i d - f)^{-2(n+1)} + e^{\frac{b^2}{4 (-f - i d)} - g} (f + i d)^{-2(n+1)} \right.$$

$$\left. \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b)^{-h-j+2n} \left(2 (-f - i d) \sqrt{z} - i b \right)^{h+j} \left(-\frac{\left(2 (-f - i d) \sqrt{z} - i b \right)^2}{-f - i d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \right)$$

$$\binom{n}{j}\left(2(-f-i\,d)\sqrt{z}-i\,b\right)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)-$$

$$i\,b\left(2(-f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)\Bigg)+$$

$$e^{\frac{b^2}{4(f-i\,d)}+g}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2(f-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(f-i\,d)\sqrt{-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2(f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)\right)-$$

$$e^{\frac{b^2}{4(f+i\,d)}+g}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2n}\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)\right)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \sin\left(b\,z^r+d\,z+e\right)\cosh(f\,z+g)$

01.20.21.0900.01

$$\int z^n \sin\left(b z^2 + d z + e\right) \cosh(g + f z)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{i (f+i d)^2}{4 b} - g - i e} \left(\sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d - 2 i b z)^{j+1} \left(-\frac{i (-f - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-f - i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + e^{-\frac{i (f-i d)^2}{4 b} + g - i e}$$

$$\left(\sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j} (f - i d - 2 i b z)^{j+1} \left(-\frac{i (f - i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (f - i d - 2 i b z)^2}{4 b} \right) \right)$$

$$(-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{i (i d - f)^2}{4 b} - g + i e} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j} (-f + i d + 2 i b z)^{j+1}$$

$$\left(\frac{i (-f + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (-f + i d + 2 i b z)^2}{4 b} \right) - (i b)^{-n-1} e^{\frac{i (f+i d)^2}{4 b} + g + i e}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2 i b z)^{j+1} \left(\frac{i (f + i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (f + i d + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0901.01

$$\int z^n \sin\left(\sqrt{z}\, b + e + d z\right) \cosh(g + f z)\, dz ==$$

$$i 2^{-2n-3} \left(-e^{\frac{b^2}{4 (i d - f)} - g + i e} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n} \left(2 \sqrt{z}\, (i d - f) + i b \right)^{h+j} \left(-\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{i d - f} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left(b i \left(2 \sqrt{z}\, (i d - f) + i b \right) \Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{4 (i d - f)} \right) + 2 \sqrt{-\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{i d - f}} \right.$$

$$\left.\left. (i d - f) \Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(2 \sqrt{z}\, (i d - f) + i b \right)^2}{4 (i d - f)} \right) \right) \right) (i d - f)^{-2(n+1)} + e^{\frac{b^2}{4 (-f + -i d)} - g - i e} (f + i d)^{-2(n+1)}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b)^{-h-j+2n} \left(2 (-f - i d) \sqrt{z} - i b \right)^{h+j} \left(-\frac{\left(2 (-f - i d) \sqrt{z} - i b \right)^2}{-f - i d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2(-f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)\right)+$$

$$e^{\frac{b^2}{4(f-i\,d)}+g-i\,e}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2(f-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(f-i\,d)\sqrt{-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2(f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)\right)-e^{\frac{b^2}{4(f+i\,d)}+g+i\,e}(f+i\,d)^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2n}\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.0902.01

$$\int z^n \sin(b\,z)\cosh\left(c\,z^2\right) dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{b^2}{4c}} \left(\sum_{j=0}^{n} 2^{j-n} (i\,b)^{n-j} (-i\,b-2\,c\,z)^{j+1} \left(\frac{(-i\,b-2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(-i\,b-2\,c\,z)^2}{4\,c} \right) \right) (-c)^{-n-1} - \right.$$

$$e^{-\frac{b^2}{4c}} \left(\sum_{j=0}^{n} 2^{j-n} (-i\,b)^{n-j} (i\,b-2\,c\,z)^{j+1} \left(\frac{(i\,b-2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(i\,b-2\,c\,z)^2}{4\,c} \right) \right) (-c)^{-n-1} +$$

$$c^{-n-1} e^{\frac{b^2}{4c}} \sum_{j=0}^{n} 2^{j-n} (i\,b)^{n-j} (-i\,b+2\,c\,z)^{j+1} \left(-\frac{(-i\,b+2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i\,b+2\,c\,z)^2}{4\,c} \right) -$$

$$\left. c^{-n-1} e^{\frac{b^2}{4c}} \sum_{j=0}^{n} 2^{j-n} (-i\,b)^{n-j} (i\,b+2\,c\,z)^{j+1} \left(-\frac{(i\,b+2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i\,b+2\,c\,z)^2}{4\,c} \right) \right) /;\ n \in \mathbb{N}$$

01.20.21.0903.01

$$\int z^n \sin(b\,z)\cosh\left(c\,\sqrt{z}\right) dz == i\,(-1)^{n-1}\,2^{-2\,n-3}\,b^{-2\,(n+1)}$$

$$\left(-e^{\frac{i\,c^2}{4\,b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n} \left(2\,i\,b\,\sqrt{z}-c\right)^{h+j} \left(\frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j} \left(2\,i\,b\,\sqrt{\frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{b}}\, \Gamma\left(\frac{1}{2}(h+j+2), \frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{4\,b} \right) - c\left(2\,i\,b\,\sqrt{z}-c\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{4\,b} \right) \right) - \right.$$

$$e^{\frac{i\,c^2}{4\,b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\,4^j\,c^{-h-j+2\,n} \left(c+2\,i\,b\,\sqrt{z}\right)^{h+j} \left(\frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j} \left(c\left(c+2\,i\,b\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{4\,b} \right) + 2\sqrt{\frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{b}}\; b\,i\,\Gamma\left(\frac{1}{2}(h+j+2), \frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{4\,b} \right) \right) +$$

$$\left. e^{-\frac{i\,c^2}{4\,b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n} \left(-c-2\,i\,b\,\sqrt{z}\right)^{h+j} \left(-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j} \right.$$

$$\left(-c\left(-c-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-\right.$$

$$\left.2\,i\,b\sqrt{-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,b\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-\right.$$

$$\left.\left.2\,i\,b\sqrt{-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n \sin(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.0904.01

$$\int z^n\sin(e+d\,z)\cosh\left(c\,z^2\right)dz==$$

$$-\frac{1}{8}\,i\left(e^{-\frac{d^2}{4\,c}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-\right.$$

$$e^{-\frac{d^2}{4\,c}+i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,z)^{j+1}\left(\frac{(i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{\frac{d^2}{4\,c}-i\,e}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,z)^{j+1}\left(-\frac{(-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.c^{-n-1}\,e^{\frac{d^2}{4\,c}+i\,e}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.0905.01

$$\int z^n \sin(e+d\,z)\cosh\left(\sqrt{z}\;c\right) dz == i\,(-1)^{n-1}\,2^{-2\,n-3}\,d^{-2\,(n+1)}$$

$$\left(-e^{\frac{i\,c^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,\sqrt{z}\;-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,i\,d\sqrt{\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{d}}\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{4\,d}\right)-c\left(2\,i\,d\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{4\,d}\right)\right)-$$

$$e^{\frac{i\,c^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,i\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-c\left(-c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sin(b\,z^r)\cosh(c\,z^r)$

01.20.21.0906.01

$$\int z^{\alpha-1}\sin(b\,z^r)\cosh(c\,z^r)\,dz == \frac{1}{4r}\left(i\,z^{\alpha}\left(\Gamma\left(\frac{\alpha}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-\frac{\alpha}{r}}-((i\,b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b-c)\,z^r\right)+((c-i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-i\,b)\,z^r\right)-((c+i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0907.01

$$\int z^n\sin\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == \frac{1}{8}i\,z^{n+1}\left(\Gamma\left(\frac{n+1}{2},(-c-i\,b)\,z^2\right)\left((-c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}-\left((i\,b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b-c)\,z^2\right)+\left((c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-i\,b)\,z^2\right)-\left((c+i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c+i\,b)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0908.01

$$\int z^n\sin\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right)dz == \frac{1}{2}i\left(-\Gamma\left(2\,(n+1),(i\,b-c)\sqrt{z}\right)(i\,b-c)^{-2\,(n+1)}+(c+i\,b)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-c-i\,b)\sqrt{z}\right)+(c-i\,b)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(c-i\,b)\sqrt{z}\right)-(c+i\,b)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(c+i\,b)\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sin(b\,z^r+e)\cosh(c\,z^r)$

01.20.21.0909.01

$$\int z^{\alpha-1}\sin(b\,z^r+e)\cosh(c\,z^r)\,dz == \frac{1}{4r}\left(i\,z^{\alpha}\left(e^{i\,e}\,\Gamma\left(\frac{\alpha}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-\frac{\alpha}{r}}-e^{-i\,e}\,((i\,b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b-c)\,z^r\right)+e^{i\,e}\,((c-i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-i\,b)\,z^r\right)-e^{-i\,e}\,((c+i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.0910.01

$$\int z^n\sin\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz == \frac{1}{8}i\,z^{n+1}\left(e^{i\,e}\,\Gamma\left(\frac{n+1}{2},(-c-i\,b)\,z^2\right)\left((-c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}-e^{-i\,e}\left((i\,b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b-c)\,z^2\right)+e^{i\,e}\left((c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-i\,b)\,z^2\right)-e^{-i\,e}\left((c+i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c+i\,b)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0911.01

$$\int z^n\sin\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c\right)dz == \frac{1}{2}i\left(e^{i\,e}\,\Gamma\left(2\,(n+1),(-c-i\,b)\sqrt{z}\right)(c+i\,b)^{-2\,(n+1)}-(i\,b-c)^{-2\,(n+1)}\,e^{-i\,e}\,\Gamma\left(2\,(n+1),(i\,b-c)\sqrt{z}\right)+(c-i\,b)^{-2\,(n+1)}\,e^{i\,e}\,\Gamma\left(2\,(n+1),(c-i\,b)\sqrt{z}\right)-(c+i\,b)^{-2\,(n+1)}\,e^{-i\,e}\,\Gamma\left(2\,(n+1),(c+i\,b)\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\sin(b\,z^r+d\,z)\cosh(c\,z^r)$

01.20.21.0912.01

$$\int z^n \sin\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)dz ==$$

$$-\frac{1}{8}i\left(e^{-\frac{i\,d^2}{4\,(i\,c-b)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-c-i\,b)\,z)^{j+1}\left(-\frac{(-i\,d+2\,(-c-i\,b)\,z)^2}{-c-i\,b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,(-c-i\,b)\,z)^2}{4\,(-c-i\,b)}\right)\right)(-c-i\,b)^{-n-1}-(i\,b-c)^{-n-1}\,e^{-\frac{i\,d^2}{4\,(b+i\,c)}}\right.$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b-c)\,z)^{j+1}\left(-\frac{(i\,d+2\,(i\,b-c)\,z)^2}{i\,b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,(i\,b-c)\,z)^2}{4\,(i\,b-c)}\right)+$$

$$(c-i\,b)^{-n-1}\,e^{\frac{i\,d^2}{4\,(b+i\,c)}}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(c-i\,b)\,z)^{j+1}\left(-\frac{(-i\,d+2\,(c-i\,b)\,z)^2}{c-i\,b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,(c-i\,b)\,z)^2}{4\,(c-i\,b)}\right)-(c+i\,b)^{-n-1}\,e^{\frac{i\,d^2}{4\,(i\,c-b)}}$$

$$\left.\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(c+i\,b)\,z)^{j+1}\left(-\frac{(i\,d+2\,(c+i\,b)\,z)^2}{c+i\,b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,(c+i\,b)\,z)^2}{4\,(c+i\,b)}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0913.01

$$\int z^n \sin\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c\right)dz ==$$

$$i\,2^{-2\,n-3}\,(i\,d)^{-2\,(n+1)}\left(-e^{\frac{i\,(i\,b-c)^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c)^{-h-j+2\,n}\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.2\sqrt{\frac{i\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-\right.$$

$$\left.e^{\frac{i\,(c+i\,b)^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-c-i\,b)^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(c-i\,b)^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b\,z^r+d\,z+e)\cosh(c\,z^r)$

01.20.21.0914.01

$$\int z^n \sin\left(b z^2 + d z + e\right) \cosh\left(c z^2\right) dz ==$$

$$-\frac{1}{8} i \left(e^{\frac{1}{4} i \left(-\frac{d^2}{i c-b}-4 e\right)} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (-c - i b) z)^2}{-c - i b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-c - i b) z)^2}{4 (-c - i b)} \right) \right) (-c - i b)^{-n-1} - (i b - c)^{-n-1} e^{\frac{1}{4} i \left(\frac{d^2}{-b-i c}+4 e\right)} \right.$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b - c) z)^{j+1} \left(-\frac{(i d + 2 (i b - c) z)^2}{i b - c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b - c) z)^2}{4 (i b - c)} \right) +$$

$$(c - i b)^{-n-1} e^{-\frac{1}{4} i \left(\frac{d^2}{-b-i c}+4 e\right)} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (c - i b) z)^2}{c - i b} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (c - i b) z)^2}{4 (c - i b)} \right) - (c + i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{d^2}{i c-b}-4 e\right)}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (c + i b) z)^{j+1} \left(-\frac{(i d + 2 (c + i b) z)^2}{c + i b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (c + i b) z)^2}{4 (c + i b)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0915.01

$$\int z^n \sin\left(\sqrt{z}\ b + e + d z\right) \cosh\left(\sqrt{z}\ c\right) dz == i\, 2^{-2n-3} (i d)^{-2(n+1)}$$

$$\left(-e^{\frac{i (i b-c)^2}{4 d}+i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h + j + 1), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d} \right) + \right.$$

$$\left. 2 \sqrt{\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}}\ d\, i\, \Gamma\left(\frac{1}{2}(h + j + 2), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d} \right) \right) -$$

$$\left. e^{\frac{i (c+i b)^2}{4 d}+i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c + i b)^{-h-j+2n} \left(c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(c + i b + 2 i d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \right)$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-c-i\,b)^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(c-i\,b)^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.0916.01

$$\int z^n \sin(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$-\frac{1}{8}i\left(e^{-\frac{d^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}(i\,d)^{n-j}(-i\,d-2\,c\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-\right.$$

$$e^{-\frac{d^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}(-i\,d)^{n-j}(i\,d-2\,c\,z)^{j+1}\left(\frac{(i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}e^{\frac{d^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}(i\,d)^{n-j}(-i\,d+2\,c\,z)^{j+1}\left(-\frac{(-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.c^{-n-1}e^{\frac{d^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}(-i\,d)^{n-j}(i\,d+2\,c\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0917.01

$$\int z^n \sin(d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz == i\,(-1)^{n-1}\,2^{-2\,n-3}\,d^{-2\,(n+1)}$$

$$\left(-e^{\frac{i\,c^2}{4\,d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,\sqrt{z}-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,i\,d\sqrt{\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}}\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)-c\left(2\,i\,d\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)\right)-$$

$$e^{\frac{i\,c^2}{4\,d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,i\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-c\left(-c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.0918.01

$$\int z^n\sin(e+d\,z)\cosh\left(c\,z^2+g\right)dz==$$

$$-\frac{1}{8}\,i\left(e^{-\frac{d^2}{4\,c}-i\,e-g}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-\right.$$

$$e^{-\frac{d^2}{4\,c}-g+i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,z)^{j+1}\left(\frac{(i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{\frac{d^2}{4\,c}-i\,e+g}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,z)^{j+1}\left(-\frac{(-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.c^{-n-1}\,e^{\frac{d^2}{4\,c}+g+i\,e}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0919.01

$$\int z^n \sin(e+d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$i\,(-1)^{n-1}\,2^{-2\,n-3}\,d^{-2\,(n+1)}\left(-e^{\frac{i\,c^2}{4\,d}-g+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,\sqrt{z}-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\sqrt{\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)-\right.$$

$$\left.c\left(2\,i\,d\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)\right)-$$

$$e^{\frac{i\,c^2}{4\,d}+g+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,i\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-i\,e-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-c\left(-c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i c^2}{4 d}-i e+g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j c^{-h-j+2 n} \left(c-2 i d \sqrt{z}\right)^{h+j} \left(-\frac{i \left(c-2 i d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(c \left(c-2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i \left(c-2 i d \sqrt{z}\right)^2}{4 d}\right) - 2 i d \sqrt{-\frac{i \left(c-2 i d \sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i \left(c-2 i d \sqrt{z}\right)^2}{4 d}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} \sin(b z^r) \cosh(c z^r + g)$

01.20.21.0920.01

$$\int z^{\alpha-1} \sin(b z^r) \cosh(c z^r + g)\, dz ==$$

$$\frac{1}{4 r}\left(i z^{\alpha}\left(e^{g} \Gamma\left(\frac{\alpha}{r}, (-c-i b) z^r\right)((-c-i b) z^r)^{-\frac{\alpha}{r}} - e^{g}((i b-c) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (i b-c) z^r\right) + e^{-g}((c-i b) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c-i b) z^r\right) - e^{-g}((c+i b) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c+i b) z^r\right)\right)\right)$$

01.20.21.0921.01

$$\int z^n \sin\left(b z^2\right) \cosh\left(c z^2 + g\right) dz ==$$

$$\frac{1}{8} i z^{n+1}\left(e^{g} \Gamma\left(\frac{n+1}{2}, (-c-i b) z^2\right)\left((-c-i b) z^2\right)^{\frac{1}{2}(-n-1)} - e^{g}\left((i b-c) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (i b-c) z^2\right) + e^{-g}\left((c-i b) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c-i b) z^2\right) - e^{-g}\left((c+i b) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c+i b) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.0922.01

$$\int z^n \sin\left(b \sqrt{z}\right) \cosh\left(\sqrt{z}\ c + g\right) dz ==$$

$$\frac{1}{2} i\left(e^{g} \Gamma\left(2(n+1), (-c-i b) \sqrt{z}\right)(-c-i b)^{-2(n+1)} - (i b-c)^{-2(n+1)} e^{g} \Gamma\left(2(n+1), (i b-c) \sqrt{z}\right) + (c-i b)^{-2(n+1)} e^{-g} \Gamma\left(2(n+1), (c-i b) \sqrt{z}\right) - (c+i b)^{-2(n+1)} e^{-g} \Gamma\left(2(n+1), (c+i b) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} \sin(b z^r + e) \cosh(c z^r + g)$

01.20.21.0923.01

$$\int z^{\alpha-1} \sin(b z^r + e) \cosh(c z^r + g)\, dz ==$$

$$\frac{1}{4 r}\left(i z^{\alpha}\left(e^{g+i e} \Gamma\left(\frac{\alpha}{r}, (-c-i b) z^r\right)((-c-i b) z^r)^{-\frac{\alpha}{r}} - e^{g-i e}((i b-c) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (i b-c) z^r\right) + e^{i e-g}((c-i b) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c-i b) z^r\right) - e^{-g-i e}((c+i b) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c+i b) z^r\right)\right)\right)$$

01.20.21.0924.01

$$\int z^n \sin\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz ==$$
$$\frac{1}{8}\,i\,z^{n+1}\left(e^{g+i\,e}\,\Gamma\left(\frac{n+1}{2},\,(-c-i\,b)\,z^2\right)\left((-c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}-e^{g-i\,e}\left((i\,b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b-c)\,z^2\right)+\right.$$
$$\left.e^{i\,e-g}\left((c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-i\,b)\,z^2\right)-e^{-g-i\,e}\left((c+i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c+i\,b)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0925.01

$$\int z^n \sin\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$
$$\frac{1}{2}\,i\left(e^{g+i\,e}\,\Gamma\left(2\,(n+1),\,(-c-i\,b)\,\sqrt{z}\right)(-c-i\,b)^{-2\,(n+1)}-(i\,b-c)^{-2\,(n+1)}\,e^{g-i\,e}\,\Gamma\left(2\,(n+1),\,(i\,b-c)\,\sqrt{z}\right)+\right.$$
$$\left.(c-i\,b)^{-2\,(n+1)}\,e^{i\,e-g}\,\Gamma\left(2\,(n+1),\,(c-i\,b)\,\sqrt{z}\right)-(c+i\,b)^{-2\,(n+1)}\,e^{-g-i\,e}\,\Gamma\left(2\,(n+1),\,(c+i\,b)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0926.01

$$\int z^n \sin\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+g\right)dz ==$$
$$-\frac{1}{8}\,i\left(e^{\frac{1}{4}\,i\left(-\frac{d^2}{i\,c-b}+4\,i\,g\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-c-i\,b)\,z)^{j+1}\left(-\frac{(-i\,d+2\,(-c-i\,b)\,z)^2}{-c-i\,b}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$
$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,(-c-i\,b)\,z)^2}{4\,(-c-i\,b)}\right)\right)(-c-i\,b)^{-n-1}-(i\,b-c)^{-n-1}\,e^{\frac{1}{4}\,i\left(\frac{d^2}{-b-i\,c}+4\,i\,g\right)}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b-c)\,z)^{j+1}\left(-\frac{(i\,d+2\,(i\,b-c)\,z)^2}{i\,b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,(i\,b-c)\,z)^2}{4\,(i\,b-c)}\right)+$$
$$(c-i\,b)^{-n-1}\,e^{-\frac{1}{4}\,i\left(\frac{d^2}{-b-i\,c}+4\,i\,g\right)}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(c-i\,b)\,z)^{j+1}\left(-\frac{(-i\,d+2\,(c-i\,b)\,z)^2}{c-i\,b}\right)^{\frac{1}{2}(-j-1)}$$
$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,(c-i\,b)\,z)^2}{4\,(c-i\,b)}\right)-(c+i\,b)^{-n-1}\,e^{-\frac{1}{4}\,i\left(-\frac{d^2}{i\,c-b}+4\,i\,g\right)}$$
$$\left.\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(c+i\,b)\,z)^{j+1}\left(-\frac{(i\,d+2\,(c+i\,b)\,z)^2}{c+i\,b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,(c+i\,b)\,z)^2}{4\,(c+i\,b)}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0927.01

$$\int z^n \sin\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+g\right)dz == i\,2^{-2\,n-3}\,(i\,d)^{-2\,(n+1)}$$
$$\left(-e^{\frac{i\,(i\,b-c)^2}{4\,d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c)^{-h-j+2\,n}\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+i\,b\;+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(-c+i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(-c+i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(-c+i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$e^{\frac{i\,(c+i\,b)^2}{4\,d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(c+i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(c+i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,(-c-i\,b)^2}{4\,d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-c-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-c-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,(c-i\,b)^2}{4\,d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(c-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\sqrt{\frac{i\left(c-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \left(\right.\right.$$

Involving $z^n \sin(b z^r + d z + e) \cosh(c z^r + g)$

01.20.21.0928.01

$$\int z^n \sin(b z^2 + d z + e) \cosh(c z^2 + g)\, dz ==$$

$$-\frac{1}{8} i \left(e^{\frac{1}{4} i \left(-\frac{d^2}{i c - b} - 4 e + 4 i g\right)} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (-c - i b) z)^2}{-c - i b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-c - i b) z)^2}{4 (-c - i b)} \right) \right) (-c - i b)^{-n-1} - (i b - c)^{-n-1} e^{\frac{1}{4} i \left(\frac{d^2}{-b - i c} + 4 e + 4 i g\right)} \right.$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b - c) z)^{j+1} \left(-\frac{(i d + 2 (i b - c) z)^2}{i b - c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b - c) z)^2}{4 (i b - c)} \right) +$$

$$(c - i b)^{-n-1} e^{-\frac{1}{4} i \left(\frac{d^2}{-b - i c} + 4 e + 4 i g\right)} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (c - i b) z)^2}{c - i b} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (c - i b) z)^2}{4 (c - i b)} \right) - (c + i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{d^2}{i c - b} - 4 e + 4 i g\right)}$$

$$\left. \left. \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (c + i b) z)^{j+1} \left(-\frac{(i d + 2 (c + i b) z)^2}{c + i b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (c + i b) z)^2}{4 (c + i b)} \right) \right) \right/; n \in \mathbb{N}$$

01.20.21.0929.01

$$\int z^n \sin(\sqrt{z}\, b + e + d z) \cosh(\sqrt{z}\, c + g)\, dz == i\, 2^{-2n-3} (i d)^{-2(n+1)}$$

$$\left(-e^{\frac{i (i b - c)^2}{4 d} - g + i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h + j + 1), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d} \right) + \right.$$

$$\left. \left. 2 \sqrt{\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}}\, d\, i\, \Gamma\left(\frac{1}{2}(h + j + 2), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d} \right) \right) \right) -$$

$$e^{\frac{i(c+ib)^2}{4d}+g+ie}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+ib)^{-h-j+2n}\left(c+ib+2id\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+ib+2id\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+ib)\left(c+ib+2id\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+ib+2id\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+ib+2id\sqrt{z}\right)^2}{d}}\;di\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(c+ib+2id\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{-\frac{i(-c-ib)^2}{4d}-ie-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-ib)^{-h-j+2n}\left(-c-ib-2id\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-ib-2id\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-ib)\left(-c-ib-2id\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-c-ib-2id\sqrt{z}\right)^2}{4d}\right)-\right.$$

$$\left.2id\sqrt{-\frac{i\left(-c-ib-2id\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-c-ib-2id\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{-\frac{i(c-ib)^2}{4d}-ie+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-ib)^{-h-j+2n}\left(c-ib-2id\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-ib-2id\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-ib)\left(c-ib-2id\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(c-ib-2id\sqrt{z}\right)^2}{4d}\right)-\right.$$

$$\left.\left.2id\sqrt{-\frac{i\left(c-ib-2id\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(c-ib-2id\sqrt{z}\right)^2}{4d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0930.01

$$\int z^n \sin(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}i\left(e^{\frac{(-f-i\,d)^2}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}(f+i\,d)^{n-j}(-f-i\,d-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}-e^{\frac{(i\,d-f)^2}{4\,c}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}(f-i\,d)^{n-j}(-f+i\,d-2\,c\,z)^{j+1}\left(\frac{(-f+i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d)^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}(i\,d-f)^{n-j}(f-i\,d+2\,c\,z)^{j+1}\left(-\frac{(f-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}\,e^{-\frac{(f+i\,d)^2}{4\,c}}$$

$$\left.\sum_{j=0}^{n}2^{j-n}(-f-i\,d)^{n-j}(f+i\,d+2\,c\,z)^{j+1}\left(-\frac{(f+i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0931.01

$$\int z^n \sin(d\,z)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$i\,2^{-2n-3}\left(-e^{-\frac{c^2}{4(i\,d-f)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(i\,d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{i\,d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f)\sqrt{-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{i\,d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{4(i\,d-f)}\right)-\right.$$

$$\left.\left.c\left(2(i\,d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{4(i\,d-f)}\right)\right)\right)(i\,d-f)^{-2(n+1)}+$$

$$e^{-\frac{c^2}{4(-f-i\,d)}}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(-f-i\,d)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$c\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)^2}{4\left(-f-i\,d\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d)}}\left(f-i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}}\;\left(f-i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)\Bigg)-$$

$$e^{-\frac{c^2}{4(f+i\,d)}}\left(f+i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f+i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}}\;\left(f+i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \sin(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.0932.01

$$\int z^n \sin(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}i\left(e^{\frac{(-f+-i\,d)^2}{4c}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}(f+i\,d)^{n-j}(-f-i\,d-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}-e^{\frac{(i\,d-f)^2}{4c}+i\,e}$$

$$\left(\sum_{j=0}^{n}2^{j-n}(f-i\,d)^{n-j}(-f+i\,d-2\,c\,z)^{j+1}\left(\frac{(-f+i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d)^2}{4c}-i\,e}\sum_{j=0}^{n}2^{j-n}(i\,d-f)^{n-j}(f-i\,d+2\,c\,z)^{j+1}\left(-\frac{(f-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d+2\,c\,z)^2}{4\,c}\right)-c^{-n-1}\,e^{-\frac{(f+i\,d)^2}{4c}+i\,e}\right.$$

$$\left.\sum_{j=0}^{n}2^{j-n}(-f-i\,d)^{n-j}(f+i\,d+2\,c\,z)^{j+1}\left(-\frac{(f+i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.0933.01

$$\int z^n \sin(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$i\,2^{-2n-3}\left(-e^{-\frac{c^2}{4(i\,d-f)}+i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(i\,d-f)\sqrt{-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)-\right.$$

$$\left.\left.\left.c\left(2\,(i\,d-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)\right)\right)(i\,d-f)^{-2(n+1)}+e^{-\frac{c^2}{4(-f+-i\,d)}-i\,e}\right.$$

$$\left.(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$\left.c\left(2(-f-i\,d)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{c^2}{4(f-i\,d)}-i\,e}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f-i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f-i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)\right)-$$

$$e^{-\frac{c^2}{4(f+i\,d)}+i\,e}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f+i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f+i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b\,z^r)\cosh(c\,z^r+f\,z)$

01.20.21.0934.01

$$\int z^n \sin\left(b z^2\right) \cosh\left(c z^2 + f z\right) dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{i f^2}{4(b-ic)}} \left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(-c-ib)z-f)^{j+1} \left(-\frac{(2(-c-ib)z-f)^2}{-c-ib} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(-c-ib)z-f)^2}{4(-c-ib)} \right) \right) \right.$$

$$(-c-ib)^{-n-1} - (ib-c)^{-n-1} e^{\frac{i f^2}{4(b+ic)}}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(ib-c)z-f)^{j+1} \left(-\frac{(2(ib-c)z-f)^2}{ib-c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(ib-c)z-f)^2}{4(ib-c)} \right) \right) +$$

$$(c-ib)^{-n-1} e^{-\frac{i f^2}{4(b+ic)}} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-ib)z)^{j+1} \left(-\frac{(f+2(c-ib)z)^2}{c-ib} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c-ib)z)^2}{4(c-ib)} \right) - (c+ib)^{-n-1} e^{\frac{i f^2}{4(b-ic)}}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c+ib)z)^{j+1} \left(-\frac{(f+2(c+ib)z)^2}{c+ib} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c+ib)z)^2}{4(c+ib)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0935.01

$$\int z^n \sin\left(\sqrt{z}\, b\right) \cosh\left(\sqrt{z}\, c + f z\right) dz ==$$

$$i 2^{-2n-3} f^{-2(n+1)} \left(e^{\frac{(-c-ib)^2}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c-ib)^{-h-j+2n} \left(-c-ib-2f\sqrt{z}\right)^{h+j} \left(\frac{\left(-c-ib-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((-c-ib)\left(-c-ib-2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-c-ib-2f\sqrt{z}\right)^2}{4f} \right) - \right.$$

$$\left. \left. 2f \sqrt{\frac{\left(-c-ib-2f\sqrt{z}\right)^2}{f}}\, \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c-ib-2f\sqrt{z}\right)^2}{4f} \right) \right) -$$

$$e^{\frac{(ib-c)^2}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (ib-c)^{-h-j+2n} \left(-c+ib-2f\sqrt{z}\right)^{h+j} \left(\frac{\left(-c+ib-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left((ib-c)\left(-c+ib-2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-c+ib-2f\sqrt{z}\right)^2}{4f} \right) - \right.$$

$$2 f \sqrt{\frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)+$$

$$e^{-\frac{(c-i b)^2}{4 f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c-i b)^{-h-j+2 n} \left(c-i b+2 f \sqrt{z}\right)^{h+j} \left(-\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((c-i b)\left(c-i b+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2 \sqrt{-\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)-$$

$$e^{-\frac{(c+i b)^2}{4 f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c+i b)^{-h-j+2 n} \left(c+i b+2 f \sqrt{z}\right)^{h+j} \left(-\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((c+i b)\left(c+i b+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2 \sqrt{-\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)\Bigg) /;\ n \in \mathbb{N}$$

Involving $z^n \sin(b z^r + e) \cosh(c z^r + f z)$

01.20.21.0936.01

$$\int z^n \sin\left(b z^2+e\right)\cosh\left(c z^2+f z\right) dz == -\frac{1}{8} i$$

$$\left(e^{-\frac{1}{4} i \left(\frac{f^2}{b-i c}+4 e\right)} \left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(-c-i b) z-f)^{j+1} \left(-\frac{(2(-c-i b) z-f)^2}{-c-i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(-c-i b) z-f)^2}{4(-c-i b)}\right)\right)\right.$$

$$(-c-i b)^{-n-1} - (i b-c)^{-n-1} e^{\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 e\right)}$$

$$\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(i b-c) z-f)^{j+1} \left(-\frac{(2(i b-c) z-f)^2}{i b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(i b-c) z-f)^2}{4(i b-c)}\right) +$$

$$(c-i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 e\right)} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-i b) z)^{j+1} \left(-\frac{(f+2(c-i b) z)^2}{c-i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c-i b) z)^2}{4(c-i b)}\right) - (c+i b)^{-n-1} e^{\frac{1}{4} i \left(\frac{f^2}{b-i c}+4 e\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c+i b) z)^{j+1} \left(-\frac{(f+2(c+i b) z)^2}{c+i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c+i b) z)^2}{4(c+i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.0937.01

$$\int z^n \sin\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+f z\right) dz ==$$

$$i 2^{-2n-3} f^{-2(n+1)} \left(e^{\frac{(-c+-i b)^2}{4 f}-i e} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (-c-i b)^{-h-j+2n} \left(-c-i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i b)\left(-c-i b-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right)-\right.$$

$$\left.\left.2 f \sqrt{\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right)\right)-\right.$$

$$\left.e^{\frac{(i b-c)^2}{4 f}+i e} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (i b-c)^{-h-j+2n} \left(-c+i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,f}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)-$$

$$e^{-\frac{(c+i\,b)^2}{4\,f}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^n \sin(b\,z^r+d\,z)\cosh(c\,z^r+f\,z)$

01.20.21.0938.01

$$\int z^n \sin\left(b z^2 + d z\right) \cosh\left(c z^2 + f z\right) dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{(-f-i d)^2}{4(-c-i b)}} \left(\sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d + 2(-c + -i b) z)^{j+1} \left(-\frac{(-f - i d + 2(-c + -i b) z)^2}{-c - i b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f - i d + 2(-c + -i b) z)^2}{4(-c - i b)} \right) \right) (-c - i b)^{-n-1} -$$

$$(i b - c)^{-n-1} e^{-\frac{(i d - f)^2}{4(i b - c)}} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j} (-f + i d + 2(i b - c) z)^{j+1} \left(-\frac{(-f + i d + 2(i b - c) z)^2}{i b - c} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f + i d + 2(i b - c) z)^2}{4(i b - c)} \right) + (c - i b)^{-n-1} e^{-\frac{(f - i d)^2}{4(c - i b)}} \sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j}$$

$$(f - i d + 2(c - i b) z)^{j+1} \left(-\frac{(f - i d + 2(c - i b) z)^2}{c - i b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f - i d + 2(c - i b) z)^2}{4(c - i b)} \right) -$$

$$(c + i b)^{-n-1} e^{-\frac{(f + i d)^2}{4(c + i b)}} \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2(c + i b) z)^{j+1} \left(-\frac{(f + i d + 2(c + i b) z)^2}{c + i b} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + i d + 2(c + i b) z)^2}{4(c + i b)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0939.01

$$\int z^n \sin\left(\sqrt{z}\, b + d z\right) \cosh\left(\sqrt{z}\, c + f z\right) dz == i\, 2^{-2n-3}$$

$$\left(-e^{-\frac{(i b - c)^2}{4(i d - f)}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2(i d - f)\sqrt{z} \right)^{h+j} \left(-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2(i d - f)\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) + \right.$$

$$\left.\left.\left. 2\sqrt{-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f}}\, (i d - f) \Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) \right) \right)$$

$$(i d - f)^{-2n-2} + e^{-\frac{(-c - i b)^2}{4(-f - i d)}} (f + i d)^{-2n-2} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c - i b)^{-h-j+2n} \left(-c - i b + 2(-f + -i d)\sqrt{z} \right)^{h+j}$$

$$\left(-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-c-i\,b)\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}}\;(-f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,(f-i\,d)}}\,(f-i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c-i\,b)\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)\right)-$$

$$e^{-\frac{(c+i\,b)^2}{4\,(f+i\,d)}}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+i\,b)\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b z^r + d z + e) \cosh(c z^r + f z)$

01.20.21.0940.01

$$\int z^n \sin(b z^2 + d z + e) \cosh(c z^2 + f z)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{(-f+-i d)^2}{4(-c+-i b)} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d + 2(-c + -i b) z)^{j+1} \left(-\frac{(-f - i d + 2(-c + -i b) z)^2}{-c - i b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f - i d + 2(-c + -i b) z)^2}{4(-c - i b)} \right) \right) (-c - i b)^{-n-1} -$$

$$(i b - c)^{-n-1} e^{-\frac{(i d - f)^2}{4(i b - c)} + i e} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j} (-f + i d + 2(i b - c) z)^{j+1} \left(-\frac{(-f + i d + 2(i b - c) z)^2}{i b - c} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f + i d + 2(i b - c) z)^2}{4(i b - c)} \right) + (c - i b)^{-n-1} e^{-\frac{(f - i d)^2}{4(c - i b)} - i e} \sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j}$$

$$(f - i d + 2(c - i b) z)^{j+1} \left(-\frac{(f - i d + 2(c - i b) z)^2}{c - i b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f - i d + 2(c - i b) z)^2}{4(c - i b)} \right) -$$

$$(c + i b)^{-n-1} e^{-\frac{(f + i d)^2}{4(c + i b)} + i e} \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2(c + i b) z)^{j+1} \left(-\frac{(f + i d + 2(c + i b) z)^2}{c + i b} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + i d + 2(c + i b) z)^2}{4(c + i b)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0941.01

$$\int z^n \sin(\sqrt{z}\, b + e + d z) \cosh(\sqrt{z}\, c + f z)\, dz == i\, 2^{-2n-3}$$

$$\left(-e^{-\frac{(i b - c)^2}{4(i d - f)} + i e} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2(i d - f)\sqrt{z} \right)^{h+j} \left(-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2(i d - f)\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) + \right.$$

$$\left.\left.\left. 2\sqrt{-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f}}\, (i d - f) \Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) \right) \right)$$

$$(i\,d-f)^{-2\,n-2}+e^{-\frac{(-c+-i\,b)^2}{4\,(-f+-i\,d)}-i\,e}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}$$

$$\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-c-i\,b)\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}}\,(-f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,(f-i\,d)}-i\,e}\,(f-i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c-i\,b)\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}}\,(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)\right)-$$

$$e^{-\frac{(c+i\,b)^2}{4\,(f+i\,d)}+i\,e}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+i\,b)\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)+\right.$$

$$2\sqrt{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}\,(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)\Bigg)\Bigg)$$

Involving $z^n \sin(d\,z)\cosh\left(c\,z^r + f\,z + g\right)$

01.20.21.0942.01

$$\int z^n \sin(d\,z)\cosh\left(c\,z^2 + f\,z + g\right) dz ==$$

$$-\frac{1}{8} i \left(e^{\frac{(-f-i\,d)^2}{4\,c}-g} \left(\sum_{j=0}^{n} 2^{j-n} (f+i\,d)^{n-j} (-f-i\,d-2\,c\,z)^{j+1} \left(\frac{(-f-i\,d-2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(-f-i\,d-2\,c\,z)^2}{4\,c} \right) \right) \right.$$

$$(-c)^{-n-1} - e^{\frac{(i\,d-f)^2}{4\,c}-g}$$

$$\left(\sum_{j=0}^{n} 2^{j-n} (f-i\,d)^{n-j} (-f+i\,d-2\,c\,z)^{j+1} \left(\frac{(-f+i\,d-2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(-f+i\,d-2\,c\,z)^2}{4\,c} \right) \right) (-c)^{-n-1} +$$

$$c^{-n-1} e^{-\frac{(f-i\,d)^2}{4\,c}+g} \sum_{j=0}^{n} 2^{j-n} (i\,d-f)^{n-j} (f-i\,d+2\,c\,z)^{j+1} \left(-\frac{(f-i\,d+2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f-i\,d+2\,c\,z)^2}{4\,c} \right) -$$

$$c^{-n-1} e^{-\frac{(f+i\,d)^2}{4\,c}+g}$$

$$\left. \sum_{j=0}^{n} 2^{j-n} (-f-i\,d)^{n-j} (f+i\,d+2\,c\,z)^{j+1} \left(-\frac{(f+i\,d+2\,c\,z)^2}{c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+i\,d+2\,c\,z)^2}{4\,c} \right) \right) /;\ n \in \mathbb{N}$$

01.20.21.0943.01

$$\int z^n \sin(d\,z)\cosh\left(\sqrt{z}\,c + g + f\,z\right) dz ==$$

$$i\,2^{-2n-3} \left(-e^{-\frac{c^2}{4(i\,d-f)}-g} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c)^{-h-j+2n} \left(2(i\,d-f)\sqrt{z}-c\right)^{h+j} \left(-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{i\,d-f} \right)^{\frac{1}{2}(-h-j-1)} \right. \right.$$

$$\binom{j}{h}\binom{n}{j} \left(2(i\,d-f)\sqrt{-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{i\,d-f}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{4(i\,d-f)} \right) - \right.$$

$$\left. \left. c\left(2(i\,d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{4(i\,d-f)} \right) \right) \right) (i\,d-f)^{-2(n+1)} +$$

$$e^{-\frac{c^2}{4(-f-i\,d)}-g} (f+i\,d)^{-2(n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c)^{-h-j+2n} \left(2(-f-i\,d)\sqrt{z}-c\right)^{h+j} \left(-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$\left.c\left(2(-f-i\,d)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{c^2}{4(f-i\,d)}+g}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f-i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f-i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)\right)-$$

$$e^{-\frac{c^2}{4(f+i\,d)}+g}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f+i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f+i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.0944.01

$$\int z^n \sin(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == -\frac{1}{8}\,i\left(e^{\frac{(-f+-i\,d)^2}{4\,c}-g-i\,e}\right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n}\,(f+i\,d)^{n-j}\,(-f-i\,d-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-$$

$$e^{\frac{(i\,d-f)^2}{4\,c}-g+i\,e}\left(\sum_{j=0}^{n} 2^{j-n}\,(f-i\,d)^{n-j}\,(-f+i\,d-2\,c\,z)^{j+1}\left(\frac{(-f+i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+i\,d-2\,c\,z)^2}{4\,c}\right)\right)$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{-\frac{(f-i\,d)^2}{4\,c}+g-i\,e}\sum_{j=0}^{n} 2^{j-n}\,(i\,d-f)^{n-j}\,(f-i\,d+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d+2\,c\,z)^2}{4\,c}\right)-c^{-n-1}\,e^{-\frac{(f+i\,d)^2}{4\,c}+g+i\,e}$$

$$\left.\sum_{j=0}^{n} 2^{j-n}\,(-f-i\,d)^{n-j}\,(f+i\,d+2\,c\,z)^{j+1}\left(-\frac{(f+i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i\,d+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.0945.01

$$\int z^n \sin(e+d\,z)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$i\,2^{-2n-3}\left(-e^{-\frac{c^2}{4\,(i\,d-f)}-g+i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(i\,d-f)\sqrt{-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)-\right.$$

$$\left.\left.c\left(2\,(i\,d-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)\right)\right)(i\,d-f)^{-2\,(n+1)}+e^{-\frac{c^2}{4\,(-f+-i\,d)}-g-i\,e}$$

$$(f+i\,d)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$\left.c\left(2(-f-i\,d)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{c^2}{4(f-i\,d)}+g-i\,e}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f-i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f-i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)\right)-$$

$$e^{-\frac{c^2}{4(f+i\,d)}+g+i\,e}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f+i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f+i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b\,z^r)\cosh(c\,z^r+f\,z+g)$

01.20.21.0946.01

$$\int z^n \sin\left(b z^2\right) \cosh\left(c z^2 + f z + g\right) dz == -\frac{1}{8} i$$

$$\left(e^{-\frac{1}{4} i \left(\frac{f^2}{b-i c}-4 i g\right)} \left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2 (-c-i b) z-f)^{j+1} \left(-\frac{(2 (-c-i b) z-f)^2}{-c-i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2 (-c-i b) z-f)^2}{4 (-c-i b)}\right)\right)\right.$$

$$(-c-i b)^{-n-1} - (i b-c)^{-n-1} e^{\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 i g\right)}$$

$$\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2 (i b-c) z-f)^{j+1} \left(-\frac{(2 (i b-c) z-f)^2}{i b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2 (i b-c) z-f)^2}{4 (i b-c)}\right) +$$

$$(c-i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 i g\right)} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2 (c-i b) z)^{j+1} \left(-\frac{(f+2 (c-i b) z)^2}{c-i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2 (c-i b) z)^2}{4 (c-i b)}\right) - (c+i b)^{-n-1} e^{\frac{1}{4} i \left(\frac{f^2}{b-i c}-4 i g\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2 (c+i b) z)^{j+1} \left(-\frac{(f+2 (c+i b) z)^2}{c+i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2 (c+i b) z)^2}{4 (c+i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.0947.01

$$\int z^n \sin\left(\sqrt{z}\ b\right) \cosh\left(\sqrt{z}\ c + g + f z\right) dz ==$$

$$i 2^{-2 n-3} f^{-2 (n+1)} \left(e^{\frac{(-c-i b)^2}{4 f}-g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c-i b)^{-h-j+2 n} \left(-c-i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h} \binom{n}{j} \left((-c-i b) \left(-c-i b-2 f \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h+j+1), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right) -\right.$$

$$\left.\left.2 f \sqrt{\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2} (h+j+2), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right)\right) -\right.$$

$$\left.e^{\frac{(i b-c)^2}{4 f}-g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b-c)^{-h-j+2 n} \left(-c+i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right)$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,f}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)-$$

$$e^{-\frac{(c+i\,b)^2}{4\,f}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b\,z^r+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.0948.01

$$\int z^n \sin\left(b z^2+e\right)\cosh\left(c z^2+f z+g\right) dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{1}{4} i \left(\frac{f^2}{b-i c}+4 e-4 i g\right)} \left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(-c-i b) z-f)^{j+1} \left(-\frac{(2(-c-i b) z-f)^2}{-c-i b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(-c-i b) z-f)^2}{4(-c-i b)}\right) \right) (-c-i b)^{-n-1} - (i b-c)^{-n-1} e^{\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 e+4 i g\right)} \right.$$

$$\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(i b-c) z-f)^{j+1} \left(-\frac{(2(i b-c) z-f)^2}{i b-c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(i b-c) z-f)^2}{4(i b-c)}\right) +$$

$$(c-i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 e+4 i g\right)} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-i b) z)^{j+1} \left(-\frac{(f+2(c-i b) z)^2}{c-i b} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c-i b) z)^2}{4(c-i b)}\right) - (c+i b)^{-n-1} e^{\frac{1}{4} i \left(\frac{f^2}{b-i c}+4 e-4 i g\right)}$$

$$\left. \left. \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c+i b) z)^{j+1} \left(-\frac{(f+2(c+i b) z)^2}{c+i b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c+i b) z)^2}{4(c+i b)}\right) \right) \right/; n \in \mathbb{N}$$

01.20.21.0949.01

$$\int z^n \sin\left(\sqrt{z}\, b+e\right)\cosh\left(\sqrt{z}\, c+g+f z\right) dz ==$$

$$i 2^{-2n-3} f^{-2(n+1)} \left(e^{\frac{(-c+-i b)^2}{4 f}-g-i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c-i b)^{-h-j+2n} \left(-c-i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((-c-i b)\left(-c-i b-2 f \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right) - \right.$$

$$\left. \left. 2 f \sqrt{\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right) \right) - \right.$$

$$\left. e^{\frac{(i b-c)^2}{4 f}-g+i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b-c)^{-h-j+2n} \left(-c+i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \right)$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\,\sqrt{\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,f}+g-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)-$$

$$e^{-\frac{(c+i\,b)^2}{4\,f}+g+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.2\,\sqrt{-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b\,z^r+d\,z)\cosh(c\,z^r+f\,z+g)$

01.20.21.0950.01

$$\int z^n \sin\left(b z^2 + d z\right) \cosh\left(c z^2 + f z + g\right) dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{(-f-i d)^2}{4(-c-i b)}-g} \left(\sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d + 2(-c + -i b) z)^{j+1} \left(-\frac{(-f - i d + 2(-c + -i b) z)^2}{-c - i b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f - i d + 2(-c + -i b) z)^2}{4(-c - i b)} \right) \right) (-c - i b)^{-n-1} -$$

$$(i b - c)^{-n-1} e^{-\frac{(i d-f)^2}{4(i b-c)}-g} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j} (-f + i d + 2(i b - c) z)^{j+1} \left(-\frac{(-f + i d + 2(i b - c) z)^2}{i b - c} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f + i d + 2(i b - c) z)^2}{4(i b - c)} \right) + (c - i b)^{-n-1} e^{-\frac{(f-i d)^2}{4(c-i b)}+g} \sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j}$$

$$(f - i d + 2(c - i b) z)^{j+1} \left(-\frac{(f - i d + 2(c - i b) z)^2}{c - i b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f - i d + 2(c - i b) z)^2}{4(c - i b)} \right) -$$

$$(c + i b)^{-n-1} e^{-\frac{(f+i d)^2}{4(c+i b)}+g} \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2(c + i b) z)^{j+1} \left(-\frac{(f + i d + 2(c + i b) z)^2}{c + i b} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + i d + 2(c + i b) z)^2}{4(c + i b)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0951.01

$$\int z^n \sin\left(\sqrt{z}\, b + d z\right) \cosh\left(\sqrt{z}\, c + g + f z\right) dz == i\, 2^{-2n-3}$$

$$\left(-e^{-\frac{(i b-c)^2}{4(i d-f)}-g} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2(i d - f)\sqrt{z} \right)^{h+j} \left(-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2(i d - f)\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) + \right.$$

$$\left.\left.\left. 2\sqrt{-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f}}\, (i d - f) \Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) \right) \right)$$

$$(i d - f)^{-2n-2} + e^{-\frac{(-c-i b)^2}{4(-f-i d)}-g} (f + i d)^{-2n-2} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c - i b)^{-h-j+2n} \left(-c - i b + 2(-f + -i d)\sqrt{z} \right)^{h+j}$$

$$\left(-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-c-i\,b)\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}}\;(-f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,(f-i\,d)}+g}\,(f-i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c-i\,b)\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)\right)-$$

$$e^{-\frac{(c+i\,b)^2}{4\,(f+i\,d)}+g}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+i\,b)\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b z^r + d z + e) \cosh(c z^r + f z + g)$

01.20.21.0952.01

$$\int z^n \sin(b z^2 + d z + e) \cosh(c z^2 + f z + g)\, dz ==$$

$$-\frac{1}{8} i \left(e^{-\frac{(-f+-i d)^2}{4(-c+-i b)}-g-i e} \left(\sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d + 2(-c + -i b) z)^{j+1} \left(-\frac{(-f - i d + 2(-c + -i b) z)^2}{-c - i b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f - i d + 2(-c + -i b) z)^2}{4(-c - i b)} \right) \right) (-c - i b)^{-n-1} -$$

$$(i b - c)^{-n-1} e^{-\frac{(i d-f)^2}{4(i b-c)}-g+i e} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j} (-f + i d + 2(i b - c) z)^{j+1} \left(-\frac{(-f + i d + 2(i b - c) z)^2}{i b - c} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f + i d + 2(i b - c) z)^2}{4(i b - c)} \right) + (c - i b)^{-n-1} e^{-\frac{(f-i d)^2}{4(c-i b)}+g-i e} \sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j}$$

$$(f - i d + 2(c - i b) z)^{j+1} \left(-\frac{(f - i d + 2(c - i b) z)^2}{c - i b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f - i d + 2(c - i b) z)^2}{4(c - i b)} \right) -$$

$$(c + i b)^{-n-1} e^{-\frac{(f+i d)^2}{4(c+i b)}+g+i e} \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2(c + i b) z)^{j+1} \left(-\frac{(f + i d + 2(c + i b) z)^2}{c + i b} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + i d + 2(c + i b) z)^2}{4(c + i b)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.0953.01

$$\int z^n \sin\left(\sqrt{z}\ b + e + d z\right) \cosh\left(\sqrt{z}\ c + g + f z\right) dz == i\, 2^{-2n-3}$$

$$\left(-e^{-\frac{(i b-c)^2}{4(i d-f)}-g+i e} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2(i d - f)\sqrt{z} \right)^{h+j} \left(-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2(i d - f)\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) + \right.$$

$$\left.\left.\left. 2\sqrt{-\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{i d - f}}\ (i d - f) \Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z} \right)^2}{4(i d - f)} \right) \right) \right)$$

$$(i\,d-f)^{-2\,n-2}+e^{-\frac{(-c+-i\,b)^2}{4\,(-f+-i\,d)}-g-i\,e}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}$$

$$\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-c-i\,b)\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}}\,(-f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,(f-i\,d)}+g-i\,e}\,(f-i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c-i\,b)\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}}\,(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)\right)-$$

$$e^{-\frac{(c+i\,b)^2}{4\,(f+i\,d)}+g+i\,e}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+i\,b)\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)+\right.$$

$$2\sqrt{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}\,\Gamma\left(\frac{1}{2}\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2\right)\Bigg)\Bigg)$$

Involving powers of sin and power

Involving $z^{\alpha-1}\sin^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.0954.01

$$\int z^{\alpha-1}\sin^{m}(c\,z)\cosh(a\,z)\,dz == 2^{-m-1}\,z^{\alpha}\left((-a\,z)^{-\alpha}\,(a\,z)^{-\alpha}\binom{m}{\frac{m}{2}}(\Gamma(\alpha,\,a\,z)\,(-a\,z)^{\alpha}+(a\,z)^{\alpha}\,\Gamma(\alpha,\,-a\,z))\,(m\bmod 2-1)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\,((-a-i\,c\,(2\,k-m))\,z)^{-\alpha}\,((a+c\,i\,(2\,k-m))\,z)^{-\alpha}\,((-a+2\,i\,c\,k-i\,c\,m)\,z)^{-\alpha}\,((a+c\,i\,(m-2\,k))\,z)^{-\alpha}\binom{m}{k}$$

$$\left(\left(\left(\Gamma(\alpha,\,(a+c\,i\,(m-2\,k))\,z)\left(\cos\left(\frac{m\,\pi}{2}\right)+i\sin\left(\frac{m\,\pi}{2}\right)\right)((-a+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}+((a+c\,i\,(m-2\,k))\,z)^{\alpha}\right.\right.\right.$$

$$\left.\left.\Gamma(\alpha,\,(-a+2\,i\,c\,k-i\,c\,m)\,z)\left(\cos\left(\frac{m\,\pi}{2}\right)-i\sin\left(\frac{m\,\pi}{2}\right)\right)\right)((-a-2\,i\,c\,k+i\,c\,m)\,z)^{\alpha}+\right.$$

$$\left.((-a+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}\,((a+c\,i\,(m-2\,k))\,z)^{\alpha}\,\Gamma(\alpha,\,(-a-2\,i\,c\,k+i\,c\,m)\,z)\left(\cos\left(\frac{m\,\pi}{2}\right)+i\sin\left(\frac{m\,\pi}{2}\right)\right)\right)$$

$$((a+c\,i\,(2\,k-m))\,z)^{\alpha}+((-a-i\,c\,(2\,k-m))\,z)^{\alpha}\,((-a+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}\,((a+c\,i\,(m-2\,k))\,z)^{\alpha}$$

$$\left.\left.\Gamma(\alpha,\,(a+c\,i\,(2\,k-m))\,z)\left(\cos\left(\frac{m\,\pi}{2}\right)-i\sin\left(\frac{m\,\pi}{2}\right)\right)\right)\right)\Big/;\,m\in\mathbb{N}^{+}$$

01.20.21.0955.01

$$\int z^{n}\sin^{\mu}(c\,z)\cosh(a\,z)\,dz == \frac{n!}{2}\,\sin^{\mu}(c\,z)\left(1-e^{2\,i\,c\,z}\right)^{-\mu}$$

$$\left(e^{a\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}}{(n-p)!\,(a-i\,c\,\mu)^{p+1}}\,{}_{p+2}F_{p+1}\left(-\frac{i\,a+c\,\mu}{2\,c},\,\ldots,\,-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,1-\frac{i\,a+c\,\mu}{2\,c},\,\ldots,\,1-\frac{i\,a+c\,\mu}{2\,c};\,e^{2\,i\,c\,z}\right)+\right.$$

$$\left.e^{-a\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}}{(n-p)!\,(-a-i\,c\,\mu)^{p+1}}\,{}_{p+2}F_{p+1}\left(\frac{i\,a-c\,\mu}{2\,c},\,\ldots,\,\frac{i\,a-c\,\mu}{2\,c},\,-\mu;\,1+\frac{i\,a-c\,\mu}{2\,c},\,\ldots,\,1+\frac{i\,a-c\,\mu}{2\,c};\,e^{2\,i\,c\,z}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sin^{\mu}(c\,z+d)\cosh(a\,z)$

01.20.21.0956.01

$$\int z^{\alpha-1} \sin^m(d+c\,z) \cosh(a\,z)\,dz == 2^{-m-1}\, z^{\alpha} \left((-a\,z)^{-\alpha}\, (a\,z)^{-\alpha} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \left(\Gamma(\alpha, a\,z)\, (-a\,z)^{\alpha} + (a\,z)^{\alpha}\, \Gamma(\alpha, -a\,z)\right) - \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \left((-a - i\,c\,(2\,k-m))\,z\right)^{-\alpha} \left((a + c\,i\,(2\,k-m))\,z\right)^{-\alpha} \left((-a + 2\,i\,c\,k - i\,c\,m)\,z\right)^{-\alpha} \left((a + c\,i\,(m-2\,k))\,z\right)^{-\alpha} \binom{m}{k}$$

$$\left(e^{\frac{1}{2} i\,(4\,d\,k - 2\,d\,m + m\,\pi)} \left((a + c\,i\,(2\,k-m))\,z\right)^{\alpha} \left((-a - i\,c\,(2\,k-m))\,z\right)^{\alpha} \Gamma(\alpha, (a + c\,i\,(m-2\,k))\,z) \left((-a + 2\,i\,c\,k - i\,c\,m)\,z\right)^{\alpha} + \right.$$

$$\left(e^{-\frac{1}{2} i\,(4\,d\,k - 2\,d\,m + m\,\pi)} \left(\Gamma(\alpha, (a + 2\,i\,c\,k - i\,c\,m)\,z) \left((-a + 2\,i\,c\,k - i\,c\,m)\,z\right)^{\alpha} + \left((a + 2\,i\,c\,k - i\,c\,m)\,z\right)^{\alpha} \right.\right.$$

$$\left.\left. \Gamma(\alpha, (-a + 2\,i\,c\,k - i\,c\,m)\,z)\right) \left((-a - i\,c\,(2\,k-m))\,z\right)^{\alpha} + e^{\frac{1}{2} i\,(4\,d\,k - 2\,d\,m + m\,\pi)} \left((a + c\,i\,(2\,k-m))\,z\right)^{\alpha} \right.$$

$$\left.\left. \left((-a + 2\,i\,c\,k - i\,c\,m)\,z\right)^{\alpha} \Gamma(\alpha, (-a - i\,c\,(2\,k-m))\,z) \right) \left((a + c\,i\,(m-2\,k))\,z\right)^{\alpha} \right) \Big/; m \in \mathbb{N}^+$$

01.20.21.0957.01

$$\int z^n \sin^{\mu}(d+c\,z) \cosh(a\,z)\,dz == \frac{1}{2} \left(1 - e^{2\,i\,(d+c\,z)}\right)^{-\mu} n!\, \sin^{\mu}(d+c\,z)$$

$$\left(e^{-a\,z} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (-a - i\,c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c\,\mu - i\,a}{2\,c}, \ldots, -\frac{c\,\mu - i\,a}{2\,c}, -\mu; 1 - \frac{c\,\mu - i\,a}{2\,c}, \ldots, 1 - \frac{c\,\mu - i\,a}{2\,c}; e^{2\,i\,(d+c\,z)}\right) + \right.$$

$$e^{a\,z} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (a - i\,c\,\mu)^{-j-1}}{(n-j)!}$$

$$\left.\left. {}_{j+2}F_{j+1}\left(-\frac{i\,a + c\,\mu}{2\,c}, \ldots, -\frac{i\,a + c\,\mu}{2\,c}, -\mu; 1 - \frac{i\,a + c\,\mu}{2\,c}, \ldots, 1 - \frac{i\,a + c\,\mu}{2\,c}; e^{2\,i\,(d+c\,z)}\right) \right) \Big/; n \in \mathbb{N}$$

Involving $z^{\alpha-1} \sin^{\mu}(c\,z) \cosh(a\,z+b)$

01.20.21.0958.01

$$\int z^{\alpha-1} \sin^m(c\,z) \cosh(b + a\,z)\,dz ==$$

$$2^{-m-1}\, z^{\alpha}\, e^{-b - \frac{i\,m\,\pi}{2}} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(-(-1)^m\, \Gamma(\alpha, (a - 2\,i\,c\,k + i\,c\,m)\,z) \left((a - 2\,i\,c\,k + i\,c\,m)\,z\right)^{-\alpha} + \right.$$

$$e^{2\,b} \left(-(-1)^m\, \Gamma(\alpha, (-a - 2\,i\,c\,k + i\,c\,m)\,z) \left((-a - 2\,i\,c\,k + i\,c\,m)\,z\right)^{-\alpha} - \left((-a + 2\,i\,c\,k - i\,c\,m)\,z\right)^{-\alpha} \right.$$

$$\left.\left. \Gamma(\alpha, (-a + 2\,i\,c\,k - i\,c\,m)\,z)\right) - \left((a + 2\,i\,c\,k - i\,c\,m)\,z\right)^{-\alpha}\, \Gamma(\alpha, (a + 2\,i\,c\,k - i\,c\,m)\,z)\right) -$$

$$2^{-m-1}\, e^{-b}\, z^{\alpha} \binom{m}{\frac{m}{2}} \left(e^{2\,b}\, \Gamma(\alpha, -a\,z)\, (-a\,z)^{-\alpha} + (a\,z)^{-\alpha}\, \Gamma(\alpha, a\,z)\right) (1 - m \bmod 2) \Big/; m \in \mathbb{N}^+$$

01.20.21.0959.01

$$\int z^n \sin^{\mu}(c\,z)\cosh(a\,z+b)\,dz == \frac{1}{2}\left(1-e^{2\,i\,c\,z}\right)^{-\mu} n!\,\sin^{\mu}(c\,z)$$
$$\left(e^{-b-a\,z}\sum_{p=0}^{n}\frac{(-1)^p\,z^{n-p}\,(-a-i\,c\,\mu)^{-p-1}}{(n-p)!}\;{}_{p+2}F_{p+1}\left(\frac{i\,a-c\,\mu}{2\,c},\ldots,\frac{i\,a-c\,\mu}{2\,c},-\mu;\frac{i\,a-c\,\mu}{2\,c}+1,\ldots,\frac{i\,a-c\,\mu}{2\,c}+1;e^{2\,i\,c\,z}\right)+\right.$$
$$e^{b+a\,z}\sum_{p=0}^{n}\frac{(-1)^p\,z^{n-p}\,(a-i\,c\,\mu)^{-p-1}}{(n-p)!}$$
$$\left.{}_{p+2}F_{p+1}\left(-\frac{i\,a+c\,\mu}{2\,c},\ldots,-\frac{i\,a+c\,\mu}{2\,c},-\mu;-\frac{i\,a+c\,\mu}{2\,c}+1,\ldots,-\frac{i\,a+c\,\mu}{2\,c}+1;e^{2\,i\,c\,z}\right)\right)/;\,n\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^{\mu}(c\,z+d)\cosh(a\,z+b)$

01.20.21.0960.01

$$\int z^{\alpha-1}\sin^{m}(d+c\,z)\cosh(b+a\,z)\,dz ==$$
$$2^{-m-1}\,z^{\alpha}\left((-a\,z)^{-\alpha}\,(a\,z)^{-\alpha}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\left(e^{-b}\,\Gamma(\alpha,a\,z)\,(-a\,z)^{\alpha}+(a\,z)^{\alpha}\,e^{b}\,\Gamma(\alpha,-a\,z)\right)-\right.$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,((-a-i\,c\,(2\,k-m))\,z)^{-\alpha}\,((a+c\,i\,(2\,k-m))\,z)^{-\alpha}\,((-a+2\,i\,c\,k-i\,c\,m)\,z)^{-\alpha}$$
$$((a+c\,i\,(m-2\,k))\,z)^{-\alpha}\binom{m}{k}\left(e^{\frac{1}{2}i\,(4\,d\,k-2\,d\,m+m\,\pi)-b}\,((a+c\,i\,(2\,k-m))\,z)^{\alpha}\right.$$
$$((-a-i\,c\,(2\,k-m))\,z)^{\alpha}\,\Gamma(\alpha,(a+c\,i\,(m-2\,k))\,z)\,((-a+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}+$$
$$\left(e^{-\frac{1}{2}i\,(4\,d\,k-2\,d\,m+m\,\pi)}\left(e^{-b}\,\Gamma(\alpha,(a+2\,i\,c\,k-i\,c\,m)\,z)\,((-a+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}+e^{b}\,((a+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}\right.\right.$$
$$\left.\Gamma(\alpha,(-a+2\,i\,c\,k-i\,c\,m)\,z)\right)((-a-i\,c\,(2\,k-m))\,z)^{\alpha}+e^{b+\frac{1}{2}i\,(4\,d\,k-2\,d\,m+m\,\pi)}\,((a+c\,i\,(2\,k-m))\,z)^{\alpha}$$
$$\left.\left.((-a+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}\,\Gamma(\alpha,(-a-i\,c\,(2\,k-m))\,z)\right)((a+c\,i\,(m-2\,k))\,z)^{\alpha}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0961.01

$$\int z^n \sin^{\mu}(d+c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2}\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu} n!\,\sin^{\mu}(d+c\,z)$$
$$\left(e^{-b-a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a-i\,c\,\mu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a}{2\,c},\ldots,-\frac{c\,\mu-i\,a}{2\,c},-\mu;1-\frac{c\,\mu-i\,a}{2\,c},\ldots,1-\frac{c\,\mu-i\,a}{2\,c};e^{2\,i\,(d+c\,z)}\right)+\right.$$
$$e^{b+a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a-i\,c\,\mu)^{-j-1}}{(n-j)!}$$
$$\left.{}_{j+2}F_{j+1}\left(-\frac{i\,a+c\,\mu}{2\,c},\ldots,-\frac{i\,a+c\,\mu}{2\,c},-\mu;1-\frac{i\,a+c\,\mu}{2\,c},\ldots,1-\frac{i\,a+c\,\mu}{2\,c};e^{2\,i\,(d+c\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin^m(b\,z^r)\cosh(c\,z)$

01.20.21.0962.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh(c\,z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c\,z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c\,z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i\,c^2}{4\,b\,(m-2\,s)}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(-c-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-c-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-c-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,c^2}{4\,b\,(m-2\,s)}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(c-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(c-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,c^2}{4\,b\,(m-2\,s)}-\frac{i\,m\,\pi}{2}}(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-c)^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c)^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,c^2}{4\,b\,(m-2\,s)}-\frac{i\,m\,\pi}{2}}(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c+2\,b\,i\,(m-2\,s)\,z)^{j+1}$$

$$\left.\left(\frac{i\,(c+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(c+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0963.01

$$\int z^n \sin^m\left(\sqrt{z}\;b\right)\cosh(c\,z)\,dz ==$$

$$2^{-m-1}\binom{m}{\frac{m}{2}}\left((-1)^n\,\Gamma(n+1,\,-c\,z)-\Gamma(n+1,\,c\,z)\right)(1-m \bmod 2)\,c^{-n-1}+2^{-m-2\,n-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,c}+\frac{i\,m\,\pi}{2}}\right.\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-2\,\sqrt{z}\;c-i\,b\,(m-2\,s)\right)^{h+j}\left(\frac{\left(-2\,\sqrt{z}\;c-i\,b\,(m-2\,s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\left.\left.\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-2\,\sqrt{z}\;c-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-2\,\sqrt{z}\;c-i\,b\,(m-2\,s)\right)^2}{4\,c}\right)-2\,c\right.\right.$$

$$\sqrt{\frac{\left(-2\sqrt{z}\,c-i\,b\,(m-2\,s)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{\left(-2\sqrt{z}\,c-i\,b\,(m-2\,s)\right)^2}{4\,c}\right)\Bigg)+e^{-\frac{b^2\,(m-2\,s)^2}{4\,c}-\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,c\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b\,(m-2\,s)-2\,c\,\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,c\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;\frac{\left(i\,b\,(m-2\,s)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)-2\,c$$

$$\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,c\,\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{\left(i\,b\,(m-2\,s)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)\Bigg)+e^{\frac{b^2\,(m-2\,s)^2}{4\,c}+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,c\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,c\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,c\sqrt{-\frac{\left(2\,c\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{\left(2\,c\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c}\right)-i$$

$$b\,(m-2\,s)\left(2\,c\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{\left(2\,c\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^2}{4\,c}\right)+2\sqrt{-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^2}{c}}$$

$$c\,\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^2}{4\,c}\right)\Bigg)\Bigg)\Bigg)\,c^{-2\,(n+1)}\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b z^r + e) \cosh(c z)$

01.20.21.0964.01

$$\int z^n \sin^m\left(b z^2+e\right)\cosh(c z)\,dz == (-1)^n\, 2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i c^2}{4 b (m-2 s)}-i e (m-2 s)+\frac{i m \pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(-c-2 i b (m-2 s) z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i (-c-2 i b (m-2 s) z)^2}{b (m-2 s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-c-2 i b (m-2 s) z)^2}{4 b (m-2 s)}\right)\right)(-i b (m-2 s))^{-n-1}+$$

$$e^{-\frac{i c^2}{4 b (m-2 s)}-i e (m-2 s)+\frac{i m \pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c-2 i b (m-2 s) z)^{j+1}\left(-\frac{i (c-2 i b (m-2 s) z)^2}{b (m-2 s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (c-2 i b (m-2 s) z)^2}{4 b (m-2 s)}\right)\right)(-i b (m-2 s))^{-n-1}+e^{\frac{i c^2}{4 b (m-2 s)}+e i (m-2 s)-\frac{i m \pi}{2}}(i b (m-2 s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(2 i b (m-2 s) z-c)^{j+1}\left(\frac{i (2 i b (m-2 s) z-c)^2}{b (m-2 s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (2 i b (m-2 s) z-c)^2}{4 b (m-2 s)}\right)+$$

$$e^{\frac{i c^2}{4 b (m-2 s)}+e i (m-2 s)-\frac{i m \pi}{2}}(i b (m-2 s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c+2 b i (m-2 s) z)^{j+1}$$

$$\left.\left(\frac{i (c+2 b i (m-2 s) z)^2}{b (m-2 s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (c+2 b i (m-2 s) z)^2}{4 b (m-2 s)}\right)\right)/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0965.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+e\right)\cosh(c z)\,dz ==$$

$$2^{-m-1}\binom{m}{\frac{m}{2}}\left((-1)^n\,\Gamma(n+1,\,-c z)-\Gamma(n+1,\,c z)\right)(1-m \bmod 2)\,c^{-n-1}+2^{-m-2\,n-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{b^2 (m-2 s)^2}{4 c}-i e (m-2 s)+\frac{i m \pi}{2}}\right.\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i b (m-2 s))^{-h-j+2 n}\left(-2\sqrt{z}\;c-i b (m-2 s)\right)^{h+j}\left(\frac{\left(-2\sqrt{z}\;c-i b (m-2 s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\left.\binom{j}{h}\binom{n}{j}\left(-i b (m-2 s)\left(-2\sqrt{z}\;c-i b (m-2 s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-2\sqrt{z}\;c-i b (m-2 s)\right)^2}{4 c}\right)-2\right.$$

$$c\sqrt{\frac{\left(-2\sqrt{z}\,c-i\,b\,(m-2\,s)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{\left(-2\sqrt{z}\,c-i\,b\,(m-2\,s)\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{-\frac{b^2(m-2s)^2}{4c}+e\,i\,(m-2s)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2n}\left(i\,b\,(m-2\,s)-2\,c\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;\frac{\left(i\,b\,(m-2\,s)-2\,c\sqrt{z}\right)^2}{4\,c}\right)-2\,c$$

$$\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{\left(i\,b\,(m-2\,s)-2\,c\sqrt{z}\right)^2}{4\,c}\right)\Bigg)+e^{\frac{b^2(m-2s)^2}{4c}-i\,e\,(m-2s)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2n}\left(2\,c\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,c\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,c\sqrt{-\frac{\left(2\,c\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{\left(2\,c\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,c}\right)-i$$

$$b\,(m-2\,s)\left(2\,c\sqrt{z}\,-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{\left(2\,c\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{\frac{b^2(m-2s)^2}{4c}+e\,i\,(m-2s)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2n}\left(2\sqrt{z}\,c+b\,i\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\sqrt{z}\,c+b\,i\,(m-2\,s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(2\sqrt{z}\,c+b\,i\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{\left(2\sqrt{z}\,c+b\,i\,(m-2\,s)\right)^2}{4\,c}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\,c+b\,i\,(m-2\,s)\right)^2}{c}}$$

$$\Bigg(1\qquad\left(2\sqrt{z}\,c+b\,i\,(m-2\,s)\right)^2\Bigg)\Bigg)\Bigg)$$

Involving $z^n \sin^m(b z^r + d z)\cosh(c z)$

01.20.21.0966.01

$$\int z^n \sin^m\left(b z^2 + d z\right)\cosh(c z)\, dz == (-1)^n 2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1, c z)(-c)^{-n-1} + c^{-n-1}\Gamma(n+1, -c z)\right)(1 - m \bmod 2) -$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i(-c-i d(m-2s))^2}{4b(m-2s)}+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(c + d i(m-2s))^{n-j}\right.\right.$$

$$(-c - i d(m-2s) - 2 i b(m-2s) z)^{j+1}\left(-\frac{i(-c - i d(m-2s) - 2 i b(m-2s) z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{i(-c - i d(m-2s) - 2 i b(m-2s) z)^2}{4b(m-2s)}\right)\right)(-i b(m-2s))^{-n-1} +$$

$$e^{-\frac{i(c-i d(m-2s))^2}{4b(m-2s)}+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(i d(m-2s) - c)^{n-j}(c - i d(m-2s) - 2 i b(m-2s) z)^{j+1}\right.$$

$$\left.\left(-\frac{i(c - i d(m-2s) - 2 i b(m-2s) z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{i(c - i d(m-2s) - 2 i b(m-2s) z)^2}{4b(m-2s)}\right)\right)$$

$$(-i b(m-2s))^{-n-1} + e^{\frac{i(i d(m-2s)-c)^2}{4b(m-2s)}-\frac{i m\pi}{2}}(i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(c - i d(m-2s))^{n-j}$$

$$(-c + d i(m-2s) + 2 b i(m-2s) z)^{j+1}\left(\frac{i(-c + d i(m-2s) + 2 b i(m-2s) z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, \frac{i(-c + d i(m-2s) + 2 b i(m-2s) z)^2}{4b(m-2s)}\right) + e^{\frac{i(c+d i(m-2s))^2}{4b(m-2s)}-\frac{i m\pi}{2}}(i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-c - i d(m-2s))^{n-j}(c + d i(m-2s) + 2 b i(m-2s) z)^{j+1}\left(\frac{i(c + d i(m-2s) + 2 b i(m-2s) z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i(c + d i(m-2s) + 2 b i(m-2s) z)^2}{4b(m-2s)}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.0967.01

$$\int z^n \sin^m\left(\sqrt{z}\ b + d\,z\right)\cosh(c\,z)\,dz == 2^{-m-1}\binom{m}{\frac{m}{2}}((-1)^n\,\Gamma(n+1,\,-c\,z) - \Gamma(n+1,\,c\,z))\,(1 - m \bmod 2)\,c^{-n-1} +$$

$$2^{-m-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-c)}-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c)}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c}}$$

$$\left.\left.(i\,d\,(m-2\,s)-c)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c)}\right)\right)\right)$$

$$(i\,d\,(m-2\,s)-c)^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(c+d\,i\,(m-2\,s))}-\frac{i\,m\,\pi}{2}}\,(c+d\,i\,(m-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{c+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(c+d\,i\,(m-2\,s))}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{c+d\,i\,(m-2\,s)}}$$

$$\left.(c+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(c+d\,i\,(m-2\,s))}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (-c-i d (m-2 s))}+\frac{i m \pi}{2}} (-c-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{-c-i d (m-2 s)}\right)^{\frac{1}{2} (-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (-c-i d (m-2 s)) \sqrt{-\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{-c-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (-c-i d (m-2 s))}\right)-i b (m-2 s) \left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (-c-i d (m-2 s))}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (c-i d (m-2 s))}+\frac{i m \pi}{2}} (c-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{c-i d (m-2 s)}\right)^{\frac{1}{2} (-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (c-i d (m-2 s)) \sqrt{-\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{c-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (c-i d (m-2 s))}\right)-i b (m-2 s) \left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (c-i d (m-2 s))}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \sin^m(b z^r + d z + e) \cosh(c z)$

01.20.21.0968.01

$$\int z^n \sin^m\left(b\,z^2+d\,z+e\right)\cosh(c\,z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c\,z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c\,z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i\,(-c-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(c+d\,i\,(m-2\,s))^{n-j}\right.\right.$$

$$(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(c-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-c)^{n-j}\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,(i\,d\,(m-2\,s)-c)^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(c-i\,d\,(m-2\,s))^{n-j}\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}$$

$$\left(\frac{i\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(c+d\,i\,(m-2\,s))^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-c-i\,d\,(m-2\,s))^{n-j}$$

$$(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0969.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh(c\,z)\,dz ==$$

$$2^{-m-1}\binom{m}{\frac{m}{2}}\left((-1)^n\,\Gamma(n+1,\,-c\,z)-\Gamma(n+1,\,c\,z)\right)(1-m \bmod 2)\,c^{-n-1}+2^{-m-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$

$$\left(e^{\frac{b^2 (m-2 s)^2}{4 (i d (m-2 s)-c)}+e i (m-2 s)-\frac{i m \pi}{2}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2 s))^{-h-j+2 n} \left(b i (m-2 s)+2 (i d (m-2 s)-c) \sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c) \sqrt{z}\right)^2}{i d (m-2 s)-c}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b i (m-2 s) \left(b i (m-2 s)+2 (i d (m-2 s)-c) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c) \sqrt{z}\right)^2}{4 (i d (m-2 s)-c)}\right)+2 \sqrt{-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c) \sqrt{z}\right)^2}{i d (m-2 s)-c}}$$

$$\left.\left.\left.(i d (m-2 s)-c) \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c) \sqrt{z}\right)^2}{4 (i d (m-2 s)-c)}\right)\right)\right)$$

$$(i d (m-2 s)-c)^{-2 (n+1)}+e^{\frac{b^2 (m-2 s)^2}{4 (c+d i (m-2 s))}+e i (m-2 s)-\frac{i m \pi}{2}} (c+d i (m-2 s))^{-2 (n+1)}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2 s))^{-h-j+2 n} \left(b i (m-2 s)+2 (c+d i (m-2 s)) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b i (m-2 s)+2 (c+d i (m-2 s)) \sqrt{z}\right)^2}{c+d i (m-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b i (m-2 s) \left(b i (m-2 s)+2 (c+d i (m-2 s)) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b i (m-2 s)+2 (c+d i (m-2 s)) \sqrt{z}\right)^2}{4 (c+d i (m-2 s))}\right)+2 \sqrt{-\frac{\left(b i (m-2 s)+2 (c+d i (m-2 s)) \sqrt{z}\right)^2}{c+d i (m-2 s)}}$$

$$\left.(c+d i (m-2 s)) \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b i (m-2 s)+2 (c+d i (m-2 s)) \sqrt{z}\right)^2}{4 (c+d i (m-2 s))}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (-c-i d (m-2 s))}-i e (m-2 s)+\frac{i m \pi}{2}} (-c-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{-c-i d (m-2 s)}\right)^{\frac{1}{2} (-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (-c-i d (m-2 s)) \sqrt{-\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{-c-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (-c-i d (m-2 s))}\right)-i b (m-2 s) \left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (-c-i d (m-2 s))}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (c-i d (m-2 s))}-i e (m-2 s)+\frac{i m \pi}{2}} (c-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{c-i d (m-2 s)}\right)^{\frac{1}{2} (-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (c-i d (m-2 s)) \sqrt{-\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{c-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (c-i d (m-2 s))}\right)-i b (m-2 s) \left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (c-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (c-i d (m-2 s))}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \sin^m(b z^r) \cosh(f z+g)$

01.20.21.0970.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh(g+f\,z)\,dz == 2^{-m-1}\,f^{-n-1}\binom{m}{\frac{m}{2}}((-1)^n\,e^g\,\Gamma(n+1,-f\,z)-e^{-g}\,\Gamma(n+1,\,f\,z))\,(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i\,f^2}{4\,b\,(m-2\,s)}-g+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-f-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-f-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,f^2}{4\,b\,(m-2\,s)}+g+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(f-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{i\,(f-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,f^2}{4\,b\,(m-2\,s)}-g-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-f)^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f)^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,f^2}{4\,b\,(m-2\,s)}+g-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,b\,i\,(m-2\,s)\,z)^{j+1}$$

$$\left.\left(\frac{i\,(f+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(f+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0971.01

$$\int z^n \sin^m\left(\sqrt{z}\;b\right)\cosh(g+f\,z)\,dz ==$$

$$2^{-m-1}\binom{m}{\frac{m}{2}}((-1)^n\,e^g\,\Gamma(n+1,-f\,z)-e^{-g}\,\Gamma(n+1,\,f\,z))\,(1-m \bmod 2)\,f^{-n-1}+2^{-m-2\,n-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,f}-g+\frac{i\,m\,\pi}{2}}\right.\right.$$

$$\left.\left.\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-2\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^{h+j}\left(\frac{\left(-2\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\left.\left.\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-2\sqrt{z}\;f-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-2\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-2\,f\right.\right.$$

$$\sqrt{\frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\Bigg)+e^{-\frac{b^2\,(m-2\,s)^2}{4\,f}-g-\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f$$

$$\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+e^{\frac{b^2\,(m-2\,s)^2}{4\,f}+g+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,f\sqrt{-\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-i$$

$$b\,(m-2\,s)\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,f}+g-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{f}}$$

$$f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{4\,f}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\ f^{-2\,(n+1)}\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b z^r + e) \cosh(f z + g)$

01.20.21.0972.01

$$\int z^n \sin^m\left(b z^2+e\right)\cosh(g+f z)\,dz == 2^{-m-1} f^{-n-1}\binom{m}{\frac{m}{2}}((-1)^n e^g \Gamma(n+1,-f z)-e^{-g}\Gamma(n+1,f z))(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i f^2}{4b(m-2s)}-g-ie(m-2s)+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n} f^{n-j}(-f-2ib(m-2s)z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i(-f-2ib(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-f-2ib(m-2s)z)^2}{4b(m-2s)}\right)\right)(-ib(m-2s))^{-n-1}+$$

$$e^{-\frac{if^2}{4b(m-2s)}+g-ie(m-2s)+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(-f)^{n-j}(f-2ib(m-2s)z)^{j+1}\left(-\frac{i(f-2ib(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(f-2ib(m-2s)z)^2}{4b(m-2s)}\right)\right)(-ib(m-2s))^{-n-1}+e^{\frac{if^2}{4b(m-2s)}-g+ei(m-2s)-\frac{im\pi}{2}}(ib(m-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n} f^{n-j}(2ib(m-2s)z-f)^{j+1}\left(\frac{i(2ib(m-2s)z-f)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(2ib(m-2s)z-f)^2}{4b(m-2s)}\right)+$$

$$e^{\frac{if^2}{4b(m-2s)}+g+ei(m-2s)-\frac{im\pi}{2}}(ib(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f)^{n-j}(f+2bi(m-2s)z)^{j+1}$$

$$\left.\left(\frac{i(f+2bi(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(f+2bi(m-2s)z)^2}{4b(m-2s)}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0973.01

$$\int z^n \sin^m\left(\sqrt{z}\,b+e\right)\cosh(g+f z)\,dz == 2^{-m-1}\binom{m}{\frac{m}{2}}((-1)^n e^g\Gamma(n+1,-f z)-e^{-g}\Gamma(n+1,f z))(1-m \bmod 2) f^{-n-1}+$$

$$2^{-m-2n-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{b^2(m-2s)^2}{4f}-ie(m-2s)-g+\frac{im\pi}{2}}\right.\right.$$

$$\left.\left.\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib(m-2s))^{-h-j+2n}\left(-2\sqrt{z}\,f-ib(m-2s)\right)^{h+j}\left(\frac{\left(-2\sqrt{z}\,f-ib(m-2s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-2\right.$$

$$\left.f\,\sqrt{\frac{\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,f}+e\,i\,(m-2\,s)-g-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+e^{\frac{b^2\,(m-2\,s)^2}{4\,f}-i\,e\,(m-2\,s)+g+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,f\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,f\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,f\,\sqrt{-\frac{\left(2\,f\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(2\,f\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-i\right.$$

$$\left.b\,(m-2\,s)\left(2\,f\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,f\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,f}+e\,i\,(m-2\,s)+g-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,\sqrt{z}\;f+b\,i\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{4\,f}\right)\right)\right)f^{-2(n+1)}\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z)\cosh(f\,z+g)$

01.20.21.0974.01

$$\int z^n \sin^m\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz == f^{-n-1}\,2^{-m-1}\binom{m}{\frac{m}{2}}((-1)^n\,e^{g}\,\Gamma(n+1,\,-f\,z)-e^{-g}\,\Gamma(n+1,\,f\,z))\,(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i\,(-f-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-g+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,s))^{n-j}\right.\right.$$

$$(-f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(f-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}+g+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-f)^{n-j}\,(f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,(i\,d\,(m-2\,s)-f)^2}{4\,b\,(m-2\,s)}-g-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,s))^{n-j}$$

$$(-f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(-f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\frac{i\,(-f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{i\,(f+d\,i\,(m-2\,s))^2}{4\,b\,(m-2\,s)}+g-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-f-i\,d\,(m-2\,s))^{n-j}\,(f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0975.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$2^{-m-1}\binom{m}{\frac{m}{2}}((-1)^n\,e^{g}\,\Gamma(n+1,\,-f\,z)-e^{-g}\,\Gamma(n+1,\,f\,z))\,(1-m \bmod 2)\,f^{-n-1}+2^{-m-2\,n-2}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-f)}-g-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}}$$

$$\left.\left.(i\,d\,(m-2\,s)-f)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\right)\right)\right)$$

$$(i\,d\,(m-2\,s)-f)^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(f+d\,i\,(m-2\,s))}+g-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}}$$

$$\left.(f+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-f-i\,d\,(m-2\,s))}-g+\frac{i\,m\,\pi}{2}}\,(-f-i\,d\,(m-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-f-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-f-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-f-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d(m-2s))\sqrt{-\frac{\left(2(-f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{-f-i\,d(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-f-i\,d(m-2s))}\right)-i\,b(m-2s)\left(2(-f-i\,d(m-2s))\sqrt{z}-\right.$$

$$\left.i\,b(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-f-i\,d(m-2s))}\right)+$$

$$e^{\frac{b^2(m-2s)^2}{4(f-i\,d(m-2s))}+g+\frac{i\,m\,\pi}{2}}(f-i\,d(m-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b(m-2s))^{-h-j+2n}$$

$$\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^{h+j}\left(-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{f-i\,d(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(f-i\,d(m-2s))\sqrt{-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{f-i\,d(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(f-i\,d(m-2s))}\right)-i\,b(m-2s)\left(2(f-i\,d(m-2s))\sqrt{z}-\right.$$

$$\left.\left.i\,b(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(f-i\,d(m-2s))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z+e)\cosh(f\,z+g)$

01.20.21.0976.01

$$\int z^n \sin^m\left(b z^2+d z+e\right)\cosh(g+f z)\,dz == f^{-n-1}\,2^{-m-1}\binom{m}{\frac{m}{2}}\left((-1)^n e^{g}\,\Gamma(n+1,-f z)-e^{-g}\,\Gamma(n+1,f z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i(-f-i d(m-2s))^2}{4b(m-2s)}-g-i e(m-2s)+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(f+d i(m-2s))^{n-j}\right.\right.$$

$$(-f-i d(m-2s)-2 i b(m-2s)z)^{j+1}\left(-\frac{i(-f-i d(m-2s)-2 i b(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-f-i d(m-2s)-2 i b(m-2s)z)^2}{4b(m-2s)}\right)\right)(-i b(m-2s))^{-n-1}+$$

$$e^{-\frac{i(f-i d(m-2s))^2}{4b(m-2s)}+g-i e(m-2s)+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(i d(m-2s)-f)^{n-j}(f-i d(m-2s)-2 i b(m-2s)z)^{j+1}\right.$$

$$\left.\left(-\frac{i(f-i d(m-2s)-2 i b(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(f-i d(m-2s)-2 i b(m-2s)z)^2}{4b(m-2s)}\right)\right)$$

$$(-i b(m-2s))^{-n-1}+e^{\frac{i(i d(m-2s)-f)^2}{4b(m-2s)}-g+e i(m-2s)-\frac{i m\pi}{2}}(i b(m-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(f-i d(m-2s))^{n-j}(-f+d i(m-2s)+2 b i(m-2s)z)^{j+1}$$

$$\left(\frac{i(-f+d i(m-2s)+2 b i(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(-f+d i(m-2s)+2 b i(m-2s)z)^2}{4b(m-2s)}\right)+$$

$$e^{\frac{i(f+d i(m-2s))^2}{4b(m-2s)}+g+e i(m-2s)-\frac{i m\pi}{2}}(i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f-i d(m-2s))^{n-j}$$

$$(f+d i(m-2s)+2 b i(m-2s)z)^{j+1}\left(\frac{i(f+d i(m-2s)+2 b i(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(f+d i(m-2s)+2 b i(m-2s)z)^2}{4b(m-2s)}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0977.01

$$\int z^n \sin^m\left(\sqrt{z}\ b+e+d z\right)\cosh(g+f z)\,dz ==$$

$$2^{-m-1}\binom{m}{\frac{m}{2}}\left((-1)^n e^{g}\,\Gamma(n+1,-f z)-e^{-g}\,\Gamma(n+1,f z)\right)(1-m \bmod 2)\,f^{-n-1}+2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$

$$\left(e^{\frac{b^2 (m-2 s)^2}{4 (i d (m-2 s)-f)}+e i (m-2 s)-g-\frac{i m \pi}{2}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2 s))^{-h-j+2 n} \left(b i (m-2 s)+2 (i d (m-2 s)-f) \sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-f) \sqrt{z}\right)^2}{i d (m-2 s)-f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b i (m-2 s) \left(b i (m-2 s)+2 (i d (m-2 s)-f) \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h+j+1),\right.\right.$$

$$\left.-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-f) \sqrt{z}\right)^2}{4 (i d (m-2 s)-f)}\right)+2 \sqrt{-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-f) \sqrt{z}\right)^2}{i d (m-2 s)-f}}$$

$$\left.\left.\left.(i d (m-2 s)-f) \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-f) \sqrt{z}\right)^2}{4 (i d (m-2 s)-f)}\right)\right)\right)$$

$$(i d (m-2 s)-f)^{-2 (n+1)}+e^{\frac{b^2 (m-2 s)^2}{4 (f+d i (m-2 s))}+e i (m-2 s)+g-\frac{i m \pi}{2}} (f+d i (m-2 s))^{-2 (n+1)}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2 s))^{-h-j+2 n} \left(b i (m-2 s)+2 (f+d i (m-2 s)) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b i (m-2 s)+2 (f+d i (m-2 s)) \sqrt{z}\right)^2}{f+d i (m-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b i (m-2 s) \left(b i (m-2 s)+2 (f+d i (m-2 s)) \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h+j+1),\right.\right.$$

$$\left.-\frac{\left(b i (m-2 s)+2 (f+d i (m-2 s)) \sqrt{z}\right)^2}{4 (f+d i (m-2 s))}\right)+2 \sqrt{-\frac{\left(b i (m-2 s)+2 (f+d i (m-2 s)) \sqrt{z}\right)^2}{f+d i (m-2 s)}}$$

$$\left.(f+d i (m-2 s)) \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(b i (m-2 s)+2 (f+d i (m-2 s)) \sqrt{z}\right)^2}{4 (f+d i (m-2 s))}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (-f-i d (m-2 s))}-i e (m-2 s)-g+\frac{i m \pi}{2}} (-f-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (-f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (-f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{-f-i d (m-2 s)}\right)^{\frac{1}{2} (-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (-f-i d (m-2 s)) \sqrt{-\frac{\left(2 (-f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{-f-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(2 (-f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (-f-i d (m-2 s))}\right)-i b (m-2 s) \left(2 (-f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (-f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (-f-i d (m-2 s))}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (f-i d (m-2 s))}-i e (m-2 s)+g+\frac{i m \pi}{2}} (f-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{f-i d (m-2 s)}\right)^{\frac{1}{2} (-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (f-i d (m-2 s)) \sqrt{-\frac{\left(2 (f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{f-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(2 (f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (f-i d (m-2 s))}\right)-i b (m-2 s) \left(2 (f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (f-i d (m-2 s)) \sqrt{z}-i b (m-2 s)\right)^2}{4 (f-i d (m-2 s))}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \sin^m(d z) \cosh\left(c z^r\right)$

01.20.21.0978.01

$$\int z^n \sin^m(d\,z)\cosh\left(c\,z^2\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-2^{-m-2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{d^2(m-2k)^2}{4c}+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(i\,d\,(m-2k))^{n-j}(-i\,d\,(m-2k)-2\,c\,z)^{j+1}\left(\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+e^{-\frac{d^2(m-2k)^2}{4c}-\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(-i\,d\,(m-2k))^{n-j}\right.$$

$$(i\,d\,(m-2k)-2\,c\,z)^{j+1}\left(\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{4\,c}\right)\Bigg)(-c)^{-n-1}+$$

$$c^{-n-1}e^{\frac{d^2(m-2k)^2}{4c}+\frac{i m\pi}{2}}\sum_{j=0}^{n}2^{j-n}(i\,d\,(m-2k))^{n-j}(2\,c\,z-i\,d\,(m-2k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{4\,c}\right)+c^{-n-1}e^{\frac{d^2(m-2k)^2}{4c}-\frac{i m\pi}{2}}\sum_{j=0}^{n}2^{j-n}(-i\,d\,(m-2k))^{n-j}(d\,i\,(m-2k)+2\,c\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{4\,c}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0979.01

$$\int z^n \sin^m(d\,z)\cosh\left(\sqrt{z}\ c\right) dz ==$$

$$2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i c^2}{4d(m-2k)}+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(-c-2\,i\,d\,(m-2k)\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-c-2\,i\,d\,(m-2k)\sqrt{z}\right)^2}{d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,i\,d\,(m-2k)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\left.\left.-\frac{i\left(-c-2\,i\,d\,(m-2k)\sqrt{z}\right)^2}{4\,d\,(m-2k)}\right)-2\,i\,d\,(m-2k)\sqrt{-\frac{i\left(-c-2\,i\,d\,(m-2k)\sqrt{z}\right)^2}{d\,(m-2k)}}\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-2\,i\,d$$

$$(m-2\,k)\sqrt{-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)$$

$$(-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$c\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}$$

$$(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m\bmod 2)\;/;\;n\in$$

$$\mathbb{N}\bigwedge$$

$$m\in$$

$$\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.0980.01

$$\int z^n \sin^m(e+d\,z)\cosh\left(c\,z^2\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m\bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}$$

$$\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\Bigg)(-c)^{-n-1}+$$

$$e^{-\frac{d^2\,(m-2\,k)^2}{4\,c}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\left(\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\Bigg)(-c)^{-n-1}+c^{-n-1}\,e^{\frac{d^2\,(m-2\,k)^2}{4\,c}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}$$

$$(2\,c\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{\frac{d^2\,(m-2\,k)^2}{4\,c}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\Bigg)\Bigg)\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0981.01

$$\int z^n \sin^m(e+d\,z)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-m-2\,n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-2\,i\,d\right.$$

$$\left.\left.(m-2\,k)\sqrt{-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)$$

$$(-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$c\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}$$

$$(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m\bmod 2)\;/;\;n\in$$

$$\mathbb{N}\bigwedge$$

$$m\in$$

$$\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^m(b\,z^r)\cosh(c\,z^r)$

01.20.21.0982.01

$$\int z^{\alpha-1}\sin^m(b\,z^r)\cosh(c\,z^r)\,dz==$$

$$-\frac{(-1)^m\,2^{-m-1}\,z^\alpha\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{\alpha}{r},\,-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,z^r\right)\right)(1-m\bmod 2)}{r}-\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z^\alpha$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg((-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}+(-1)^m\left((c-2\,i\,b\,k+i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+\left((-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+$$

$$\left((c+2\,i\,b\,k-i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\Bigg)\;/;\;m\in\mathbb{N}^+$$

01.20.21.0983.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz ==$$
$$-(-1)^m\,2^{-m-2}\,z^{n+1}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)-$$
$$i^{-m}\,2^{-m-2}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{n+1}{2},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+$$
$$(-1)^m\left((c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-2\,i\,b\,k+i\,b\,m)\,z^2\right)+\left((-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\right.$$
$$\left.\left.(-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)+\left((c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c+2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)/;\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

01.20.21.0984.01

$$\int z^n \sin^m\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right)dz ==$$
$$-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(2\,(n+1),\,(-c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)(-c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}+(-1)^m\,(c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}\right.$$
$$\Gamma\left(2\,(n+1),\,(c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)+(-c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)+$$
$$\left.(c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)(2\,i)^{-m}-$$
$$\left(-\frac{1}{2}\right)^m c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m \bmod 2)\,/;\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^m\left(b\,z^r+e\right)\cosh\left(c\,z^r\right)$

01.20.21.0985.01

$$\int z^{\alpha-1}\sin^m(b\,z^r+e)\cosh(c\,z^r)\,dz == -\frac{(-1)^m\,2^{-m-1}\,z^\alpha\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{\alpha}{r},\,-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$
$$\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{\alpha}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}+\right.$$
$$(-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\left((c-2\,i\,b\,k+i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{-2\,i\,e\,k+i\,e\,m}\left((-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}$$
$$\left.\Gamma\left(\frac{\alpha}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-2\,i\,e\,k+i\,e\,m}\left((c+2\,i\,b\,k-i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.0986.01

$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz ==$$

$$-(-1)^m\,2^{-m-2}\,z^{n+1}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)-$$

$$i^{-m}\,2^{-m-2}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$(-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\left((c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-2\,i\,b\,k+i\,b\,m)\,z^2\right)+$$

$$e^{-2\,i\,e\,k+i\,e\,m}\left((-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)+$$

$$\left.e^{-2\,i\,e\,k+i\,e\,m}\left((c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c+2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0987.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c\right)dz ==$$

$$-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(-c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)(-c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}+\right.$$

$$(-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,(c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)+$$

$$e^{-2\,i\,e\,k+i\,e\,m}\,(-c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)+$$

$$\left.e^{-2\,i\,e\,k+i\,e\,m}\,(c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)(2\,i)^{-m}-$$

$$\left(-\frac{1}{2}\right)^m c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m \bmod 2)\,/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r\right)$

01.20.21.0988.01

$$\int z^n \sin^m\left(b z^2 + d z\right) \cosh\left(c z^2\right) dz ==$$

$$-2^{-m-2} \binom{m}{\frac{m}{2}} \left(\Gamma\left(\frac{n+1}{2}, -c z^2\right) \left(-c z^2\right)^{\frac{1}{2}(-n-1)} + \left(c z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c z^2\right)\right) (1 - m \bmod 2)\, z^{n+1} -$$

$$2^{-m-2} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s \binom{m}{s} \left(e^{\frac{1}{4} i \left(\frac{d^2 (m-2s)^2}{-i c - b m + 2 b s} - 2 m \pi \right)} \left(\sum_{j=0}^{n} 2^{j-n} (-i d (m-2s))^{n-j} (d i (m-2s) + 2 (i b (m-2s) - c) z)^{j+1} \right.\right.$$

$$\left.\left(-\frac{(d i (m-2s) + 2 (i b (m-2s) - c) z)^2}{i b (m-2s) - c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d i (m-2s) + 2 (i b (m-2s) - c) z)^2}{4 (i b (m-2s) - c)}\right) \right)$$

$$(i b (m-2s) - c)^{-n-1} + e^{-\frac{1}{4} i \left(-\frac{d^2 (m-2s)^2}{i c - b m + 2 b s} + 2 m \pi \right)} (c + b i (m-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d (m-2s))^{n-j} (d i (m-2s) + 2 (c + b i (m-2s)) z)^{j+1}$$

$$\left(-\frac{(d i (m-2s) + 2 (c + b i (m-2s)) z)^2}{c + b i (m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d i (m-2s) + 2 (c + b i (m-2s)) z)^2}{4 (c + b i (m-2s))}\right) +$$

$$e^{\frac{1}{4} i \left(-\frac{d^2 (m-2s)^2}{i c - b m + 2 b s} + 2 m \pi \right)} (-c - i b (m-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (i d (m-2s))^{n-j} (2 (-c - i b (m-2s)) z - i d (m-2s))^{j+1}$$

$$\left(-\frac{(2 (-c - i b (m-2s)) z - i d (m-2s))^2}{-c - i b (m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(2 (-c - i b (m-2s)) z - i d (m-2s))^2}{4 (-c - i b (m-2s))}\right) + e^{-\frac{1}{4} i \left(\frac{d^2 (m-2s)^2}{-i c - b m + 2 b s} - 2 m \pi \right)} (c - i b (m-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n}$$

$$(i d (m-2s))^{n-j} (2 (c - i b (m-2s)) z - i d (m-2s))^{j+1} \left(-\frac{(2 (c - i b (m-2s)) z - i d (m-2s))^2}{c - i b (m-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2 (c - i b (m-2s)) z - i d (m-2s))^2}{4 (c - i b (m-2s))}\right) \right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\ b + d z\right) \cosh\left(\sqrt{z}\ c\right) dz ==$$

$$2^{-m-2n-2} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s (i d (m-2s))^{-2(n+1)} \binom{m}{s} \left(e^{\frac{i (i b (m-2s) - c)^2}{4 d (m-2s)} - \frac{i m \pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2s) - c)^{-h-j+2n} \right.$$

$$\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\right.$$

$$\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)(1-m\bmod 2)\;/;\;n\in\mathbb{N}\bigwedge$$

$m\in\mathbb{N}^+$

Involving $z^n \sin^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

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$$\int z^n \sin^m\left(b z^2 + d z + e\right) \cosh\left(c z^2\right) dz ==$$

$$-2^{-m-2} \binom{m}{\frac{m}{2}} \left(\Gamma\left(\frac{n+1}{2}, -c z^2\right) \left(-c z^2\right)^{\frac{1}{2}(-n-1)} + \left(c z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c z^2\right)\right) (1 - m \bmod 2)\, z^{n+1} -$$

$$2^{-m-2} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s \binom{m}{s} \left(e^{\frac{1}{4} i \left(\frac{d^2 (m-2s)^2}{-i c - b m + 2 b s} + 4 e (m-2s) - 2 m \pi \right)} \left(\sum_{j=0}^{n} 2^{j-n} (-i d (m-2s))^{n-j} (d i (m-2s) + 2 (i b (m-2s) - c) z)^{j+1} \right.\right.$$

$$\left.\left. \left(-\frac{(d i (m-2s) + 2 (i b (m-2s) - c) z)^2}{i b (m-2s) - c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d i (m-2s) + 2 (i b (m-2s) - c) z)^2}{4 (i b (m-2s) - c)} \right) \right) \right.$$

$$(i b (m-2s) - c)^{-n-1} + e^{-\frac{1}{4} i \left(-\frac{d^2 (m-2s)^2}{i c - b m + 2 b s} - 4 e (m-2s) + 2 m \pi \right)} (c + b i (m-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d (m-2s))^{n-j} (d i (m-2s) + 2 (c + b i (m-2s)) z)^{j+1}$$

$$\left(-\frac{(d i (m-2s) + 2 (c + b i (m-2s)) z)^2}{c + b i (m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d i (m-2s) + 2 (c + b i (m-2s)) z)^2}{4 (c + b i (m-2s))} \right) +$$

$$e^{\frac{1}{4} i \left(-\frac{d^2 (m-2s)^2}{i c - b m + 2 b s} - 4 e (m-2s) + 2 m \pi \right)} (-c - i b (m-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (i d (m-2s))^{n-j}$$

$$(2 (-c - i b (m-2s)) z - i d (m-2s))^{j+1} \left(-\frac{(2 (-c - i b (m-2s)) z - i d (m-2s))^2}{-c - i b (m-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2 (-c - i b (m-2s)) z - i d (m-2s))^2}{4 (-c - i b (m-2s))} \right) +$$

$$e^{-\frac{1}{4} i \left(\frac{d^2 (m-2s)^2}{-i c - b m + 2 b s} + 4 e (m-2s) - 2 m \pi \right)} (c - i b (m-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (i d (m-2s))^{n-j}$$

$$(2 (c - i b (m-2s)) z - i d (m-2s))^{j+1} \left(-\frac{(2 (c - i b (m-2s)) z - i d (m-2s))^2}{c - i b (m-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2 (c - i b (m-2s)) z - i d (m-2s))^2}{4 (c - i b (m-2s))} \right) \right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\ b + e + d z\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2n-2} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s (i d (m-2s))^{-2(n+1)} \binom{m}{s} \left(e^{\frac{i (i b (m-2s) - c)^2}{4 d (m-2s)} + e i (m-2s) - \frac{i m \pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2s) - c)^{-h-j+2n} \right.$$

$$\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\right.$$

$$\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\,\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\,\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m\bmod 2)\;/;\;n\in\mathbb{N}\bigwedge$$

$m\in\mathbb{N}^+$

Involving $z^n \sin^m(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.0992.01

$$\int z^n \sin^m(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{d^2(m-2k)^2}{4c}-g+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{-\frac{d^2(m-2k)^2}{4c}-g-\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\left(\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}+g+\frac{i m\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}$$

$$(2\,c\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}+g-\frac{i m\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0993.01

$$\int z^n \sin^m(d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-2\,n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}-g+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left.\left(-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.\right.$$

$$\left.\left.\left.-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}+g+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-2\,i\,d$$

$$(m-2\,k)\sqrt{-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)$$

$$(-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}-g-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$c\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}+g-\frac{i\,m\,\pi}{2}}$$

$$(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)$$

$$(1-$$

$$m \bmod 2)\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}$$

Involving $z^n \sin^m(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.0994.01

$$\int z^n \sin^m(e+d\,z)\cosh\left(c\,z^2+g\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c}-i\,e\,(m-2\,k)-g+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}$$

$$\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\Bigg)(-c)^{-n-1}+$$

$$e^{-\frac{d^2\,(m-2\,k)^2}{4\,c}+e\,i\,(m-2\,k)-g-\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\left(\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\Bigg)(-c)^{-n-1}+c^{-n-1}\,e^{\frac{d^2\,(m-2\,k)^2}{4\,c}-i\,e\,(m-2\,k)+g+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}$$

$$(2\,c\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{\frac{d^2\,(m-2\,k)^2}{4\,c}+e\,i\,(m-2\,k)+g-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\Bigg)\Bigg)\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}$$

01.20.21.0995.01

$$\int z^n \sin^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-2\,n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}-g-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+\right.$$

$$\left.\left.\left.2),-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}+g-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-2\,i\,d\right.$$

$$\left.\left.(m-2\,k)\sqrt{-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)$$

$$(-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}-g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$c\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}+g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}$$

$$(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)$$

$$(1-m \bmod 2)\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^m(b\,z^r)\cosh(c\,z^r+g)$

01.20.21.0996.01

$$\int z^{\alpha-1}\sin^m(b\,z^r)\cosh(c\,z^r+g)\,dz==$$

$$-\frac{1}{r}\left((-1)^m\,2^{-m-1}\,z^{\alpha}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{\alpha}{r},\,-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+e^{-g}\,(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,z^r\right)\right)(1-m \bmod 2)\right)-$$

$$\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg((-1)^m\,e^{g}\,\Gamma\left(\frac{\alpha}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}+$$

$$(-1)^m\,e^{-g}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{g}\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-g}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\Bigg)\;/;\;m\in\mathbb{N}^+$$

01.20.21.0997.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$-(-1)^m\,2^{-m-2}\,z^{n+1}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)-$$

$$i^{-m}\,2^{-m-2}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^g\,\Gamma\left(\frac{n+1}{2},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+$$

$$(-1)^m\,e^{-g}\left((c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-2\,i\,b\,k+i\,b\,m)\,z^2\right)+$$

$$e^g\left((-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)+$$

$$e^{-g}\left((c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c+2\,i\,b\,k-i\,b\,m)\,z^2\right)\Big)\,/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.0998.01

$$\int z^n \sin^m\left(\sqrt{z}\;b\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^g\,\Gamma\left(2\,(n+1),\,(-c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)(-c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}+\right.$$

$$(-1)^m\,e^{-g}\,(c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)+e^g\,(-c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}$$

$$\left.\Gamma\left(2\,(n+1),\,(-c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)+e^{-g}\,(c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)$$

$$(2\,i)^{-m}-\left(-\frac{1}{2}\right)^m c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m \bmod 2)\,/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.0999.01

$$\int z^{\alpha-1}\sin^m(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{1}{r}\left((-1)^m\,2^{-m-1}\,z^\alpha\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{\alpha}{r},\,-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+e^{-g}\,(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,z^r\right)\right)(1-m \bmod 2)\right)-$$

$$\frac{1}{r}\,i^{-m}\,2^{-m-1}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{g+2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{\alpha}{r},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}+(-1)^m\right.$$

$$e^{-g+2\,i\,e\,k-i\,e\,m}\left((c-2\,i\,b\,k+i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{g-2\,i\,e\,k+i\,e\,m}\left((-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}$$

$$\left.\Gamma\left(\frac{\alpha}{r},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-g-2\,i\,e\,k+i\,e\,m}\left((c+2\,i\,b\,k-i\,b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)\,/;\,m\in\mathbb{N}^+$$

01.20.21.1000.01

$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$-(-1)^m\,2^{-m-2}\,z^{n+1}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)-$$

$$i^{-m}\,2^{-m-2}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{g+2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,(-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$(-1)^m\,e^{-g+2\,i\,e\,k-i\,e\,m}\left((c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-2\,i\,b\,k+i\,b\,m)\,z^2\right)+$$

$$e^{g-2\,i\,e\,k+i\,e\,m}\left((-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)+$$

$$\left.e^{-g-2\,i\,e\,k+i\,e\,m}\left((c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c+2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1001.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{g+2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(-c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)(-c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}+\right.$$

$$(-1)^m\,e^{-g+2\,i\,e\,k-i\,e\,m}\,(c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)+$$

$$e^{g-2\,i\,e\,k+i\,e\,m}\,(-c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)+$$

$$\left.e^{-g-2\,i\,e\,k+i\,e\,m}\,(c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)(2\,i)^{-m}-$$

$$\left(-\frac{1}{2}\right)^m c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m \bmod 2)\,/;\,n\in$$

$\mathbb{N}\bigwedge m\in\mathbb{N}^+$

Involving $z^n \sin^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1002.01

$$\int z^n \sin^m\left(b z^2+d z\right)\cosh\left(c z^2+g\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},-c z^2\right)\left(-c z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c z^2\right)\right)(1-m \bmod 2)\, z^{n+1}-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-ic-bm+2bs}+4ig-2m\pi\right)}\left(\sum_{j=0}^{n}2^{j-n}(-i d(m-2s))^{n-j}(d i(m-2s)+2(i b(m-2s)-c)z)^{j+1}\right.\right.$$

$$\left.\left.\left(-\frac{(d i(m-2s)+2(i b(m-2s)-c)z)^2}{i b(m-2s)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d i(m-2s)+2(i b(m-2s)-c)z)^2}{4(i b(m-2s)-c)}\right)\right)$$

$$(i b(m-2s)-c)^{-n-1}+e^{-\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{ic-bm+2bs}+4ig+2m\pi\right)}(c+b i(m-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-i d(m-2s))^{n-j}(d i(m-2s)+2(c+b i(m-2s))z)^{j+1}$$

$$\left(-\frac{(d i(m-2s)+2(c+b i(m-2s))z)^2}{c+b i(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d i(m-2s)+2(c+b i(m-2s))z)^2}{4(c+b i(m-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{ic-bm+2bs}+4ig+2m\pi\right)}(-c-i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(i d(m-2s))^{n-j}$$

$$(2(-c-i b(m-2s))z-i d(m-2s))^{j+1}\left(-\frac{(2(-c-i b(m-2s))z-i d(m-2s))^2}{-c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(-c-i b(m-2s))z-i d(m-2s))^2}{4(-c-i b(m-2s))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-ic-bm+2bs}+4ig-2m\pi\right)}(c-i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(i d(m-2s))^{n-j}$$

$$(2(c-i b(m-2s))z-i d(m-2s))^{j+1}\left(-\frac{(2(c-i b(m-2s))z-i d(m-2s))^2}{c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(c-i b(m-2s))z-i d(m-2s))^2}{4(c-i b(m-2s))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1003.01

$$\int z^n \sin^m\left(\sqrt{z}\ b+d z\right)\cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s(i d(m-2s))^{-2(n+1)}\binom{m}{s}\left(e^{\frac{i(i b(m-2s)-c)^2}{4d(m-2s)}-g-\frac{i m\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i b(m-2s)-c)^{-h-j+2n}\right.$$

$$\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\right.$$

$$\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-g+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)$$

(1 − m mod 2) /; $n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$

Involving $z^n\sin^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1004.01

$$\int z^n \sin^m\left(b z^2+d z+e\right)\cosh\left(c z^2+g\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{n+1}{2},-c z^2\right)\left(-c z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-i c-b m+2 b s}+4e(m-2s)+4ig-2m\pi\right)}\left(\sum_{j=0}^{n}2^{j-n}(-i d(m-2s))^{n-j}(d i(m-2s)+2(i b(m-2s)-c)z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(d i(m-2s)+2(i b(m-2s)-c)z)^2}{i b(m-2s)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d i(m-2s)+2(i b(m-2s)-c)z)^2}{4(i b(m-2s)-c)}\right)\right)$$

$$(i b(m-2s)-c)^{-n-1}+e^{-\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{i c-b m+2 b s}-4e(m-2s)+4ig+2m\pi\right)}(c+b i(m-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-i d(m-2s))^{n-j}(d i(m-2s)+2(c+b i(m-2s))z)^{j+1}$$

$$\left(-\frac{(d i(m-2s)+2(c+b i(m-2s))z)^2}{c+b i(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d i(m-2s)+2(c+b i(m-2s))z)^2}{4(c+b i(m-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{i c-b m+2 b s}-4e(m-2s)+4ig+2m\pi\right)}(-c-i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(i d(m-2s))^{n-j}$$

$$(2(-c-i b(m-2s))z-i d(m-2s))^{j+1}\left(-\frac{(2(-c-i b(m-2s))z-i d(m-2s))^2}{-c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(-c-i b(m-2s))z-i d(m-2s))^2}{4(-c-i b(m-2s))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-i c-b m+2 b s}+4e(m-2s)+4ig-2m\pi\right)}(c-i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(i d(m-2s))^{n-j}$$

$$(2(c-i b(m-2s))z-i d(m-2s))^{j+1}\left(-\frac{(2(c-i b(m-2s))z-i d(m-2s))^2}{c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(c-i b(m-2s))z-i d(m-2s))^2}{4(c-i b(m-2s))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1005.01

$$\int z^n \sin^m\left(\sqrt{z}\ b+e+d z\right)\cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s(i d(m-2s))^{-2(n+1)}\binom{m}{s}\left(e^{\frac{i(i b(m-2s)-c)^2}{4d(m-2s)}-g+e i(m-2s)-\frac{i m\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i b(m-2s)-c)^{-h-j+2n}\right.$$

$$\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\right.$$

$$\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-g-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)$$

(1 − m mod 2) /; $n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$

Involving $z^n\sin^m(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1006.01

$$\int z^n \sin^m(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.$$

$$\left.\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1007.01

$$\int z^n \sin^m(d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{c^2}{4\,i\,d\,(m-2k)-f)}-\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{i\,d\,(m-2k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2k)-f)$$

$$\sqrt{-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{i\,d\,(m-2k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)\Bigg)\Bigg)$$

$$(i\,d\,(m-2k)-f)^{-2(n+1)}+e^{-\frac{c^2}{4\,(f+d\,i\,(m-2k))}-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}}\ (f+d\,i\,(m-2k))\,\Gamma\Bigg($$

$$\frac{1}{2}(h+j+2),-\frac{\left(c+2(f+d\,i\,(m-2k))\sqrt{z}\right)^2}{4(f+d\,i\,(m-2k))}\Bigg)+e^{-\frac{c^2}{4(-f-i\,d\,(m-2k))}+\frac{i\,m\,\pi}{2}}$$

$$(-f-i\,d\,(m-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^{h+j}$$

$$\left(-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2(-f-i\,d\,(m-2k))$$

$$\sqrt{-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{4(-f-i\,d\,(m-2k))}\right)-$$

$$c\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{4(-f-i\,d\,(m-2k))}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d\,(m-2k))}+\frac{i\,m\,\pi}{2}}(f-i\,d\,(m-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{f-i\,d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{4(f-i\,d\,(m-2k))}\Bigg)+2\sqrt{-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{f-i\,d\,(m-2k)}}$$

$$(f-i\,d\,(m-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{4(f-i\,d\,(m-2k))}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1008.01

$$\int z^n \sin^m(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.$$

$$\left.\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1009.01

$$\int z^n \sin^m(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)f^{-2(n+1)}+$$

$$2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{c^2}{4\,i\,d\,(m-2k)-f)}+e\,i\,(m-2k)-\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2k)-f)$$

$$\sqrt{-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)\Bigg)\Bigg)$$

$$(i\,d\,(m-2k)-f)^{-2(n+1)}+e^{-\frac{c^2}{4\,(f+d\,i\,(m-2k))}+e\,i\,(m-2k)-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}}\ (f+d\,i\,(m-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$-\frac{\left(c+2\left(f+d\,i\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f+d\,i\,(m-2\,k)\right)}\Bigg)+e^{-\frac{c^2}{4(-f-i\,d\,(m-2\,k))}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$(-f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{-f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(-f-i\,d\,(m-2\,k))$$

$$\sqrt{-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{-f-i\,d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)-$$

$$c\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d\,(m-2\,k))}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\,(f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+1),-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\Bigg)+2\sqrt{-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}}$$

$$(f-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1010.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-2^{-m-2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}-2\,m\,\pi\right)}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)(i\,b\,(m-2\,k)-c)^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-2\,m\,\pi\right)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-2\,m\,\pi\right)}(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}-2\,m\,\pi\right)}(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1011.01

$$\int z^n \sin^m\left(\sqrt{z}\;b\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\Bigg(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{\frac{(i\,b\,(m-2k)-c)^2}{4f}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k)-c)^{-h-j+2n}$$

$$\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,k)-c)\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\,\sqrt{\frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{(-c-i\,b\,(m-2k))^2}{4f}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,k))^{-h-j+2n}\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-i\,b\,(m-2\,k))\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\sqrt{\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,k))^2}{4\,f}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,k))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+b\,i\,(m-2\,k))\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b\,(m-2\,k))^2}{4\,f}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,k))\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)f^{-2\,(n+1)}\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+e)\cosh(c\,z^r+f\,z)$

01.20.21.1012.01

$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(e^{\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,e\,(m-2\,k)-2\,m\,\pi\right)}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)(i\,b\,(m-2\,k)-c)^{-n-1}+\right.$$

$$e^{\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}+4\,e\,(m-2\,k)-2\,m\,\pi\right)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}+4\,e\,(m-2\,k)-2\,m\,\pi\right)}(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,e\,(m-2\,k)-2\,m\,\pi\right)}(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1013.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Gamma\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\Bigg(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{\frac{(i\,b\,(m-2k)-c)^2}{4f}+e\,i\,(m-2k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2k)-c)^{-h-j+2n}$$

$$\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2k)-c)\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\,\sqrt{\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{(-c-i\,b\,(m-2k))^2}{4f}-i\,e\,(m-2k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2k))^{-h-j+2n}\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-i\,b\,(m-2k))\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\sqrt{\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,k))^2}{4\,f}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,k))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c+b\,i\,(m-2\,k))\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2$$

$$\sqrt{-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{(c-i\,b\,(m-2\,k))^2}{4\,f}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((c-i\,b\,(m-2\,k))\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}$$

$$f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)\Bigg)\Bigg)\,f^{-2\,(n+1)}\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z)\cosh(c\,z^r+f\,z)$

01.20.21.1014.01

$$\int z^n\sin^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\Bigg(e^{\frac{f^2}{4\,c}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\;\frac{(-f-2\,c\,z)^2}{4\,c}\right)\Bigg)(-c)^{-n-1}+$$

$$c^{-n-1}\, e^{-\frac{f^2}{4c}} \sum_{j=0}^{n} 2^{j-n}\, (-f)^{n-j}\, (f+2\,c\,z)^{j+1} \left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg) -$$

$$2^{-m-2} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \Bigg(e^{-\frac{(i\,d\,(2\,k-m)-f)^2}{4\,(i\,b\,(2\,k-m)-c)} + \frac{i\,m\,\pi}{2}} \Bigg(\sum_{j=0}^{n} 2^{j-n}\, (f - i\,d\,(2\,k-m))^{n-j}\, (-f + d\,i\,(2\,k-m) + 2\,(i\,b\,(2\,k-m)-c)\,z)^{j+1}$$

$$\left(-\frac{(-f + d\,i\,(2\,k-m) + 2\,(i\,b\,(2\,k-m)-c)\,z)^2}{i\,b\,(2\,k-m)-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(-f + d\,i\,(2\,k-m) + 2\,(i\,b\,(2\,k-m)-c)\,z)^2}{4\,(i\,b\,(2\,k-m)-c)}\right)\Bigg) (i\,b\,(2\,k-m)-c)^{-n-1} +$$

$$e^{-\frac{(f+d\,i\,(2\,k-m))^2}{4\,(c+b\,i\,(2\,k-m))} + \frac{i\,m\,\pi}{2}} (c + b\,i\,(2\,k-m))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (-f - i\,d\,(2\,k-m))^{n-j}$$

$$(f + d\,i\,(2\,k-m) + 2\,(c + b\,i\,(2\,k-m))\,z)^{j+1} \left(-\frac{(f + d\,i\,(2\,k-m) + 2\,(c + b\,i\,(2\,k-m))\,z)^2}{c + b\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + d\,i\,(2\,k-m) + 2\,(c + b\,i\,(2\,k-m))\,z)^2}{4\,(c + b\,i\,(2\,k-m))}\right) +$$

$$e^{-\frac{(i\,d\,(m-2\,k)-f)^2}{4\,(i\,b\,(m-2\,k)-c)} - \frac{i\,m\,\pi}{2}} (i\,b\,(m-2\,k)-c)^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (f - i\,d\,(m-2\,k))^{n-j}\, (-f + d\,i\,(m-2\,k) + 2\,(i\,b\,(m-2\,k)-c)\,z)^{j+1}$$

$$\left(-\frac{(-f + d\,i\,(m-2\,k) + 2\,(i\,b\,(m-2\,k)-c)\,z)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(-f + d\,i\,(m-2\,k) + 2\,(i\,b\,(m-2\,k)-c)\,z)^2}{4\,(i\,b\,(m-2\,k)-c)}\right) +$$

$$e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,(c+b\,i\,(m-2\,k))} - \frac{i\,m\,\pi}{2}} (c + b\,i\,(m-2\,k))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (-f - i\,d\,(m-2\,k))^{n-j}$$

$$(f + d\,i\,(m-2\,k) + 2\,(c + b\,i\,(m-2\,k))\,z)^{j+1} \left(-\frac{(f + d\,i\,(m-2\,k) + 2\,(c + b\,i\,(m-2\,k))\,z)^2}{c + b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + d\,i\,(m-2\,k) + 2\,(c + b\,i\,(m-2\,k))\,z)^2}{4\,(c + b\,i\,(m-2\,k))}\right)\Bigg) /;\, n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1015.01

$$\int z^n \sin^m\left(\sqrt{z}\ b + d\,z\right)\cosh\left(\sqrt{z}\ c + f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,f\,\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)$$

$$f^{-2\,n-2}+2^{-m-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{(i\,b\,(2\,s-m)-c)^2}{4\,(i\,d\,(2\,s-m)-f)}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(2\,s-m)-c)^{-h-j+2\,n}\left(-c+b\,i\,(2\,s-m)+\right.\right.\right.$$

$$\left.\left.\left.2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{i\,d\,(2\,s-m)-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(\left(i\,b\,(2\,s-m)-c\right)\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,s-m)-f)}\right)+2$$

$$\left.\left.\left.(i\,d\,(2\,s-m)-f)\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,s-m)-f)}\right)\right)\right)\right)$$

$$\sqrt{-\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{i\,d\,(2\,s-m)-f}}\Bigg)\Bigg)(i\,d\,(2\,s-m)-f)^{-2\,n-2}+$$

$$e^{-\frac{(c+b\,i\,(2\,s-m))^2}{4\,(f+d\,i\,(2\,s-m))}+\frac{i\,m\,\pi}{2}}(f+d\,i\,(2\,s-m))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(2\,s-m))^{-h-j+2\,n}$$

$$\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,s-m)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((c+b\,i\,(2\,s-m))\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),\,-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,s-m))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,s-m)}}\,(f+d\,i\,(2\,s-m))\,\Gamma\Bigg(\frac{1}{2}(h+j+2),$$

$$-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,s-m))}\Bigg)\Bigg)+e^{-\frac{(i\,b\,(m-2\,s)-c)^2}{4\,(i\,d\,(m-2\,s)-f)}-\frac{i\,m\,\pi}{2}}(i\,d\,(m-2\,s)-f)^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c)^{-h-j+2\,n}\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),\,-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}}\;(i\,d\,(m-2\,s)-f)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\right)+e^{-\frac{(c+b\,i\,(m-2\,s))^2}{4\,(f+d\,i\,(m-2\,s))}-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2\,s))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\left(c+b\,i\,(m-2\,s)+\right.\right.$$

$$\left.2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}}\;(f+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)\right)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z+e)\cosh(c\,z^r+f\,z)$

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$$\int z^n\sin^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(e^{\frac{f^2}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(i\,d\,(2\,k-m)-f)^2}{4\,(i\,b\,(2\,k-m)-c)}+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(2\,k-m))^{n-j}\right.\right.$$

$$(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^{j+1}\left(-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{i\,b\,(2\,k-m)-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{4\,(i\,b\,(2\,k-m)-c)}\right)(i\,b\,(2\,k-m)-c)^{-n-1}+$$

$$e^{-\frac{(f+d\,i\,(2\,k-m))^2}{4\,(c+b\,i\,(2\,k-m))}+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}(c+b\,i\,(2\,k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(2\,k-m))^{n-j}$$

$$(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^{j+1}\left(-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{c+b\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{4\,(c+b\,i\,(2\,k-m))}\right)+$$

$$e^{-\frac{(i\,d\,(m-2\,k)-f)^2}{4\,(i\,b\,(m-2\,k)-c)}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}(i\,b\,(m-2\,k)-c)^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}$$

$$(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^{j+1}\left(-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)+$$

$$e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,(c+b\,i\,(m-2\,k))}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}$$

$$(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}\left(-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz==2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)+2\sqrt{-\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)f^{-2n-2}+$$

$$2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{(ib(2s-m)-c)^2}{4(id(2s-m)-f)}+ei(2s-m)+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(ib(2s-m)-c)^{-h-j+2n}\left(-c+bi(2s-m)+\right.\right.\right.$$

$$\left.\left.\left.2(id(2s-m)-f)\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)^2}{id(2s-m)-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left((ib(2s-m)-c)\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)^2}{4(id(2s-m)-f)}\right)+2$$

$$(id(2s-m)-f)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)^2}{4(id(2s-m)-f)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)^2}{id(2s-m)-f}}\right)\right)$$

$$(id(2s-m)-f)^{-2n-2}+e^{-\frac{(c+bi(2s-m))^2}{4(f+di(2s-m))}+ei(2s-m)+\frac{im\pi}{2}}(f+di(2s-m))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+bi(2s-m))^{-h-j+2n}\left(c+bi(2s-m)+2(f+di(2s-m))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+bi(2s-m)+2(f+di(2s-m))\sqrt{z}\right)^2}{f+di(2s-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+bi(2s-m))\left(c+bi(2s-m)+\right.\right.$$

$$2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\,\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\,\right)^2}{4\,(f+d\,i\,(2\,s-m))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\,\right)^2}{f+d\,i\,(2\,s-m)}}\;(f+d\,i\,(2\,s-m))\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\,\right)^2}{4\,(f+d\,i\,(2\,s-m))}\Bigg)\Bigg)+$$

$$e^{-\frac{(i\,b\,(m-2\,s)-c)^2}{4\,(i\,d\,(m-2\,s)-f)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,s)-f)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c)^{-h-j+2\,n}$$

$$\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\,\right)^{h+j}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\,\right)^2}{i\,d\,(m-2\,s)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\,\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\,\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\,\right)^2}{i\,d\,(m-2\,s)-f}}\;(i\,d\,(m-2\,s)-f)\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+2),\,-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\,\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\Bigg)\Bigg)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,s))^2}{4\,(f+d\,i\,(m-2\,s))}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\,\right)^{h+j}\left(-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\,\right)^2}{f+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)+2\sqrt{-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}}\,(f+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1018.01

$$\int z^n \sin^m(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}-g-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}-g+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.$$

$$\left.\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}+g-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}+g+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1019.01

$$\int z^n \sin^m(d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{c^2}{4\,i\,d\,(m-2k)-f)}-g-\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\ -c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\ -c\right)^2}{i\,d\,(m-2\,k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2\,k)-f)$$

$$\sqrt{-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\ -c\right)^2}{i\,d\,(m-2\,k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\ -c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\ -c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\ -c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)\Bigg)\Bigg)$$

$$(i\,d\,(m-2\,k)-f)^{-2(n+1)}+e^{-\frac{c^2}{4(f+d\,i\,(m-2k))}+g-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2\,k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}}\ (f+d\,i\,(m-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(c+2\left(f+d\,i\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f+d\,i\,(m-2\,k)\right)}\right)+e^{-\frac{c^2}{4(-f-i\,d\,(m-2\,k))}-g+\frac{i\,m\,\pi}{2}}$$

$$(-f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-f-i\,d\,(m-2\,k))\right.$$

$$\sqrt{-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)-$$

$$c\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d\,(m-2\,k))}+g+\frac{i\,m\,\pi}{2}}\,(f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\right)+2\sqrt{-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}}$$

$$\left.\left.(f-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\right)\right)\right)\Bigg/;\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1020.01

$$\int z^n \sin^m(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}-g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}-g-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.$$

$$\left.\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}+g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}+g-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

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$$\int z^n \sin^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{c^2}{4(i\,d(m-2k)-f)}-g+e\,i\,(m-2k)-\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}$$

$$\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{i\,d\,(m-2k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2k)-$$

$$f)\sqrt{-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{i\,d\,(m-2k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)\Bigg)\Bigg)\Bigg)$$

$$(i\,d\,(m-2k)-f)^{-2(n+1)}+e^{-\frac{c^2}{4(f+d\,i\,(m-2k))}+g+e\,i\,(m-2k)-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}}\ (f+d\,i\,(m-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(c+2\left(f+d\,i\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f+d\,i\,(m-2\,k)\right)}\right)+e^{-\frac{c^2}{4(-f-i\,d\,(m-2\,k))}-g-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$(-f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{-f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-f-i\,d\,(m-2\,k))\right.$$

$$\sqrt{-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{-f-i\,d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)-$$

$$c\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d\,(m-2\,k))}+g-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\,(f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\right)+2\sqrt{-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}}$$

$$\left.\left.(f-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\right)\right)\right)\Bigg/;\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1022.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z+g\right)dz == -2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k$$

$$\binom{m}{k}\left(e^{\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,i\,g-2\,m\,\pi\right)}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)(i\,b\,(m-2\,k)-c)^{-n-1}+\right.$$

$$e^{\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g-2\,m\,\pi\right)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g-2\,m\,\pi\right)}(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,i\,g-2\,m\,\pi\right)}(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1023.01

$$\int z^n \sin^m\left(\sqrt{z}\;b\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2f\sqrt{z}\right)^2}{4f}\right)-2f\sqrt{\frac{\left(-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2f\sqrt{z}\right)^2}{4f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2f\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)+2\sqrt{-\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\Bigg(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{\frac{(ib(m-2k)-c)^2}{4f}-g-\frac{im\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(ib(m-2k)-c)^{-h-j+2n}$$

$$\left(-c+bi(m-2k)-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+bi(m-2k)-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((ib(m-2k)-c)\left(-c+bi(m-2k)-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+bi(m-2k)-2f\sqrt{z}\right)^2}{4f}\right)-2$$

$$f\sqrt{\frac{\left(-c+bi(m-2k)-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+bi(m-2k)-2f\sqrt{z}\right)^2}{4f}\right)\Bigg)+$$

$$e^{\frac{(-c-ib(m-2k))^2}{4f}-g+\frac{im\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-ib(m-2k))^{-h-j+2n}\left(-c-ib(m-2k)-2f\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-ib(m-2k)-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-ib(m-2k))\left(-c-ib(m-2k)-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-ib(m-2k)-2f\sqrt{z}\right)^2}{4f}\right)-2$$

$$f\sqrt{\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,k))^2}{4\,f}+g-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,k))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+b\,i\,(m-2\,k))\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b\,(m-2\,k))^2}{4\,f}+g+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,k))\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)f^{-2\,(n+1)}\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.1024.01

$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,i\,g+4\,e\,(m-2\,k)-2\,m\,\pi\right)}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)$$

$$(i\,b\,(m-2\,k)-c)^{-n-1}+e^{\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g+4\,e\,(m-2\,k)-2\,m\,\pi\right)}(c+b\,i\,(m-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g+4\,e\,(m-2\,k)-2\,m\,\pi\right)}(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,i\,g+4\,e\,(m-2\,k)-2\,m\,\pi\right)}(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1025.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\Bigg(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{\frac{(i\,b\,(m-2k)-c)^2}{4f}-g+e\,i\,(m-2k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2k)-c)^{-h-j+2n}$$

$$\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2k)-c)\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\,\sqrt{\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{(-c-i\,b\,(m-2k))^2}{4f}-g-i\,e\,(m-2k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2k))^{-h-j+2n}\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-i\,b\,(m-2k))\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\sqrt{\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,k))^2}{4\,f}+g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,k))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c+b\,i\,(m-2\,k))\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2$$

$$\sqrt{-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{(c-i\,b\,(m-2\,k))^2}{4\,f}+g-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((c-i\,b\,(m-2\,k))\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}$$

$$f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)\Bigg)\Bigg)\,f^{-2\,(n+1)}\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z)\cosh(c\,z^r+f\,z+g)$

01.20.21.1026.01

$$\int z^n\sin^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(e^{\frac{f^2}{4\,c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}\,(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\;\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(i\,d\,(2\,k-m)-f)^2}{4\,(i\,b\,(2\,k-m)-c)}-g+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(2\,k-m))^{n-j}\,(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^{j+1}\right.\right.$$

$$\left(-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{i\,b\,(2\,k-m)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{4\,(i\,b\,(2\,k-m)-c)}\right)\right)(i\,b\,(2\,k-m)-c)^{-n-1}+\right.$$

$$e^{-\frac{(f+d\,i\,(2\,k-m))^2}{4\,(c+b\,i\,(2\,k-m))}+g+\frac{i\,m\,\pi}{2}}\,(c+b\,i\,(2\,k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(2\,k-m))^{n-j}$$

$$(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^{j+1}\left(-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{c+b\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{4\,(c+b\,i\,(2\,k-m))}\right)+$$

$$e^{-\frac{(i\,d\,(m-2\,k)-f)^2}{4\,(i\,b\,(m-2\,k)-c)}-g-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k)-c)^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}$$

$$(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^{j+1}\left(-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)+$$

$$e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,(c+b\,i\,(m-2\,k))}+g-\frac{i\,m\,\pi}{2}}\,(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}$$

$$(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}\left(-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1027.01

$$\int z^n \sin^m\left(\sqrt{z}\ b + d\,z\right)\cosh\left(\sqrt{z}\ c + g + f\,z\right)dz == 2^{-m-2n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(-c-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2f\sqrt{z}\right)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2f\sqrt{z}\right)^2}{4f}\right)-2f\sqrt{\frac{\left(-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2f\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)+2\sqrt{-\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right)$$

$$f^{-2n-2}+2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{(ib(2s-m)-c)^2}{4(id(2s-m)-f)}-g+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(ib(2s-m)-c)^{-h-j+2n}\left(-c+bi(2s-m)+\right.\right.\right.$$

$$\left.2(id(2s-m)-f)\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)^2}{id(2s-m)-f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((ib(2s-m)-c)\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)^2}{4(id(2s-m)-f)}\right)+2$$

$$\left.\left.\left.(id(2s-m)-f)\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-c+bi(2s-m)+2(id(2s-m)-f)\sqrt{z}\right)^2}{4(id(2s-m)-f)}\right)\right)\right)$$

$$\sqrt{-\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{i\,d\,(2\,s-m)-f}}\Bigg)\Bigg)(i\,d\,(2\,s-m)-f)^{-2\,n-2}+$$

$$e^{-\frac{(c+b\,i\,(2\,s-m))^2}{4\,(f+d\,i\,(2\,s-m))}+g+\frac{i\,m\,\pi}{2}}(f+d\,i\,(2\,s-m))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(2\,s-m))^{-h-j+2\,n}$$

$$\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,s-m)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(\Bigg(c+b\,i\,(2\,s-m)\Big)\Big(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\Big)\,\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),\,-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,s-m))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,s-m)}}\,(f+d\,i\,(2\,s-m))\,\Gamma\Bigg(\frac{1}{2}(h+j+2),$$

$$-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,s-m))}\Bigg)\Bigg)+e^{-\frac{(i\,b\,(m-2\,s)-c)^2}{4\,(i\,d\,(m-2\,s)-f)}-g-\frac{i\,m\,\pi}{2}}(i\,d\,(m-2\,s)-f)^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c)^{-h-j+2\,n}\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,s)-c)\Big(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\Big)\,\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),\,-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}}\;(i\,d\,(m-2\,s)-f)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\right)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,s))^2}{4\,(f+d\,i\,(m-2\,s))}+g-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}}\;(f+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.1028.01

$$\int z^n \sin^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$\left.(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(i\,d\,(2\,k-m)-f)^2}{4\,(i\,b\,(2\,k-m)-c)}-g+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(2\,k-m))^{n-j}\right.\right.$$

$$(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^{j+1}\left(-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{i\,b\,(2\,k-m)-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{4\,(i\,b\,(2\,k-m)-c)}\right)\right)(i\,b\,(2\,k-m)-c)^{-n-1}+\right.$$

$$e^{-\frac{(f+d\,i\,(2\,k-m))^2}{4\,(c+b\,i\,(2\,k-m))}+g+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\,(c+b\,i\,(2\,k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(2\,k-m))^{n-j}$$

$$(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^{j+1}\left(-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{c+b\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{4\,(c+b\,i\,(2\,k-m))}\right)+$$

$$e^{-\frac{(i\,d\,(m-2\,k)-f)^2}{4\,(i\,b\,(m-2\,k)-c)}-g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k)-c)^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}$$

$$(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^{j+1}\left(-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)+$$

$$e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,(c+b\,i\,(m-2\,k))}+g+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}$$

$$(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}\left(-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1029.01

$$\int z^n\sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(e^{\frac{c^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+e^{g-\frac{c^2}{4f}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)f^{-2n-2}+$$

$$2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{(i\,b\,(2s-m)-c)^2}{4\,(i\,d\,(2s-m)-f)}-g+e\,i\,(2s-m)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(2\,s-m)-c)^{-h-j+2n}\left(-c+b\,i\,(2\,s-m)+\right.\right.\right.$$

$$\left.\left.\left.2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{i\,d\,(2\,s-m)-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(2\,s-m)-c)\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,s-m)-f)}\right)+2$$

$$(i\,d\,(2\,s-m)-f)\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,s-m)-f)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(-c+b\,i\,(2\,s-m)+2\,(i\,d\,(2\,s-m)-f)\,\sqrt{z}\right)^2}{i\,d\,(2\,s-m)-f}}\right)\right)$$

$$(i\,d\,(2\,s-m)-f)^{-2n-2}+e^{-\frac{(c+b\,i\,(2s-m))^2}{4\,(f+d\,i\,(2s-m))}+g+e\,i\,(2s-m)+\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(2\,s-m))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(c+b\,i\,(2\,s-m))^{-h-j+2\,n}\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^{2}}{f+d\,i\,(2\,s-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(2\,s-m))\left(c+b\,i\,(2\,s-m)+\right.\right.$$

$$\left.2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^{2}}{4\,(f+d\,i\,(2\,s-m))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^{2}}{f+d\,i\,(2\,s-m)}}\,(f+d\,i\,(2\,s-m))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+2),-\frac{\left(c+b\,i\,(2\,s-m)+2\,(f+d\,i\,(2\,s-m))\,\sqrt{z}\right)^{2}}{4\,(f+d\,i\,(2\,s-m))}\right)\right)+$$

$$e^{-\frac{(i\,b\,(m-2\,s)-c)^{2}}{4\,(i\,d\,(m-2\,s)-f)}-g+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,s)-f)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b\,(m-2\,s)-c)^{-h-j+2\,n}$$

$$\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{2}}{i\,d\,(m-2\,s)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{2}}{4\,(i\,d\,(m-2\,s)-f)}\right)+$$

$$2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{2}}{i\,d\,(m-2\,s)-f}}\,(i\,d\,(m-2\,s)-f)\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+2),-\frac{\left(-c+b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{2}}{4\,(i\,d\,(m-2\,s)-f)}\right)\right)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,s))^2}{4\,(f+d\,i\,(m-2\,s))}+g+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(f+d\,i\,(m-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}}\,(f+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c+b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)\right)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving cos and power

Involving $z^{\alpha-1}\cos(c\,z)\cosh(a\,z)$

01.20.21.1030.01

$$\int z^{\alpha-1}\cos(c\,z)\cosh(a\,z)\,dz==\frac{1}{4}\,z^{\alpha}\,(-\Gamma(\alpha,\,-(a+i\,c)\,z)\,(-(a+i\,c)\,z)^{-\alpha}-$$
$$((a+i\,c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+i\,c)\,z)-(-(a-i\,c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a-i\,c)\,z)-((a-i\,c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a-i\,c)\,z))$$

01.20.21.1031.01

$$\int z^n\cos(c\,z)\cosh(a\,z)\,dz==\frac{1}{4}\,n!\left(-(-a-i\,c)^{-n-1}\,e^{(a+i\,c)\,z}\sum_{k=0}^{n}\frac{(-(a+i\,c)\,z)^k}{k!}-(a+i\,c)^{-n-1}\,e^{-(a+i\,c)\,z}\sum_{k=0}^{n}\frac{((a+i\,c)\,z)^k}{k!}-\right.$$
$$\left.(i\,c-a)^{-n-1}\,e^{(a-i\,c)\,z}\sum_{k=0}^{n}\frac{(-(a-i\,c)\,z)^k}{k!}-(a-i\,c)^{-n-1}\,e^{i\,c\,z-a\,z}\sum_{k=0}^{n}\frac{((a-i\,c)\,z)^k}{k!}\right)\Big/;\,n\in\mathbb{N}$$

01.20.21.1032.01

$$\int z^{-n} \cos(c\,z) \cosh(a\,z)\,dz == \frac{1}{4\left(a^2+c^2\right)(n-1)!}$$
$$\left(e^{-(a+i\,c)\,z}\left(-(a+i\,c)\,e^{2\,a\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(i\,c-a)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(i\,c-a)^n+(-1)^n\,e^{(a+i\,c)\,z}\left((i\,c-a)^n\,(a+i\,c)\,\mathrm{Ei}((a-i\,c)\,z)-\right.\right.\right.$$
$$\left.\left.\left.(a-i\,c)\,(a+i\,c)^n\,\mathrm{Ei}(-(a+i\,c)\,z)\right)+(a+i\,c)^n\,(a-i\,c)\,(n-1)!\sum_{k=1}^{n-1}\frac{(a+i\,c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)+\right.$$
$$e^{-2\,a\,z}\left(-(a-i\,c)\,e^{3\,a\,z+i\,c\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(-a-i\,c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(-a-i\,c)^n+(-1)^n\,e^{2\,a\,z}\left((-a-i\,c)^n\,(a-i\,c)\,\mathrm{Ei}((a+i\,c)\,z)-\right.\right.$$
$$\left.\left.\left.\left.(a-i\,c)^n\,(a+i\,c)\,\mathrm{Ei}(i\,c\,z-a\,z)\right)+(a+i\,c)\,(a-i\,c)^n\,e^{(a+i\,c)\,z}\,(n-1)!\sum_{k=1}^{n-1}\frac{(a-i\,c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)\right)\Big/;\ n\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos(c\,z+d)\cosh(a\,z)$

01.20.21.1033.01

$$\int z^{\alpha-1}\cos(d+c\,z)\cosh(a\,z)\,dz ==$$
$$-\frac{1}{4}z^{\alpha}\left(-(a-i\,c)^2\,z^2\right)^{-\alpha}\left(-(a+i\,c)^2\,z^2\right)^{-\alpha}\left((-(a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,(a-i\,c)\,z)\,(\cos(d)+i\sin(d))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+\right.$$
$$((a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,-(a-i\,c)\,z)\,(\cos(d)-i\sin(d))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+$$
$$\left.\left(-(a-i\,c)^2\,z^2\right)^{\alpha}\left(\Gamma(\alpha,(a+i\,c)\,z)\,(\cos(d)-i\sin(d))\,(-(a+i\,c)\,z)^{\alpha}+((a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,-(a+i\,c)\,z)\,(\cos(d)+i\sin(d))\right)\right)$$

Involving $z^{\alpha-1}\cos(c\,z)\cosh(a\,z+b)$

01.20.21.1034.01

$$\int z^{\alpha-1}\cos(c\,z)\cosh(b+a\,z)\,dz ==$$
$$-\frac{1}{4}z^{\alpha}\left(-(a-i\,c)^2\,z^2\right)^{-\alpha}\left(-(a+i\,c)^2\,z^2\right)^{-\alpha}\left((-(a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,(a-i\,c)\,z)\,(\cosh(b)-\sinh(b))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+\right.$$
$$((a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,-(a-i\,c)\,z)\,(\cosh(b)+\sinh(b))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+$$
$$\left.\left(-(a-i\,c)^2\,z^2\right)^{\alpha}\left(\Gamma(\alpha,(a+i\,c)\,z)\,(\cosh(b)-\sinh(b))\,(-(a+i\,c)\,z)^{\alpha}+((a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,-(a+i\,c)\,z)\,(\cosh(b)+\sinh(b))\right)\right)$$

Involving $z^{\alpha-1}\cos(c\,z+d)\cosh(a\,z+b)$

01.20.21.1035.01

$$\int z^{\alpha-1}\cos(d+c\,z)\cosh(b+a\,z)\,dz == -\frac{1}{4}z^{\alpha}\left(-(a-i\,c)^2\,z^2\right)^{-\alpha}\left(-(a+i\,c)^2\,z^2\right)^{-\alpha}$$
$$\left((-(a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,(a-i\,c)\,z)\,(\cos(d)+i\sin(d))\,(\cosh(b)-\sinh(b))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+\right.$$
$$((a-i\,c)\,z)^{\alpha}\,\Gamma(\alpha,-(a-i\,c)\,z)\,(\cos(d)-i\sin(d))\,(\cosh(b)+\sinh(b))\left(-(a+i\,c)^2\,z^2\right)^{\alpha}+$$
$$\left(-(a-i\,c)^2\,z^2\right)^{\alpha}\left(\Gamma(\alpha,(a+i\,c)\,z)\,(\cos(d)-i\sin(d))\,(\cosh(b)-\sinh(b))\,(-(a+i\,c)\,z)^{\alpha}+\right.$$
$$\left.\left.((a+i\,c)\,z)^{\alpha}\,\Gamma(\alpha,-(a+i\,c)\,z)\,(\cos(d)+i\sin(d))\,(\cosh(b)+\sinh(b))\right)\right)$$

Involving $z^n \cos\left(b\, z^r\right) \cosh(c\, z)$

01.20.21.1036.01

$$\int z^n \cos\left(b\, z^2\right) \cosh(c\, z)\, dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i\, c^2}{4\, b}}\left(\sum_{j=0}^{n} 2^{j-n}\, (-c)^{n-j}\, (c-2\, i\, b\, z)^{j+1}\left(-\frac{i\, (c-2\, i\, b\, z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\, (c-2\, i\, b\, z)^2}{4\, b}\right)\right)(-i\, b)^{-n-1} -\right.$$

$$(i\, b)^{-n-1}\, e^{\frac{i\, c^2}{4\, b}} \sum_{j=0}^{n} 2^{j-n}\, c^{n-j}\, (2\, i\, b\, z-c)^{j+1}\left(\frac{i\, (2\, i\, b\, z-c)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i\, (2\, i\, b\, z-c)^2}{4\, b}\right) -$$

$$(i\, b)^{-n-1}\, e^{\frac{i\, c^2}{4\, b}} \sum_{j=0}^{n} 2^{j-n}\, (-c)^{n-j}\, (c+2\, i\, b\, z)^{j+1}\left(\frac{i\, (c+2\, i\, b\, z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i\, (c+2\, i\, b\, z)^2}{4\, b}\right) -$$

$$\left.(-i\, b)^{-n-1}\, e^{-\frac{i\, c^2}{4\, b}} \sum_{j=0}^{n} 2^{j-n}\, c^{n-j}\, (-c-2\, i\, b\, z)^{j+1}\left(-\frac{i\, (-c-2\, i\, b\, z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\, (-c-2\, i\, b\, z)^2}{4\, b}\right)\right) /;\ n \in \mathbb{N}$$

01.20.21.1037.01

$$\int z^n \cos\left(\sqrt{z}\, b\right) \cosh(c\, z)\, dz == 2^{-2\,n-3}\, c^{-2\,(n+1)}$$

$$\left(e^{-\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2\,n} \left(-2\,\sqrt{z}\, c - i\, b\right)^{h+j} \left(\frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\, b \left(-2\,\sqrt{z}\, c - i\, b\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{4\,c} \right) - 2\,c \sqrt{\frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\,\sqrt{z}\, c - i\, b\right)^2}{4\,c} \right) \right) +$$

$$e^{-\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2\,n} \left(i\, b - 2\,c\,\sqrt{z}\right)^{h+j} \left(\frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(i\, b \left(i\, b - 2\,c\,\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{4\,c} \right) - 2\,c \sqrt{\frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\, b - 2\,c\,\sqrt{z}\right)^2}{4\,c} \right) \right) +$$

$$e^{\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b)^{-h-j+2\,n} \left(2\,c\,\sqrt{z} - i\, b\right)^{h+j} \left(-\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2\,c \sqrt{-\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{c}} \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{4\,c} \right) - i\, b \left(2\,c\,\sqrt{z} - i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,c\,\sqrt{z} - i\, b\right)^2}{4\,c} \right) \right) +$$

$$e^{\frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b)^{-h-j+2\,n} \left(2\,\sqrt{z}\, c + i\, b\right)^{h+j} \left(-\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\, i \left(2\,\sqrt{z}\, c + i\, b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{4\,c} \right) + \right.$$

$$\left. 2 \sqrt{-\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{c}}\ c\, \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,\sqrt{z}\, c + i\, b\right)^2}{4\,c} \right) \right) \Big/; n \in \mathbb{N}$$

Involving $z^n \cos\left(b\, z^r + e\right) \cosh(c\, z)$

01.20.21.1038.01

$$\int z^n \cos\left(b z^2+e\right) \cosh(c z)\, dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i c^2}{4 b}-i e}\left(\sum_{j=0}^{n} 2^{j-n}(-c)^{n-j}(c-2 i b z)^{j+1}\left(-\frac{i (c-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (c-2 i b z)^2}{4 b}\right)\right)(-i b)^{-n-1}-\right.$$

$$(i b)^{-n-1} e^{\frac{i c^2}{4 b}+i e}\sum_{j=0}^{n} 2^{j-n} c^{n-j}(2 i b z-c)^{j+1}\left(\frac{i (2 i b z-c)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (2 i b z-c)^2}{4 b}\right)-$$

$$(i b)^{-n-1} e^{\frac{i c^2}{4 b}+i e}\sum_{j=0}^{n} 2^{j-n}(-c)^{n-j}(c+2 i b z)^{j+1}\left(\frac{i (c+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (c+2 i b z)^2}{4 b}\right)-$$

$$\left.(-i b)^{-n-1} e^{-\frac{i c^2}{4 b}-i e}\sum_{j=0}^{n} 2^{j-n} c^{n-j}(-c-2 i b z)^{j+1}\left(-\frac{i (-c-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-c-2 i b z)^2}{4 b}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1039.01

$$\int z^n \cos\left(\sqrt{z}\, b + e\right) \cosh(c\, z)\, dz == 2^{-2\,n-3}\, c^{-2\,(n+1)}$$

$$\left(e^{-\frac{b^2}{4\,c} - i\,e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-2\,\sqrt{z}\, c - i\,b\right)^{h+j} \left(\frac{\left(-2\,\sqrt{z}\, c - i\,b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b \left(-2\,\sqrt{z}\, c - i\,b\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-2\,\sqrt{z}\, c - i\,b\right)^2}{4\,c} \right) - 2\,c \sqrt{\frac{\left(-2\,\sqrt{z}\, c - i\,b\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\,\sqrt{z}\, c - i\,b\right)^2}{4\,c} \right) \right) +$$

$$e^{i\,e - \frac{b^2}{4\,c}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b)^{-h-j+2\,n} \left(i\,b - 2\,c\,\sqrt{z}\right)^{h+j} \left(\frac{\left(i\,b - 2\,c\,\sqrt{z}\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(i\,b \left(i\,b - 2\,c\,\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\,b - 2\,c\,\sqrt{z}\right)^2}{4\,c} \right) - 2\,c \sqrt{\frac{\left(i\,b - 2\,c\,\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\,b - 2\,c\,\sqrt{z}\right)^2}{4\,c} \right) \right) + e^{\frac{b^2}{4\,c} - i\,e}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(2\,c\,\sqrt{z} - i\,b\right)^{h+j} \left(-\frac{\left(2\,c\,\sqrt{z} - i\,b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2\,c \sqrt{-\frac{\left(2\,c\,\sqrt{z} - i\,b\right)^2}{c}} \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,c\,\sqrt{z} - i\,b\right)^2}{4\,c} \right) - i\,b \left(2\,c\,\sqrt{z} - i\,b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,c\,\sqrt{z} - i\,b\right)^2}{4\,c} \right) \right) +$$

$$e^{\frac{b^2}{4\,c} + i\,e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b)^{-h-j+2\,n} \left(2\,\sqrt{z}\, c + i\,b\right)^{h+j} \left(-\frac{\left(2\,\sqrt{z}\, c + i\,b\right)^2}{c} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\,i \left(2\,\sqrt{z}\, c + i\,b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,\sqrt{z}\, c + i\,b\right)^2}{4\,c} \right) + \right.$$

$$\left. 2 \sqrt{-\frac{\left(2\,\sqrt{z}\, c + i\,b\right)^2}{c}}\ c\, \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,\sqrt{z}\, c + i\,b\right)^2}{4\,c} \right) \right) \Bigg) /;\ n \in \mathbb{N}$$

Involving $z^n \cos\left(b\, z^r + d\, z\right) \cosh(c\, z)$

01.20.21.1040.01

$$\int z^n \cos\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i\,(c-i\,d)^2}{4\,b}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-c)^{n-j}\,(c-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(c-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(c-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)\right.$$

$$(-i\,b)^{-n-1}-(i\,b)^{-n-1}\,e^{\frac{i\,(i\,d-c)^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(c-i\,d)^{n-j}\,(-c+i\,d\,+2\,i\,b\,z)^{j+1}$$

$$\left(\frac{i\,(-c+i\,d\,+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(-c+i\,d\,+2\,i\,b\,z)^2}{4\,b}\right)-(i\,b)^{-n-1}\,e^{\frac{i\,(c+i\,d)^2}{4\,b}}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-c-i\,d)^{n-j}\,(c+i\,d\,+2\,i\,b\,z)^{j+1}\left(\frac{i\,(c+i\,d\,+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(c+i\,d\,+2\,i\,b\,z)^2}{4\,b}\right)-$$

$$(-i\,b)^{-n-1}\,e^{-\frac{i\,(-c-i\,d)^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(c+i\,d)^{n-j}\,(-c-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-c-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-c-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1041.01

$$\int z^n \cos\left(\sqrt{z}\;b+d\,z\right)\cosh(c\,z)\,dz ==$$

$$2^{-2\,n-3}\left(e^{\frac{b^2}{4\,(i\,d-c)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(2\sqrt{z}\;(i\,d-c)+i\,b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\;(i\,d-c)+i\,b\right)^2}{i\,d-c}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(2\sqrt{z}\;(i\,d-c)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\;(i\,d-c)+i\,b\right)^2}{4\,(i\,d-c)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(2\sqrt{z}\;(i\,d-c)+i\,b\right)^2}{i\,d-c}}\;(i\,d-c)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\;(i\,d-c)+i\,b\right)^2}{4\,(i\,d-c)}\right)\right)\right)(i\,d-c)^{-2\,(n+1)}+$$

$$(c+i\,d)^{-2\,(n+1)}\,e^{\frac{b^2}{4\,(c+i\,d)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(2\sqrt{z}\;(c+i\,d)+i\,b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\;(c+i\,d)+i\,b\right)^2}{c+i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{c+i\,d}}\,(c+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)\right)+$$

$$(c+i\,d)^{-2(n+1)}\,e^{\frac{b^2}{4(-c-i\,d)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{-c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-c-i\,d)\sqrt{-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{-c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(-c-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(-c-i\,d)}\right)\right)+$$

$$(c-i\,d)^{-2(n+1)}\,e^{\frac{b^2}{4(c-i\,d)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(c-i\,d)\sqrt{-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(c-i\,d)}\right)-\right.$$

$$\left.\left.i\,b\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(c-i\,d)\sqrt{z}-i\,b\right)^2}{4\,(c-i\,d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.1042.01

$$\int z^n \cos\left(b z^2 + d z + e\right) \cosh(c z)\, dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i (c-i d)^2}{4 b}-i e}\left(\sum_{j=0}^{n} 2^{j-n} (i d-c)^{n-j} (c-i d-2 i b z)^{j+1}\left(-\frac{i (c-i d-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (c-i d-2 i b z)^2}{4 b}\right)\right)\right.$$

$$(-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{i (i d-c)^2}{4 b}+i e} \sum_{j=0}^{n} 2^{j-n} (c-i d)^{n-j} (-c+i d+2 i b z)^{j+1}$$

$$\left(\frac{i (-c+i d+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (-c+i d+2 i b z)^2}{4 b}\right) - (i b)^{-n-1} e^{\frac{i (c+i d)^2}{4 b}+i e}$$

$$\sum_{j=0}^{n} 2^{j-n} (-c-i d)^{n-j} (c+i d+2 i b z)^{j+1}\left(\frac{i (c+i d+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (c+i d+2 i b z)^2}{4 b}\right) -$$

$$(-i b)^{-n-1} e^{-\frac{i (-c-i d)^2}{4 b}-i e} \sum_{j=0}^{n} 2^{j-n} (c+i d)^{n-j} (-c-i d-2 i b z)^{j+1}$$

$$\left.\left(-\frac{i (-c-i d-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-c-i d-2 i b z)^2}{4 b}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1043.01

$$\int z^n \cos\left(\sqrt{z}\ b + e + d z\right) \cosh(c z)\, dz ==$$

$$2^{-2 n-3}\left(e^{\frac{b^2}{4 (i d-c)}+i e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2 n}\left(2\sqrt{z}\ (i d-c)+i b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\ (i d-c)+i b\right)^2}{i d-c}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(b i\left(2\sqrt{z}\ (i d-c)+i b\right)\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2\sqrt{z}\ (i d-c)+i b\right)^2}{4 (i d-c)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(2\sqrt{z}\ (i d-c)+i b\right)^2}{i d-c}}\ (i d-c)\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2\sqrt{z}\ (i d-c)+i b\right)^2}{4 (i d-c)}\right)\right)\right)(i d-c)^{-2 (n+1)} +$$

$$(c+i d)^{-2 (n+1)} e^{\frac{b^2}{4 (c+i d)}+i e}\sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2 n}\left(2\sqrt{z}\ (c+i d)+i b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\ (c+i d)+i b\right)^2}{c+i d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{c+i\,d}}\,(c+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(c+i\,d)+i\,b\right)^2}{4\,(c+i\,d)}\right)\right)+(c+i\,d)^{-2\,(n+1)}$$

$$e^{\frac{b^2}{4\,(-c-i\,d)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^{h+j}\left(-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{-c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-c-i\,d)\sqrt{-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{-c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(-c-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(-c-i\,d)}\right)\right)+$$

$$(c-i\,d)^{-2\,(n+1)}\,e^{\frac{b^2}{4\,(c-i\,d)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^{h+j}\left(-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{c-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(c-i\,d)\sqrt{-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{c-i\,d}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(c-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(c-i\,d)\sqrt{z}\,-i\,b\right)^2}{4\,(c-i\,d)}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n\cos\left(b\,z^r\right)\cosh(f\,z+g)$

01.20.21.1044.01

$$\int z^n \cos\left(b\,z^2\right) \cosh(g + f\,z)\,dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i\,f^2}{4\,b}+g}\left(\sum_{j=0}^{n} 2^{j-n}\,(-f)^{n-j}\,(f-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(f-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(f-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}-\right.$$

$$(i\,b)^{-n-1}\,e^{\frac{i\,f^2}{4\,b}-g}\sum_{j=0}^{n} 2^{j-n}\,f^{n-j}\,(2\,i\,b\,z-f)^{j+1}\left(\frac{i\,(2\,i\,b\,z-f)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(2\,i\,b\,z-f)^2}{4\,b}\right)-$$

$$(i\,b)^{-n-1}\,e^{\frac{i\,f^2}{4\,b}+g}\sum_{j=0}^{n} 2^{j-n}\,(-f)^{n-j}\,(f+2\,i\,b\,z)^{j+1}\left(\frac{i\,(f+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(f+2\,i\,b\,z)^2}{4\,b}\right)-$$

$$\left.(-i\,b)^{-n-1}\,e^{-\frac{i\,f^2}{4\,b}-g}\sum_{j=0}^{n} 2^{j-n}\,f^{n-j}\,(-f-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-f-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-f-2\,i\,b\,z)^2}{4\,b}\right)\right)\Big/;\, n\in\mathbb{N}$$

01.20.21.1045.01

$$\int z^n \cos\left(\sqrt{z}\, b\right) \cosh(g + f z)\, dz == 2^{-2n-3}\, f^{-2(n+1)}$$

$$\left(e^{-\frac{b^2}{4f}-g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i b)^{-h-j+2n} \left(-2\sqrt{z}\, f - i b\right)^{h+j} \left(\frac{\left(-2\sqrt{z}\, f - i b\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i b \left(-2\sqrt{z}\, f - i b\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-2\sqrt{z}\, f - i b\right)^2}{4f} \right) - 2f \sqrt{\frac{\left(-2\sqrt{z}\, f - i b\right)^2}{f}}\, \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-2\sqrt{z}\, f - i b\right)^2}{4f} \right) \right) +$$

$$e^{-\frac{b^2}{4f}-g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i b)^{-h-j+2n} \left(i b - 2f\sqrt{z}\right)^{h+j} \left(\frac{\left(i b - 2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(i b \left(i b - 2f\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(i b - 2f\sqrt{z}\right)^2}{4f} \right) - 2f \sqrt{\frac{\left(i b - 2f\sqrt{z}\right)^2}{f}}\, \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(i b - 2f\sqrt{z}\right)^2}{4f} \right) \right) + e^{\frac{b^2}{4f}+g}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i b)^{-h-j+2n} \left(2f\sqrt{z} - i b\right)^{h+j} \left(-\frac{\left(2f\sqrt{z} - i b\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2f \sqrt{-\frac{\left(2f\sqrt{z} - i b\right)^2}{f}} \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2f\sqrt{z} - i b\right)^2}{4f} \right) - i b \left(2f\sqrt{z} - i b\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2f\sqrt{z} - i b\right)^2}{4f} \right) \right) +$$

$$e^{\frac{b^2}{4f}+g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i b)^{-h-j+2n} \left(2\sqrt{z}\, f + i b\right)^{h+j} \left(-\frac{\left(2\sqrt{z}\, f + i b\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\, i \left(2\sqrt{z}\, f + i b\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2\sqrt{z}\, f + i b\right)^2}{4f} \right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(2\sqrt{z}\, f + i b\right)^2}{f}}\, f\, \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2\sqrt{z}\, f + i b\right)^2}{4f} \right) \right) \right) /; n \in \mathbb{N}$$

Involving $z^n \cos\left(b\, z^r + e\right) \cosh(f\, z + g)$

01.20.21.1046.01

$$\int z^n \cos\left(b z^2+e\right)\cosh(g+f z)\,dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i f^2}{4 b}+g-i e}\left(\sum_{j=0}^{n} 2^{j-n}(-f)^{n-j}(f-2 i b z)^{j+1}\left(-\frac{i(f-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(f-2 i b z)^2}{4 b}\right)\right)(-i b)^{-n-1}-\right.$$

$$(i b)^{-n-1} e^{\frac{i f^2}{4 b}-g+i e}\sum_{j=0}^{n} 2^{j-n} f^{n-j}(2 i b z-f)^{j+1}\left(\frac{i(2 i b z-f)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(2 i b z-f)^2}{4 b}\right)-$$

$$(i b)^{-n-1} e^{\frac{i f^2}{4 b}+g+i e}\sum_{j=0}^{n} 2^{j-n}(-f)^{n-j}(f+2 i b z)^{j+1}\left(\frac{i(f+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(f+2 i b z)^2}{4 b}\right)-(-i b)^{-n-1}$$

$$\left.e^{-\frac{i f^2}{4 b}-g-i e}\sum_{j=0}^{n} 2^{j-n} f^{n-j}(-f-2 i b z)^{j+1}\left(-\frac{i(-f-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-f-2 i b z)^2}{4 b}\right)\right)\text{/; } n\in\mathbb{N}$$

01.20.21.1047.01

$$\int z^n \cos\left(\sqrt{z}\,b+e\right)\cosh(g+f z)\,dz ==$$

$$2^{-2n-3} f^{-2(n+1)}\left(e^{-\frac{b^2}{4 f}-g-i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (-i b)^{-h-j+2n}\left(-2\sqrt{z}\,f-i b\right)^{h+j}\left(\frac{\left(-2\sqrt{z}\,f-i b\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i b\left(-2\sqrt{z}\,f-i b\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-2\sqrt{z}\,f-i b\right)^2}{4 f}\right)-\right.$$

$$\left.2 f\sqrt{\frac{\left(-2\sqrt{z}\,f-i b\right)^2}{f}}\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-2\sqrt{z}\,f-i b\right)^2}{4 f}\right)\right)+$$

$$e^{-\frac{b^2}{4 f}-g+i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (i b)^{-h-j+2n}\left(i b-2 f\sqrt{z}\right)^{h+j}\left(\frac{\left(i b-2 f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i b\left(i b-2 f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(i b-2 f\sqrt{z}\right)^2}{4 f}\right)-2 f\sqrt{\frac{\left(i b-2 f\sqrt{z}\right)^2}{f}}\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(i b-2 f\sqrt{z}\right)^2}{4 f}\right)\right)+$$

$$e^{\frac{b^2}{4f}+g-ie}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-ib)^{-h-j+2n}\left(2f\sqrt{z}-ib\right)^{h+j}\left(-\frac{\left(2f\sqrt{z}-ib\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2f\sqrt{-\frac{\left(2f\sqrt{z}-ib\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2f\sqrt{z}-ib\right)^2}{4f}\right)-\right.$$

$$\left.ib\left(2f\sqrt{z}-ib\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2f\sqrt{z}-ib\right)^2}{4f}\right)\right)+$$

$$e^{\frac{b^2}{4f}+g+ie}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(ib)^{-h-j+2n}\left(2\sqrt{z}\,f+ib\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(bi\left(2\sqrt{z}\,f+ib\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{4f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,f+ib\right)^2}{4f}\right)\right)\text{/; }n\in\mathbb{N}$$

Involving $z^n \cos\left(b z^r + d z\right) \cosh(f z + g)$

01.20.21.1048.01

$$\int z^n \cos\left(b z^2 + d z\right) \cosh(g + f z)\, dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i (f - i d)^2}{4 b} + g}\left(\sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j} (f - i d - 2 i b z)^{j+1}\left(-\frac{i (f - i d - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\right.\right.$$

$$\left.\Gamma\left(\frac{j+1}{2}, -\frac{i (f - i d - 2 i b z)^2}{4 b}\right)\right)(-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{i (i d - f)^2}{4 b} - g}$$

$$\sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j} (-f + i d + 2 i b z)^{j+1}\left(\frac{i (-f + i d + 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i (-f + i d + 2 i b z)^2}{4 b}\right) -$$

$$(i b)^{-n-1} e^{\frac{i (f + i d)^2}{4 b} + g} \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2 i b z)^{j+1}\left(\frac{i (f + i d + 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, \frac{i (f + i d + 2 i b z)^2}{4 b}\right) - (-i b)^{-n-1} e^{-\frac{i (-f - i d)^2}{4 b} - g} \sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d - 2 i b z)^{j+1}$$

$$\left.\left.\left(-\frac{i (-f - i d - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{i (-f - i d - 2 i b z)^2}{4 b}\right)\right) /; n \in \mathbb{N}\right.$$

01.20.21.1049.01

$$\int z^n \cos\left(\sqrt{z}\ b + d z\right) \cosh(g + f z)\, dz ==$$

$$2^{-2n-3}\left(e^{\frac{b^2}{4 (i d - f)} - g}\left(\sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n}\left(2\sqrt{z}\ (i d - f) + i b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\ (i d - f) + i b\right)^2}{i d - f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}\right.\right.$$

$$\left(b i \left(2\sqrt{z}\ (i d - f) + i b\right)\Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(2\sqrt{z}\ (i d - f) + i b\right)^2}{4 (i d - f)}\right) + 2\sqrt{-\frac{\left(2\sqrt{z}\ (i d - f) + i b\right)^2}{i d - f}}\right.$$

$$\left.\left.\left.(i d - f)\Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(2\sqrt{z}\ (i d - f) + i b\right)^2}{4 (i d - f)}\right)\right)\right)(i d - f)^{-2(n+1)} + e^{\frac{b^2}{4 (-f - i d)} - g} (f + i d)^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b)^{-h-j+2n}\left(2 (-f - i d)\sqrt{z} - i b\right)^{h+j}\left(-\frac{\left(2 (-f - i d)\sqrt{z} - i b\right)^2}{-f - i d}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2(-f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)\right)+$$

$$e^{\frac{b^2}{4(f-i\,d)}+g}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2(f-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(f-i\,d)\sqrt{-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2(f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)\right)+$$

$$e^{\frac{b^2}{4(f+i\,d)}+g}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2n}\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n\cos\left(b\,z^r+d\,z+e\right)\cosh(f\,z+g)$

01.20.21.1050.01

$$\int z^n \cos\left(b z^2+d z+e\right)\cosh(g+f z)\,dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{i(f-i d)^2}{4b}+g-i e}\left(\sum_{j=0}^{n} 2^{j-n}(i d-f)^{n-j}(f-i d-2 i b z)^{j+1}\left(-\frac{i(f-i d-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(f-i d-2 i b z)^2}{4b}\right)\right)(-i b)^{-n-1}-(i b)^{-n-1}e^{\frac{i(i d-f)^2}{4b}-g+i e}\right.$$

$$\sum_{j=0}^{n} 2^{j-n}(f-i d)^{n-j}(-f+i d+2 i b z)^{j+1}\left(\frac{i(-f+i d+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(-f+i d+2 i b z)^2}{4b}\right)-$$

$$(i b)^{-n-1}e^{\frac{i(f+i d)^2}{4b}+g+i e}\sum_{j=0}^{n} 2^{j-n}(-f-i d)^{n-j}(f+i d+2 i b z)^{j+1}\left(\frac{i(f+i d+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(f+i d+2 i b z)^2}{4b}\right)-(-i b)^{-n-1}e^{-\frac{i(-f+-i d)^2}{4b}-g-i e}\sum_{j=0}^{n} 2^{j-n}(f+i d)^{n-j}$$

$$\left.(-f-i d-2 i b z)^{j+1}\left(-\frac{i(-f-i d-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-f-i d-2 i b z)^2}{4b}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1051.01

$$\int z^n \cos\left(\sqrt{z}\ b+e+d z\right)\cosh(g+f z)\,dz ==$$

$$2^{-2n-3}\left(e^{\frac{b^2}{4(i d-f)}-g+i e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i b)^{-h-j+2n}\left(2\sqrt{z}\ (i d-f)+i b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\ (i d-f)+i b\right)^2}{i d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.\binom{j}{h}\binom{n}{j}$$

$$\left(b i\left(2\sqrt{z}\ (i d-f)+i b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\ (i d-f)+i b\right)^2}{4(i d-f)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ (i d-f)+i b\right)^2}{i d-f}}\right.$$

$$\left.\left.\left.(i d-f)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\ (i d-f)+i b\right)^2}{4(i d-f)}\right)\right)\right)(i d-f)^{-2(n+1)}+e^{\frac{b^2}{4(-f+-i d)}-g-i e}(f+i d)^{-2(n+1)}$$

$$\left.\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-i b)^{-h-j+2n}\left(2(-f-i d)\sqrt{z}-i b\right)^{h+j}\left(-\frac{\left(2(-f-i d)\sqrt{z}-i b\right)^2}{-f-i d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\right.$$

$$\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2(-f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-i\,b\right)^2}{4(-f-i\,d)}\right)\right)+$$

$$e^{\frac{b^2}{4(f-i\,d)}+g-i\,e}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2n}\left(2(f-i\,d)\sqrt{z}-i\,b\right)^{h+j}\left(-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(f-i\,d)\sqrt{-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)-\right.$$

$$\left.i\,b\left(2(f-i\,d)\sqrt{z}-i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f-i\,d)\sqrt{z}-i\,b\right)^2}{4(f-i\,d)}\right)\right)+e^{\frac{b^2}{4(f+i\,d)}+g+i\,e}(f+i\,d)^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2n}\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,(f+i\,d)+i\,b\right)^2}{4(f+i\,d)}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n \cos(b\,z)\cosh(c\,z^r)$

01.20.21.1052.01

$$\int z^n \cos(b\,z)\cosh\left(c\,z^2\right) dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{b^2}{4c}}\left(\sum_{j=0}^{n} 2^{j-n}\,(-i\,b)^{n-j}\,(i\,b-2\,c\,z)^{j+1}\left(\frac{(i\,b-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,b-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-\right.$$

$$(-c)^{-n-1}\,e^{-\frac{b^2}{4c}}\sum_{j=0}^{n} 2^{j-n}\,(i\,b)^{n-j}\,(-i\,b-2\,c\,z)^{j+1}\left(\frac{(-i\,b-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,b-2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}\,e^{\frac{b^2}{4c}}\sum_{j=0}^{n} 2^{j-n}\,(i\,b)^{n-j}\,(-i\,b+2\,c\,z)^{j+1}\left(-\frac{(-i\,b+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,b+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.c^{-n-1}\,e^{\frac{b^2}{4c}}\sum_{j=0}^{n} 2^{j-n}\,(-i\,b)^{n-j}\,(i\,b+2\,c\,z)^{j+1}\left(-\frac{(i\,b+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,b+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\, n\in\mathbb{N}$$

01.20.21.1053.01

$$\int z^n \cos(b\,z)\cosh\left(c\,\sqrt{z}\right) dz == (-1)^{n-1}\,2^{-2\,n-3}\,b^{-2\,(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,b\,\sqrt{z}-c\right)^{h+j}\left(\frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,i\,b\,\sqrt{\frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{b}}\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{4\,b}\right)-c\left(2\,i\,b\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,b\,\sqrt{z}-c\right)^2}{4\,b}\right)\right)+$$

$$e^{\frac{i\,c^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,i\,b\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,i\,b\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)+2\sqrt{\frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{b}}\;b\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(c+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,b\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(-c\left(-c-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-\right.$$

$$\left.2\,i\,b\sqrt{-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,b\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-\right.$$

$$\left.\left.2\,i\,b\sqrt{-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \cos(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.1054.01

$$\int z^n\cos(e+d\,z)\cosh\left(c\,z^2\right)dz==$$

$$\frac{1}{8}\left(-e^{-\frac{d^2}{4c}+i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,z)^{j+1}\left(\frac{(i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-\right.$$

$$(-c)^{-n-1}\,e^{-\frac{d^2}{4c}-i\,e}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d-2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}\,e^{\frac{d^2}{4c}-i\,e}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,z)^{j+1}\left(-\frac{(-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.c^{-n-1}\,e^{\frac{d^2}{4c}+i\,e}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1055.01

$$\int z^n \cos(e+d\,z)\cosh\left(\sqrt{z}\;c\right) dz == (-1)^{n-1}\,2^{-2\,n-3}\,d^{-2\,(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,\sqrt{z}\;-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,\sqrt{\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{4\,d}\right)-c\left(2\,i\,d\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,d\,\sqrt{z}\;-c\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,c^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\Bigg)\Bigg/;\; n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos(b\,z^r)\cosh(c\,z^r)$

01.20.21.1056.01

$$\int z^{\alpha-1}\cos(b\,z^r)\cosh(c\,z^r)\,dz == -\frac{1}{4r}\left(z^{\alpha}\left(\Gamma\left(\frac{\alpha}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-\frac{\alpha}{r}}+((i\,b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b-c)\,z^r\right)+((c-i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-i\,b)\,z^r\right)+((c+i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.1057.01

$$\int z^n\cos\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == -\frac{1}{8}z^{n+1}\left(\Gamma\left(\frac{n+1}{2},(-c-i\,b)\,z^2\right)\left((-c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((i\,b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b-c)\,z^2\right)+\left((c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-i\,b)\,z^2\right)+\left((c+i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c+i\,b)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1058.01

$$\int z^n\cos\left(\sqrt{z}\;b\right)\cosh\left(\sqrt{z}\;c\right)dz == \frac{1}{2}\left(-(c+i\,b)^{-2(n+1)}\,\Gamma\left(2(n+1),(-c-i\,b)\sqrt{z}\right)-(i\,b-c)^{-2(n+1)}\,\Gamma\left(2(n+1),(i\,b-c)\sqrt{z}\right)-(c-i\,b)^{-2(n+1)}\,\Gamma\left(2(n+1),(c-i\,b)\sqrt{z}\right)-(c+i\,b)^{-2(n+1)}\,\Gamma\left(2(n+1),(c+i\,b)\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos(b\,z^r+e)\cosh(c\,z^r)$

01.20.21.1059.01

$$\int z^{\alpha-1}\cos(b\,z^r+e)\cosh(c\,z^r)\,dz == -\frac{1}{4r}\left(z^{\alpha}\left(e^{i\,e}\,\Gamma\left(\frac{\alpha}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-\frac{\alpha}{r}}+e^{-i\,e}\,((i\,b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b-c)\,z^r\right)+e^{i\,e}\,((c-i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-i\,b)\,z^r\right)+e^{-i\,e}\,((c+i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+i\,b)\,z^r\right)\right)\right)$$

01.20.21.1060.01

$$\int z^n\cos\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz == -\frac{1}{8}z^{n+1}\left(e^{i\,e}\,\Gamma\left(\frac{n+1}{2},(-c-i\,b)\,z^2\right)\left((-c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-i\,e}\left((i\,b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b-c)\,z^2\right)+e^{i\,e}\left((c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-i\,b)\,z^2\right)+e^{-i\,e}\left((c+i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c+i\,b)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1061.01

$$\int z^n\cos\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c\right)dz == \frac{1}{2}\left(-(c+i\,b)^{-2(n+1)}\,e^{i\,e}\,\Gamma\left(2(n+1),(-c-i\,b)\sqrt{z}\right)-(i\,b-c)^{-2(n+1)}\,e^{-i\,e}\,\Gamma\left(2(n+1),(i\,b-c)\sqrt{z}\right)-(c-i\,b)^{-2(n+1)}\,e^{i\,e}\,\Gamma\left(2(n+1),(c-i\,b)\sqrt{z}\right)-(c+i\,b)^{-2(n+1)}\,e^{-i\,e}\,\Gamma\left(2(n+1),(c+i\,b)\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\cos(b\,z^r+d\,z)\cosh(c\,z^r)$

01.20.21.1062.01

$$\int z^n \cos\left(b z^2 + d z\right) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{8}\left(-(-c - i b)^{-n-1} e^{-\frac{i d^2}{4(i c - b)}} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2(-c - i b) z)^{j+1} \left(-\frac{(-i d + 2(-c - i b) z)^2}{-c - i b}\right)^{\frac{1}{2}(-j-1)} \right.$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2(-c - i b) z)^2}{4(-c - i b)}\right) - (i b - c)^{-n-1} e^{-\frac{i d^2}{4(b + i c)}}$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2(i b - c) z)^{j+1} \left(-\frac{(i d + 2(i b - c) z)^2}{i b - c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2(i b - c) z)^2}{4(i b - c)}\right) -$$

$$(c - i b)^{-n-1} e^{\frac{i d^2}{4(b + i c)}} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2(c - i b) z)^{j+1} \left(-\frac{(-i d + 2(c - i b) z)^2}{c - i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2(c - i b) z)^2}{4(c - i b)}\right) - (c + i b)^{-n-1} e^{\frac{i d^2}{4(i c - b)}}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2(c + i b) z)^{j+1} \left(-\frac{(i d + 2(c + i b) z)^2}{c + i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2(c + i b) z)^2}{4(c + i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1063.01

$$\int z^n \cos\left(\sqrt{z}\ b + d z\right) \cosh\left(\sqrt{z}\ c\right) dz ==$$

$$2^{-2n-3} (i d)^{-2(n+1)} \left(e^{\frac{i(i b - c)^2}{4 d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i\left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left((i b - c)\left(-c + i b + 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h + j + 1), \frac{i\left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d}\right) + \right.$$

$$\left.\left. 2\sqrt{\frac{i\left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}}\ d i \Gamma\left(\frac{1}{2}(h + j + 2), \frac{i\left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d}\right)\right) +$$

$$\left. e^{\frac{i(c + i b)^2}{4 d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c + i b)^{-h-j+2n} \left(c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i\left(c + i b + 2 i d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \right)$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-c-i\,b)^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(c-i\,b)^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

01.20.21.1064.01

$$\int z^n \cos\left(b z^2 + d z + e\right) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{8}\left(-(-c - i b)^{-n-1} e^{\frac{1}{4} i \left(-\frac{d^2}{i c - b} - 4 e\right)} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (-c - i b) z)^2}{-c - i b}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-c - i b) z)^2}{4 (-c - i b)}\right) - (i b - c)^{-n-1} e^{\frac{1}{4} i \left(\frac{d^2}{-b - i c} + 4 e\right)}$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b - c) z)^{j+1} \left(-\frac{(i d + 2 (i b - c) z)^2}{i b - c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b - c) z)^2}{4 (i b - c)}\right) -$$

$$(c - i b)^{-n-1} e^{-\frac{1}{4} i \left(\frac{d^2}{-b - i c} + 4 e\right)} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (c - i b) z)^2}{c - i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (c - i b) z)^2}{4 (c - i b)}\right) - (c + i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{d^2}{i c - b} - 4 e\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (c + i b) z)^{j+1} \left(-\frac{(i d + 2 (c + i b) z)^2}{c + i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (c + i b) z)^2}{4 (c + i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1065.01

$$\int z^n \cos\left(\sqrt{z}\ b + e + d z\right) \cosh\left(\sqrt{z}\ c\right) dz ==$$

$$2^{-2n-3} (i d)^{-2(n+1)} \left(e^{\frac{i (i b - c)^2}{4 d} + i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h + j + 1), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d}\right) +\right.$$

$$\left.\left. 2 \sqrt{\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}}\ d i \Gamma\left(\frac{1}{2}(h + j + 2), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d}\right)\right) +\right.$$

$$\left. e^{\frac{i (c + i b)^2}{4 d} + i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c + i b)^{-h-j+2n} \left(c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(c + i b + 2 i d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-c-i\,b)^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(c-i\,b)^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.1066.01

$$\int z^n \cos(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$\frac{1}{8}\left(-e^{-\frac{d^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}(-i\,d)^{n-j}(i\,d-2\,c\,z)^{j+1}\left(\frac{(i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-\right.$$

$$(-c)^{-n-1}e^{-\frac{d^2}{4c}-g}\sum_{j=0}^{n}2^{j-n}(i\,d)^{n-j}(-i\,d-2\,c\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d-2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}e^{\frac{d^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}(i\,d)^{n-j}(-i\,d+2\,c\,z)^{j+1}\left(-\frac{(-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.c^{-n-1}e^{\frac{d^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}(-i\,d)^{n-j}(i\,d+2\,c\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1067.01

$$\int z^n \cos(d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz == (-1)^{n-1}\,2^{-2\,n-3}\,d^{-2\,(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,\sqrt{z}-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,i\,d\sqrt{\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}}\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)-c\left(2\,i\,d\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,c^2}{4\,d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,i\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-c\left(-c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\,\sqrt{-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\,\sqrt{-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n \cos(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.1068.01

$$\int z^n\cos(e+d\,z)\cosh\left(c\,z^2+g\right)dz==$$

$$\frac{1}{8}\left(-e^{-\frac{d^2}{4c}-g+i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,z)^{j+1}\left(\frac{(i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}-\right.$$

$$(-c)^{-n-1}\,e^{-\frac{d^2}{4c}-i\,e-g}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d-2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}\,e^{\frac{d^2}{4c}-i\,e+g}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,z)^{j+1}\left(-\frac{(-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.c^{-n-1}\,e^{\frac{d^2}{4c}+g+i\,e}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.1069.01

$$\int z^n \cos(e+d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz == (-1)^{n-1}\,2^{-2\,n-3}\,d^{-2\,(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,d}-g+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,\sqrt{z}-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,i\,d\sqrt{\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{d}}\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)-c\left(2\,i\,d\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,c^2}{4\,d}+g+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,i\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(c+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-i\,e-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-c\left(-c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2}{4\,d}-i\,e+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(c-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos(b\,z^r)\cosh(c\,z^r+g)$

01.20.21.1070.01

$$\int z^{\alpha-1}\cos(b\,z^r)\cosh(c\,z^r+g)\,dz ==$$
$$-\frac{1}{4r}\left(z^{\alpha}\left(e^{g}\,\Gamma\left(\frac{\alpha}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-\frac{\alpha}{r}}+e^{g}\,((i\,b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b-c)\,z^r\right)+e^{-g}\,((c-i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-i\,b)\,z^r\right)+\right.$$
$$\left.e^{-g}\,((c+i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+i\,b)\,z^r\right)\right)\Big)$$

01.20.21.1071.01

$$\int z^{n}\cos\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz ==$$
$$-\frac{1}{8}z^{n+1}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},(-c-i\,b)\,z^2\right)\left((-c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{g}\left((i\,b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b-c)\,z^2\right)+\right.$$
$$\left.e^{-g}\left((c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-i\,b)\,z^2\right)+e^{-g}\left((c+i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c+i\,b)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1072.01

$$\int z^{n}\cos\left(\sqrt{z}\;b\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$
$$\frac{1}{2}\left(-(c+i\,b)^{-2(n+1)}\,e^{g}\,\Gamma\left(2\,(n+1),(-c-i\,b)\,\sqrt{z}\right)-(i\,b-c)^{-2(n+1)}\,e^{g}\,\Gamma\left(2\,(n+1),(i\,b-c)\,\sqrt{z}\right)-\right.$$
$$\left.(c-i\,b)^{-2(n+1)}\,e^{-g}\,\Gamma\left(2\,(n+1),(c-i\,b)\,\sqrt{z}\right)-(c+i\,b)^{-2(n+1)}\,e^{-g}\,\Gamma\left(2\,(n+1),(c+i\,b)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos(b\,z^r+e)\cosh(c\,z^r+g)$

01.20.21.1073.01

$$\int z^{\alpha-1}\cos(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$
$$-\frac{1}{4r}\left(z^{\alpha}\left(e^{g+i\,e}\,\Gamma\left(\frac{\alpha}{r},(-c-i\,b)\,z^r\right)((-c-i\,b)\,z^r)^{-\frac{\alpha}{r}}+e^{g-i\,e}\,((i\,b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b-c)\,z^r\right)+\right.$$
$$\left.e^{i\,e-g}\,((c-i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-i\,b)\,z^r\right)+e^{-g-i\,e}\,((c+i\,b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+i\,b)\,z^r\right)\right)\Big)$$

01.20.21.1074.01

$$\int z^{n}\cos\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz ==$$
$$-\frac{1}{8}z^{n+1}\left(e^{g+i\,e}\,\Gamma\left(\frac{n+1}{2},(-c-i\,b)\,z^2\right)\left((-c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{g-i\,e}\left((i\,b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b-c)\,z^2\right)+\right.$$
$$\left.e^{i\,e-g}\left((c-i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-i\,b)\,z^2\right)+e^{-g-i\,e}\left((c+i\,b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c+i\,b)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1075.01

$$\int z^{n}\cos\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$
$$\frac{1}{2}\left(-(c+i\,b)^{-2(n+1)}\,e^{g+i\,e}\,\Gamma\left(2\,(n+1),(-c-i\,b)\,\sqrt{z}\right)-(i\,b-c)^{-2(n+1)}\,e^{g-i\,e}\,\Gamma\left(2\,(n+1),(i\,b-c)\,\sqrt{z}\right)-\right.$$
$$\left.(c-i\,b)^{-2(n+1)}\,e^{i\,e-g}\,\Gamma\left(2\,(n+1),(c-i\,b)\,\sqrt{z}\right)-(c+i\,b)^{-2(n+1)}\,e^{-g-i\,e}\,\Gamma\left(2\,(n+1),(c+i\,b)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos(b z^r + d z) \cosh(c z^r + g)$

01.20.21.1076.01

$$\int z^n \cos(b z^2 + d z) \cosh(c z^2 + g)\, dz ==$$

$$\frac{1}{8}\left(-(-c - i b)^{-n-1} e^{\frac{1}{4} i \left(-\frac{d^2}{i c - b} + 4 i g\right)} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (-c - i b) z)^2}{-c - i b}\right)^{\frac{1}{2}(-j-1)} \right.$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-c - i b) z)^2}{4 (-c - i b)}\right) - (i b - c)^{-n-1} e^{\frac{1}{4} i \left(\frac{d^2}{-b - i c} + 4 i g\right)}$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b - c) z)^{j+1} \left(-\frac{(i d + 2 (i b - c) z)^2}{i b - c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b - c) z)^2}{4 (i b - c)}\right) -$$

$$(c - i b)^{-n-1} e^{-\frac{1}{4} i \left(\frac{d^2}{-b - i c} + 4 i g\right)} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (c - i b) z)^{j+1} \left(-\frac{(-i d + 2 (c - i b) z)^2}{c - i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (c - i b) z)^2}{4 (c - i b)}\right) - (c + i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{d^2}{i c - b} + 4 i g\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (c + i b) z)^{j+1} \left(-\frac{(i d + 2 (c + i b) z)^2}{c + i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (c + i b) z)^2}{4 (c + i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1077.01

$$\int z^n \cos(\sqrt{z}\ b + d z) \cosh(\sqrt{z}\ c + g)\, dz ==$$

$$2^{-2n-3} (i d)^{-2(n+1)} \left(e^{\frac{i (i b - c)^2}{4 d} - g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((i b - c) \left(-c + i b + 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h + j + 1), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d}\right) + \right.$$

$$\left.\left. 2 \sqrt{\frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{d}}\ d\, i\, \Gamma\left(\frac{1}{2}(h + j + 2), \frac{i \left(-c + i b + 2 i d \sqrt{z}\right)^2}{4 d}\right)\right) +$$

$$\left. e^{\frac{i (c + i b)^2}{4 d} + g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c + i b)^{-h-j+2n} \left(c + i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(c + i b + 2 i d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-c-i\,b)^2}{4\,d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(c-i\,b)^2}{4\,d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\;n\in\mathbb{N}$$

Involving $z^n\cos\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1078.01

$$\int z^n \cos\left(b z^2+d z+e\right)\cosh\left(c z^2+g\right) dz ==$$

$$\frac{1}{8}\left(-(-c-i b)^{-n-1}\, e^{\frac{1}{4} i\left(-\frac{d^2}{i c-b}-4 e+4 i g\right)} \sum_{j=0}^{n} 2^{j-n}\,(i d)^{n-j}\,(-i d+2(-c-i b) z)^{j+1}\left(-\frac{(-i d+2(-c-i b) z)^2}{-c-i b}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i d+2(-c-i b) z)^2}{4(-c-i b)}\right)-(i b-c)^{-n-1}\, e^{\frac{1}{4} i\left(\frac{d^2}{-b-i c}+4 e+4 i g\right)}$$

$$\sum_{j=0}^{n} 2^{j-n}\,(-i d)^{n-j}\,(i d+2(i b-c) z)^{j+1}\left(-\frac{(i d+2(i b-c) z)^2}{i b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i d+2(i b-c) z)^2}{4(i b-c)}\right)-$$

$$(c-i b)^{-n-1}\, e^{-\frac{1}{4} i\left(\frac{d^2}{-b-i c}+4 e+4 i g\right)} \sum_{j=0}^{n} 2^{j-n}\,(i d)^{n-j}\,(-i d+2(c-i b) z)^{j+1}\left(-\frac{(-i d+2(c-i b) z)^2}{c-i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i d+2(c-i b) z)^2}{4(c-i b)}\right)-(c+i b)^{-n-1}\, e^{-\frac{1}{4} i\left(-\frac{d^2}{i c-b}-4 e+4 i g\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n}\,(-i d)^{n-j}\,(i d+2(c+i b) z)^{j+1}\left(-\frac{(i d+2(c+i b) z)^2}{c+i b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i d+2(c+i b) z)^2}{4(c+i b)}\right)\right) /;\ n\in\mathbb{N}$$

01.20.21.1079.01

$$\int z^n \cos\left(\sqrt{z}\ b+e+d z\right)\cosh\left(\sqrt{z}\ c+g\right) dz == 2^{-2n-3}\,(i d)^{-2(n+1)}$$

$$\left(e^{\frac{i(i b-c)^2}{4 d}-g+i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i b-c)^{-h-j+2n}\left(-c+i b+2 i d\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+i b+2 i d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i b-c)\left(-c+i b+2 i d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(-c+i b+2 i d\sqrt{z}\right)^2}{4 d}\right)+\right.$$

$$\left.\left.2\sqrt{\frac{i\left(-c+i b+2 i d\sqrt{z}\right)^2}{d}}\ d i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(-c+i b+2 i d\sqrt{z}\right)^2}{4 d}\right)\right)+\right.$$

$$\left.e^{\frac{i(c+i b)^2}{4 d}+g+i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i b)^{-h-j+2n}\left(c+i b+2 i d\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+i b+2 i d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right)$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(c+i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-c-i\,b)^2}{4\,d}-i\,e-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(c-i\,b)^2}{4\,d}-i\,e+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\;n\in\mathbb{N}$$

Involving $z^n \cos(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1080.01

$$\int z^n \cos(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{1}{8}\left(-e^{\frac{(i\,d-f)^2}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}(f-i\,d)^{n-j}(-f+i\,d-2\,c\,z)^{j+1}\left(\frac{(-f+i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+i\,d-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}-(-c)^{-n-1}e^{\frac{(-f-i\,d)^2}{4\,c}}$$

$$\sum_{j=0}^{n}2^{j-n}(f+i\,d)^{n-j}(-f-i\,d-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d-2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}e^{-\frac{(f-i\,d)^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}(i\,d-f)^{n-j}(f-i\,d+2\,c\,z)^{j+1}\left(-\frac{(f-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d+2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}e^{-\frac{(f+i\,d)^2}{4\,c}}$$

$$\left.\sum_{j=0}^{n}2^{j-n}(-f-i\,d)^{n-j}(f+i\,d+2\,c\,z)^{j+1}\left(-\frac{(f+i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1081.01

$$\int z^n \cos(d\,z)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-2n-3}\left(e^{-\frac{c^2}{4(i\,d-f)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(i\,d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{i\,d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f)\sqrt{-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{i\,d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{4(i\,d-f)}\right)-\right.$$

$$\left.\left.c\left(2(i\,d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f)\sqrt{z}-c\right)^2}{4(i\,d-f)}\right)\right)\right)(i\,d-f)^{-2(n+1)}+$$

$$e^{-\frac{c^2}{4(-f-i\,d)}}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(-f-i\,d)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$c\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)^2}{4\left(-f-i\,d\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\left(f-i\,d\right)}}\left(f-i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}}\,\left(f-i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\left(f+i\,d\right)}}\left(f+i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f+i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}}\,\left(f+i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \cos(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1082.01

$$\int z^n \cos(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{1}{8}\left(-e^{\frac{(i\,d-f)^2}{4\,c}+i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d)^{n-j}\,(-f+i\,d-2\,c\,z)^{j+1}\left(\frac{(-f+i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+i\,d-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}-(-c)^{-n-1}\,e^{\frac{(-f+-i\,d)^2}{4\,c}-i\,e}$$

$$\sum_{j=0}^{n}2^{j-n}\,(f+i\,d)^{n-j}\,(-f-i\,d-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d-2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d)^2}{4\,c}-i\,e}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f)^{n-j}\,(f-i\,d+2\,c\,z)^{j+1}\left(-\frac{(f-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d+2\,c\,z)^2}{4\,c}\right)-c^{-n-1}\,e^{-\frac{(f+i\,d)^2}{4\,c}+i\,e}$$

$$\left.\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d)^{n-j}\,(f+i\,d+2\,c\,z)^{j+1}\left(-\frac{(f+i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i\,d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1083.01

$$\int z^n \cos(e+d\,z)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-2\,n-3}\left(e^{-\frac{c^2}{4\,(i\,d-f)}+i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(i\,d-f)\,\sqrt{-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)-\right.$$

$$\left.\left.c\left(2\,(i\,d-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)\right)\right)(i\,d-f)^{-2\,(n+1)}+e^{-\frac{c^2}{4\,(-f+-i\,d)}-i\,e}$$

$$(f+i\,d)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-f-i\,d)\,\sqrt{-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^2}{4\,(-f-i\,d)}\right)-\right.$$

$$c\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)^2}{4\left(-f-i\,d\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d)}-i\,e}\left(f-i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}}\,\left(f-i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f+i\,d)}+i\,e}\left(f+i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f+i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}}\,\left(f+i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1084.01

$$\int z^n \cos\left(b\,z^2\right) \cosh\left(c\,z^2+f\,z\right) dz == \frac{1}{8}\left(-(-c-i\,b)^{-n-1}\, e^{-\frac{i\,f^2}{4\,(b-i\,c)}}\right.$$

$$\sum_{j=0}^{n} 2^{j-n}\, f^{n-j}\,(2\,(-c-i\,b)\,z-f)^{j+1}\left(-\frac{(2\,(-c-i\,b)\,z-f)^2}{-c-i\,b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b)\,z-f)^2}{4\,(-c-i\,b)}\right)-$$

$$(i\,b-c)^{-n-1}\, e^{\frac{i\,f^2}{4\,(b+i\,c)}} \sum_{j=0}^{n} 2^{j-n}\, f^{n-j}\,(2\,(i\,b-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b-c)\,z-f)^2}{i\,b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b-c)\,z-f)^2}{4\,(i\,b-c)}\right)-$$

$$(c-i\,b)^{-n-1}\, e^{-\frac{i\,f^2}{4\,(b+i\,c)}} \sum_{j=0}^{n} 2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b)\,z)^{j+1}\left(-\frac{(f+2\,(c-i\,b)\,z)^2}{c-i\,b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b)\,z)^2}{4\,(c-i\,b)}\right)-(c+i\,b)^{-n-1}\, e^{\frac{i\,f^2}{4\,(b-i\,c)}}$$

$$\left.\sum_{j=0}^{n} 2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+i\,b)\,z)^{j+1}\left(-\frac{(f+2\,(c+i\,b)\,z)^2}{c+i\,b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+i\,b)\,z)^2}{4\,(c+i\,b)}\right)\right) /;\, n\in\mathbb{N}$$

01.20.21.1085.01

$$\int z^n \cos\left(\sqrt{z}\;b\right) \cosh\left(\sqrt{z}\;c+f\,z\right) dz ==$$

$$2^{-2\,n-3}\, f^{-2\,(n+1)}\left(e^{\frac{(-c-i\,b)^2}{4\,f}} \sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b)^{-h-j+2\,n}\left(-c-i\,b\;-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-i\,b\;-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i\,b)\left(-c-i\,b\;-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c-i\,b\;-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.\left.2\,f\sqrt{\frac{\left(-c-i\,b\;-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c-i\,b\;-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+\right.$$

$$e^{\frac{(i\,b-c)^2}{4\,f}} \sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c)^{-h-j+2\,n}\left(-c+i\,b\;-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+i\,b\;-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b\;-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c+i\,b\;-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$2 f \sqrt{\frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)+$$

$$e^{-\frac{(c-i b)^2}{4 f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c-i b)^{-h-j+2 n} \left(c-i b+2 f \sqrt{z}\right)^{h+j} \left(-\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((c-i b)\left(c-i b+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2 \sqrt{-\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c-i b+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)+$$

$$e^{-\frac{(c+i b)^2}{4 f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c+i b)^{-h-j+2 n} \left(c+i b+2 f \sqrt{z}\right)^{h+j} \left(-\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((c+i b)\left(c+i b+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2 \sqrt{-\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+i b+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)\Bigg/;\ n \in \mathbb{N}$$

Involving $z^n \cos\left(b z^r+e\right) \cosh\left(c z^r+f z\right)$

01.20.21.1086.01

$$\int z^n \cos\left(b z^2+e\right)\cosh\left(c z^2+f z\right) dz ==$$

$$\frac{1}{8}\left(-(-c-i b)^{-n-1}\, e^{-\frac{1}{4} i\left(\frac{f^2}{b-i c}+4 e\right)} \sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(-c-i b) z-f)^{j+1} \left(-\frac{(2(-c-i b) z-f)^2}{-c-i b}\right)^{\frac{1}{2}(-j-1)} \right.$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(-c-i b) z-f)^2}{4(-c-i b)}\right) - (i b-c)^{-n-1}\, e^{\frac{1}{4} i\left(-\frac{f^2}{-b-i c}+4 e\right)}$$

$$\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(i b-c) z-f)^{j+1} \left(-\frac{(2(i b-c) z-f)^2}{i b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(i b-c) z-f)^2}{4(i b-c)}\right) -$$

$$(c-i b)^{-n-1}\, e^{-\frac{1}{4} i\left(-\frac{f^2}{-b-i c}+4 e\right)} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-i b) z)^{j+1} \left(-\frac{(f+2(c-i b) z)^2}{c-i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c-i b) z)^2}{4(c-i b)}\right) - (c+i b)^{-n-1}\, e^{\frac{1}{4} i\left(\frac{f^2}{b-i c}+4 e\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c+i b) z)^{j+1} \left(-\frac{(f+2(c+i b) z)^2}{c+i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c+i b) z)^2}{4(c+i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1087.01

$$\int z^n \cos\left(\sqrt{z}\, b+e\right)\cosh\left(\sqrt{z}\, c+f z\right) dz ==$$

$$2^{-2n-3} f^{-2(n+1)} \left(e^{\frac{(-c+-i b)^2}{4 f}-i e} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (-c-i b)^{-h-j+2n} \left(-c-i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i b)\left(-c-i b-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right) -\right.$$

$$\left.\left.2 f \sqrt{\frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c-i b-2 f \sqrt{z}\right)^2}{4 f}\right)\right) +$$

$$\left.e^{\frac{(i b-c)^2}{4 f}+i e} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (i b-c)^{-h-j+2n} \left(-c+i b-2 f \sqrt{z}\right)^{h+j} \left(\frac{\left(-c+i b-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,f}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4\,f}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1088.01

$$\int z^n \cos(b z^2 + d z) \cosh(c z^2 + f z)\, dz ==$$

$$\frac{1}{8}\left(-(-c - i b)^{-n-1} e^{-\frac{(-f-i d)^2}{4(-c-i b)}} \sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d + 2(-c + -i b) z)^{j+1} \left(-\frac{(-f - i d + 2(-c + -i b) z)^2}{-c - i b}\right)^{\frac{1}{2}(-j-1)} \right.$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f - i d + 2(-c + -i b) z)^2}{4(-c - i b)}\right) - (i b - c)^{-n-1} e^{-\frac{(i d-f)^2}{4(i b-c)}} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j}$$

$$(-f + i d + 2(i b - c) z)^{j+1} \left(-\frac{(-f + i d + 2(i b - c) z)^2}{i b - c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f + i d + 2(i b - c) z)^2}{4(i b - c)}\right) -$$

$$(c - i b)^{-n-1} e^{-\frac{(f-i d)^2}{4(c-i b)}} \sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j} (f - i d + 2(c - i b) z)^{j+1} \left(-\frac{(f - i d + 2(c - i b) z)^2}{c - i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(f - i d + 2(c - i b) z)^2}{4(c - i b)}\right) - (c + i b)^{-n-1} e^{-\frac{(f+i d)^2}{4(c+i b)}} \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j} (f + i d + 2(c + i b) z)^{j+1}$$

$$\left.\left(-\frac{(f + i d + 2(c + i b) z)^2}{c + i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + i d + 2(c + i b) z)^2}{4(c + i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1089.01

$$\int z^n \cos(\sqrt{z}\ b + d z) \cosh(\sqrt{z}\ c + f z)\, dz ==$$

$$2^{-2n-3}\left(e^{-\frac{(i b-c)^2}{4(i d-f)}} \left(\sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2(i d - f)\sqrt{z}\right)^{h+j} \left(-\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{i d - f}\right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i b - c)\left(-c + i b + 2(i d - f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{4(i d - f)}\right) + \right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{i d - f}}\ (i d - f)\Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{4(i d - f)}\right)\right)\right)$$

$$(i d - f)^{-2n-2} + e^{-\frac{(-c-i b)^2}{4(-f-i d)}} (f + i d)^{-2n-2} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (-c - i b)^{-h-j+2n} \left(-c - i b + 2(-f + -i d)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-c - i b + 2(-f + -i d)\sqrt{z}\right)^2}{-f - i d}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}$$

$$\left((-c-i\,b)\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}}\;(-f-i\,d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,(f-i\,d)}}\,(f-i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c-i\,b)\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4\,(f+i\,d)}}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+i\,b)\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)\right)\right/;\,n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1090.01

$$\int z^n \cos\left(b z^2+d z+e\right)\cosh\left(c z^2+f z\right) dz ==$$

$$\frac{1}{8}\left(-(-c-i b)^{-n-1} e^{-\frac{(-f+-i d)^2}{4(-c+-i b)}-i e}\sum_{j=0}^{n} 2^{j-n}(f+i d)^{n-j}(-f-i d+2(-c+-i b)z)^{j+1}\right.$$

$$\left(-\frac{(-f-i d+2(-c+-i b)z)^2}{-c-i b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f-i d+2(-c+-i b)z)^2}{4(-c-i b)}\right)-$$

$$(i b-c)^{-n-1} e^{i e-\frac{(i d-f)^2}{4(i b-c)}}\sum_{j=0}^{n} 2^{j-n}(f-i d)^{n-j}(-f+i d+2(i b-c)z)^{j+1}\left(-\frac{(-f+i d+2(i b-c)z)^2}{i b-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f+i d+2(i b-c)z)^2}{4(i b-c)}\right)-(c-i b)^{-n-1} e^{-\frac{(f-i d)^2}{4(c-i b)}-i e}\sum_{j=0}^{n} 2^{j-n}(i d-f)^{n-j}$$

$$(f-i d+2(c-i b)z)^{j+1}\left(-\frac{(f-i d+2(c-i b)z)^2}{c-i b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i d+2(c-i b)z)^2}{4(c-i b)}\right)-$$

$$(c+i b)^{-n-1} e^{i e-\frac{(f+i d)^2}{4(c+i b)}}\sum_{j=0}^{n} 2^{j-n}(-f-i d)^{n-j}(f+i d+2(c+i b)z)^{j+1}\left(-\frac{(f+i d+2(c+i b)z)^2}{c+i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i d+2(c+i b)z)^2}{4(c+i b)}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1091.01

$$\int z^n \cos\left(\sqrt{z}\ b+e+d z\right)\cosh\left(\sqrt{z}\ c+f z\right) dz == 2^{-2n-3}$$

$$\left(e^{-\frac{(i b-c)^2}{4(i d-f)}+i e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i b-c)^{-h-j+2n}\left(-c+i b+2(i d-f)\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{i d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i b-c)\left(-c+i b+2(i d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{4(i d-f)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{i d-f}}\ (i d-f)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{4(i d-f)}\right)\right)\right)$$

$$(i d-f)^{-2n-2}+e^{-\frac{(-c+-i b)^2}{4(-f+-i d)}-i e}(f+i d)^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c-i b)^{-h-j+2n}$$

$$\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(-c-i\,b\right)\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{4\left(-f-i\,d\right)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{-f-i\,d}}\left(-f-i\,d\right)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{4\left(-f-i\,d\right)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4(f-i\,d)}-i\,e}\left(f-i\,d\right)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\left(c-i\,b\right)^{-h-j+2\,n}\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(c-i\,b\right)\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{4\left(f-i\,d\right)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{f-i\,d}}\left(f-i\,d\right)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{4\left(f-i\,d\right)}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4(f+i\,d)}+i\,e}\left(f+i\,d\right)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\left(c+i\,b\right)^{-h-j+2\,n}\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(c+i\,b\right)\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{4\left(f+i\,d\right)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{f+i\,d}}\left(f+i\,d\right)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{4\left(f+i\,d\right)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos(d\,z)\cosh\left(c\,z^r + f\,z + g\right)$

01.20.21.1092.01

$$\int z^n \cos(d\,z)\cosh\left(c\,z^2 + f\,z + g\right) dz ==$$

$$\frac{1}{8}\left(-e^{\frac{(i\,d-f)^2}{4\,c}-g}\left(\sum_{j=0}^{n} 2^{j-n}\,(f-i\,d)^{n-j}\,(-f+i\,d-2\,c\,z)^{j+1}\left(\frac{(-f+i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+i\,d-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1} - (-c)^{-n-1}\,e^{\frac{(-f-i\,d)^2}{4\,c}-g}$$

$$\sum_{j=0}^{n} 2^{j-n}\,(f+i\,d)^{n-j}\,(-f-i\,d-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d-2\,c\,z)^2}{4\,c}\right) -$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d)^2}{4\,c}+g}\sum_{j=0}^{n} 2^{j-n}\,(i\,d-f)^{n-j}\,(f-i\,d+2\,c\,z)^{j+1}\left(-\frac{(f-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d+2\,c\,z)^2}{4\,c}\right) -$$

$$c^{-n-1}\,e^{-\frac{(f+i\,d)^2}{4\,c}+g}$$

$$\left.\left.\sum_{j=0}^{n} 2^{j-n}\,(-f-i\,d)^{n-j}\,(f+i\,d+2\,c\,z)^{j+1}\left(-\frac{(f+i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i\,d+2\,c\,z)^2}{4\,c}\right)\right)\right) /;\ n\in\mathbb{N}$$

01.20.21.1093.01

$$\int z^n \cos(d\,z)\cosh\left(\sqrt{z}\,c + g + f\,z\right) dz ==$$

$$2^{-2n-3}\left(e^{-\frac{c^2}{4(i\,d-f)}-g}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(i\,d-f)\sqrt{-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{i\,d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)-\right.$$

$$\left.\left.c\left(2\,(i\,d-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d-f)}\right)\right)\right)(i\,d-f)^{-2(n+1)} +$$

$$e^{-\frac{c^2}{4(-f-i\,d)}-g}\,(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}-c\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d)\sqrt{-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)-\right.$$

$$\left.c\left(2(-f-i\,d)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d)\sqrt{z}-c\right)^2}{4(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{c^2}{4(f-i\,d)}+g}(f-i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f-i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f-i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f-i\,d)\sqrt{z}\right)^2}{4(f-i\,d)}\right)\right)+$$

$$e^{-\frac{c^2}{4(f+i\,d)}+g}(f+i\,d)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f+i\,d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\left(c+2(f+i\,d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f+i\,d)\sqrt{z}\right)^2}{4(f+i\,d)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1094.01

$$\int z^n \cos(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{8}\left(-e^{\frac{(i\,d-f)^2}{4\,c}-g+i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d)^{n-j}\,(-f+i\,d-2\,c\,z)^{j+1}\left(\frac{(-f+i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+i\,d-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}-(-c)^{-n-1}\,e^{\frac{(-f+-i\,d)^2}{4\,c}-g-i\,e}$$

$$\sum_{j=0}^{n}2^{j-n}\,(f+i\,d)^{n-j}\,(-f-i\,d-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d-2\,c\,z)^2}{4\,c}\right)-$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d)^2}{4\,c}+g-i\,e}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f)^{n-j}\,(f-i\,d+2\,c\,z)^{j+1}\left(-\frac{(f-i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d+2\,c\,z)^2}{4\,c}\right)-c^{-n-1}\,e^{-\frac{(f+i\,d)^2}{4\,c}+g+i\,e}$$

$$\left.\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d)^{n-j}\,(f+i\,d+2\,c\,z)^{j+1}\left(-\frac{(f+i\,d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i\,d+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.1095.01

$$\int z^n \cos(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-2\,n-3}\left(e^{-\frac{c^2}{4\,(i\,d-f)}-g+i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(i\,d-f)\,\sqrt{z}\;-c\right)^{h+j}\left(-\frac{\left(2\,(i\,d-f)\,\sqrt{z}\;-c\right)^2}{i\,d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(i\,d-f)\,\sqrt{-\frac{\left(2\,(i\,d-f)\,\sqrt{z}\;-c\right)^2}{i\,d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}\;-c\right)^2}{4\,(i\,d-f)}\right)-\right.$$

$$\left.\left.c\left(2\,(i\,d-f)\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(i\,d-f)\,\sqrt{z}\;-c\right)^2}{4\,(i\,d-f)}\right)\right)\right)(i\,d-f)^{-2\,(n+1)}+e^{-\frac{c^2}{4\,(-f+-i\,d)}-g-i\,e}$$

$$(f+i\,d)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(-f-i\,d)\,\sqrt{z}\;-c\right)^{h+j}\left(-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}\;-c\right)^2}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-f-i\,d)\,\sqrt{-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}\;-c\right)^2}{-f-i\,d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-f-i\,d)\,\sqrt{z}\;-c\right)^2}{4\,(-f-i\,d)}\right)-\right.$$

$$c\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(2\left(-f-i\,d\right)\sqrt{z}\,-c\right)^2}{4\left(-f-i\,d\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d)}+g-i\,e}\left(f-i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{f-i\,d}}\,\left(f-i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f-i\,d\right)\sqrt{z}\right)^2}{4\left(f-i\,d\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f+i\,d)}+g+i\,e}\left(f+i\,d\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\,c^{-h-j+2\,n}\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f+i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{f+i\,d}}\,\left(f+i\,d\right)\Gamma\left(\frac{1}{2}\left(h+j+2\right),\,-\frac{\left(c+2\left(f+i\,d\right)\sqrt{z}\right)^2}{4\left(f+i\,d\right)}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1096.01

$$\int z^n \cos\left(b\,z^2\right) \cosh\left(c\,z^2+f\,z+g\right) dz ==$$

$$\frac{1}{8}\left(-(-c-i\,b)^{-n-1}\, e^{-\frac{1}{4}i\left(\frac{f^2}{b-i\,c}-4\,i\,g\right)} \sum_{j=0}^{n} 2^{j-n}\, f^{n-j}\, (2\,(-c-i\,b)\,z-f)^{j+1} \left(-\frac{(2\,(-c-i\,b)\,z-f)^2}{-c-i\,b}\right)^{\frac{1}{2}(-j-1)} \right.$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2\,(-c-i\,b)\,z-f)^2}{4\,(-c-i\,b)}\right) - (i\,b-c)^{-n-1}\, e^{\frac{1}{4}i\left(-\frac{f^2}{-b-i\,c}+4\,i\,g\right)}$$

$$\sum_{j=0}^{n} 2^{j-n}\, f^{n-j}\, (2\,(i\,b-c)\,z-f)^{j+1} \left(-\frac{(2\,(i\,b-c)\,z-f)^2}{i\,b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2\,(i\,b-c)\,z-f)^2}{4\,(i\,b-c)}\right) -$$

$$(c-i\,b)^{-n-1}\, e^{-\frac{1}{4}i\left(-\frac{f^2}{-b-i\,c}+4\,i\,g\right)} \sum_{j=0}^{n} 2^{j-n}\, (-f)^{n-j}\, (f+2\,(c-i\,b)\,z)^{j+1} \left(-\frac{(f+2\,(c-i\,b)\,z)^2}{c-i\,b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2\,(c-i\,b)\,z)^2}{4\,(c-i\,b)}\right) - (c+i\,b)^{-n-1}\, e^{\frac{1}{4}i\left(\frac{f^2}{b-i\,c}-4\,i\,g\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n}\, (-f)^{n-j}\, (f+2\,(c+i\,b)\,z)^{j+1} \left(-\frac{(f+2\,(c+i\,b)\,z)^2}{c+i\,b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2\,(c+i\,b)\,z)^2}{4\,(c+i\,b)}\right)\right) /;\, n \in \mathbb{N}$$

01.20.21.1097.01

$$\int z^n \cos\left(\sqrt{z}\ b\right) \cosh\left(\sqrt{z}\ c+g+f\,z\right) dz ==$$

$$2^{-2\,n-3}\, f^{-2\,(n+1)} \left(e^{\frac{(-c-i\,b)^2}{4\,f}-g} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c-i\,b)^{-h-j+2\,n} \left(-c-i\,b\ -2\,f\,\sqrt{z}\right)^{h+j} \left(\frac{\left(-c-i\,b\ -2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j} \left((-c-i\,b)\left(-c-i\,b\ -2\,f\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-c-i\,b\ -2\,f\,\sqrt{z}\right)^2}{4\,f}\right) -$$

$$\left.2\,f\,\sqrt{\frac{\left(-c-i\,b\ -2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c-i\,b\ -2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right) +$$

$$\left.e^{\frac{(i\,b-c)^2}{4\,f}-g} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b-c)^{-h-j+2\,n} \left(-c+i\,b\ -2\,f\,\sqrt{z}\right)^{h+j} \left(\frac{\left(-c+i\,b\ -2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\,\sqrt{\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,f}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4\,f}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.2\,\sqrt{-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right/;\,n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1098.01

$$\int z^n \cos\left(b z^2+e\right)\cosh\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{8}\left(-(-c-i b)^{-n-1} e^{-\frac{1}{4} i \left(\frac{f^2}{b-i c}+4 e-4 i g\right)} \sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(-c-i b) z-f)^{j+1}\left(-\frac{(2(-c-i b) z-f)^2}{-c-i b}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(2(-c-i b) z-f)^2}{4(-c-i b)}\right)-(i b-c)^{-n-1} e^{\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 e+4 i g\right)}$$

$$\sum_{j=0}^{n} 2^{j-n} f^{n-j} (2(i b-c) z-f)^{j+1}\left(-\frac{(2(i b-c) z-f)^2}{i b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(2(i b-c) z-f)^2}{4(i b-c)}\right)-$$

$$(c-i b)^{-n-1} e^{-\frac{1}{4} i \left(-\frac{f^2}{-b-i c}+4 e+4 i g\right)} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-i b) z)^{j+1}\left(-\frac{(f+2(c-i b) z)^2}{c-i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c-i b) z)^2}{4(c-i b)}\right)-(c+i b)^{-n-1} e^{\frac{1}{4} i \left(\frac{f^2}{b-i c}+4 e-4 i g\right)}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c+i b) z)^{j+1}\left(-\frac{(f+2(c+i b) z)^2}{c+i b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f+2(c+i b) z)^2}{4(c+i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1099.01

$$\int z^n \cos\left(\sqrt{z}\, b+e\right)\cosh\left(\sqrt{z}\, c+g+f z\right) dz ==$$

$$2^{-2n-3} f^{-2(n+1)}\left(e^{\frac{(-c+-i b)^2}{4 f}-g-i e} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (-c-i b)^{-h-j+2n}\left(-c-i b-2 f\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-i b-2 f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-c-i b)\left(-c-i b-2 f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-c-i b-2 f\sqrt{z}\right)^2}{4 f}\right)-\right.$$

$$\left.\left.2 f\sqrt{\frac{\left(-c-i b-2 f\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c-i b-2 f\sqrt{z}\right)^2}{4 f}\right)\right)+$$

$$\left.e^{\frac{(i b-c)^2}{4 f}-g+i e} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (i b-c)^{-h-j+2n}\left(-c+i b-2 f\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+i b-2 f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c+i\,b-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,f}+g-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4\,f}+g+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos(b\,z^r+d\,z)\cosh(c\,z^r+f\,z+g)$

01.20.21.1100.01

$$\int z^n \cos\left(b z^2 + d z\right) \cosh\left(c z^2 + f z + g\right) dz ==$$

$$\frac{1}{8}\left(-(-c - i b)^{-n-1} e^{-\frac{(-f-i d)^2}{4(-c-i b)}-g} \sum_{j=0}^{n} 2^{j-n} (f + i d)^{n-j} (-f - i d + 2(-c + -i b) z)^{j+1} \left(-\frac{(-f - i d + 2(-c + -i b) z)^2}{-c - i b}\right)^{\frac{1}{2}(-j-1)} \right.$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f - i d + 2(-c + -i b) z)^2}{4(-c - i b)}\right) - (i b - c)^{-n-1} e^{-\frac{(i d-f)^2}{4(i b-c)}-g} \sum_{j=0}^{n} 2^{j-n} (f - i d)^{n-j}$$

$$(-f + i d + 2(i b - c) z)^{j+1} \left(-\frac{(-f + i d + 2(i b - c) z)^2}{i b - c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-f + i d + 2(i b - c) z)^2}{4(i b - c)}\right) -$$

$$(c - i b)^{-n-1} e^{-\frac{(f-i d)^2}{4(c-i b)}+g} \sum_{j=0}^{n} 2^{j-n} (i d - f)^{n-j} (f - i d + 2(c - i b) z)^{j+1} \left(-\frac{(f - i d + 2(c - i b) z)^2}{c - i b}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f - i d + 2(c - i b) z)^2}{4(c - i b)}\right) - (c + i b)^{-n-1} e^{-\frac{(f+i d)^2}{4(c+i b)}+g} \sum_{j=0}^{n} 2^{j-n} (-f - i d)^{n-j}$$

$$\left.(f + i d + 2(c + i b) z)^{j+1} \left(-\frac{(f + i d + 2(c + i b) z)^2}{c + i b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f + i d + 2(c + i b) z)^2}{4(c + i b)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1101.01

$$\int z^n \cos\left(\sqrt{z}\ b + d z\right) \cosh\left(\sqrt{z}\ c + g + f z\right) dz ==$$

$$2^{-2n-3}\left(e^{-\frac{(i b-c)^2}{4(i d-f)}-g}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (i b - c)^{-h-j+2n} \left(-c + i b + 2(i d - f)\sqrt{z}\right)^{h+j} \left(-\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{i d - f}\right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i b - c)\left(-c + i b + 2(i d - f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h + j + 1), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{4(i d - f)}\right) + \right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{i d - f}}\ (i d - f)\Gamma\left(\frac{1}{2}(h + j + 2), -\frac{\left(-c + i b + 2(i d - f)\sqrt{z}\right)^2}{4(i d - f)}\right)\right)\right)$$

$$(i d - f)^{-2n-2} + e^{-\frac{(-c-i b)^2}{4(-f-i d)}-g} (f + i d)^{-2n-2} \sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (-c - i b)^{-h-j+2n} \left(-c - i b + 2(-f + -i d)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-c - i b + 2(-f + -i d)\sqrt{z}\right)^2}{-f - i d}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}$$

$$\left((-c-i\,b)\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{-f-i\,d}}\;(-f-i\,d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-c-i\,b+2\,(-f+-i\,d)\,\sqrt{z}\right)^2}{4\,(-f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,(f-i\,d)}+g}\,(f-i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c-i\,b)\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{f-i\,d}}\;(f-i\,d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c-i\,b+2\,(f-i\,d)\,\sqrt{z}\right)^2}{4\,(f-i\,d)}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4\,(f+i\,d)}+g}\,(f+i\,d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+i\,b)\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{f+i\,d}}\;(f+i\,d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+i\,b+2\,(f+i\,d)\,\sqrt{z}\right)^2}{4\,(f+i\,d)}\right)\right)\right/;\,n\in\mathbb{N}$$

Involving $z^n \cos\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1102.01

$$\int z^n \cos\left(b z^2+d z+e\right)\cosh\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{8}\left(-(-c-i b)^{-n-1} e^{-\frac{(-f+-i d)^2}{4(-c+-i b)}-g-i e}\sum_{j=0}^{n} 2^{j-n}(f+i d)^{n-j}(-f-i d+2(-c+-i b)z)^{j+1}\right.$$

$$\left(-\frac{(-f-i d+2(-c+-i b)z)^2}{-c-i b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f-i d+2(-c+-i b)z)^2}{4(-c-i b)}\right)-$$

$$(i b-c)^{-n-1} e^{-\frac{(i d-f)^2}{4(i b-c)}-g+i e}\sum_{j=0}^{n} 2^{j-n}(f-i d)^{n-j}(-f+i d+2(i b-c)z)^{j+1}\left(-\frac{(-f+i d+2(i b-c)z)^2}{i b-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-f+i d+2(i b-c)z)^2}{4(i b-c)}\right)-(c-i b)^{-n-1} e^{-\frac{(f-i d)^2}{4(c-i b)}+g-i e}\sum_{j=0}^{n} 2^{j-n}(i d-f)^{n-j}$$

$$(f-i d+2(c-i b)z)^{j+1}\left(-\frac{(f-i d+2(c-i b)z)^2}{c-i b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i d+2(c-i b)z)^2}{4(c-i b)}\right)-$$

$$(c+i b)^{-n-1} e^{-\frac{(f+i d)^2}{4(c+i b)}+g+i e}\sum_{j=0}^{n} 2^{j-n}(-f-i d)^{n-j}(f+i d+2(c+i b)z)^{j+1}$$

$$\left.\left(-\frac{(f+i d+2(c+i b)z)^2}{c+i b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+i d+2(c+i b)z)^2}{4(c+i b)}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1103.01

$$\int z^n \cos\left(\sqrt{z}\ b+e+d z\right)\cosh\left(\sqrt{z}\ c+g+f z\right) dz == 2^{-2n-3}$$

$$\left(e^{-\frac{(i b-c)^2}{4(i d-f)}-g+i e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i b-c)^{-h-j+2n}\left(-c+i b+2(i d-f)\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{i d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i b-c)\left(-c+i b+2(i d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{4(i d-f)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{i d-f}}\ (i d-f)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c+i b+2(i d-f)\sqrt{z}\right)^2}{4(i d-f)}\right)\right)\right)$$

$$(i d-f)^{-2n-2}+e^{-\frac{(-c+-i b)^2}{4(-f+-i d)}-g-i e}(f+i d)^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c-i b)^{-h-j+2n}$$

$$\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{h+j}\left(-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{-f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(-c-i\,b\right)\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{4\left(-f-i\,d\right)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{-f-i\,d}}\left(-f-i\,d\right)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c-i\,b+2\left(-f+-i\,d\right)\sqrt{z}\right)^{2}}{4\left(-f-i\,d\right)}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4(f-i\,d)}+g-i\,e}\left(f-i\,d\right)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\left(c-i\,b\right)^{-h-j+2\,n}\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{f-i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(c-i\,b\right)\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{4\left(f-i\,d\right)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{f-i\,d}}\left(f-i\,d\right)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\left(f-i\,d\right)\sqrt{z}\right)^{2}}{4\left(f-i\,d\right)}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4(f+i\,d)}+g+i\,e}\left(f+i\,d\right)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\left(c+i\,b\right)^{-h-j+2\,n}\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{f+i\,d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(c+i\,b\right)\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{4\left(f+i\,d\right)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{f+i\,d}}\left(f+i\,d\right)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\left(f+i\,d\right)\sqrt{z}\right)^{2}}{4\left(f+i\,d\right)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving powers of cos and power

Involving $z^{\alpha-1}\cos^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.1104.01

$$\int z^{\alpha-1}\cos^{m}(c\,z)\cosh(a\,z)\,dz == 2^{-m-1}\binom{m}{\frac{m}{2}}(-z^{\alpha}\,\Gamma(\alpha,\,-a\,z)\,(-a\,z)^{-\alpha}-z^{\alpha}\,(a\,z)^{-\alpha}\,\Gamma(\alpha,\,a\,z))\,(1-m\bmod 2)-$$

$$2^{-m-1}\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Big(\Gamma(\alpha,\,(-a-2\,i\,c\,k+i\,c\,m)\,z)\,((-a-2\,i\,c\,k+i\,c\,m)\,z)^{-\alpha}+$$

$$((a-2\,i\,c\,k+i\,c\,m)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a-2\,i\,c\,k+i\,c\,m)\,z)+((-a+2\,i\,c\,k-i\,c\,m)\,z)^{-\alpha}\,\Gamma(\alpha,\,(-a+2\,i\,c\,k-i\,c\,m)\,z)+$$
$$((a+2\,i\,c\,k-i\,c\,m)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+2\,i\,c\,k-i\,c\,m)\,z)\Big)\,/;\,m\in\mathbb{N}^{+}$$

01.20.21.1105.01

$$\int z^{n}\cos^{\mu}(c\,z)\cosh(a\,z)\,dz == \frac{n!}{2}\,\cos^{\mu}(c\,z)\left(1+e^{2\,i\,c\,z}\right)^{-\mu}$$

$$\left(e^{a\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}}{(n-p)!\,(a-i\,c\,\mu)^{p+1}}\,{}_{p+2}F_{p+1}\left(-\frac{i\,a+c\,\mu}{2\,c},\,\ldots,\,-\frac{i\,a+c\,\mu}{2\,c},\,-\mu;\,1-\frac{i\,a+c\,\mu}{2\,c},\,\ldots,\,1-\frac{i\,a+c\,\mu}{2\,c};\,-e^{2\,i\,c\,z}\right)+e^{-a\,z}\right.$$

$$\left.\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}}{(n-p)!\,(-a-i\,c\,\mu)^{p+1}}\,{}_{p+2}F_{p+1}\left(\frac{i\,a-c\,\mu}{2\,c},\,\ldots,\,\frac{i\,a-c\,\mu}{2\,c},\,-\mu;\,1+\frac{i\,a-c\,\mu}{2\,c},\,\ldots,\,1+\frac{i\,a-c\,\mu}{2\,c};\,-e^{2\,i\,c\,z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos^{\mu}(c\,z+d)\cosh(a\,z)$

01.20.21.1106.01

$$\int z^{\alpha-1}\cos^{m}(d+c\,z)\cosh(a\,z)\,dz == -2^{-m-1}\binom{m}{\frac{m}{2}}(E_{1-\alpha}(-a\,z)+E_{1-\alpha}(a\,z))\,(1-m\bmod 2)\,z^{\alpha}-$$

$$2^{-m-1}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-i\,d\,m-2\,i\,d\,s}\binom{m}{s}\Big(e^{2\,i\,d\,m}\,(E_{1-\alpha}((a-i\,c\,m+2\,i\,c\,s)\,z)+E_{1-\alpha}((-a-i\,c\,(m-2\,s))\,z))+\right.\right.$$

$$\left.\left.e^{4\,i\,d\,s}\,(E_{1-\alpha}((-a+i\,c\,m-2\,i\,c\,s)\,z)+E_{1-\alpha}((a+c\,i\,(m-2\,s))\,z))\Big)\right)z^{\alpha}\,/;\,m\in\mathbb{N}^{+}$$

01.20.21.1107.01

$$\int z^n \cos^\mu(d+c\,z)\cosh(a\,z)\,dz == \frac{1}{2}\,n!\cos^\mu(d+c\,z)\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}$$
$$\left(e^{-a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a}{2\,c},\ldots,-\frac{c\,\mu-i\,a}{2\,c},-\mu;1-\frac{c\,\mu-i\,a}{2\,c},\ldots,1-\frac{c\,\mu-i\,a}{2\,c};-e^{2\,i\,(d+c\,z)}\right)+\right.$$
$$e^{a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a-i\,c\,\mu)^{-j-1}}{(n-j)!}$$
$$\left.{}_{j+2}F_{j+1}\left(-\frac{i\,a+c\,\mu}{2\,c},\ldots,-\frac{i\,a+c\,\mu}{2\,c},-\mu;1-\frac{i\,a+c\,\mu}{2\,c},\ldots,1-\frac{i\,a+c\,\mu}{2\,c};-e^{2\,i\,(d+c\,z)}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos^\mu(c\,z)\cosh(a\,z+b)$

01.20.21.1108.01

$$\int z^{\alpha-1}\cos^m(c\,z)\cosh(b+a\,z)\,dz ==$$
$$-2^{-m-1}\,e^{-b}\binom{m}{\frac{m}{2}}\left(e^{2\,b}\,E_{1-\alpha}(-a\,z)+E_{1-\alpha}(a\,z)\right)(1-m\bmod 2)\,z^\alpha-2^{-m-1}\,e^{-b}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(E_{1-\alpha}((a-i\,c\,m+2\,i\,c\,s)\,z)+\right.\right.$$
$$\left.\left.e^{2\,b}\,E_{1-\alpha}((-a+i\,c\,m-2\,i\,c\,s)\,z)+E_{1-\alpha}((a+c\,i\,(m-2\,s))\,z)+e^{2\,b}\,E_{1-\alpha}((-a-i\,c\,(m-2\,s))\,z)\right)z^\alpha\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1109.01

$$\int z^n\cos^\mu(c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2}\,n!\cos^\mu(c\,z)\left(1+e^{2\,i\,c\,z}\right)^{-\mu}$$
$$\left(e^{-b-a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a}{2\,c},\ldots,-\frac{c\,\mu-i\,a}{2\,c},-\mu;1-\frac{c\,\mu-i\,a}{2\,c},\ldots,1-\frac{c\,\mu-i\,a}{2\,c};-e^{2\,i\,c\,z}\right)+\right.$$
$$e^{b+a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a-i\,c\,\mu)^{-j-1}}{(n-j)!}$$
$$\left.{}_{j+2}F_{j+1}\left(-\frac{i\,a+c\,\mu}{2\,c},\ldots,-\frac{i\,a+c\,\mu}{2\,c},-\mu;1-\frac{i\,a+c\,\mu}{2\,c},\ldots,1-\frac{i\,a+c\,\mu}{2\,c};-e^{2\,i\,c\,z}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos^\mu(c\,z+d)\cosh(a\,z+b)$

01.20.21.1110.01

$$\int z^{\alpha-1}\cos^m(d+c\,z)\cosh(b+a\,z)\,dz == -2^{-m-1}\,e^{-b}\binom{m}{\frac{m}{2}}\left(e^{2\,b}\,E_{1-\alpha}(-a\,z)+E_{1-\alpha}(a\,z)\right)(1-m\bmod 2)\,z^\alpha-$$
$$2^{-m-1}\,z^\alpha\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-b-i\,d\,m-2\,i\,d\,s}\binom{m}{s}\left(e^{2\,i\,d\,m}\left(E_{1-\alpha}((a-i\,c\,m+2\,i\,c\,s)\,z)+e^{2\,b}\,E_{1-\alpha}((-a-i\,c\,(m-2\,s))\,z)\right)+\right.$$
$$\left.e^{4\,i\,d\,s}\left(e^{2\,b}\,E_{1-\alpha}((-a+i\,c\,m-2\,i\,c\,s)\,z)+E_{1-\alpha}((a+c\,i\,(m-2\,s))\,z)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1111.01

$$\int z^n \cos^{\mu}(d+c\,z)\cosh(b+a\,z)\,dz ==$$

$$\frac{1}{2}\,n!\cos^{\mu}(d+c\,z)\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}\left(e^{-b-a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a-i\,c\,\mu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a}{2\,c},\ldots,-\frac{c\,\mu-i\,a}{2\,c},\right.\right.$$

$$\left.-\mu;1-\frac{c\,\mu-i\,a}{2\,c},\ldots,1-\frac{c\,\mu-i\,a}{2\,c};-e^{2\,i\,(d+c\,z)}\right)+e^{b+a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a-i\,c\,\mu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(-\frac{i\,a+c\,\mu}{2\,c},\ldots,-\frac{i\,a+c\,\mu}{2\,c},-\mu;1-\frac{i\,a+c\,\mu}{2\,c},\ldots,1-\frac{i\,a+c\,\mu}{2\,c};-e^{2\,i\,(d+c\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos^m\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1112.01

$$\int z^n\cos^m\left(b\,z^2\right)\cosh(c\,z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c\,z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c\,z)\right)(1-m\bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,c^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(-c-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-c-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-c-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,c^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(c-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{i\,(c-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,c^2}{4\,b\,(m-2\,s)}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-c)^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c)^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,c^2}{4\,b\,(m-2\,s)}}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(c+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(c+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1113.01

$$\int z^n \cos^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$2^{-m-2n-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{b^2(m-2s)^2}{4c}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2s))^{-h-j+2n}\left(-2\sqrt{z}\;c-i\,b\,(m-2s)\right)^{h+j}\right.\right.$$

$$\left(\frac{\left(-2\sqrt{z}\;c-i\,b\,(m-2s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(-i\,b\,(m-2s)\left(-2\sqrt{z}\;c-i\,b\,(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-2\sqrt{z}\;c-i\,b\,(m-2s)\right)^2}{4c}\right)-2c\right.$$

$$\left.\sqrt{\frac{\left(-2\sqrt{z}\;c-i\,b\,(m-2s)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-2\sqrt{z}\;c-i\,b\,(m-2s)\right)^2}{4c}\right)\right)+e^{-\frac{b^2(m-2s)^2}{4c}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2s))^{-h-j+2n}\left(i\,b\,(m-2s)-2c\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b\,(m-2s)-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2s)\left(i\,b\,(m-2s)-2c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(i\,b\,(m-2s)-2c\sqrt{z}\right)^2}{4c}\right)-2\right.$$

$$\left.c\sqrt{\frac{\left(i\,b\,(m-2s)-2c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(i\,b\,(m-2s)-2c\sqrt{z}\right)^2}{4c}\right)\right)+e^{\frac{b^2(m-2s)^2}{4c}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2s))^{-h-j+2n}\left(2c\sqrt{z}\;-i\,b\,(m-2s)\right)^{h+j}\left(-\frac{\left(2c\sqrt{z}\;-i\,b\,(m-2s)\right)^2}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2c\sqrt{-\frac{\left(2c\sqrt{z}\;-i\,b\,(m-2s)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2c\sqrt{z}\;-i\,b\,(m-2s)\right)^2}{4c}\right)-i\,b\right.$$

$$\left.(m-2s)\left(2c\sqrt{z}\;-i\,b\,(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2c\sqrt{z}\;-i\,b\,(m-2s)\right)^2}{4c}\right)\right)+e^{\frac{b^2(m-2s)^2}{4c}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^{2}}{c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^{2}}{4\,c}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^{2}}{c}}\;c\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,\sqrt{z}\;c+b\,i\,(m-2\,s)\right)^{2}}{4\,c}\right)\right)\Bigg)\Bigg)$$

$$c^{-2\,(n+1)}+(-1)^{n}\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c\,z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c\,z)\right)$$

$(1-$

$m \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}$

Involving $z^{n}\cos^{m}\left(b\,z^{r}+e\right)\cosh(c\,z)$

01.20.21.1114.01

$$\int z^n \cos^m\left(b\,z^2+e\right)\cosh(c\,z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c\,z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c\,z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,c^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(-c-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-c-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-c-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,c^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(c-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(c-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,c^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,c^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-c)^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c)^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,c^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-c)^{n-j}\,(c+2\,b\,i\,(m-2\,s)\,z)^{j+1}$$

$$\left.\left(\frac{i\,(c+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(c+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1115.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+e\right)\cosh^v(c\,z)\,dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)+(-1)^n\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}\left(e^{i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\,-i\,b\,(m-2\,k)\,\sqrt{z}\right)+e^{-i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(c\,(v-2\,k))^{-2\,(n+1)}$$

$$\left(e^{-\frac{b^2 (m-2 s)^2}{4 c (v-2 k)}-i e (m-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n} \left(-i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{c (v-2 k)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i b (m-2 s) \left(-i b (m-2 s)-\right.\right.$$

$$\left.2 c (v-2 k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{4 c (v-2 k)}\right)-2 c (v-2 k)$$

$$\left.\sqrt{\frac{\left(-i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{c (v-2 k)}} \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{4 c (v-2 k)}\right)\right)+$$

$$e^{-\frac{b^2 (m-2 s)^2}{4 c (v-2 k)}+e i (m-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2 s))^{-h-j+2 n} \left(i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{c (v-2 k)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(i b (m-2 s) \left(i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{4 c (v-2 k)}\right)-2 c (v-2 k)$$

$$\left.\sqrt{\frac{\left(i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{c (v-2 k)}} \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(i b (m-2 s)-2 c (v-2 k) \sqrt{z}\right)^2}{4 c (v-2 k)}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 c (v-2 k)}-i e (m-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n} \left(2 c (v-2 k) \sqrt{z}-i b (m-2 s)\right)^{h+j}$$

$$\left(-\frac{\left(2 c (v-2 k) \sqrt{z}-i b (m-2 s)\right)^2}{c (v-2 k)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(2 c (v-2 k) \sqrt{-\frac{\left(2 c (v-2 k) \sqrt{z}-i b (m-2 s)\right)^2}{c (v-2 k)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2c(v-2k)\sqrt{z}-ib(m-2s)\right)^2}{4c(v-2k)}\right)-ib(m-2s)$$

$$\left(2c(v-2k)\sqrt{z}-ib(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2c(v-2k)\sqrt{z}-ib(m-2s)\right)^2}{4c(v-2k)}\right)\Bigg)+$$

$$e^{\frac{b^2(m-2s)^2}{4c(v-2k)}+ei(m-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2s))^{-h-j+2n}\left(bi(m-2s)+2c(v-2k)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(bi(m-2s)+2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(bi(m-2s)\left(bi(m-2s)+2c(v-2k)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(bi(m-2s)+2c(v-2k)\sqrt{z}\right)^2}{4c(v-2k)}\right)+$$

$$2c(v-2k)\sqrt{-\frac{\left(bi(m-2s)+2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(bi(m-2s)+2c(v-2k)\sqrt{z}\right)^2}{4c(v-2k)}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m(bz^r+dz)\cosh(cz)$

01.20.21.1116.01

$$\int z^n \cos^m\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c\,z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c\,z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,(-c-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(c+d\,i\,(m-2\,s))^{n-j}\right.\right.$$

$$(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(c-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-c)^{n-j}\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left(-\frac{i\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{i\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-c)^2}{4\,b\,(m-2\,s)}}(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(c-i\,d\,(m-2\,s))^{n-j}\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}$$

$$\left(\frac{i\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(c+d\,i\,(m-2\,s))^2}{4\,b\,(m-2\,s)}}(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-c-i\,d\,(m-2\,s))^{n-j}\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}$$

$$\left(\frac{i\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{i\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1117.01

$$\int z^n \cos^m\left(\sqrt{z}\ b + d\,z\right) \cosh(c\,z)\, dz == (-1)^n\, 2^{-m-1} \binom{m}{\frac{m}{2}} \left(\Gamma(n+1,\, c\,z)\,(-c)^{-n-1} + c^{-n-1}\,\Gamma(n+1,\, -c\,z)\right)(1 - m \bmod 2) +$$

$$2^{-m-2\,n-2} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-c)}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(m-2\,s))^{-h-j+2\,n} \right.\right.$$

$$\left(b\,i\,(m-2\,s) + 2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^{h+j} \left(-\frac{\left(b\,i\,(m-2\,s) + 2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(b\,i\,(m-2\,s) \left(b\,i\,(m-2\,s) + 2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+j+1), \right.\right.$$

$$\left. - \frac{\left(b\,i\,(m-2\,s) + 2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c)} \right) + 2\,\sqrt{ - \frac{\left(b\,i\,(m-2\,s) + 2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c} }$$

$$\left.\left. (i\,d\,(m-2\,s)-c)\,\Gamma\left(\frac{1}{2}\,(h+j+2), - \frac{\left(b\,i\,(m-2\,s) + 2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c)} \right) \right) \right)$$

$$(i\,d\,(m-2\,s)-c)^{-2\,(n+1)} + e^{\frac{b^2\,(m-2\,s)^2}{4\,(c+d\,i\,(m-2\,s))}}\, (c + d\,i\,(m-2\,s))^{-2\,(n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s) + 2\,(c + d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j} \left(-\frac{\left(b\,i\,(m-2\,s) + 2\,(c + d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{c + d\,i\,(m-2\,s)} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(b\,i\,(m-2\,s) \left(b\,i\,(m-2\,s) + 2\,(c + d\,i\,(m-2\,s))\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+j+1), \right.\right.$$

$$\left. - \frac{\left(b\,i\,(m-2\,s) + 2\,(c + d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(c + d\,i\,(m-2\,s))} \right) + 2\,\sqrt{ - \frac{\left(b\,i\,(m-2\,s) + 2\,(c + d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{c + d\,i\,(m-2\,s)} }$$

$$\left.\left. (c + d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2), - \frac{\left(b\,i\,(m-2\,s) + 2\,(c + d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(c + d\,i\,(m-2\,s))} \right) \right) \right) +$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (-c-i d (m-2 s))}} (-c-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (-c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{-c-i d (m-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (-c-i d (m-2 s)) \sqrt{-\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{-c-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), \right.\right.$$

$$\left. -\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{4 (-c-i d (m-2 s))}\right) - i b (m-2 s) \left(2 (-c-i d (m-2 s)) \sqrt{z} - \right.$$

$$\left. i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (-c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{4 (-c-i d (m-2 s))}\right)\Bigg) +$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (c-i d (m-2 s))}} (c-i d (m-2 s))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 (c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^{h+j} \left(-\frac{\left(2 (c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{c-i d (m-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(2 (c-i d (m-2 s)) \sqrt{-\frac{\left(2 (c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{c-i d (m-2 s)}}\ \Gamma\left(\frac{1}{2} (h+j+2), \right.\right.$$

$$\left. -\frac{\left(2 (c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{4 (c-i d (m-2 s))}\right) - i b (m-2 s) \left(2 (c-i d (m-2 s)) \sqrt{z} - \right.$$

$$\left. \left. i b (m-2 s)\right) \Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(2 (c-i d (m-2 s)) \sqrt{z} - i b (m-2 s)\right)^2}{4 (c-i d (m-2 s))}\right)\right)\Bigg) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \cos^m\left(b z^r + d z + e\right) \cosh(c z)$

01.20.21.1118.01

$$\int z^n \cos^m\left(b z^2+d z+e\right)\cosh(c z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,(-c-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(c+d\,i\,(m-2\,s))^{n-j}\right.\right.$$

$$(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(c-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-c)^{n-j}\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(c-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,(i\,d\,(m-2\,s)-c)^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(c-i\,d\,(m-2\,s))^{n-j}$$

$$(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\frac{i\,(-c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{i\,(c+d\,i\,(m-2\,s))^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-c-i\,d\,(m-2\,s))^{n-j}\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(c+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1119.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh(c z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c z)\,(-c)^{-n-1}+c^{-n-1}\,\Gamma(n+1,\,-c z)\right)(1-m \bmod 2)+$$

$$2^{-m-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-c)}+e\,i\,(m-2\,s)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c)}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c}}$$

$$\left.\left.(i\,d\,(m-2\,s)-c)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c)}\right)\right)\right)$$

$$(i\,d\,(m-2\,s)-c)^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(c+d\,i\,(m-2\,s))}+e\,i\,(m-2\,s)}\,(c+d\,i\,(m-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{c+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(c+d\,i\,(m-2\,s))}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{c+d\,i\,(m-2\,s)}}$$

$$\left.(c+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(c+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(c+d\,i\,(m-2\,s))}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-c-i\,d\,(m-2\,s))}-i\,e\,(m-2\,s)}\,(-c-i\,d\,(m-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-c-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-c-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-c-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-c-i\,d(m-2s))\sqrt{-\frac{\left(2(-c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{-c-i\,d(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-c-i\,d(m-2s))}\right)-i\,b(m-2s)\left(2(-c-i\,d(m-2s))\sqrt{z}-\right.$$

$$\left.i\,b(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-c-i\,d(m-2s))}\right)\Bigg)+$$

$$e^{\frac{b^2(m-2s)^2}{4(c-i\,d(m-2s))}-i\,e(m-2s)}(c-i\,d(m-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b(m-2s))^{-h-j+2n}$$

$$\left(2(c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^{h+j}\left(-\frac{\left(2(c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{c-i\,d(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(c-i\,d(m-2s))\sqrt{-\frac{\left(2(c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{c-i\,d(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(c-i\,d(m-2s))}\right)-i\,b(m-2s)\left(2(c-i\,d(m-2s))\sqrt{z}-\right.$$

$$\left.\left.i\,b(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(c-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(c-i\,d(m-2s))}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \cos^m(b\,z^r)\cosh(f\,z+g)$

01.20.21.1120.01

$$\int z^n \cos^m\left(b\,z^2\right)\cosh(g+f\,z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f\,z)\,(-f)^{-n-1}+e^{g}\,f^{-n-1}\,\Gamma(n+1,\,-f\,z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,f^2}{4\,b\,(m-2\,s)}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-f-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-f-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,f^2}{4\,b\,(m-2\,s)}+g}\left(\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(f-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(f-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,f^2}{4\,b\,(m-2\,s)}-g}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-f)^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f)^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,f^2}{4\,b\,(m-2\,s)}+g}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(f+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(f+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

01.20.21.1121.01

$$\int z^n \cos^m\left(\sqrt{z}\;b\right)\cosh(g+f\,z)\,dz ==$$

$$2^{-m-2\,n-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^{h+j}\right.\right.$$

$$\left.\left(\frac{\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left.\left(-i\,b\,(m-2\,s)\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-2\,\sqrt{z}\;f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-2\,f\right.\right.$$

$$\sqrt{\frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\Bigg)+e^{-\frac{b^2\,(m-2\,s)^2}{4\,f}-g}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\,b\,(m-2\,s)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+e^{\frac{b^2\,(m-2\,s)^2}{4\,f}+g}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,f\sqrt{-\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-i\,b$$

$$(m-2\,s)\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,f\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\Bigg)+e^{\frac{b^2\,(m-2\,s)^2}{4\,f}+g}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{4\,f}\right)+2$$

$$\sqrt{-\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\sqrt{z}\ f+b\,i\,(m-2\,s)\right)^2}{4\,f}\right)\Bigg)\Bigg)\Bigg)$$

$$f^{-2(n+1)} + (-1)^n 2^{-m-1} \binom{m}{\frac{m}{2}} \left(e^{-g}\, \Gamma(n+1,\ f z)\, (-f)^{-n-1} + e^{g}\, f^{-n-1}\, \Gamma(n+1,\ -f z)\right)$$

$$(1 - m \bmod 2) \text{ /; } n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \cos^m\left(b z^r + e\right) \cosh(f z + g)$

01.20.21.1122.01

$$\int z^n \cos^m\left(b z^2 + e\right) \cosh(g + f z)\, dz ==$$

$$(-1)^n 2^{-m-1} \binom{m}{\frac{m}{2}} \left(e^{-g}\, \Gamma(n+1,\ f z)\, (-f)^{-n-1} + e^{g}\, f^{-n-1}\, \Gamma(n+1,\ -f z)\right) (1 - m \bmod 2) - 2^{-m-2}$$

$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{-\frac{i f^2}{4 b (m-2 s)} - g - i e (m-2 s)} \left(\sum_{j=0}^{n} 2^{j-n}\, f^{n-j}\, (-f - 2 i b (m-2 s) z)^{j+1} \left(-\frac{i (-f - 2 i b (m-2 s) z)^2}{b (m-2 s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \right.\right.\right.$$

$$\left.\left.\left. -\frac{i (-f - 2 i b (m-2 s) z)^2}{4 b (m-2 s)} \right) \right) (-i b (m-2 s))^{-n-1} +$$

$$e^{-\frac{i f^2}{4 b (m-2 s)} + g - i e (m-2 s)} \left(\sum_{j=0}^{n} 2^{j-n}\, (-f)^{n-j}\, (f - 2 i b (m-2 s) z)^{j+1} \left(-\frac{i (f - 2 i b (m-2 s) z)^2}{b (m-2 s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (f - 2 i b (m-2 s) z)^2}{4 b (m-2 s)} \right) \right) (-i b (m-2 s))^{-n-1} + e^{\frac{i f^2}{4 b (m-2 s)} - g + e i (m-2 s)} (i b (m-2 s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n}\, f^{n-j}\, (2 i b (m-2 s) z - f)^{j+1} \left(\frac{i (2 i b (m-2 s) z - f)^2}{b (m-2 s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b (m-2 s) z - f)^2}{4 b (m-2 s)} \right) +$$

$$e^{\frac{i f^2}{4 b (m-2 s)} + g + e i (m-2 s)} (i b (m-2 s))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (-f)^{n-j}\, (f + 2 b i (m-2 s) z)^{j+1}$$

$$\left(\frac{i (f + 2 b i (m-2 s) z)^2}{b (m-2 s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (f + 2 b i (m-2 s) z)^2}{4 b (m-2 s)} \right) \Bigg) \text{ /; } n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1123.01

$$\int z^n \cos^m\left(\sqrt{z}\ b + e\right) \cosh(g + f z)\, dz ==$$

$$2^{-m-2n-2} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{-\frac{b^2 (m-2 s)^2}{4 f} - i e (m-2 s) - g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i b (m-2 s))^{-h-j+2n} \left(-2 \sqrt{z}\ f - i b (m-2 s)\right)^{h+j} \right. \right.$$

$$\left(\frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{f}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\sqrt{z}\ f-i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\right)+e^{-\frac{b^2(m-2\,s)^2}{4\,f}+e\,i\,(m-2\,s)-g}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,f\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b\,(m-2\,s)-2\,f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\,b\,(m-2\,s)-2\,f\sqrt{z}\right)^2}{4\,f}\right)-2\right.$$

$$f\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\,b\,(m-2\,s)-2\,f\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{b^2(m-2\,s)^2}{4\,f}-i\,e\,(m-2\,s)+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,f\sqrt{z}\ -i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,f\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,f\sqrt{-\frac{\left(2\,f\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,f\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,f}\right)-i\,b\,(m-2\,s)\right.$$

$$\left.\left(2\,f\sqrt{z}\ -i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,f\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,f}\right)\right)+e^{\frac{b^2(m-2\,s)^2}{4\,f}+e\,i\,(m-2\,s)+g}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,\sqrt{z}\;f+b\,i\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,\sqrt{z}\;f+b\,i\,(m-2\,s)\right)^{2}}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(2\,\sqrt{z}\;f+b\,i\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,\sqrt{z}\;f+b\,i\,(m-2\,s)\right)^{2}}{4\,f}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(2\,\sqrt{z}\;f+b\,i\,(m-2\,s)\right)^{2}}{f}}\;\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,\sqrt{z}\;f+b\,i\,(m-2\,s)\right)^{2}}{4\,f}\right)\right)\Bigg)\Bigg)$$

$$f^{-2\,(n+1)}+(-1)^{n}\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f\,z)\,(-f)^{-n-1}+e^{g}\,f^{-n-1}\,\Gamma(n+1,\,-f\,z)\right)$$

$(1-$

$m \bmod 2)\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}$

Involving $z^{n}\cos^{m}\left(b\,z^{r}+d\,z\right)\cosh(f\,z+g)$

01.20.21.1124.01

$$\int z^n \cos^m\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz == (-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f\,z)\,(-f)^{-n-1}+e^{g}\,f^{-n-1}\,\Gamma(n+1,\,-f\,z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,(-f-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-g}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,s))^{n-j}\right.\right.$$

$$(-f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\left(-\frac{i\,(-f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(f-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}+g}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-f)^{n-j}\,(f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(f-i\,d\,(m-2\,s)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,(i\,d\,(m-2\,s)-f)^2}{4\,b\,(m-2\,s)}-g}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,s))^{n-j}$$

$$(-f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(-f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\frac{i\,(-f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{i\,(f+d\,i\,(m-2\,s))^2}{4\,b\,(m-2\,s)}+g}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-f-i\,d\,(m-2\,s))^{n-j}\,(f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(f+d\,i\,(m-2\,s)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1125.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$(-1)^n\,2^{-m-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f\,z)\,(-f)^{-n-1}+e^{g}\,f^{-n-1}\,\Gamma(n+1,\,-f\,z)\right)(1-m \bmod 2)+$$

$$2^{-m-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-f)}-g}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f}}$$

$$\left.\left.(i\,d\,(m-2\,s)-f)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f)}\right)\right)\right)$$

$$(i\,d\,(m-2\,s)-f)^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(f+d\,i\,(m-2\,s))}+g}\,(f+d\,i\,(m-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,s)}}$$

$$\left.(f+d\,i\,(m-2\,s))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(f+d\,i\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,s))}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-f-i\,d\,(m-2\,s))}-g}\,(-f-i\,d\,(m-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-f-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-f-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-f-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-f-i\,d(m-2s))\sqrt{-\frac{\left(2(-f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{-f-i\,d(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-f-i\,d(m-2s))}\right)-i\,b(m-2s)\left(2(-f-i\,d(m-2s))\sqrt{z}-\right.$$

$$\left.i\,b(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-f-i\,d(m-2s))}\right)+$$

$$e^{\frac{b^2(m-2s)^2}{4(f-i\,d(m-2s))}+g}(f-i\,d(m-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b(m-2s))^{-h-j+2n}$$

$$\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^{h+j}\left(-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{f-i\,d(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(f-i\,d(m-2s))\sqrt{-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{f-i\,d(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(f-i\,d(m-2s))}\right)-i\,b(m-2s)\left(2(f-i\,d(m-2s))\sqrt{z}-\right.$$

$$\left.\left.i\,b(m-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(f-i\,d(m-2s))}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \cos^m(b\,z^r+d\,z+e)\cosh(f\,z+g)$

01.20.21.1126.01

$$\int z^n \cos^m\left(b z^2+d z+e\right)\cosh(g+f z)\,dz ==$$

$$(-1)^n 2^{-m-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f z)(-f)^{-n-1}+e^{g}\,f^{-n-1}\,\Gamma(n+1,\,-f z)\right)(1-m \bmod 2)-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i(-f-i d(m-2s))^2}{4b(m-2s)}-g-i e(m-2s)}\left(\sum_{j=0}^{n}2^{j-n}(f+d i(m-2s))^{n-j}\right.\right.$$

$$(-f-i d(m-2s)-2 i b(m-2s)z)^{j+1}\left(-\frac{i(-f-i d(m-2s)-2 i b(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-f-i d(m-2s)-2 i b(m-2s)z)^2}{4b(m-2s)}\right)\right)(-i b(m-2s))^{-n-1}+$$

$$e^{-\frac{i(f-i d(m-2s))^2}{4b(m-2s)}+g-i e(m-2s)}\left(\sum_{j=0}^{n}2^{j-n}(i d(m-2s)-f)^{n-j}(f-i d(m-2s)-2 i b(m-2s)z)^{j+1}\right.$$

$$\left.\left(-\frac{i(f-i d(m-2s)-2 i b(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(f-i d(m-2s)-2 i b(m-2s)z)^2}{4b(m-2s)}\right)\right)$$

$$(-i b(m-2s))^{-n-1}+e^{\frac{i(i d(m-2s)-f)^2}{4b(m-2s)}-g+e i(m-2s)}(i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f-i d(m-2s))^{n-j}$$

$$(-f+d i(m-2s)+2 b i(m-2s)z)^{j+1}\left(\frac{i(-f+d i(m-2s)+2 b i(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\frac{i(-f+d i(m-2s)+2 b i(m-2s)z)^2}{4b(m-2s)}\right)+e^{\frac{i(f+d i(m-2s))^2}{4b(m-2s)}+g+e i(m-2s)}(i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-f-i d(m-2s))^{n-j}(f+d i(m-2s)+2 b i(m-2s)z)^{j+1}\left(\frac{i(f+d i(m-2s)+2 b i(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(f+d i(m-2s)+2 b i(m-2s)z)^2}{4b(m-2s)}\right)\right)/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1127.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+e+d z\right)\cosh(g+f z)\,dz ==$$

$$(-1)^n 2^{-m-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f z)(-f)^{-n-1}+e^{g}\,f^{-n-1}\,\Gamma(n+1,\,-f z)\right)(1-m \bmod 2)+$$

$$2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{b^2(m-2s)^2}{4(id(m-2s)-f)}+ei(m-2s)-g}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2s))^{-h-j+2n}\right.\right.$$

$$\left(bi(m-2s)+2(id(m-2s)-f)\sqrt{z}\right)^{h+j}\left(-\frac{\left(bi(m-2s)+2(id(m-2s)-f)\sqrt{z}\right)^2}{id(m-2s)-f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(bi(m-2s)\left(bi(m-2s)+2(id(m-2s)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(bi(m-2s)+2(id(m-2s)-f)\sqrt{z}\right)^2}{4(id(m-2s)-f)}\right)+2\sqrt{-\frac{\left(bi(m-2s)+2(id(m-2s)-f)\sqrt{z}\right)^2}{id(m-2s)-f}}$$

$$\left.\left.(id(m-2s)-f)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(bi(m-2s)+2(id(m-2s)-f)\sqrt{z}\right)^2}{4(id(m-2s)-f)}\right)\right)\right)$$

$$(id(m-2s)-f)^{-2(n+1)}+e^{\frac{b^2(m-2s)^2}{4(f+di(m-2s))}+ei(m-2s)+g}(f+di(m-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2s))^{-h-j+2n}$$

$$\left(bi(m-2s)+2(f+di(m-2s))\sqrt{z}\right)^{h+j}\left(-\frac{\left(bi(m-2s)+2(f+di(m-2s))\sqrt{z}\right)^2}{f+di(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(bi(m-2s)\left(bi(m-2s)+2(f+di(m-2s))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(bi(m-2s)+2(f+di(m-2s))\sqrt{z}\right)^2}{4(f+di(m-2s))}\right)+2\sqrt{-\frac{\left(bi(m-2s)+2(f+di(m-2s))\sqrt{z}\right)^2}{f+di(m-2s)}}$$

$$\left.(f+di(m-2s))\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(bi(m-2s)+2(f+di(m-2s))\sqrt{z}\right)^2}{4(f+di(m-2s))}\right)\right)+$$

$$e^{\frac{b^2(m-2s)^2}{4(-f-id(m-2s))}-ie(m-2s)-g}(-f-id(m-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib(m-2s))^{-h-j+2n}$$

$$\left(2\left(-f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\left(-f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-f-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\left(-f-i\,d\,(m-2\,s)\right)\sqrt{-\frac{\left(2\left(-f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-f-i\,d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2\left(-f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\left(-f-i\,d\,(m-2\,s)\right)}\right)-i\,b\,(m-2\,s)\left(2\left(-f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-$$

$$\left.i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\left(-f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\left(-f-i\,d\,(m-2\,s)\right)}\right)+$$

$$e^{\frac{b^2(m-2s)^2}{4(f-i\,d\,(m-2\,s))}-i\,e\,(m-2\,s)+g}\left(f-i\,d\,(m-2\,s)\right)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\left(f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\left(f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\left(f-i\,d\,(m-2\,s)\right)\sqrt{-\frac{\left(2\left(f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f-i\,d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2\left(f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\left(f-i\,d\,(m-2\,s)\right)}\right)-i\,b\,(m-2\,s)\left(2\left(f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-$$

$$\left.\left.i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\left(f-i\,d\,(m-2\,s)\right)\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\left(f-i\,d\,(m-2\,s)\right)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z)\cosh\left(c\,z^r\right)$

01.20.21.1128.01

$$\int z^n \cos^m(d\,z)\cosh\left(c\,z^2\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-2^{-m-2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{d^2(m-2k)^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}(i\,d\,(m-2k))^{n-j}(-i\,d\,(m-2k)-2\,c\,z)^{j+1}\left(\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.\right.\right.$$

$$\left.\left.\left.\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{4c}\right)\right)(-c)^{-n-1}+e^{-\frac{d^2(m-2k)^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}(-i\,d\,(m-2k))^{n-j}(i\,d\,(m-2k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{4c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}e^{\frac{d^2(m-2k)^2}{4c}}\sum_{j=0}^{n}2^{j-n}(i\,d\,(m-2k))^{n-j}(2\,c\,z-i\,d\,(m-2k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{4c}\right)+c^{-n-1}e^{\frac{d^2(m-2k)^2}{4c}}\sum_{j=0}^{n}2^{j-n}(-i\,d\,(m-2k))^{n-j}(d\,i\,(m-2k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{4c}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1129.01

$$\int z^n \cos^m(d\,z)\cosh\left(\sqrt{z}\,c\right) dz == 2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(i\,d\,(m-2k))^{-2(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,d\,(m-2k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^2}{d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\right.$$

$$\binom{n}{j}\left(2\,i\,d\,(m-2k)\sqrt{\frac{i\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^2}{d\,(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^2}{4\,d\,(m-2k)}\right)-\right.$$

$$\left.\left.c\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^2}{4\,d\,(m-2k)}\right)\right)+\right.$$

$$e^{\frac{i c^2}{4 d (m-2 k)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j c^{-h-j+2 n} \left(c+2 d i (m-2 k) \sqrt{z}\right)^{h+j} \left(\frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c \left(c+2 d i (m-2 k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)+\right.$$

$$\left.2 d i (m-2 k) \sqrt{\frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)\right)+$$

$$e^{-\frac{i c^2}{4 d (m-2 k)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c)^{-h-j+2 n} \left(-c-2 i d (m-2 k) \sqrt{z}\right)^{h+j} \left(-\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-c \left(-c-2 i d (m-2 k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)-\right.$$

$$\left.2 i d (m-2 k) \sqrt{-\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)\right)+$$

$$e^{-\frac{i c^2}{4 d (m-2 k)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j c^{-h-j+2 n} \left(c-2 i d (m-2 k) \sqrt{z}\right)^{h+j} \left(-\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c \left(c-2 i d (m-2 k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)-\right.$$

$$\left.\left.2 i d (m-2 k) \sqrt{-\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)\right)\right)-$$

$$2^{-m} c^{-2 (n+1)} \binom{m}{\frac{m}{2}} \left(\Gamma\left(2 (n+1), -c \sqrt{z}\right)+\Gamma\left(2 (n+1), c \sqrt{z}\right)\right) (1-m \bmod 2) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \cos^m(d\,z+e)\cosh(c\,z^r)$

01.20.21.1130.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(c\,z^2\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{d^2(m-2k)^2}{4c}-i\,e\,(m-2k)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2k))^{n-j}\,(-i\,d\,(m-2k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{-\frac{d^2(m-2k)^2}{4c}+e\,i\,(m-2k)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(i\,d\,(m-2k)-2\,c\,z)^{j+1}\left(\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}-i\,e\,(m-2k)}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2k))^{n-j}$$

$$(2\,c\,z-i\,d\,(m-2k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}+e\,i\,(m-2k)}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(d\,i\,(m-2k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1131.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(\sqrt{z}\,c\right)dz == 2^{-m-2\,n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(i\,d\,(m-2k))^{-2(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,d\,(m-2k)}+e\,i\,(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^2}{d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\right.$$

$$\left.\binom{n}{j}\left(2\,i\,d\,(m-2k)\sqrt{\frac{i\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^2}{d\,(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(2\,i\,d\,(m-2k)\sqrt{z}-c\right)^2}{4\,d\,(m-2k)}\right)-\right.$$

$$c\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}+e\,i\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)$$

$$\sqrt{\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(-c\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\, c^{-2\,(n+1)} \binom{m}{\frac{m}{2}} \left(\Gamma\left(2\,(n+1),\, -c\,\sqrt{z}\right) + \Gamma\left(2\,(n+1),\, c\,\sqrt{z}\right)\right) (1 - m \bmod 2) \;/;\; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1} \cos^m\left(b\, z^r\right) \cosh\left(c\, z^r\right)$

01.20.21.1132.01

$$\int z^{\alpha-1} \cos^m\left(b\, z^r\right) \cosh\left(c\, z^r\right) dz == -\frac{2^{-m-1}\, z^{\alpha} \binom{m}{\frac{m}{2}} \left(\Gamma\left(\frac{\alpha}{r},\, -c\, z^r\right) \left(-c\, z^r\right)^{-\frac{\alpha}{r}} + \left(c\, z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r},\, c\, z^r\right)\right) (1 - m \bmod 2)}{r} -$$

$$\frac{1}{r}\, 2^{-m-1}\, z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\Gamma\left(\frac{\alpha}{r},\, (-c - 2\,i\,b\,k + i\,b\,m)\, z^r\right) \left((-c - 2\,i\,b\,k + i\,b\,m)\, z^r\right)^{-\frac{\alpha}{r}} + \left((c - 2\,i\,b\,k + i\,b\,m)\, z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r},\, (c - 2\,i\,b\,k + i\,b\,m)\, z^r\right) + \left((-c + 2\,i\,b\,k - i\,b\,m)\, z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r},\, (-c + 2\,i\,b\,k - i\,b\,m)\, z^r\right) + \left((c + 2\,i\,b\,k - i\,b\,m)\, z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r},\, (c + 2\,i\,b\,k - i\,b\,m)\, z^r\right)\right) /;\; m \in \mathbb{N}^+$$

01.20.21.1133.01

$$\int z^n \cos^m\left(b\, z^2\right) \cosh\left(c\, z^2\right) dz ==$$

$$-2^{-m-2} \binom{m}{\frac{m}{2}} \left(\Gamma\left(\frac{n+1}{2},\, -c\, z^2\right) \left(-c\, z^2\right)^{\frac{1}{2}(-n-1)} + \left(c\, z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2},\, c\, z^2\right)\right) (1 - m \bmod 2)\, z^{n+1} - 2^{-m-2}$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\Gamma\left(\frac{n+1}{2},\, (-c - 2\,i\,b\,k + i\,b\,m)\, z^2\right) \left((-c - 2\,i\,b\,k + i\,b\,m)\, z^2\right)^{\frac{1}{2}(-n-1)} + \left((c - 2\,i\,b\,k + i\,b\,m)\, z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2},\, (c - 2\,i\,b\,k + i\,b\,m)\, z^2\right) + \left((-c + 2\,i\,b\,k - i\,b\,m)\, z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2},\, (-c + 2\,i\,b\,k - i\,b\,m)\, z^2\right) + \left((c + 2\,i\,b\,k - i\,b\,m)\, z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2},\, (c + 2\,i\,b\,k - i\,b\,m)\, z^2\right)\right)\right) z^{n+1} /;\; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1134.01

$$\int z^n \cos^m\left(b\,\sqrt{z}\right) \cosh\left(c\,\sqrt{z}\right) dz == -2^{-m} \binom{m}{\frac{m}{2}} \left(\Gamma\left(2\,(n+1),\, -c\,\sqrt{z}\right) + \Gamma\left(2\,(n+1),\, c\,\sqrt{z}\right)\right) (1 - m \bmod 2)\, c^{-2\,(n+1)} -$$

$$2^{-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\Gamma\left(2\,(n+1),\, (-c - 2\,i\,b\,k + i\,b\,m)\,\sqrt{z}\right) (-c - 2\,i\,b\,k + i\,b\,m)^{-2\,(n+1)} + (c - 2\,i\,b\,k + i\,b\,m)^{-2\,(n+1)} \Gamma\left(2\,(n+1),\, (c - 2\,i\,b\,k + i\,b\,m)\,\sqrt{z}\right) + (-c + 2\,i\,b\,k - i\,b\,m)^{-2\,(n+1)} \Gamma\left(2\,(n+1),\, (-c + 2\,i\,b\,k - i\,b\,m)\,\sqrt{z}\right) + (c + 2\,i\,b\,k - i\,b\,m)^{-2\,(n+1)} \Gamma\left(2\,(n+1),\, (c + 2\,i\,b\,k - i\,b\,m)\,\sqrt{z}\right)\right) /;\; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1} \cos^m\left(b\, z^r + e\right) \cosh\left(c\, z^r\right)$

01.20.21.1135.01

$$\int z^{\alpha-1}\cos^m(b\,z^r+e)\cosh(c\,z^r)\,dz == -\frac{2^{-m-1}\,z^\alpha\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{\alpha}{r},-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},c\,z^r\right)\right)(1-m\bmod 2)}{r}-$$

$$\frac{1}{r}\,2^{-m-1}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{\alpha}{r},(-c-2\,i\,b\,k+i\,b\,m)\,z^r\right)((-c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{2\,i\,e\,k-i\,e\,m}\,((c-2\,i\,b\,k+i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2\,i\,b\,k+i\,b\,m)\,z^r\right)+e^{-2\,i\,e\,k+i\,e\,m}\,((-c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\Gamma\left(\frac{\alpha}{r},(-c+2\,i\,b\,k-i\,b\,m)\,z^r\right)+e^{-2\,i\,e\,k+i\,e\,m}\,((c+2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1136.01

$$\int z^n\cos^m\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(1-m\bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{n+1}{2},(-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)\left((-c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$e^{2\,i\,e\,k-i\,e\,m}\left((c-2\,i\,b\,k+i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(c-2\,i\,b\,k+i\,b\,m)\,z^2\right)+$$

$$e^{-2\,i\,e\,k+i\,e\,m}\left((-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(-c+2\,i\,b\,k-i\,b\,m)\,z^2\right)+$$

$$\left.\left.e^{-2\,i\,e\,k+i\,e\,m}\left((c+2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(c+2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)\right)z^{n+1}/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1137.01

$$\int z^n\cos^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c\right)dz == -2^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)(1-m\bmod 2)\,c^{-2\,(n+1)}-$$

$$2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),(-c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)(-c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}+\right.$$

$$e^{2\,i\,e\,k-i\,e\,m}\,(c-2\,i\,b\,k+i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(c-2\,i\,b\,k+i\,b\,m)\,\sqrt{z}\right)+$$

$$e^{-2\,i\,e\,k+i\,e\,m}\,(-c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)+$$

$$\left.e^{-2\,i\,e\,k+i\,e\,m}\,(c+2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(c+2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r\right)$

01.20.21.1138.01

$$\int z^n \cos^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{i\,d^2\,(m-2\,s)^2}{4\,(-i\,c-b\,m+2\,b\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c)\,z)^2}{i\,b\,(m-2\,s)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c)\,z)^2}{4\,(i\,b\,(m-2\,s)-c)}\right)\right)$$

$$(i\,b\,(m-2\,s)-c)^{-n-1}+e^{\frac{i\,d^2\,(m-2\,s)^2}{4\,(i\,c-b\,m+2\,b\,s)}}\,(c+b\,i\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,(c+b\,i\,(m-2\,s))\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,s)+2\,(c+b\,i\,(m-2\,s))\,z)^2}{c+b\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-\frac{(d\,i\,(m-2\,s)+2\,(c+b\,i\,(m-2\,s))\,z)^2}{4\,(c+b\,i\,(m-2\,s))}\right)+e^{-\frac{i\,d^2\,(m-2\,s)^2}{4\,(i\,c-b\,m+2\,b\,s)}}\,(-c-i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}$$

$$(2\,(-c-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^{j+1}\left(-\frac{(2\,(-c-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2}{-c-i\,b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2}{4\,(-c-i\,b\,(m-2\,s))}\right)+e^{-\frac{i\,d^2\,(m-2\,s)^2}{4\,(i\,c-b\,m+2\,b\,s)}}\,(c-i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(i\,d\,(m-2\,s))^{n-j}\,(2\,(c-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^{j+1}\left(-\frac{(2\,(c-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2}{c-i\,b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(c-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2}{4\,(c-i\,b\,(m-2\,s))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1139.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c\right)dz ==$$

$$2^{-m-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(i\,d\,(m-2\,s))^{-2\,(n+1)}\binom{m}{s}\left(e^{\frac{i\,(i\,b\,(m-2\,s)-c)^2}{4\,d\,(m-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c)^{-h-j+2\,n}\right.$$

$$\left.\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-\right.\right.$$

$$2\,i\,d\,(m-2\,s)\,\sqrt{z}\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\,\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$e^{-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-\right.\right.$$

$$2\,i\,d\,(m-2\,s)\,\sqrt{z}\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\,\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\Bigg)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(1-m\bmod 2)\;/;\;n\in\mathbb{N}\,\bigwedge$$

$m\in\mathbb{N}^+$

Involving $z^n\cos^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

01.20.21.1140.01

$$\int z^n \cos^m\left(b z^2+d z+e\right)\cosh\left(c z^2\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},-c z^2\right)\left(-c z^2\right)^{\frac{1}{2}(-n-1)}+\left(c z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c z^2\right)\right)(1-m \bmod 2)\, z^{n+1}-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-ic-bm+2bs}+4e(m-2s)\right)}\left(\sum_{j=0}^{n}2^{j-n}(-i d(m-2s))^{n-j}(d i(m-2s)+2(i b(m-2s)-c)z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(d i(m-2s)+2(i b(m-2s)-c)z)^2}{i b(m-2s)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d i(m-2s)+2(i b(m-2s)-c)z)^2}{4(i b(m-2s)-c)}\right)\right)$$

$$(i b(m-2s)-c)^{-n-1}+e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{ic-bm+2bs}+4e(m-2s)\right)}(c+b i(m-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-i d(m-2s))^{n-j}(d i(m-2s)+2(c+b i(m-2s))z)^{j+1}$$

$$\left(-\frac{(d i(m-2s)+2(c+b i(m-2s))z)^2}{c+b i(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d i(m-2s)+2(c+b i(m-2s))z)^2}{4(c+b i(m-2s))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{ic-bm+2bs}+4e(m-2s)\right)}(-c-i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(i d(m-2s))^{n-j}$$

$$(2(-c-i b(m-2s))z-i d(m-2s))^{j+1}\left(-\frac{(2(-c-i b(m-2s))z-i d(m-2s))^2}{-c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(-c-i b(m-2s))z-i d(m-2s))^2}{4(-c-i b(m-2s))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-ic-bm+2bs}+4e(m-2s)\right)}(c-i b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(i d(m-2s))^{n-j}$$

$$(2(c-i b(m-2s))z-i d(m-2s))^{j+1}\left(-\frac{(2(c-i b(m-2s))z-i d(m-2s))^2}{c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(c-i b(m-2s))z-i d(m-2s))^2}{4(c-i b(m-2s))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1141.01

$$\int z^n \cos^m\left(\sqrt{z}\ b+e+d z\right)\cosh\left(c\sqrt{z}\right) dz ==$$

$$2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(i d(m-2s))^{-2(n+1)}\binom{m}{s}\left(e^{\frac{i(i b(m-2s)-c)^2}{4d(m-2s)}+e i(m-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i b(m-2s)-c)^{-h-j+2n}\right.$$

$$\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+e\,i\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\right.$$

$$\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)(1-m\bmod 2)\;/;\;n\in\mathbb{N}\bigwedge$$

$m\in\mathbb{N}^+$

Involving $z^n\cos^m(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.1142.01

$$\int z^n \cos^m(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{d^2(m-2k)^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+e^{-\frac{d^2(m-2k)^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\right.$$

$$\left.\left.(i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\left(\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(2\,c\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,z-i\,d\,(m-2\,k))^2}{4\,c}\right)+c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1143.01

$$\int z^n \cos^m(d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz == 2^{-m-2\,n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(i\,d\,(m-2\,k))^{-2\,(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\right.$$

$$\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$\left.\left.c\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\;-c\right)^2}{4\,d\,(m-2\,k)}\right)\right)+\right.$$

$$e^{\frac{i c^2}{4 d (m-2 k)}+g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j c^{-h-j+2 n} \left(c+2 d i (m-2 k) \sqrt{z}\right)^{h+j} \left(\frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c \left(c+2 d i (m-2 k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)+\right.$$

$$\left. 2 d i (m-2 k) \sqrt{\frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{i \left(c+2 d i (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)\right)+$$

$$e^{-\frac{i c^2}{4 d (m-2 k)}-g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c)^{-h-j+2 n} \left(-c-2 i d (m-2 k) \sqrt{z}\right)^{h+j} \left(-\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-c \left(-c-2 i d (m-2 k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)-\right.$$

$$\left. 2 i d (m-2 k) \sqrt{-\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i \left(-c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)\right)+$$

$$e^{g-\frac{i c^2}{4 d (m-2 k)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j c^{-h-j+2 n} \left(c-2 i d (m-2 k) \sqrt{z}\right)^{h+j} \left(-\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c \left(c-2 i d (m-2 k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)-\right.$$

$$\left.\left. 2 i d (m-2 k) \sqrt{-\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{d (m-2 k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i \left(c-2 i d (m-2 k) \sqrt{z}\right)^2}{4 d (m-2 k)}\right)\right)\right)-$$

$$2^{-m} c^{-2 (n+1)} \binom{m}{\frac{m}{2}} \left(e^g \Gamma\left(2 (n+1), -c \sqrt{z}\right)+e^{-g} \Gamma\left(2 (n+1), c \sqrt{z}\right)\right) (1-m \bmod 2) /; n \in \mathbb{N} \bigwedge$$

$m \in \mathbb{N}^+$

Involving $z^n \cos^m(d\,z+e)\cosh(c\,z^r+g)$

01.20.21.1144.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{d^2(m-2k)^2}{4c}-i\,e\,(m-2k)-g}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2k))^{n-j}\,(-i\,d\,(m-2k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{-\frac{d^2(m-2k)^2}{4c}+e\,i\,(m-2k)-g}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(i\,d\,(m-2k)-2\,c\,z)^{j+1}\left(\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}-i\,e\,(m-2k)+g}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2k))^{n-j}$$

$$(2\,c\,z-i\,d\,(m-2k))^{j+1}\left(-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,z-i\,d\,(m-2k))^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{\frac{d^2(m-2k)^2}{4c}+e\,i\,(m-2k)+g}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(d\,i\,(m-2k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2k)+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1145.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz == 2^{-m-2\,n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(i\,d\,(m-2k))^{-2(n+1)}$$

$$\left(e^{\frac{i\,c^2}{4\,d\,(m-2k)}-g+e\,i\,(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,i\,d\,(m-2k)\,\sqrt{z}\;-c\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2k)\,\sqrt{z}\;-c\right)^2}{d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2k)\sqrt{\frac{i\left(2\,i\,d\,(m-2k)\,\sqrt{z}\;-c\right)^2}{d\,(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2k)\,\sqrt{z}\;-c\right)^2}{4\,d\,(m-2k)}\right)-$$

$$c\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,c^2}{4\,d\,(m-2\,k)}+g+e\,i\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)$$

$$\sqrt{\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(c+2\,d\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}-g-i\,e\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(-c\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{-\frac{i\,c^2}{4\,d\,(m-2\,k)}+g-i\,e\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\, c^{-2\,(n+1)} \binom{m}{\frac{m}{2}} \left(e^{g}\, \Gamma\left(2\,(n+1),\, -c\,\sqrt{z}\right) + e^{-g}\, \Gamma\left(2\,(n+1),\, c\,\sqrt{z}\right)\right)$$

$$(1 - m \bmod 2)\ /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^{+}$$

Involving $z^{\alpha-1} \cos^{m}(b\, z^{r}) \cosh(c\, z^{r} + g)$

01.20.21.1146.01

$$\int z^{\alpha-1} \cos^{m}(b\, z^{r}) \cosh(c\, z^{r} + g)\, dz == -\frac{2^{-m-1}\, z^{\alpha} \binom{m}{\frac{m}{2}} \left(e^{g}\, \Gamma\left(\frac{\alpha}{r},\, -c\, z^{r}\right) (-c\, z^{r})^{-\frac{\alpha}{r}} + e^{-g}\, (c\, z^{r})^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, c\, z^{r}\right)\right) (1 - m \bmod 2)}{r} -$$

$$\frac{1}{r}\, 2^{-m-1}\, z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{g}\, \Gamma\left(\frac{\alpha}{r},\, (-c - 2\,i\,b\,k + i\,b\,m)\, z^{r}\right) ((-c - 2\,i\,b\,k + i\,b\,m)\, z^{r})^{-\frac{\alpha}{r}} +\right.$$

$$e^{-g}\, ((c - 2\,i\,b\,k + i\,b\,m)\, z^{r})^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (c - 2\,i\,b\,k + i\,b\,m)\, z^{r}\right) + e^{g}\, ((-c + 2\,i\,b\,k - i\,b\,m)\, z^{r})^{-\frac{\alpha}{r}}$$

$$\left.\Gamma\left(\frac{\alpha}{r},\, (-c + 2\,i\,b\,k - i\,b\,m)\, z^{r}\right) + e^{-g}\, ((c + 2\,i\,b\,k - i\,b\,m)\, z^{r})^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (c + 2\,i\,b\,k - i\,b\,m)\, z^{r}\right)\right)\ /;\ m \in \mathbb{N}^{+}$$

01.20.21.1147.01

$$\int z^{n} \cos^{m}\left(b\, z^{2}\right) \cosh\left(c\, z^{2} + g\right) dz ==$$

$$-2^{-m-2} \binom{m}{\frac{m}{2}} \left(e^{g}\, \Gamma\left(\frac{n+1}{2},\, -c\, z^{2}\right) \left(-c\, z^{2}\right)^{\frac{1}{2}(-n-1)} + e^{-g} \left(c\, z^{2}\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, c\, z^{2}\right)\right) (1 - m \bmod 2)\, z^{n+1} -$$

$$2^{-m-2} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{g}\, \Gamma\left(\frac{n+1}{2},\, (-c - 2\,i\,b\,k + i\,b\,m)\, z^{2}\right) \left((-c - 2\,i\,b\,k + i\,b\,m)\, z^{2}\right)^{\frac{1}{2}(-n-1)} + e^{-g} \left((c - 2\,i\,b\,k + i\,b\,m)\, z^{2}\right)^{\frac{1}{2}(-n-1)}\right.\right.$$

$$\Gamma\left(\frac{n+1}{2},\, (c - 2\,i\,b\,k + i\,b\,m)\, z^{2}\right) + e^{g} \left((-c + 2\,i\,b\,k - i\,b\,m)\, z^{2}\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (-c + 2\,i\,b\,k - i\,b\,m)\, z^{2}\right) +$$

$$\left.\left. e^{-g} \left((c + 2\,i\,b\,k - i\,b\,m)\, z^{2}\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (c + 2\,i\,b\,k - i\,b\,m)\, z^{2}\right)\right)\right) z^{n+1}\ /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^{+}$$

01.20.21.1148.01

$$\int z^{n} \cos^{m}\left(b\,\sqrt{z}\right) \cosh\left(\sqrt{z}\ c + g\right) dz ==$$

$$-2^{-m} \binom{m}{\frac{m}{2}} \left(e^{g}\, \Gamma\left(2\,(n+1),\, -c\,\sqrt{z}\right) + e^{-g}\, \Gamma\left(2\,(n+1),\, c\,\sqrt{z}\right)\right) (1 - m \bmod 2)\, (-c)^{-2\,(n+1)} -$$

$$2^{-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{g}\, \Gamma\left(2\,(n+1),\, (-c - 2\,i\,b\,k + i\,b\,m)\,\sqrt{z}\right) (-c - 2\,i\,b\,k + i\,b\,m)^{-2\,(n+1)} + e^{-g}\, (c - 2\,i\,b\,k + i\,b\,m)^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\, (c - 2\,i\,b\,k + i\,b\,m)\,\sqrt{z}\right) + e^{g}\, (-c + 2\,i\,b\,k - i\,b\,m)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1),\, (-c + 2\,i\,b\,k - i\,b\,m)\,\sqrt{z}\right) +$$

$$\left. e^{-g}\, (c + 2\,i\,b\,k - i\,b\,m)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1),\, (c + 2\,i\,b\,k - i\,b\,m)\,\sqrt{z}\right)\right)\ /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^{+}$$

Involving $z^{\alpha-1}\cos^m(b\,z^r+e)\cosh(c\,z^r+g)$

01.20.21.1149.01

$$\int z^{\alpha-1}\cos^m(b\,z^r+e)\cosh(c\,z^r+g)\,dz == -\frac{2^{-m-1}\,z^\alpha\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{\alpha}{r},-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+e^{-g}\,(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$

$$\frac{1}{r}2^{-m-1}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{g+2iek-iem}\,\Gamma\left(\frac{\alpha}{r},(-c-2ibk+ibm)\,z^r\right)((-c-2ibk+ibm)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-g+2iek-iem}\,((c-2ibk+ibm)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2ibk+ibm)\,z^r\right)+e^{g-2iek+iem}\,((-c+2ibk-ibm)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\Gamma\left(\frac{\alpha}{r},(-c+2ibk-ibm)\,z^r\right)+e^{-g-2iek+iem}\,((c+2ibk-ibm)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2ibk-ibm)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1150.01

$$\int z^n\cos^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{g+2iek-iem}\,\Gamma\left(\frac{n+1}{2},(-c-2ibk+ibm)\,z^2\right)\left((-c-2ibk+ibm)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$e^{-g+2iek-iem}\left((c-2ibk+ibm)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(c-2ibk+ibm)\,z^2\right)+$$

$$e^{g-2iek+iem}\left((-c+2ibk-ibm)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(-c+2ibk-ibm)\,z^2\right)+$$

$$\left.\left.e^{-g-2iek+iem}\left((c+2ibk-ibm)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(c+2ibk-ibm)\,z^2\right)\right)\right)z^{n+1}\,/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1151.01

$$\int z^n\cos^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$-2^{-m}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)(1-m \bmod 2)\,c^{-2\,(n+1)}-$$

$$2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{g+2iek-iem}\,\Gamma\left(2\,(n+1),(-c-2ibk+ibm)\,\sqrt{z}\right)(-c-2ibk+ibm)^{-2\,(n+1)}+\right.$$

$$e^{-g+2iek-iem}\,(c-2ibk+ibm)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(c-2ibk+ibm)\,\sqrt{z}\right)+$$

$$e^{g-2iek+iem}\,(-c+2ibk-ibm)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-c+2ibk-ibm)\,\sqrt{z}\right)+$$

$$\left.e^{-g-2iek+iem}\,(c+2ibk-ibm)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(c+2ibk-ibm)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\cos^m(b\,z^r+d\,z)\cosh(c\,z^r+g)$

01.20.21.1152.01

$$\int z^n \cos^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-i\,c-b\,m+2\,b\,s}+4\,i\,g\right)}\left(\sum_{j=0}^{n}2^{j-n}\left(-i\,d\,(m-2\,s)\right)^{n-j}\left(d\,i\,(m-2\,s)+2\left(i\,b\,(m-2\,s)-c\right)z\right)^{j+1}\right.\right.$$

$$\left.\left(-\frac{\left(d\,i\,(m-2\,s)+2\left(i\,b\,(m-2\,s)-c\right)z\right)^2}{i\,b\,(m-2\,s)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(d\,i\,(m-2\,s)+2\left(i\,b\,(m-2\,s)-c\right)z\right)^2}{4\left(i\,b\,(m-2\,s)-c\right)}\right)\right)$$

$$\left(i\,b\,(m-2\,s)-c\right)^{-n-1}+e^{-\frac{1}{4}i\left(4\,i\,g-\frac{d^2(m-2s)^2}{i\,c-b\,m+2\,b\,s}\right)}\left(c+b\,i\,(m-2\,s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(-i\,d\,(m-2\,s)\right)^{n-j}\left(d\,i\,(m-2\,s)+2\left(c+b\,i\,(m-2\,s)\right)z\right)^{j+1}$$

$$\left(-\frac{\left(d\,i\,(m-2\,s)+2\left(c+b\,i\,(m-2\,s)\right)z\right)^2}{c+b\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(d\,i\,(m-2\,s)+2\left(c+b\,i\,(m-2\,s)\right)z\right)^2}{4\left(c+b\,i\,(m-2\,s)\right)}\right)+$$

$$e^{\frac{1}{4}i\left(4\,i\,g-\frac{d^2(m-2s)^2}{i\,c-b\,m+2\,b\,s}\right)}\left(-c-i\,b\,(m-2\,s)\right)^{-n-1}\sum_{j=0}^{n}2^{j-n}\left(i\,d\,(m-2\,s)\right)^{n-j}\left(2\left(-c-i\,b\,(m-2\,s)\right)z-i\,d\,(m-2\,s)\right)^{j+1}$$

$$\left(-\frac{\left(2\left(-c-i\,b\,(m-2\,s)\right)z-i\,d\,(m-2\,s)\right)^2}{-c-i\,b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{\left(2\left(-c-i\,b\,(m-2\,s)\right)z-i\,d\,(m-2\,s)\right)^2}{4\left(-c-i\,b\,(m-2\,s)\right)}\right)+e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-i\,c-b\,m+2\,b\,s}+4\,i\,g\right)}\left(c-i\,b\,(m-2\,s)\right)^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$\left(i\,d\,(m-2\,s)\right)^{n-j}\left(2\left(c-i\,b\,(m-2\,s)\right)z-i\,d\,(m-2\,s)\right)^{j+1}\left(-\frac{\left(2\left(c-i\,b\,(m-2\,s)\right)z-i\,d\,(m-2\,s)\right)^2}{c-i\,b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2\left(c-i\,b\,(m-2\,s)\right)z-i\,d\,(m-2\,s)\right)^2}{4\left(c-i\,b\,(m-2\,s)\right)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1153.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(i\,d\,(m-2\,s)\right)^{-2\,(n+1)}\binom{m}{s}\left(e^{\frac{i\left(i\,b\,(m-2\,s)-c\right)^2}{4\,d\,(m-2\,s)}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\left(i\,b\,(m-2\,s)-c\right)^{-h-j+2\,n}\right.$$

$$\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\right.$$

$$\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{g-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)$$

(1 −
m
mod
2) /; $n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$

Involving $z^n\cos^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1154.01

$$\int z^n \cos^m\left(b z^2+d z+e\right)\cosh\left(c z^2+g\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{n+1}{2},-c z^2\right)\left(-c z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c z^2\right)\right)(1-m \bmod 2)\,z^{n+1}-$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-i c-b m+2 b s}+4 e(m-2s)+4 i g\right)}\left(\sum_{j=0}^{n}2^{j-n}\left(-i d(m-2s)\right)^{n-j}\left(d i(m-2s)+2\left(i b(m-2s)-c\right)z\right)^{j+1}\right.\right.$$

$$\left.\left.\left(-\frac{\left(d i(m-2s)+2\left(i b(m-2s)-c\right)z\right)^2}{i b(m-2s)-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(d i(m-2s)+2\left(i b(m-2s)-c\right)z\right)^2}{4\left(i b(m-2s)-c\right)}\right)\right)$$

$$\left(i b(m-2s)-c\right)^{-n-1}+e^{-\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{i c-b m+2 b s}-4 e(m-2s)+4 i g\right)}\left(c+b i(m-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(-i d(m-2s)\right)^{n-j}\left(d i(m-2s)+2\left(c+b i(m-2s)\right)z\right)^{j+1}$$

$$\left(-\frac{\left(d i(m-2s)+2\left(c+b i(m-2s)\right)z\right)^2}{c+b i(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(d i(m-2s)+2\left(c+b i(m-2s)\right)z\right)^2}{4\left(c+b i(m-2s)\right)}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{i c-b m+2 b s}-4 e(m-2s)+4 i g\right)}\left(-c-i b(m-2s)\right)^{-n-1}\sum_{j=0}^{n}2^{j-n}\left(i d(m-2s)\right)^{n-j}$$

$$\left(2\left(-c-i b(m-2s)\right)z-i d(m-2s)\right)^{j+1}\left(-\frac{\left(2\left(-c-i b(m-2s)\right)z-i d(m-2s)\right)^2}{-c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2\left(-c-i b(m-2s)\right)z-i d(m-2s)\right)^2}{4\left(-c-i b(m-2s)\right)}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{-i c-b m+2 b s}+4 e(m-2s)+4 i g\right)}\left(c-i b(m-2s)\right)^{-n-1}\sum_{j=0}^{n}2^{j-n}\left(i d(m-2s)\right)^{n-j}$$

$$\left(2\left(c-i b(m-2s)\right)z-i d(m-2s)\right)^{j+1}\left(-\frac{\left(2\left(c-i b(m-2s)\right)z-i d(m-2s)\right)^2}{c-i b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2\left(c-i b(m-2s)\right)z-i d(m-2s)\right)^2}{4\left(c-i b(m-2s)\right)}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1155.01

$$\int z^n \cos^m\left(\sqrt{z}\ b+e+d z\right)\cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(i d(m-2s)\right)^{-2(n+1)}\binom{m}{s}\left(e^{\frac{i\left(i b(m-2s)-c\right)^2}{4 d(m-2s)}-g+e i(m-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\left(i b(m-2s)-c\right)^{-h-j+2n}\right.$$

$$\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b\,(m-2\,s)-c)\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(-c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{\frac{i\,(c+b\,i\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g+e\,i\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,s))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c+b\,i\,(m-2\,s))\right.$$

$$\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\sqrt{\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(c+b\,i\,(m-2\,s)+2\,d\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(-c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-g-i\,e\,(m-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(c-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g-i\,e\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(c-i\,b\,(m-2\,s)-2\,i\,d\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m}\,c^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),c\,\sqrt{z}\right)\right)$$

(1 −
m
mod
2) /; $n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$

Involving $z^n\cos^m(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1156.01

$$\int z^n \cos^m(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1157.01

$$\int z^n \cos^m(d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{-\frac{c^2}{4\,i\,d\,(m-2k)-f)}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2\,k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2\,k)-f)$$

$$\sqrt{-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2\,k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)\Bigg)\Bigg)$$

$$(i\,d\,(m-2\,k)-f)^{-2(n+1)}+e^{-\frac{c^2}{4\,(f+d\,i\,(m-2\,k))}}\,(f+d\,i\,(m-2\,k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}$$

$$\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(c\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}}\;(f+d\,i\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{c^2}{4\,(-f-i\,d\,(m-2\,k))}}\,(-f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{-f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-f-i\,d\,(m-2\,k))\right.$$

$$\sqrt{-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{-f-i\,d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)-$$

$$c\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-f-i\,d\,(m-2\,k))\,\sqrt{z}\,-c\right)^2}{4\,(-f-i\,d\,(m-2\,k))}\right)+$$

$$e^{-\frac{c^2}{4\,(f-i\,d\,(m-2\,k))}}\,(f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\right)+2\sqrt{-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}}\right.$$

$$\left.(f-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(f-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f-i\,d\,(m-2\,k))}\right)\right)\Big/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1158.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}+e\,i\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.$$

$$\left.\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{i\,e\,(m-2\,k)-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}-i\,e\,(m-2\,k)}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1159.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{i\,e\,(m-2k)-\frac{c^2}{4(i\,d\,(m-2k)-f)}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}-c\right)^2}{i\,d\,(m-2\,k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2\,k)-f)$$

$$\sqrt{-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}-c\right)^2}{i\,d\,(m-2\,k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}-c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)\Bigg)\Bigg)$$

$$(i\,d\,(m-2\,k)-f)^{-2(n+1)}+e^{i\,e\,(m-2k)-\frac{c^2}{4(f+d\,i\,(m-2k))}}\,(f+d\,i\,(m-2\,k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}}\ (f+d\,i\,(m-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(c+2\left(f+d\,i\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f+d\,i\,(m-2\,k)\right)}\right)+e^{-\frac{c^2}{4(-f-i\,d\,(m-2\,k))}-i\,e\,(m-2\,k)}$$

$$(-f-i\,d\,(m-2\,k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^{h+j}$$

$$\left(-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\left(-f-i\,d\,(m-2\,k)\right)\right.$$

$$\sqrt{-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{4\left(-f-i\,d\,(m-2\,k)\right)}\right)-$$

$$c\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{4\left(-f-i\,d\,(m-2\,k)\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d\,(m-2\,k))}-i\,e\,(m-2\,k)}\,(f-i\,d\,(m-2\,k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f-i\,d\,(m-2\,k)\right)}\right)+2\sqrt{-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}}$$

$$\left.\left.(f-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f-i\,d\,(m-2\,k)\right)}\right)\right)\right)\Bigg/;\;n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1160.01

$$\int z^n \cos^m\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{i\,f^2}{4(-i\,c+2\,b\,k-b\,m)}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)(i\,b\,(m-2\,k)-c)^{-n-1}+$$

$$e^{\frac{i\,f^2}{4(-i\,c-2\,b\,k+b\,m)}}\,(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{i\,f^2}{4(-i\,c-2\,b\,k+b\,m)}}\,(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{\frac{i\,f^2}{4(-i\,c+2\,b\,k-b\,m)}}\,(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1161.01

$$\int z^n \cos^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{\frac{(i\,b\,(m-2k)-c)^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k)-c)^{-h-j+2n}\right.$$

$$\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,k)-c)\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\,\sqrt{\frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{(-c-i\,b\,(m-2k))^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,k))^{-h-j+2n}\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-i\,b\,(m-2\,k))\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2$$

$$f\sqrt{\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,k))^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+b\,i\,(m-2\,k))^{-h-j+2\,n}\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c+b\,i\,(m-2\,k))\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c+b\,i\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(c-i\,b\,(m-2\,k))^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c-i\,b\,(m-2\,k))\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c-i\,b\,(m-2\,k)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)f^{-2\,(n+1)}\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1162.01

$$\int z^n \cos^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{1}{4}i\left(4\,e\,(m-2\,k)-\frac{f^2}{-i\,c+2\,b\,k-b\,m}\right)}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)(i\,b\,(m-2\,k)-c)^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}+4\,e\,(m-2\,k)\right)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}+4\,e\,(m-2\,k)\right)}(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(4\,e\,(m-2\,k)-\frac{f^2}{-i\,c+2\,b\,k-b\,m}\right)}(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1163.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\,f^{-2(n+1)}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{\frac{(i\,b\,(m-2k)-c)^2}{4f}+e\,i\,(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2k)-c)^{-h-j+2n}$$

$$\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2k)-c)\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-$$

$$2\,f\,\sqrt{\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{(-c-i\,b\,(m-2k))^2}{4f}-i\,e\,(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2k))^{-h-j+2n}\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-i\,b\,(m-2k))\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-$$

$$2 f \sqrt{\frac{\left(-c - i b (m-2k) - 2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c - i b (m-2k) - 2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg) +$$

$$e^{-\frac{(c+b i (m-2k))^2}{4 f} + e i (m-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c + b i (m-2k))^{-h-j+2n} \left(c + b i (m-2k) + 2 f \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\Bigg((c + b i (m-2k)) \left(c + b i (m-2k) + 2 f \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\right) +$$

$$2 \sqrt{-\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{f}}\ f \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg) +$$

$$e^{-\frac{(c-i b (m-2k))^2}{4 f} - i e (m-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c - i b (m-2k))^{-h-j+2n} \left(c - i b (m-2k) + 2 f \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \Bigg((c - i b (m-2k)) \left(c - i b (m-2k) + 2 f \sqrt{z}\right) \Gamma\Bigg($$

$$\frac{1}{2}(h+j+1), -\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\Bigg) + 2 \sqrt{-\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{f}}\ f \Gamma\Bigg($$

$$\frac{1}{2}(h+j+2), -\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\Bigg)\Bigg)\Bigg) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + d z) \cosh(c z^r + f z)$

01.20.21.4940.01

$$\int z^n \cos^m\left(b z^2 + d z\right) \cosh\left(c z^2 + f z\right) dz ==$$

$$-2^{-m-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \Bigg((-1)^{n-1} e^{\frac{f^2}{4c}} \sum_{q=0}^{n} 2^{q-n} f^{n-q} (-f - 2 c z)^{q+1} \left(\frac{(f + 2 c z)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f + 2 c z)^2}{4 c}\right) +$$

$$e^{-\frac{f^2}{4c}}\sum_{q=0}^{n}2^{q-n}(-f)^{n-q}(f+2cz)^{q+1}\left(-\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2cz)^2}{4c}\right)c^{-n-1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(id(2k-m)-f)^2}{4(ib(2k-m)-c)}}\left(\sum_{q=0}^{n}2^{q-n}(f-id(2k-m))^{n-q}(-f+di(2k-m)+2(ib(2k-m)-c)z)^{q+1}\right.\right.$$

$$\left(-\frac{(-f+di(2k-m)+2(ib(2k-m)-c)z)^2}{ib(2k-m)-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(-f+di(2k-m)+2(ib(2k-m)-c)z)^2}{4(ib(2k-m)-c)}\right)\right)(ib(2k-m)-c)^{-n-1}+$$

$$e^{-\frac{(f+di(2k-m))^2}{4(c+bi(2k-m))}}(c+bi(2k-m))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-id(2k-m))^{n-q}(f+di(2k-m)+2(c+bi(2k-m))z)^{q+1}$$

$$\left(-\frac{(f+di(2k-m)+2(c+bi(2k-m))z)^2}{c+bi(2k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(f+di(2k-m)+2(c+bi(2k-m))z)^2}{4(c+bi(2k-m))}\right)+$$

$$e^{-\frac{(id(m-2k)-f)^2}{4(ib(m-2k)-c)}}(ib(m-2k)-c)^{-n-1}\sum_{q=0}^{n}2^{q-n}(f-id(m-2k))^{n-q}(-f+di(m-2k)+2(ib(m-2k)-c)z)^{q+1}$$

$$\left(-\frac{(-f+di(m-2k)+2(ib(m-2k)-c)z)^2}{ib(m-2k)-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-f+di(m-2k)+2(ib(m-2k)-c)z)^2}{4(ib(m-2k)-c)}\right)+$$

$$e^{-\frac{(f+di(m-2k))^2}{4(c+bi(m-2k))}}(c+bi(m-2k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-id(m-2k))^{n-q}(f+di(m-2k)+2(c+bi(m-2k))z)^{q+1}$$

$$\left(-\frac{(f+di(m-2k)+2(c+bi(m-2k))z)^2}{c+bi(m-2k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(f+di(m-2k)+2(c+bi(m-2k))z)^2}{4(c+bi(m-2k))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1164.01

$$\int z^n \cos^m\left(\sqrt{z}\ b + d\,z\right) \cosh\left(\sqrt{z}\ c + f\,z\right) dz == 2^{-m-2\,n-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-c)^{-h-k+2\,n} \left(-c - 2\,f\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-c \left(-c - 2\,f\,\sqrt{z}\right) \right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) - 2\,f \sqrt{\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) \Bigg) +$$

$$e^{-\frac{c^2}{4\,f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, c^{-h-k+2\,n} \left(c + 2\,f\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(c \left(c + 2\,f\,\sqrt{z}\right) \right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) + 2 \sqrt{-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) \right) \right)$$

$$f^{-2\,n-2} + 2^{-m-2\,n-2} \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \left(e^{-\frac{(i\,b\,(2\,j-m)-c)^2}{4\,(i\,d\,(2\,j-m)-f)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (i\,b\,(2\,j-m) - c)^{-h-k+2\,n} \left(-c + b\,i\,(2\,j-m) + \right.\right.\right.$$

$$\left.\left.\left. 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z} \right)^{h+k} \left(-\frac{\left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right)^2}{i\,d\,(2\,j-m) - f} \right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\binom{k}{h} \binom{n}{k} \left((i\,b\,(2\,j-m) - c) \left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,j-m) - f)} \right) + 2$$

$$\left.\left.\left. \sqrt{-\frac{\left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right)^2}{i\,d\,(2\,j-m) - f}}\ (i\,d\,(2\,j-m) - f) \right) \right) \right)$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(-c+b\,i\,(2\,j-m)+2\,(i\,d\,(2\,j-m)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,j-m)-f)}\right)\Bigg)\Bigg)(i\,d\,(2\,j-m)-f)^{-2\,n-2}+$$

$$e^{-\frac{(c+b\,i\,(2\,j-m))^2}{4\,(f+d\,i\,(2\,j-m))}}\,(f+d\,i\,(2\,j-m))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,i\,(2\,j-m))^{-h-k+2\,n}$$

$$\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,j-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(\Bigg(c+b\,i\,(2\,j-m)\Bigg)\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\,-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,j-m)}}\;(f+d\,i\,(2\,j-m))\,\Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\Bigg)\Bigg)+e^{-\frac{(i\,b\,(m-2\,j)-c)^2}{4\,(i\,d\,(m-2\,j)-f)}}\,(i\,d\,(m-2\,j)-f)^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,(m-2\,j)-c)^{-h-k+2\,n}\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((i\,b\,(m-2\,j)-c)\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\,-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}}\;(i\,d\,(m-2\,j)-f)\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\right)+e^{-\frac{(c+b\,i\,(m-2\,j))^2}{4\,(f+d\,i\,(m-2\,j))}}\,(f+d\,i\,(m-2\,j))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,i\,(m-2\,j))^{-h-k+2\,n}\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,i\,(m-2\,j))\left(c+b\,i\,(m-2\,j)+\right.\right.$$

$$\left.2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}}\;(f+d\,i\,(m-2\,j))\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)\right)\Bigg/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\cos^m(b\,z^r+d\,z+e)\cosh(c\,z^r+f\,z)$

01.20.21.1165.01

$$\int z^n\cos^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left((-1)^{n-1}\,e^{\frac{f^2}{4\,c}}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f-2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$e^{-\frac{f^2}{4\,c}}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)c^{-n-1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(i\,d\,(2\,k-m)-f)^2}{4\,(i\,b\,(2\,k-m)-c)}+e\,i\,(2\,k-m)}\left(\sum_{q=0}^{n}2^{q-n}\,(f-i\,d\,(2\,k-m))^{n-q}\,(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^{q+1}\right.\right.$$

$$\left(-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{i\,b\,(2\,k-m)-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{4\,(i\,b\,(2\,k-m)-c)}\right)\Bigg)(i\,b\,(2\,k-m)-c)^{-n-1}+$$

$$e^{-\frac{(f+d\,i\,(2\,k-m))^2}{4\,(c+b\,i\,(2\,k-m))}+e\,i\,(2\,k-m)}(c+b\,i\,(2\,k-m))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-i\,d\,(2\,k-m))^{n-q}$$

$$(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^{q+1}\left(-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{c+b\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{4\,(c+b\,i\,(2\,k-m))}\right)+$$

$$e^{-\frac{(i\,d\,(m-2\,k)-f)^2}{4\,(i\,b\,(m-2\,k)-c)}+e\,i\,(m-2\,k)}(i\,b\,(m-2\,k)-c)^{-n-1}\sum_{q=0}^{n}2^{q-n}(f-i\,d\,(m-2\,k))^{n-q}$$

$$(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^{q+1}\left(-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)+$$

$$e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,(c+b\,i\,(m-2\,k))}+e\,i\,(m-2\,k)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-i\,d\,(m-2\,k))^{n-q}$$

$$(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^{q+1}\left(-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)\Bigg)/;\,n\in\mathbb{N}\wedge m\in\mathbb{Z}\wedge m>0$$

01.20.21.1166.01

$$\int z^n\cos^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz==2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\Bigg(e^{\frac{c^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(-c\left(-c-2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4f}} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, c^{-h-k+2n} \left(c+2f\sqrt{z}\right)^{h+k} \left(-\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(c\left(c+2f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right) + 2\sqrt{-\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\; f\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)$$

$$f^{-2n-2} + 2^{-m-2n-2} \sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{j} \left(e^{ie(2j-m)-\frac{(ib(2j-m)-c)^2}{4(id(2j-m)-f)}} \left(\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (ib(2j-m)-c)^{-h-k+2n} \left(-c+bi(2j-m)+\right.\right.\right.$$

$$\left.\left.\left. 2(id(2j-m)-f)\sqrt{z}\right)^{h+k} \left(-\frac{\left(-c+bi(2j-m)+2(id(2j-m)-f)\sqrt{z}\right)^2}{id(2j-m)-f}\right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\binom{k}{h}\binom{n}{k} \left((ib(2j-m)-c)\left(-c+bi(2j-m)+2(id(2j-m)-f)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(-c+bi(2j-m)+2(id(2j-m)-f)\sqrt{z}\right)^2}{4(id(2j-m)-f)}\right) + 2$$

$$\sqrt{-\frac{\left(-c+bi(2j-m)+2(id(2j-m)-f)\sqrt{z}\right)^2}{id(2j-m)-f}}\; (id(2j-m)-f)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(-c+bi(2j-m)+2(id(2j-m)-f)\sqrt{z}\right)^2}{4(id(2j-m)-f)}\right)\right)\right) (id(2j-m)-f)^{-2n-2} +$$

$$e^{ie(2j-m)-\frac{(c+bi(2j-m))^2}{4(f+di(2j-m))}} (f+di(2j-m))^{-2n-2} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (c+bi(2j-m))^{-h-k+2n}$$

$$\left(c+bi(2j-m)+2(f+di(2j-m))\sqrt{z}\right)^{h+k} \left(-\frac{\left(c+bi(2j-m)+2(f+di(2j-m))\sqrt{z}\right)^2}{f+di(2j-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left((c+bi(2j-m))\left(c+bi(2j-m)+2(f+di(2j-m))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}(h+k+1),\ -\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,j-m)}}\ (f+d\,i\,(2\,j-m))\,\Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\Bigg)\Bigg)+e^{i\,e\,(m-2\,j)-\frac{(i\,b\,(m-2\,j)-c)^2}{4\,(i\,d\,(m-2\,j)-f)}}\,(i\,d\,(m-2\,j)-f)^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,(m-2\,j)-c)^{-h-k+2\,n}\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((i\,b\,(m-2\,j)-c)\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\ -\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}}\ (i\,d\,(m-2\,j)-f)\,\Gamma\Bigg($$

$$\frac{1}{2}(h+k+2),\ -\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\Bigg)\Bigg)+$$

$$e^{i\,e\,(m-2\,j)-\frac{(c+b\,i\,(m-2\,j))^2}{4\,(f+d\,i\,(m-2\,j))}}\,(f+d\,i\,(m-2\,j))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,i\,(m-2\,j))^{-h-k+2\,n}$$

$$\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((c+b\,i\,(m-2\,j))\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)+2\sqrt{-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}}\,(f+d\,i\,(m-2\,j))\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1167.01

$$\int z^n \cos^m(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.$$

$$\left.\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{g-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{g-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1168.01

$$\int z^n \cos^m(d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{-\frac{c^2}{4\,i\,d\,(m-2k)-f)}-g}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2\,k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2\,k)-f)$$

$$\sqrt{-\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2\,k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2\,k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2\,k)-f)}\right)\Bigg)\Bigg)$$

$$(i\,d\,(m-2\,k)-f)^{-2(n+1)}+e^{g-\frac{c^2}{4\,(f+d\,i\,(m-2\,k))}}\,(f+d\,i\,(m-2\,k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2\,k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,k)}}\ (f+d\,i\,(m-2\,k))\,\Gamma\Bigg($$

$$\frac{1}{2}(h+j+2),-\frac{\left(c+2(f+d\,i\,(m-2k))\sqrt{z}\right)^2}{4(f+d\,i\,(m-2k))}\Bigg)+$$

$$e^{-\frac{c^2}{4(-f-i\,d\,(m-2k))}-g}(-f-i\,d\,(m-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^{h+j}$$

$$\left(-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2(-f-i\,d\,(m-2k))$$

$$\sqrt{-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{4(-f-i\,d\,(m-2k))}\right)-$$

$$c\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-f-i\,d\,(m-2k))\sqrt{z}-c\right)^2}{4(-f-i\,d\,(m-2k))}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4(f-i\,d\,(m-2k))}}(f-i\,d\,(m-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{f-i\,d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{4(f-i\,d\,(m-2k))}\Bigg)+2\sqrt{-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{f-i\,d\,(m-2k)}}$$

$$(f-i\,d\,(m-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2(f-i\,d\,(m-2k))\sqrt{z}\right)^2}{4(f-i\,d\,(m-2k))}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1169.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{(i\,d\,(m-2\,k)-f)^2}{4\,c}-g+e\,i\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f-i\,d\,(m-2\,k))^{n-j}\,(-f+d\,i\,(m-2\,k)-2\,c\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f+d\,i\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$e^{\frac{(-f-i\,d\,(m-2\,k))^2}{4\,c}-g-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f+d\,i\,(m-2\,k))^{n-j}\,(-f-i\,d\,(m-2\,k)-2\,c\,z)^{j+1}\right.$$

$$\left.\left(\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-i\,d\,(m-2\,k)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,c}+g+e\,i\,(m-2\,k)}\sum_{j=0}^{n}2^{j-n}\,(-f-i\,d\,(m-2\,k))^{n-j}\,(f+d\,i\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left(-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f-i\,d\,(m-2\,k))^2}{4\,c}+g-i\,e\,(m-2\,k)}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f)^{n-j}\,(f-i\,d\,(m-2\,k)+2\,c\,z)^{j+1}$$

$$\left.\left(-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-i\,d\,(m-2\,k)+2\,c\,z)^2}{4\,c}\right)\right)\Bigg);\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1170.01

$$\int z^n \cos^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{-\frac{c^2}{4\,i\,d\,(m-2k)-f)}-g+e\,i\,(m-2k)}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2k)-f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(i\,d\,(m-2k)-f)$$

$$\sqrt{-\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{i\,d\,(m-2k)-f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)-c$$

$$\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(i\,d\,(m-2k)-f)\,\sqrt{z}\,-c\right)^2}{4\,(i\,d\,(m-2k)-f)}\right)\Bigg)\Bigg)$$

$$(i\,d\,(m-2k)-f)^{-2(n+1)}+e^{-\frac{c^2}{4\,(f+d\,i\,(m-2k))}+g+e\,i\,(m-2k)}\,(f+d\,i\,(m-2k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2k))}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f+d\,i\,(m-2k))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2k)}}\ (f+d\,i\,(m-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$-\frac{\left(c+2\left(f+d\,i\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f+d\,i\,(m-2\,k)\right)}\Bigg)+e^{-\frac{c^2}{4(-f-i\,d\,(m-2\,k))}-g-i\,e\,(m-2\,k)}$$

$$(-f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^{h+j}$$

$$\left(-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\left(-f-i\,d\,(m-2\,k)\right)$$

$$\sqrt{-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{-f-i\,d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{4\left(-f-i\,d\,(m-2\,k)\right)}\right)-$$

$$c\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\left(-f-i\,d\,(m-2\,k)\right)\sqrt{z}-c\right)^2}{4\left(-f-i\,d\,(m-2\,k)\right)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4(f-i\,d\,(m-2\,k))}+g-i\,e\,(m-2\,k)}\,(f-i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f-i\,d\,(m-2\,k)\right)}\Bigg)+2\sqrt{-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{f-i\,d\,(m-2\,k)}}$$

$$(f-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+2\left(f-i\,d\,(m-2\,k)\right)\sqrt{z}\right)^2}{4\left(f-i\,d\,(m-2\,k)\right)}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \cos^m(b\,z^r)\cosh(c\,z^r+f\,z+g)$

01.20.21.1171.01

$$\int z^n \cos^m\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)\right.$$

$$(-c)^{-n-1}+c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{1}{4}i\left(4\,i\,g-\frac{f^2}{-i\,c+2\,b\,k-b\,m}\right)}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)(i\,b\,(m-2\,k)-c)^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g\right)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g\right)}(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(4\,i\,g-\frac{f^2}{-i\,c+2\,b\,k-b\,m}\right)}(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1172.01

$$\int z^n \cos^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Gamma\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}f^{-2(n+1)}\binom{m}{k}\Bigg(e^{\frac{(i\,b\,(m-2k)-c)^2}{4f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k)-c)^{-h-j+2n}$$

$$\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,k)-c)\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-$$

$$2\,f\,\sqrt{\frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+b\,i\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{(-c-i\,b\,(m-2k))^2}{4f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2\,k))^{-h-j+2n}\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-i\,b\,(m-2\,k))\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-i\,b\,(m-2\,k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-$$

$$2 f \sqrt{\frac{\left(-c - i b (m-2k) - 2 f \sqrt{z}\right)^2}{f}} \; \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c - i b (m-2k) - 2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg) +$$

$$e^{g - \frac{(c+b i (m-2k))^2}{4 f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c + b i (m-2k))^{-h-j+2n} \left(c + b i (m-2k) + 2 f \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\Bigg((c + b i (m-2k)) \left(c + b i (m-2k) + 2 f \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\right) +$$

$$2 \sqrt{-\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{f}} \; f \, \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(c + b i (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg) +$$

$$e^{g - \frac{(c - i b (m-2k))^2}{4 f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c - i b (m-2k))^{-h-j+2n} \left(c - i b (m-2k) + 2 f \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \Bigg((c - i b (m-2k)) \left(c - i b (m-2k) + 2 f \sqrt{z}\right) \Gamma\Bigg($$

$$\frac{1}{2}(h+j+1), -\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\Bigg) + 2 \sqrt{-\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{f}} \; f \, \Gamma\Bigg($$

$$\frac{1}{2}(h+j+2), -\frac{\left(c - i b (m-2k) + 2 f \sqrt{z}\right)^2}{4 f}\Bigg)\Bigg)\Bigg) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + e) \cosh(c z^r + f z + g)$

01.20.21.1173.01

$$\int z^n \cos^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz == -2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{f^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2\,c\,z)^{j+1}\left(\frac{(-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,c\,z)^{j+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\Bigg)-2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,i\,g+4\,e\,(m-2\,k)\right)}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(i\,b\,(m-2\,k)-c)\,z-f)^{j+1}\left(-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(i\,b\,(m-2\,k)-c)\,z-f)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)\right)(i\,b\,(m-2\,k)-c)^{-n-1}+\right.$$

$$e^{\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g+4\,e\,(m-2\,k)\right)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c+b\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2}{-i\,c-2\,b\,k+b\,m}-4\,i\,g+4\,e\,(m-2\,k)\right)}(-c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(2\,(-c-i\,b\,(m-2\,k))\,z-f)^{j+1}$$

$$\left(-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{-c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-c-i\,b\,(m-2\,k))\,z-f)^2}{4\,(-c-i\,b\,(m-2\,k))}\right)+$$

$$e^{-\frac{1}{4}i\left(-\frac{f^2}{-i\,c+2\,b\,k-b\,m}+4\,i\,g+4\,e\,(m-2\,k)\right)}(c-i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2\,(c-i\,b\,(m-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{c-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2\,(c-i\,b\,(m-2\,k))\,z)^2}{4\,(c-i\,b\,(m-2\,k))}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1174.01

$$\int z^n \cos^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{\frac{c^2}{4f}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2\,f\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)$$

$$f^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}f^{-2(n+1)}\binom{m}{k}\Bigg(e^{\frac{(i\,b\,(m-2k)-c)^2}{4f}-g+e\,i\,(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2k)-c)^{-h-j+2n}$$

$$\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2k)-c)\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-$$

$$2\,f\,\sqrt{\frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c+b\,i\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)+$$

$$e^{\frac{(-c-i\,b\,(m-2k))^2}{4f}-g-i\,e\,(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c-i\,b\,(m-2k))^{-h-j+2n}\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-c-i\,b\,(m-2k))\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-c-i\,b\,(m-2k)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-$$

$$2 f \sqrt{\frac{\left(-c-i b (m-2 k)-2 f \sqrt{z}\right)^2}{f}} \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c-i b (m-2 k)-2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$e^{-\frac{(c+b i (m-2 k))^2}{4 f}+g+e i (m-2 k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c+b i (m-2 k))^{-h-j+2 n} \left(c+b i (m-2 k)+2 f \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c+b i (m-2 k)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((c+b i (m-2 k)) \left(c+b i (m-2 k)+2 f \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(c+b i (m-2 k)+2 f \sqrt{z}\right)^2}{4 f}\right)+\right.$$

$$\left. 2 \sqrt{-\frac{\left(c+b i (m-2 k)+2 f \sqrt{z}\right)^2}{f}} f \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(c+b i (m-2 k)+2 f \sqrt{z}\right)^2}{4 f}\right)\right)+$$

$$e^{-\frac{(c-i b (m-2 k))^2}{4 f}+g-i e (m-2 k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c-i b (m-2 k))^{-h-j+2 n} \left(c-i b (m-2 k)+2 f \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c-i b (m-2 k)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left((c-i b (m-2 k)) \left(c-i b (m-2 k)+2 f \sqrt{z}\right) \Gamma\left(\right.\right.$$

$$\left. \frac{1}{2}(h+j+1), -\frac{\left(c-i b (m-2 k)+2 f \sqrt{z}\right)^2}{4 f}\right)+2 \sqrt{-\frac{\left(c-i b (m-2 k)+2 f \sqrt{z}\right)^2}{f}} f \Gamma\left(\right.$$

$$\left.\left. \frac{1}{2}(h+j+2), -\frac{\left(c-i b (m-2 k)+2 f \sqrt{z}\right)^2}{4 f}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + d z) \cosh(c z^r + f z + g)$

01.20.21.4941.01

$$\int z^n \cos^m\left(b z^2+d z\right) \cosh\left(c z^2+f z+g\right) dz ==$$

$$-2^{-m-2} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \left((-1)^{n-1} e^{\frac{f^2}{4 c}-g} \sum_{q=0}^{n} 2^{q-n} f^{n-q} (-f-2 c z)^{q+1} \left(\frac{(f+2 c z)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f+2 c z)^2}{4 c}\right)+\right.$$

$$e^{g-\frac{f^2}{4c}}\sum_{q=0}^{n}2^{q-n}(-f)^{n-q}(f+2cz)^{q+1}\left(-\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2cz)^2}{4c}\right)c^{-n-1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(id(2k-m)-f)^2}{4(ib(2k-m)-c)}-g}\left(\sum_{q=0}^{n}2^{q-n}(f-id(2k-m))^{n-q}(-f+di(2k-m)+2(ib(2k-m)-c)z)^{q+1}\right.\right.$$

$$\left(-\frac{(-f+di(2k-m)+2(ib(2k-m)-c)z)^2}{ib(2k-m)-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(-f+di(2k-m)+2(ib(2k-m)-c)z)^2}{4(ib(2k-m)-c)}\right)\right)(ib(2k-m)-c)^{-n-1}+$$

$$e^{g-\frac{(f+di(2k-m))^2}{4(c+bi(2k-m))}}(c+bi(2k-m))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-id(2k-m))^{n-q}(f+di(2k-m)+2(c+bi(2k-m))z)^{q+1}$$

$$\left(-\frac{(f+di(2k-m)+2(c+bi(2k-m))z)^2}{c+bi(2k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(f+di(2k-m)+2(c+bi(2k-m))z)^2}{4(c+bi(2k-m))}\right)+$$

$$e^{-\frac{(id(m-2k)-f)^2}{4(ib(m-2k)-c)}-g}(ib(m-2k)-c)^{-n-1}\sum_{q=0}^{n}2^{q-n}(f-id(m-2k))^{n-q}(-f+di(m-2k)+2(ib(m-2k)-c)z)^{q+1}$$

$$\left(-\frac{(-f+di(m-2k)+2(ib(m-2k)-c)z)^2}{ib(m-2k)-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-f+di(m-2k)+2(ib(m-2k)-c)z)^2}{4(ib(m-2k)-c)}\right)+$$

$$e^{g-\frac{(f+di(m-2k))^2}{4(c+bi(m-2k))}}(c+bi(m-2k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-id(m-2k))^{n-q}(f+di(m-2k)+2(c+bi(m-2k))z)^{q+1}$$

$$\left(-\frac{(f+di(m-2k)+2(c+bi(m-2k))z)^2}{c+bi(m-2k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(f+di(m-2k)+2(c+bi(m-2k))z)^2}{4(c+bi(m-2k))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1175.01

$$\int z^n \cos^m\left(\sqrt{z}\ b + d\,z\right) \cosh\left(\sqrt{z}\ c + g + f\,z\right) dz == 2^{-m-2\,n-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f} - g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-c)^{-h-k+2\,n} \left(-c - 2\,f\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-c \left(-c - 2\,f\,\sqrt{z}\right) \right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) - 2\,f \sqrt{\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) \Bigg) +$$

$$e^{g - \frac{c^2}{4\,f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, c^{-h-k+2\,n} \left(c + 2\,f\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(c \left(c + 2\,f\,\sqrt{z}\right) \right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) + 2 \sqrt{-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) \right) \right)$$

$$f^{-2\,n-2} + 2^{-m-2\,n-2} \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \left(e^{-\frac{(i\,b\,(2\,j-m)-c)^2}{4\,(i\,d\,(2\,j-m)-f)} - g} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (i\,b\,(2\,j-m) - c)^{-h-k+2\,n} \left(-c + b\,i\,(2\,j-m) + \right.\right.\right.$$

$$\left.\left.\left. 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z} \right)^{h+k} \left(-\frac{\left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right)^2}{i\,d\,(2\,j-m) - f} \right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\binom{k}{h} \binom{n}{k} \left((i\,b\,(2\,j-m) - c) \left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,j-m) - f)} \right) + 2$$

$$\left.\left.\left. \sqrt{-\frac{\left(-c + b\,i\,(2\,j-m) + 2\,(i\,d\,(2\,j-m) - f)\,\sqrt{z}\right)^2}{i\,d\,(2\,j-m) - f}}\ (i\,d\,(2\,j-m) - f) \right) \right) \right)$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(-c+b\,i\,(2\,j-m)+2\,(i\,d\,(2\,j-m)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(2\,j-m)-f)}\right)\Bigg)\Bigg)(i\,d\,(2\,j-m)-f)^{-2\,n-2}+$$

$$e^{g-\frac{(c+b\,i\,(2\,j-m))^2}{4\,(f+d\,i\,(2\,j-m))}}\,(f+d\,i\,(2\,j-m))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,i\,(2\,j-m))^{-h-k+2\,n}$$

$$\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,j-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((c+b\,i\,(2\,j-m))\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\,-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,j-m)}}\;(f+d\,i\,(2\,j-m))\,\Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\Bigg)\Bigg)+e^{-\frac{(i\,b\,(m-2\,j)-c)^2}{4\,(i\,d\,(m-2\,j)-f)}-g}\,(i\,d\,(m-2\,j)-f)^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,(m-2\,j)-c)^{-h-k+2\,n}\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((i\,b\,(m-2\,j)-c)\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\,-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}}\;(i\,d\,(m-2\,j)-f)\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\right)+e^{g-\frac{(c+b\,i\,(m-2\,j))^2}{4\,(f+d\,i\,(m-2\,j))}}\,(f+d\,i\,(m-2\,j))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,i\,(m-2\,j))^{-h-k+2\,n}\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,i\,(m-2\,j))\left(c+b\,i\,(m-2\,j)+\right.\right.$$

$$\left.2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}}\;(f+d\,i\,(m-2\,j))\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)\right)\right)\Big/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\cos^m(b\,z^r+d\,z+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.1176.01

$$\int z^n\cos^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left((-1)^{n-1}\,e^{\frac{f^2}{4c}-g}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f-2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.e^{g-\frac{f^2}{4c}}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\right)c^{-n-1}-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(i\,d\,(2\,k-m)-f)^2}{4\,(i\,b\,(2\,k-m)-c)}-g+e\,i\,(2\,k-m)}\left(\sum_{q=0}^{n}2^{q-n}\,(f-i\,d\,(2\,k-m))^{n-q}\,(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^{q+1}\right.\right.$$

$$\left(-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{i\,b\,(2\,k-m)-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-f+d\,i\,(2\,k-m)+2\,(i\,b\,(2\,k-m)-c)\,z)^2}{4\,(i\,b\,(2\,k-m)-c)}\right)(i\,b\,(2\,k-m)-c)^{-n-1}+$$

$$e^{-\frac{(f+d\,i\,(2\,k-m))^2}{4\,(c+b\,i\,(2\,k-m))}+g+e\,i\,(2\,k-m)}(c+b\,i\,(2\,k-m))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-i\,d\,(2\,k-m))^{n-q}$$

$$(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^{q+1}\left(-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{c+b\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,i\,(2\,k-m)+2\,(c+b\,i\,(2\,k-m))\,z)^2}{4\,(c+b\,i\,(2\,k-m))}\right)+$$

$$e^{-\frac{(i\,d\,(m-2\,k)-f)^2}{4\,(i\,b\,(m-2\,k)-c)}-g+e\,i\,(m-2\,k)}(i\,b\,(m-2\,k)-c)^{-n-1}\sum_{q=0}^{n}2^{q-n}(f-i\,d\,(m-2\,k))^{n-q}$$

$$(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^{q+1}\left(-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{i\,b\,(m-2\,k)-c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-f+d\,i\,(m-2\,k)+2\,(i\,b\,(m-2\,k)-c)\,z)^2}{4\,(i\,b\,(m-2\,k)-c)}\right)+$$

$$e^{-\frac{(f+d\,i\,(m-2\,k))^2}{4\,(c+b\,i\,(m-2\,k))}+g+e\,i\,(m-2\,k)}(c+b\,i\,(m-2\,k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-i\,d\,(m-2\,k))^{n-q}$$

$$(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^{q+1}\left(-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{c+b\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,i\,(m-2\,k)+2\,(c+b\,i\,(m-2\,k))\,z)^2}{4\,(c+b\,i\,(m-2\,k))}\right)\right/;\ n\in\mathbb{N}\wedge m\in\mathbb{Z}\wedge m>0$$

01.20.21.1177.01

$$\int z^n\cos^m\left(\sqrt{z}\ b+d\,z+e\right)\cosh\left(\sqrt{z}\ c+f\,z+g\right)dz==2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,f^{-2\,n-2}$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{g-\frac{c^2}{4f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c+2f\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\left(c+2f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)+2\sqrt{-\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$2^{-m-2n-2}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{-\frac{(ib(2j-m)-c)^2}{4(id(2j-m)-f)}-g+ei(2j-m)}\left(id(2j-m)-f\right)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\left(ib(2j-m)-c\right)^{-h-k+2n}\right.$$

$$\left(-c+bi(2j-m)+2\left(id(2j-m)-f\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+bi(2j-m)+2\left(id(2j-m)-f\right)\sqrt{z}\right)^2}{id(2j-m)-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(\left(ib(2j-m)-c\right)\left(-c+bi(2j-m)+2\left(id(2j-m)-f\right)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),-\frac{\left(-c+bi(2j-m)+2\left(id(2j-m)-f\right)\sqrt{z}\right)^2}{4\left(id(2j-m)-f\right)}\right)+$$

$$2\sqrt{-\frac{\left(-c+bi(2j-m)+2\left(id(2j-m)-f\right)\sqrt{z}\right)^2}{id(2j-m)-f}}\;\left(id(2j-m)-f\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+k+2),-\frac{\left(-c+bi(2j-m)+2\left(id(2j-m)-f\right)\sqrt{z}\right)^2}{4\left(id(2j-m)-f\right)}\right)\right)+$$

$$e^{-\frac{(c+bi(2j-m))^2}{4(f+di(2j-m))}+g+ei(2j-m)}\left(f+di(2j-m)\right)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\left(c+bi(2j-m)\right)^{-h-k+2n}$$

$$\left(c+bi(2j-m)+2\left(f+di(2j-m)\right)\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+bi(2j-m)+2\left(f+di(2j-m)\right)\sqrt{z}\right)^2}{f+di(2j-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((c+b\,i\,(2\,j-m))\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\right)+2\sqrt{-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{f+d\,i\,(2\,j-m)}}\,(f+d\,i\,(2\,j-m))\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+b\,i\,(2\,j-m)+2\,(f+d\,i\,(2\,j-m))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(2\,j-m))}\right)\right)+$$

$$e^{-\frac{(i\,b\,(m-2\,j)-c)^2}{4\,(i\,d\,(m-2\,j)-f)}-g+e\,i\,(m-2\,j)}\,(i\,d\,(m-2\,j)-f)^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,(m-2\,j)-c)^{-h-k+2\,n}$$

$$\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((i\,b\,(m-2\,j)-c)\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\right)+2\sqrt{-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{i\,d\,(m-2\,j)-f}}\,(i\,d\,(m-2\,j)-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-c+b\,i\,(m-2\,j)+2\,(i\,d\,(m-2\,j)-f)\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,j)-f)}\right)\right)+$$

$$e^{-\frac{(c+b\,i\,(m-2\,j))^2}{4\,(f+d\,i\,(m-2\,j))}+g+e\,i\,(m-2\,j)}\,(f+d\,i\,(m-2\,j))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,i\,(m-2\,j))^{-h-k+2\,n}$$

$$\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((c+b\,i\,(m-2\,j))\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\,-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{f+d\,i\,(m-2\,j)}}\,(f+d\,i\,(m-2\,j))\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(c+b\,i\,(m-2\,j)+2\,(f+d\,i\,(m-2\,j))\,\sqrt{z}\right)^2}{4\,(f+d\,i\,(m-2\,j))}\right)\right)\right)\Big/;\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving trigonometric and exponential functions

Involving sin and exp

Involving $e^{p\,z}\sin(c\,z)\cosh(a\,z)$

01.20.21.1178.01

$$\int e^{p\,z}\sin(c\,z)\cosh(a\,z)\,dz==$$

$$\left(e^{p\,z}\left(a\left(2\,p\,c\cos(c\,z)+\left(a^2-p^2+c^2\right)\sin(c\,z)\right)\sinh(a\,z)-\cosh(a\,z)\left(c\left(a^2+p^2+c^2\right)\cos(c\,z)-p\left(-a^2+p^2+c^2\right)\sin(c\,z)\right)\right)\right)\Big/$$

$$\left(a^4-2\left(p^2-c^2\right)a^2+\left(p^2+c^2\right)^2\right)$$

01.20.21.1179.01

$$\int e^{c\,z}\sin(c\,z)\cosh(a\,z)\,dz==$$

$$\frac{1}{a^4+4\,c^4}\left(e^{c\,z}\left(a\left(\sin(c\,z)\,a^2+2\,c^2\cos(c\,z)\right)\sinh(a\,z)-c\cosh(a\,z)\left(\left(a^2+2\,c^2\right)\cos(c\,z)+\left(a^2-2\,c^2\right)\sin(c\,z)\right)\right)\right)$$

Involving $e^{p\,z}\sin(c\,z+d)\cosh(a\,z)$

01.20.21.1180.01

$$\int e^{p\,z}\sin(d+c\,z)\cosh(a\,z)\,dz==\left(e^{p\,z}\left(a\left(2\,c\,p\cos(d+c\,z)+\left(a^2+c^2-p^2\right)\sin(d+c\,z)\right)\sinh(a\,z)-\right.\right.$$

$$\left.\left.\cosh(a\,z)\left(c\left(a^2+c^2+p^2\right)\cos(d+c\,z)-p\left(-a^2+c^2+p^2\right)\sin(d+c\,z)\right)\right)\right)\Big/\left(a^4+2\left(c^2-p^2\right)a^2+\left(c^2+p^2\right)^2\right)$$

Involving $e^{p z} \sin(c z) \cosh(a z + b)$

01.20.21.1181.01

$$\int e^{p z} \sin(c z) \cosh(b + a z)\, dz == \left(e^{p z} \left(a \left(2 c p \cos(c z) + \left(a^2 + c^2 - p^2\right) \sin(c z)\right) \sinh(b + a z) - \cosh(b + a z) \left(c \left(a^2 + c^2 + p^2\right) \cos(c z) - p \left(-a^2 + c^2 + p^2\right) \sin(c z)\right)\right)\right) \Big/ \left(a^4 + 2 \left(c^2 - p^2\right) a^2 + \left(c^2 + p^2\right)^2\right)$$

Involving $e^{p z} \sin(c z + d) \cosh(a z + b)$

01.20.21.1182.01

$$\int e^{p z} \sin(d + c z) \cosh(b + a z)\, dz == \left(e^{p z} \left(a \left(2 c p \cos(d + c z) + \left(a^2 + c^2 - p^2\right) \sin(d + c z)\right) \sinh(b + a z) - \cosh(b + a z) \left(c \left(a^2 + c^2 + p^2\right) \cos(d + c z) - p \left(-a^2 + c^2 + p^2\right) \sin(d + c z)\right)\right)\right) \Big/ \left(a^4 + 2 \left(c^2 - p^2\right) a^2 + \left(c^2 + p^2\right)^2\right)$$

Involving $e^{p z^r} \sin\left(b z^r\right) \cosh(c z)$

01.20.21.1183.01

$$\int e^{p z^2} \sin\left(b z^2\right) \cosh(c z)\, dz == \frac{1}{8} i \sqrt{\pi} \left(\frac{e^{-\frac{c^2}{4(-i b + p)}} \left(\operatorname{erfi}\left(\frac{2(-i b + p) z - c}{2\sqrt{-i b + p}}\right) + \operatorname{erfi}\left(\frac{c + 2(-i b + p) z}{2\sqrt{-i b + p}}\right)\right)}{\sqrt{-i b + p}} - \frac{e^{-\frac{c^2}{4(i b + p)}} \left(\operatorname{erfi}\left(\frac{2(i b + p) z - c}{2\sqrt{i b + p}}\right) + \operatorname{erfi}\left(\frac{c + 2(i b + p) z}{2\sqrt{i b + p}}\right)\right)}{\sqrt{i b + p}} \right)$$

01.20.21.1184.01

$$\int e^{p \sqrt{z}} \sin\left(b \sqrt{z}\right) \cosh(c z)\, dz == \frac{1}{8} i \left(\frac{c\, e^{-\frac{(b + i p)^2}{4 c}} (-i b + p) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2\sqrt{z}\, c - i b + p}{2\sqrt{-c}}\right)}{(-c)^{5/2}} + \frac{e^{\frac{(i b + p)^2}{4 c}} (i b + p) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2\sqrt{z}\, c + i b + p}{2\sqrt{-c}}\right)}{(-c)^{3/2}} + \frac{e^{\frac{(b + i p)^2}{4 c}} i (b + i p) \sqrt{\pi} \operatorname{erfi}\left(\frac{2\sqrt{z}\, c - i b + p}{2\sqrt{c}}\right)}{c^{3/2}} + \frac{e^{\frac{(b - i p)^2}{4 c}} (i b + p) \sqrt{\pi} \operatorname{erfi}\left(\frac{2\sqrt{z}\, c + i b + p}{2\sqrt{c}}\right)}{c^{3/2}} - \frac{8 i\, e^{p \sqrt{z}} \sin\left(b \sqrt{z}\right) \sinh(c z)}{c} \right)$$

Involving $e^{p z^r} \sin(b z) \cosh(c z)$

01.20.21.1185.01

$$\int e^{p z^2} \sin(b z) \cosh(c z)\, dz == \frac{1}{8\sqrt{p}} \left(\sqrt{\pi} \left(e^{-\frac{(-c - i b)^2 - 2\pi i p}{4 p}} \operatorname{erfi}\left(\frac{-c - i b + 2 p z}{2\sqrt{p}}\right) + e^{-\frac{(i b - c)^2 + 2\pi i p}{4 p}} \operatorname{erfi}\left(\frac{-c + i b + 2 p z}{2\sqrt{p}}\right) + e^{-\frac{(c - i b)^2 - 2\pi i p}{4 p}} \operatorname{erfi}\left(\frac{c - i b + 2 p z}{2\sqrt{p}}\right) + e^{-\frac{(c + i b)^2 + 2\pi i p}{4 p}} \operatorname{erfi}\left(\frac{c + i b + 2 p z}{2\sqrt{p}}\right) \right) \right)$$

01.20.21.1186.01

$$\int e^{p\sqrt{z}}\sin(b\,z)\cosh(c\,z)\,dz == \frac{1}{8}i\left(\frac{8\,i\,e^{p\sqrt{z}}\,(b\cos(b\,z)\cosh(c\,z)-c\sin(b\,z)\sinh(c\,z))}{b^2+c^2}+\frac{e^{\frac{p^2}{4c-4ib}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c-ib)\sqrt{z}}{2\sqrt{ib-c}}\right)}{(ib-c)^{3/2}}+\right.$$
$$\left.\frac{e^{\frac{p^2}{-4c-4ib}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+ib)+p}{2\sqrt{c+ib}}\right)}{(c+ib)^{3/2}}-\frac{e^{\frac{p^2}{4c+4ib}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c+ib)\sqrt{z}}{2\sqrt{-c-ib}}\right)}{(-c-ib)^{3/2}}-\frac{e^{\frac{p^2}{4ib-4c}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c-ib)+p}{2\sqrt{c-ib}}\right)}{(c-ib)^{3/2}}\right)$$

Involving $e^{p\,z}\sin(b\,z^r)\cosh(c\,z)$

01.20.21.1187.01

$$\int e^{p\,z}\sin\left(b\,z^2\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{8b}\left(i\sqrt{\pi}\left(\sqrt{-ib}\;e^{-\frac{i\left((p-c)^2-2b\pi\right)}{4b}}\operatorname{erfi}\left(\frac{-c+p-2ibz}{2\sqrt{-ib}}\right)+\sqrt{-ib}\;e^{-\frac{i\left((c+p)^2-2b\pi\right)}{4b}}\operatorname{erfi}\left(\frac{c+p-2ibz}{2\sqrt{-ib}}\right)-\right.\right.$$
$$\left.\left.\sqrt{ib}\;e^{\frac{i\left((p-c)^2-2b\pi\right)}{4b}}\operatorname{erfi}\left(\frac{-c+p+2ibz}{2\sqrt{ib}}\right)-\sqrt{ib}\;e^{\frac{i\left((c+p)^2-2b\pi\right)}{4b}}\operatorname{erfi}\left(\frac{c+p+2ibz}{2\sqrt{ib}}\right)\right)\right)$$

01.20.21.1188.01

$$\int e^{p\,z}\sin\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$
$$\frac{1}{8}\left(\frac{8\,e^{p\,z}\sin\left(b\sqrt{z}\right)(p\cosh(c\,z)-c\sinh(c\,z))}{p^2-c^2}-\frac{b\,e^{\frac{b^2}{4p-4c}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-ib+2(p-c)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}}-\frac{b\,e^{\frac{b^2}{4p-4c}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{ib+2(p-c)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}}-\right.$$
$$\left.\frac{b\,e^{\frac{b^2}{4(c+p)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-ib+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}}-\frac{b\,e^{\frac{b^2}{4(c+p)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{ib+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}}\right)$$

Involving $e^{p\,z}\sin(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1189.01

$$\int e^{p\,z}\sin(b\,z)\cosh\left(c\,z^2\right)dz ==$$
$$-\frac{1}{8c}\left(\sqrt{\pi}\left(\sqrt{-c}\;e^{\frac{(-ib+p)^2+2\pi ic}{4c}}\operatorname{erfi}\left(\frac{-ib+p-2cz}{2\sqrt{-c}}\right)+\sqrt{-c}\;e^{\frac{(ib+p)^2-2\pi ic}{4c}}\operatorname{erfi}\left(\frac{ib+p-2cz}{2\sqrt{-c}}\right)-\sqrt{c}\right.\right.$$
$$\left.\left.e^{-\frac{(-ib+p)^2-2\pi ic}{4c}}\operatorname{erfi}\left(\frac{-ib+p+2cz}{2\sqrt{c}}\right)-\sqrt{c}\;e^{-\frac{(ib+p)^2+2\pi ic}{4c}}\operatorname{erfi}\left(\frac{ib+p+2cz}{2\sqrt{c}}\right)\right)\right)$$

01.20.21.1190.01

$$\int e^{p z} \sin(b z) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{8} i \left(\frac{4 e^{(-i b+p) z} \cosh\left(c \sqrt{z}\right)}{-i b+p} - \frac{4 e^{(i b+p) z} \cosh\left(c \sqrt{z}\right)}{i b+p} + \frac{c e^{-\frac{c^2}{4 (i b+p)} - i \pi} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2 (i b+p) \sqrt{z} - c}{2 \sqrt{i b+p}}\right)}{(i b+p)^{3/2}} + \frac{c e^{-\frac{c^2}{4 (i b+p)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2 (i b+p) \sqrt{z}}{2 \sqrt{i b+p}}\right)}{(i b+p)^{3/2}} - \frac{c e^{i \pi - \frac{c^2}{4 (-i b+p)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2 (-i b+p) \sqrt{z} - c}{2 \sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}} - \frac{c e^{-\frac{c^2}{4 (-i b+p)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2 (-i b+p) \sqrt{z}}{2 \sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}} \right)$$

Involving $e^{p z^r} \sin(b z) \cosh\left(c z^r\right)$

01.20.21.1191.01

$$\int e^{p z^2} \sin(b z) \cosh\left(c z^2\right) dz == \frac{1}{8} \sqrt{\pi} \left(\frac{1}{(p-c)(c+p)} \left(e^{-\frac{2 i (p-c) \pi - b^2}{4 (p-c)}} \sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{i b - 2 c z + 2 p z}{2 \sqrt{p-c}}\right) + e^{-\frac{-b^2 - 2 i (c+p) \pi}{4 (c+p)}} (p-c) \sqrt{c+p}\ \operatorname{erfi}\left(\frac{-i b + 2 (c+p) z}{2 \sqrt{c+p}}\right) \right) + \frac{1}{(p-c)(c+p)} \left(e^{-\frac{-b^2 - 2 i (p-c) \pi}{4 (p-c)}} \sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{-i b - 2 c z + 2 p z}{2 \sqrt{p-c}}\right) + e^{-\frac{2 i (c+p) \pi - b^2}{4 (c+p)}} (p-c) \sqrt{c+p}\ \operatorname{erfi}\left(\frac{i b + 2 (c+p) z}{2 \sqrt{c+p}}\right) \right) \right)$$

01.20.21.1192.01

$$\int e^{p \sqrt{z}} \sin(b z) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{4} i \left(\frac{2 e^{(p-c) \sqrt{z}} \left(1 + e^{2 c \sqrt{z}}\right) i \cos(b z)}{b} + \frac{e^{\frac{i (p-c)^2}{4 b}} (p-c) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+p+2 i b \sqrt{z}}{2 \sqrt{i b}}\right)}{2 (i b)^{3/2}} + \frac{e^{\frac{i (c+p)^2}{4 b}} (c+p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+p+2 i b \sqrt{z}}{2 \sqrt{i b}}\right)}{2 (i b)^{3/2}} - \frac{e^{-\frac{i (p-c)^2}{4 b}} (p-c) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+p-2 i b \sqrt{z}}{2 \sqrt{-i b}}\right)}{2 (-i b)^{3/2}} - \frac{e^{-\frac{i (c+p)^2}{4 b}} (c+p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+p-2 i b \sqrt{z}}{2 \sqrt{-i b}}\right)}{2 (-i b)^{3/2}} \right)$$

Involving $e^{p z} \sin\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1193.01

$$\int e^{p z} \sin\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$
$$\frac{1}{8} \sqrt{\pi} \left(\frac{1}{(i b - c)(c - i b)} \left(\sqrt{i b - c}\ (c - i b)\, e^{-\frac{p^2 + 2(i b - c) i \pi}{4(i b - c)}} \operatorname{erfi}\left(\frac{p - 2(c - i b) z}{2\sqrt{i b - c}} \right) + (i b - c) \sqrt{c - i b} \right.\right.$$
$$\left. e^{-\frac{p^2 - 2 i (c - i b) \pi}{4(c - i b)}} \operatorname{erfi}\left(\frac{p + 2(c - i b) z}{2\sqrt{c - i b}} \right) \right) + \frac{1}{(-c - i b)(c + i b)}$$
$$\left. \left(\sqrt{-c - i b}\ (c + i b)\, e^{-\frac{p^2 - 2 i (-c - i b) \pi}{4(-c - i b)}} \operatorname{erfi}\left(\frac{p - 2(c + i b) z}{2\sqrt{-c - i b}} \right) + (-c - i b) \sqrt{c + i b}\ e^{-\frac{p^2 + 2(c + i b) i \pi}{4(c + i b)}} \operatorname{erfi}\left(\frac{p + 2(c + i b) z}{2\sqrt{c + i b}} \right) \right) \right)$$

01.20.21.1194.01

$$\int e^{p z} \sin\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz == -\frac{1}{8} i \left(\frac{(b + i c)\, e^{\frac{(b + i c)^2}{4 p}} \sqrt{\pi} \left(\operatorname{erf}\left(\frac{b + i c - 2 i p \sqrt{z}}{2\sqrt{p}} \right) - \operatorname{erf}\left(\frac{b + i c + 2 i p \sqrt{z}}{2\sqrt{p}} \right) \right)}{p^{3/2}} + \right.$$
$$\left. \frac{(b - i c)\, e^{\frac{(b - i c)^2}{4 p}} \sqrt{\pi} \left(\operatorname{erf}\left(\frac{b - i c - 2 i p \sqrt{z}}{2\sqrt{p}} \right) - \operatorname{erf}\left(\frac{b - i c + 2 i p \sqrt{z}}{2\sqrt{p}} \right) \right)}{p^{3/2}} + \frac{8\, e^{p z}\, i \cosh\left(c \sqrt{z}\right) \sin\left(b \sqrt{z}\right)}{p} \right)$$

Involving $e^{p z^r} \sin\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1195.01

$$\int e^{p z^r} \sin(b z^r) \cosh(c z^r)\, dz ==$$
$$\frac{i z}{4 r} \left(-\Gamma\left(\frac{1}{r}, (-c + i b - p) z^r \right) \left((-c + i b - p) z^r \right)^{-1/r} - \left((c + i b - p) z^r \right)^{-1/r} \Gamma\left(\frac{1}{r}, (c + i b - p) z^r \right) + \right.$$
$$\left. \left((-c - i b - p) z^r \right)^{-1/r} \Gamma\left(\frac{1}{r}, (-c - i b - p) z^r \right) + \left((c - i b - p) z^r \right)^{-1/r} \Gamma\left(\frac{1}{r}, (c - i b - p) z^r \right) \right)$$

01.20.21.1196.01

$$\int e^{p z^2} \sin\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$
$$\frac{1}{8} i \sqrt{\pi} \left(\frac{\operatorname{erf}\left(\sqrt{c + i b - p}\ z \right)}{\sqrt{c + i b - p}} + \frac{\operatorname{erfi}\left(\sqrt{c - i b + p}\ z \right)}{\sqrt{c - i b + p}} - \frac{\operatorname{erf}\left(\sqrt{c - i b - p}\ z \right)}{\sqrt{c - i b - p}} - \frac{\operatorname{erfi}\left(\sqrt{c + i b + p}\ z \right)}{\sqrt{c + i b + p}} \right)$$

01.20.21.1197.01

$$\int e^{p \sqrt{z}} \sin\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$
$$\frac{1}{2} i \left(e^{(-c - i b + p) \sqrt{z}} \left(\frac{\sqrt{z}}{-c - i b + p} + \frac{1}{(b - i (c - p))^2} \right) - e^{(-c + i b + p) \sqrt{z}} \left(\frac{\sqrt{z}}{-c + i b + p} + \frac{1}{(b + i (c - p))^2} \right) + \right.$$
$$\left. e^{(c - i b + p) \sqrt{z}} \left(\frac{\sqrt{z}}{c - i b + p} + \frac{1}{(b + i (c + p))^2} \right) - e^{(c + i b + p) \sqrt{z}} \left(\frac{\sqrt{z}}{c + i b + p} + \frac{1}{(b - i (c + p))^2} \right) \right)$$

Involving $e^{b z^r+e} \sin(a z^r+q) \sinh(c z^r+g)$

01.20.21.1198.01

$$\int e^{b z^r+e} \sin(a z^r+q) \cosh(c z^r+g)\, dz ==$$
$$-\frac{1}{4r}\left(z\left(e^{e+g+i q-\frac{i\pi}{2}}\,\Gamma\left(\frac{1}{r},(-b-c-i a) z^r\right)((-b-c-i a) z^r)^{-1/r}+e^{e+g-i q+\frac{i\pi}{2}}((-b-c+i a) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+i a) z^r\right)+\right.\right.$$
$$\left.\left.e^{e-g+i q-\frac{i\pi}{2}}((-b+c-i a) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-i a) z^r\right)+e^{e-g-i q+\frac{i\pi}{2}}((-b+c+i a) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+i a) z^r\right)\right)\right)$$

01.20.21.1199.01

$$\int e^{b z^2+e} \sin\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz == \frac{1}{8} i \sqrt{\pi}$$
$$\left(\frac{e^{e-g-i q}\operatorname{erfi}\left(\sqrt{b-c-i a}\ z\right)}{\sqrt{b-c-i a}}+\frac{e^{e+g-i q}\operatorname{erfi}\left(\sqrt{b+c-i a}\ z\right)}{\sqrt{b+c-i a}}-\frac{e^{e-g+i q}\operatorname{erfi}\left(\sqrt{b-c+i a}\ z\right)}{\sqrt{b-c+i a}}-\frac{e^{e+g+i q}\operatorname{erfi}\left(\sqrt{b+c+i a}\ z\right)}{\sqrt{b+c+i a}}\right)$$

01.20.21.1200.01

$$\int e^{\sqrt{z}\ b+e} \sin\left(\sqrt{z}\ a+q\right) \cosh\left(\sqrt{z}\ c+g\right) dz ==$$
$$\frac{1}{2} i\left(\frac{e^{\sqrt{z}\ (b-c-i a)+e-g-i q}\left((b-c-i a)\sqrt{z}-1\right)}{(b-c-i a)^2}+\frac{e^{\sqrt{z}\ (b+c-i a)+e+g-i q}\left((b+c-i a)\sqrt{z}-1\right)}{(b+c-i a)^2}-\right.$$
$$\left.\frac{e^{\sqrt{z}\ (b-c+i a)+e-g+i q}\left((b-c+i a)\sqrt{z}-1\right)}{(b-c+i a)^2}-\frac{e^{\sqrt{z}\ (b+c+i a)+e+g+i q}\left((b+c+i a)\sqrt{z}-1\right)}{(b+c+i a)^2}\right)$$

Involving $e^{b z^r+d z+e} \sin(a z^r+p z+q) \cosh(c z^r+f z+g)$

01.20.21.1201.01

$$\int e^{b z^2+d z+e} \sin\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$
$$\frac{1}{8}\sqrt{\pi}\left(\frac{1}{a^2+2 i c a+b^2-c^2}\left(i (b-c+i a)\sqrt{b+c-i a}\ e^{-\frac{(d+f-i p)^2}{4(b+c-i a)}+e+g-i q}\operatorname{erfi}\left(\frac{d+f-i p+2(b+c-i a) z}{2\sqrt{b+c-i a}}\right)-\right.\right.$$
$$\left.i\sqrt{b-c+i a}\ (b+c-i a)\, e^{-\frac{(d-f+i p)^2}{4(b-c+i a)}+e-g+i q}\operatorname{erfi}\left(\frac{d-f+i p+2 b z-2 c z+2 i a z}{2\sqrt{b-c+i a}}\right)\right)+$$
$$\frac{1}{a^2-2 i c a+b^2-c^2}\left(i\sqrt{b-c-i a}\ (b+c+i a)\, e^{-\frac{(-d+f+i p)^2}{4(b-c-i a)}+e-g-i q}\operatorname{erfi}\left(\frac{d-f-i p+2 b z-2(c+i a) z}{2\sqrt{b-c-i a}}\right)-\right.$$
$$\left.\left.(a+(b-c) i)\sqrt{b+c+i a}\ e^{-\frac{(d+f+i p)^2}{4(b+c+i a)}+e+g+i q}\operatorname{erfi}\left(\frac{d+f+i p+2(b+c+i a) z}{2\sqrt{b+c+i a}}\right)\right)\right)$$

01.20.21.1202.01

$$\int e^{\sqrt{z}\ b+d\,z+e}\sin\left(\sqrt{z}\ a+p\,z+q\right)\cosh\left(\sqrt{z}\ c+f\,z+g\right)dz ==$$

$$-\frac{1}{8}\,i\,e^{e-g-i\,q}\left(e^{2\,i\,q}\left(-\frac{(b-c+i\,a)\,e^{-\frac{(b-c+i\,a)^2}{4\,(d-f+i\,p)}}\sqrt{\pi}\ \text{erfi}\left(\frac{b-c+i\,a+2\,(d-f+i\,p)\,\sqrt{z}}{2\sqrt{d-f+i\,p}}\right)}{(d-f+i\,p)^{3/2}}+\right.\right.$$

$$\frac{(b+c-i\,a)\,e^{\frac{(a+(b+c)\,i)^2}{4\,(d+f-i\,p)}+2\,g-2\,i\,q}\sqrt{\pi}\ \text{erfi}\left(\frac{b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}}{2\sqrt{d+f-i\,p}}\right)}{(d+f-i\,p)^{3/2}}+$$

$$\left.\left.\frac{2\,e^{\sqrt{z}\ (b-c+i\,a)+(d-f+i\,p)\,z}}{d-f+i\,p}-\frac{2\,e^{\sqrt{z}\ (b+c-i\,a)+2\,g-2\,i\,q+(d+f-i\,p)\,z}}{d+f-i\,p}\right)+\right.$$

$$\frac{(b-c-i\,a)\,e^{-\frac{(-b+c+i\,a)^2}{4\,(d-f-i\,p)}}\sqrt{\pi}\ \text{erfi}\left(\frac{b-c-i\,a+2\,(d-f-i\,p)\,\sqrt{z}}{2\sqrt{d-f-i\,p}}\right)}{(d-f-i\,p)^{3/2}}+\frac{2\,e^{\sqrt{z}\ (b+c+i\,a)+2\,g+2\,i\,q+(d+f+i\,p)\,z}}{d+f+i\,p}-$$

$$\left.\frac{(b+c+i\,a)\,e^{-\frac{(b+c+i\,a)^2}{4\,(d+f+i\,p)}+2\,g+2\,i\,q}\sqrt{\pi}\ \text{erfi}\left(\frac{b+c+i\,a+2\,(d+f+i\,p)\,\sqrt{z}}{2\sqrt{d+f+i\,p}}\right)}{(d+f+i\,p)^{3/2}}-\frac{2\,e^{\sqrt{z}\ (b-c-i\,a)+(d-f-i\,p)\,z}}{d-f-i\,p}\right)$$

Involving sin and rational functions of exp

Involving $\sin(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1203.01

$$\int\frac{\sin(e\,z)\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz ==$$

$$\frac{1}{4}\,i\,a^{-n}\left(\frac{e^{i\,e\,z-c\,z}}{c-i\,e}\left(e^{2\,(c-i\,e)\,z}\,{}_2F_1\left(\frac{c-i\,e}{d},\,n;\,\frac{c+d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+{}_2F_1\left(-\frac{c-i\,e}{d},\,n;\,\frac{-c+d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)-\right.$$

$$\left.\frac{e^{-(c+i\,e)\,z}}{c+i\,e}\left(e^{2\,(c+i\,e)\,z}\,{}_2F_1\left(\frac{c+i\,e}{d},\,n;\,\frac{c+d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+{}_2F_1\left(-\frac{c+i\,e}{d},\,n;\,\frac{-c+d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\Big/;\,n\in\mathbb{N}^+$$

Involving $e^{p\,z}\sin(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1204.01

$$\int \frac{e^{p z} \sin(e z) \cosh(c z)}{\left(a + b\, e^{d z}\right)^n} dz ==$$
$$\frac{1}{4} i\, a^{-n} \left(\frac{1}{(c - i e - p)(c - i e + p)} \left(e^{(-c+i e+p) z} (c - i e + p)\, {}_2F_1\left(\frac{-c + i e + p}{d}, n; \frac{-c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) + e^{(c-i e+p) z} (c - i e - p)\, {}_2F_1\left(\frac{c - i e + p}{d}, n; \frac{c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) + \frac{1}{(c + i e - p)(c + i e + p)} \left(e^{(c+i e+p) z} (-c - i e + p)\, {}_2F_1\left(\frac{c + i e + p}{d}, n; \frac{c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) - e^{(-c-i e+p) z} (c + i e + p)\, {}_2F_1\left(\frac{-c - i e + p}{d}, n; \frac{-c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right) /; n \in \mathbb{N}^+$$

Involving sin and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^\beta \sin(e z) \cosh(c z)$

01.20.21.1205.01

$$\int \left(a + b\, e^{d z}\right)^\beta \sin(e z) \cosh(c z)\, dz == \frac{1}{4} i \left(a + b\, e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta}$$
$$\left(\frac{1}{c - i e} \left(e^{i e z - c z} \left(e^{2(c - i e) z}\, {}_2F_1\left(\frac{c - i e}{d}, -\beta; \frac{c + d - i e}{d}; -\frac{b\, e^{d z}}{a} \right) + {}_2F_1\left(-\frac{c - i e}{d}, -\beta; \frac{-c + d + i e}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right) - \frac{1}{c + i e} \left(e^{-(c+i e) z} \left(e^{2(c+i e) z}\, {}_2F_1\left(\frac{c + i e}{d}, -\beta; \frac{c + d + i e}{d}; -\frac{b\, e^{d z}}{a} \right) + {}_2F_1\left(-\frac{c + i e}{d}, -\beta; \frac{-c + d - i e}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right) \right)$$

Involving $e^{p z} \left(a + b\, e^{d z}\right)^\beta \sin(e z) \cosh(c z)$

01.20.21.1206.01

$$\int e^{p z} \left(a + b\, e^{d z}\right)^\beta \sin(e z) \cosh(c z)\, dz == \frac{1}{4} i \left(a + b\, e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta}$$
$$\left(\frac{1}{(c - i e - p)(c - i e + p)} \left(e^{(-c+i e+p) z} (c - i e + p)\, {}_2F_1\left(\frac{-c + i e + p}{d}, -\beta; \frac{-c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) + e^{(c-i e+p) z} (c - i e - p)\, {}_2F_1\left(\frac{c - i e + p}{d}, -\beta; \frac{c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) + \frac{1}{(c + i e - p)(c + i e + p)} \left(e^{(c+i e+p) z} (-c - i e + p)\, {}_2F_1\left(\frac{c + i e + p}{d}, -\beta; \frac{c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) - e^{(-c-i e+p) z} (c + i e + p)\, {}_2F_1\left(\frac{-c - i e + p}{d}, -\beta; \frac{-c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right)$$

Involving powers of sin and exp

Involving $e^{p z} \sin^{\mu}(c z) \cosh(a z)$

01.20.21.1207.01

$$\int e^{p z} \sin^{\mu}(c z) \cosh(a z)\, dz == \frac{1}{2}\left(1 - e^{2 i c z}\right)^{-\mu} \sin^{\mu}(c z)\left(\frac{e^{(p-a) z}}{-a + p - i c \mu}\, {}_2F_1\left(-\frac{i (-a + p - i c \mu)}{2 c}, -\mu; 1 - \frac{i (-a + p - i c \mu)}{2 c}; e^{2 i c z}\right) + \frac{e^{(a+p) z}}{a + p - i c \mu}\, {}_2F_1\left(-\frac{i (a + p - i c \mu)}{2 c}, -\mu; 1 - \frac{i (a + p - i c \mu)}{2 c}; e^{2 i c z}\right)\right)$$

01.20.21.1208.01

$$\int e^{p z} \sin^{m}(c z) \cosh(a z)\, dz == \binom{m}{\frac{m}{2}} \frac{2^{-m} e^{p z} (1 - m \bmod 2) (a \sinh(a z) - p \cosh(a z))}{a^2 - p^2} + 2^{1-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{p z} \binom{m}{k} \left(a \left(-\cos(c (m - 2 k) z)\left(\left(-a^2 + p^2 - c^2 (m - 2 k)^2\right) \cos\left(\frac{m \pi}{2}\right) + 2 p c (2 k - m) \sin\left(\frac{m \pi}{2}\right)\right) - \left(\left(-a^2 + p^2 - c^2 (m - 2 k)^2\right) \sin\left(\frac{m \pi}{2}\right) - 2 p c (2 k - m) \cos\left(\frac{m \pi}{2}\right)\right) \sin(c (m - 2 k) z)\right) \sinh(a z) - \cosh(a z)\left(\cos(c (m - 2 k) z)\left(p \left(a^2 - p^2 - c^2 (m - 2 k)^2\right) \cos\left(\frac{m \pi}{2}\right) - c (2 k - m) \left(a^2 + p^2 + c^2 (m - 2 k)^2\right) \sin\left(\frac{m \pi}{2}\right)\right) + \left(c (2 k - m) \left(a^2 + p^2 + c^2 (m - 2 k)^2\right) \cos\left(\frac{m \pi}{2}\right) + p \left(a^2 - p^2 - c^2 (m - 2 k)^2\right) \sin\left(\frac{m \pi}{2}\right)\right) \sin(c (m - 2 k) z)\right)\right) \Big/ \left(\left(a^4 - 2 \left(p^2 - c^2 (m - 2 k)^2\right) a^2 + \left(p^2 + c^2 (m - 2 k)^2\right)^2\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z} \sin^{\mu}(c z + d) \cosh(a z)$

01.20.21.1209.01

$$\int e^{p z} \sin^{\mu}(d + c z) \cosh(a z)\, dz == \frac{1}{2}\left(1 - e^{2 i (d+c z)}\right)^{-\mu}\left(\frac{e^{(a+p) z}}{a + p - i c \mu}\, {}_2F_1\left(-\frac{i (a + p - i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i (a + p)}{c} - \mu + 2\right); e^{2 i (d+c z)}\right) - \frac{e^{(p-a) z}}{a - p + i c \mu}\, {}_2F_1\left(\frac{i (a - p + i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(\frac{i (a - p)}{c} - \mu + 2\right); e^{2 i (d+c z)}\right)\right) \sin^{\mu}(d + c z)$$

01.20.21.1210.01

$$\int e^{p z} \sin^m(d + c z) \cosh(a z)\, dz ==$$

$$\frac{e^{p z} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) (p \cosh(a z) - a \sinh(a z))}{(a^2 - p^2) 2^m} + 2^{1-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left((-1)^k e^{p z} \binom{m}{k} \left(\cos\left(2 d k - d m + \frac{m \pi}{2} \right) \right.\right.$$

$$\left(c (2 k - m) \sin(c (m - 2 k) z) \left(\left(-a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(a z) + 2 a p \sinh(a z) \right) - \cos(c (m - 2 k) z) \right.$$

$$\left. \left(p \left(a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(a z) + a \left(-a^2 - c^2 (m - 2 k)^2 + p^2\right) \sinh(a z) \right) \right) -$$

$$\left. \sin\left(2 d k - d m + \frac{m \pi}{2} \right) \left(c (2 k - m) \cos(c (m - 2 k) z) \left(\left(-a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(a z) + 2 a p \sinh(a z) \right) + \right.\right.$$

$$\left.\left. \sin(c (m - 2 k) z) \left(p \left(a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(a z) + a \left(-a^2 - c^2 (m - 2 k)^2 + p^2\right) \sinh(a z) \right) \right) \right) \Big/$$

$$\left(a^4 + 2 \left(c^2 (m - 2 k)^2 - p^2\right) a^2 + \left(c^2 (m - 2 k)^2 + p^2\right)^2 \right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z} \sin^{\mu}(c z) \cosh(a z + b)$

01.20.21.1211.01

$$\int e^{p z} \sin^{\mu}(c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2} e^{-b} \left(1 - e^{2 i c z}\right)^{-\mu} \left(\frac{e^{2 b + (a + p) z}}{a + p - i c \mu} {}_2F_1\left(-\frac{i (a + p - i c \mu)}{2 c}, -\mu; \frac{1}{2} \left(-\frac{i (a + p)}{c} - \mu + 2 \right); e^{2 i c z} \right) - \right.$$

$$\left. \frac{e^{(p - a) z}}{a - p + i c \mu} {}_2F_1\left(\frac{i (a - p + i c \mu)}{2 c}, -\mu; \frac{1}{2} \left(\frac{i (a - p)}{c} - \mu + 2 \right); e^{2 i c z} \right) \right) \sin^{\mu}(c z)$$

01.20.21.1212.01

$$\int e^{p z} \sin^m(c z) \cosh(b + a z)\, dz == \binom{m}{\frac{m}{2}} \frac{e^{p z} (m \bmod 2 - 1) (p \cosh(b + a z) - a \sinh(b + a z))}{(a^2 - p^2) 2^m} + 2^{1-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{p z} \binom{m}{k}$$

$$\left(\cos\left(\frac{m \pi}{2} \right) \left(c (2 k - m) \sin(c (m - 2 k) z) \left(\left(-a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + 2 a p \sinh(b + a z) \right) - \right.\right.$$

$$\left. \cos(c (m - 2 k) z) \left(p \left(a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + a \left(-a^2 - c^2 (m - 2 k)^2 + p^2\right) \sinh(b + a z) \right) \right) -$$

$$\left. \sin\left(\frac{m \pi}{2} \right) \left(c (2 k - m) \cos(c (m - 2 k) z) \left(\left(-a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + 2 a p \sinh(b + a z) \right) + \right.\right.$$

$$\left.\left. \sin(c (m - 2 k) z) \left(p \left(a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + a \left(-a^2 - c^2 (m - 2 k)^2 + p^2\right) \sinh(b + a z) \right) \right) \right) \Big/$$

$$\left(a^4 + 2 \left(c^2 (m - 2 k)^2 - p^2\right) a^2 + \left(c^2 (m - 2 k)^2 + p^2\right)^2 \right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z} \sin^{\mu}(c z + d) \cosh(a z + b)$

01.20.21.1213.01

$$\int e^{p z} \sin^{\mu}(d + c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2} e^{-b} \left(1 - e^{2 i (d+c z)}\right)^{-\mu} \left(\frac{e^{2 b+(a+p) z}}{a + p - i c \mu} {}_2F_1\left(-\frac{i (a + p - i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i (a + p)}{c} - \mu + 2\right); e^{2 i (d+c z)}\right) - \frac{e^{(p-a) z}}{a - p + i c \mu} {}_2F_1\left(\frac{i (a - p + i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(\frac{i (a - p)}{c} - \mu + 2\right); e^{2 i (d+c z)}\right)\right) \sin^{\mu}(d + c z)$$

01.20.21.1214.01

$$\int e^{p z} \sin^{m}(d + c z) \cosh(b + a z)\, dz ==$$

$$\binom{m}{\frac{m}{2}} \frac{e^{p z} (m \bmod 2 - 1) (p \cosh(b + a z) - a \sinh(b + a z))}{\left(a^2 - p^2\right) 2^m} + 2^{1-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{p z} \binom{m}{k} \left(\cos\left(2 d k - d m + \frac{m \pi}{2}\right) \left(c (2 k - m) \sin(c (m - 2 k) z) \left(\left(-a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + 2 a p \sinh(b + a z)\right) - \cos(c (m - 2 k) z) \left(p \left(a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + a \left(-a^2 - c^2 (m - 2 k)^2 + p^2\right) \sinh(b + a z)\right)\right) - \sin\left(2 d k - d m + \frac{m \pi}{2}\right) \left(c (2 k - m) \cos(c (m - 2 k) z) \left(\left(-a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + 2 a p \sinh(b + a z)\right) + \sin(c (m - 2 k) z) \left(p \left(a^2 - c^2 (m - 2 k)^2 - p^2\right) \cosh(b + a z) + a \left(-a^2 - c^2 (m - 2 k)^2 + p^2\right) \sinh(b + a z)\right)\right)\right) \Big/ \left(a^4 + 2 \left(c^2 (m - 2 k)^2 - p^2\right) a^2 + \left(c^2 (m - 2 k)^2 + p^2\right)^2\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \sin^m(b z^r) \cosh(c z)$

01.20.21.1215.01

$$\int e^{p z^2} \sin^m\left(b z^2\right) \cosh(c z)\, dz == \frac{2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(e^{-\frac{c^2}{4 p}} \operatorname{erfi}\left(\frac{2 p z - c}{2 \sqrt{p}}\right) + e^{-\frac{c^2}{4 p}} \operatorname{erfi}\left(\frac{c + 2 p z}{2 \sqrt{p}}\right)\right) (1 - m \bmod 2)}{\sqrt{p}} +$$

$$2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\left(e^{-\frac{c^2 + 2 i m (p - i b (2k - m)) \pi}{4 (p - i b (2k - m))}} \sqrt{p - i b (2k - m)}\ (b i (2k - m) + p) \operatorname{erfi}\left(\frac{-c - 2 i b (2k - m) z + 2 p z}{2 \sqrt{p - i b (2k - m)}}\right) + \right.\right.$$

$$\left. e^{-\frac{c^2 - 2 i m (b i (2k - m) + p) \pi}{4 (b i (2k - m) + p)}} (p - i b (2k - m)) \sqrt{b i (2k - m) + p}\ \operatorname{erfi}\left(\frac{c + 2 (b i (2k - m) + p) z}{2 \sqrt{b i (2k - m) + p}}\right) \right) \Big/$$

$$((p - i b (2k - m)) (b i (2k - m) + p)) + \left(e^{-\frac{c^2 - 2 i m (p - i b (m - 2k)) \pi}{4 (p - i b (m - 2k))}} \sqrt{p - i b (m - 2k)}\ (b i (m - 2k) + p) \right.$$

$$\operatorname{erfi}\left(\frac{-c - 2 i b (m - 2k) z + 2 p z}{2 \sqrt{p - i b (m - 2k)}}\right) + e^{-\frac{c^2 + 2 i m (b i (m - 2k) + p) \pi}{4 (b i (m - 2k) + p)}} (p - i b (m - 2k)) \sqrt{b i (m - 2k) + p}$$

$$\left. \left. \operatorname{erfi}\left(\frac{c + 2 (b i (m - 2k) + p) z}{2 \sqrt{b i (m - 2k) + p}}\right) \right) \Big/ ((p - i b (m - 2k)) (b i (m - 2k) + p)) \right) ;\ m \in \mathbb{Z} \wedge m > 0$$

01.20.21.1216.01

$$\int e^{p\sqrt{z}} \sin^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz == 2^{-m-1}\,(-i)^m$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{i\,m\,\pi}\left(-\frac{e^{\frac{(2\,i\,b\,k-i\,b\,m+p)^2}{4\,c}}\,(2\,i\,b\,k-i\,b\,m+p)\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p}{2\sqrt{-c}}\right)}{2\,(-c)^{3/2}}-\frac{e^{(2\,i\,b\,k-i\,b\,m+p)\sqrt{z}-c\,z}}{c}\right)+\right.$$

$$\frac{e^{\sqrt{z}\,(b\,i\,(m-2\,k)+p)+c\,z}}{c}-\frac{e^{\frac{(b\,i\,(m-2\,k)+p)^2}{4\,c}}\,(b\,i\,(m-2\,k)+p)\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-2\sqrt{z}\,c+b\,i\,(m-2\,k)+p}{2\sqrt{-c}}\right)}{2\,(-c)^{3/2}}+$$

$$e^{i\,m\,\pi}\left(\frac{e^{\sqrt{z}\,(2\,i\,b\,k-i\,b\,m+p)+c\,z}}{c}-\frac{e^{-\frac{(2\,i\,b\,k-i\,b\,m+p)^2}{4\,c}}\,(2\,i\,b\,k-i\,b\,m+p)\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p}{2\sqrt{c}}\right)}{2\,c^{3/2}}\right)-$$

$$\left.\frac{e^{-\frac{(b\,i\,(m-2\,k)+p)^2}{4\,c}}\,(b\,i\,(m-2\,k)+p)\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+b\,i\,(m-2\,k)+p}{2\sqrt{c}}\right)}{2\,c^{3/2}}-\frac{e^{(b\,i\,(m-2\,k)+p)\sqrt{z}-c\,z}}{c}\right)+$$

$$2^{-m}\left(\frac{e^{-\frac{p^2}{4\,c}}\,p\,\sqrt{\pi}\left(e^{\frac{p^2}{2\,c}}\operatorname{erf}\left(\frac{2\,c\sqrt{z}-p}{2\sqrt{c}}\right)-\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+p}{2\sqrt{c}}\right)\right)}{4\,c^{3/2}}+\frac{e^{p\sqrt{z}}\,\sinh(c\,z)}{c}\right)\binom{m}{\frac{m}{2}}(1-m\bmod 2)\;/;\;m\in\mathbb{N}^+$$

Involving $e^{p\,z^r}\sin^m(b\,z)\cosh(c\,z)$

01.20.21.1217.01

$$\int e^{p\,z^2}\sin^m(b\,z)\cosh(c\,z)\,dz == \frac{2^{-m-2}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(e^{-\frac{c^2}{4\,p}}\operatorname{erfi}\left(\frac{2\,p\,z-c}{2\sqrt{p}}\right)+e^{-\frac{c^2}{4\,p}}\operatorname{erfi}\left(\frac{c+2\,p\,z}{2\sqrt{p}}\right)\right)(1-m\bmod 2)}{\sqrt{p}}+$$

$$\frac{1}{\sqrt{p}}\left(2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(c+b\,i\,(2\,k-m))^2-2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{c+b\,i\,(2\,k-m)+2\,p\,z}{2\sqrt{p}}\right)+\right.\right.$$

$$e^{-\frac{(-c-i\,b\,(2\,k-m))^2+2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{-c-i\,b\,(2\,k-m)+2\,p\,z}{2\sqrt{p}}\right)+e^{-\frac{(c+b\,i\,(m-2\,k))^2+2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{c+b\,i\,(m-2\,k)+2\,p\,z}{2\sqrt{p}}\right)+$$

$$\left.\left.e^{-\frac{(-c-i\,b\,(m-2\,k))^2-2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{-c-i\,b\,(m-2\,k)+2\,p\,z}{2\sqrt{p}}\right)\right)\right)\;/;\;m\in\mathbb{Z}\wedge m>0$$

01.20.21.1218.01

$$\int e^{p\sqrt{z}} \sin^m(b\,z)\cosh(c\,z)\,dz ==$$

$$2^{-m-1}(-i)^m \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{i\,m\,\pi}\left(-\frac{e^{\frac{p^2}{4c-8ibk+4ibm}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c-2ibk+ibm)\sqrt{z}}{2\sqrt{ib(2k-m)-c}}\right)}{2(ib(2k-m)-c)^{3/2}}-\frac{e^{p\sqrt{z}-(c-2ibk+ibm)z}}{c+bi(m-2k)}\right)+\right.$$

$$e^{im\pi}\left(\frac{e^{\sqrt{z}\,p+(c+2ibk-ibm)z}}{c+bi(2k-m)}-\frac{e^{\frac{p^2}{-4c-8ibk+4ibm}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+2ibk-ibm)+p}{2\sqrt{c+bi(2k-m)}}\right)}{2(c+bi(2k-m))^{3/2}}\right)-$$

$$\frac{e^{p\sqrt{z}-(c+bi(2k-m))z}}{c+bi(2k-m)}-\frac{e^{\frac{p^2}{4c+8ibk-4ibm}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c+bi(2k-m))\sqrt{z}}{2\sqrt{ib(m-2k)-c}}\right)}{2(ib(m-2k)-c)^{3/2}}+$$

$$\left.\frac{e^{\sqrt{z}\,p+(c+bi(m-2k))z}}{c+bi(m-2k)}-\frac{e^{\frac{p^2}{-4c+8ibk-4ibm}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+bi(m-2k))+p}{2\sqrt{c+bi(m-2k)}}\right)}{2(c+bi(m-2k))^{3/2}}\right)+$$

$$2^{-m}\left(\frac{e^{-\frac{p^2}{4c}}\,p\sqrt{\pi}\left(e^{\frac{p^2}{2c}}\operatorname{erf}\left(\frac{2c\sqrt{z}-p}{2\sqrt{c}}\right)-\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+p}{2\sqrt{c}}\right)\right)}{4c^{3/2}}+\frac{e^{p\sqrt{z}}\sinh(c\,z)}{c}\right)\binom{m}{\frac{m}{2}}(1-m\bmod 2)\;/;\;m\in\mathbb{N}^+$$

Involving $e^{p\,z}\sin^m(b\,z^r)\cosh(c\,z)$

01.20.21.1219.01

$$\int e^{p\,z}\sin^m\left(b\,z^2\right)\cosh(c\,z)\,dz == \frac{2^{-m}\,e^{p\,z}\,(1-m\bmod 2)\,(c\sinh(c\,z)-p\cosh(c\,z))}{(c-p)(c+p)}\binom{m}{\frac{m}{2}}+$$

$$\frac{i\,2^{-m-2}\sqrt{\pi}}{b}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{2k-m}\left((-1)^k\binom{m}{k}\left(e^{-\frac{i\left((p-c)^2+2b(2k-m)m\pi\right)}{4b(2k-m)}}\sqrt{-ib(2k-m)}\,\operatorname{erfi}\left(\frac{-c+p-2ib(2k-m)z}{2\sqrt{-ib(2k-m)}}\right)-\right.\right.$$

$$e^{\frac{i\left((c+p)^2+2b(2k-m)m\pi\right)}{4b(2k-m)}}\sqrt{ib(2k-m)}\,\operatorname{erfi}\left(\frac{c+p+2bi(2k-m)z}{2\sqrt{ib(2k-m)}}\right)-e^{-\frac{i\left((p-c)^2-2bm(m-2k)\pi\right)}{4b(m-2k)}}\sqrt{-ib(m-2k)}$$

$$\left.\left.\operatorname{erfi}\left(\frac{-c+p-2ib(m-2k)z}{2\sqrt{-ib(m-2k)}}\right)+e^{\frac{i\left((c+p)^2-2bm(m-2k)\pi\right)}{4b(m-2k)}}\sqrt{ib(m-2k)}\,\operatorname{erfi}\left(\frac{c+p+2bi(m-2k)z}{2\sqrt{ib(m-2k)}}\right)\right)\right)/;\;m\in\mathbb{N}^+$$

01.20.21.1220.01

$$\int e^{p z} \sin^m\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$2^{-m-1} (-i)^m \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{i m \pi} \left(\frac{i b e^{-\frac{b^2 (m-2k)^2}{4(c-p)}} (m-2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b i (2k-m) + 2(p-c)\sqrt{z}}{2\sqrt{p-c}} \right)}{2(p-c)^{3/2}} + \frac{e^{b i \sqrt{z}\ (2k-m)+(p-c) z}}{p-c} \right) - \right.$$

$$\frac{i b e^{-\frac{b^2 (m-2k)^2}{4(c-p)}} (m-2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b i (m-2k) + 2(p-c)\sqrt{z}}{2\sqrt{p-c}} \right)}{2(p-c)^{3/2}} +$$

$$e^{i m \pi} \left(\frac{i b e^{\frac{b^2 (m-2k)^2}{4(c+p)}} (m-2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b i (2k-m) + 2(c+p)\sqrt{z}}{2\sqrt{c+p}} \right)}{2(c+p)^{3/2}} + \frac{e^{b i \sqrt{z}\ (2k-m)+(c+p) z}}{c+p} \right) -$$

$$\left. \frac{i b e^{\frac{b^2 (m-2k)^2}{4(c+p)}} (m-2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b i (m-2k) + 2(c+p)\sqrt{z}}{2\sqrt{c+p}} \right)}{2(c+p)^{3/2}} + \frac{e^{b i \sqrt{z}\ (m-2k)+(p-c) z}}{p-c} + \frac{e^{b i \sqrt{z}\ (m-2k)+(c+p) z}}{c+p} \right) +$$

$$\binom{m}{\frac{m}{2}} \frac{2^{-m} e^{p z} (1 - m \bmod 2) (p \cosh(c z) - c \sinh(c z))}{p^2 - c^2} /; m \in \mathbb{N}^+$$

Involving $e^{p z} \sin^m(b z) \cosh\left(c z^r\right)$

01.20.21.1221.01

$$\int e^{p z} \sin^m(b z) \cosh\left(c z^2\right) dz == -\frac{2^{-m-2} \sqrt{\pi}\ (1 - m \bmod 2)}{c} \binom{m}{\frac{m}{2}} \left(\sqrt{-c}\ e^{\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p - 2cz}{2\sqrt{-c}} \right) - \sqrt{c}\ e^{-\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p + 2cz}{2\sqrt{c}} \right) \right) -$$

$$\frac{2^{-m-2} \sqrt{\pi}}{c} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\sqrt{-c}\ e^{\frac{(p - i b (2k-m))^2 - 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{-i b (2k-m) + p - 2cz}{2\sqrt{-c}} \right) + \right.$$

$$\sqrt{-c}\ e^{\frac{(p - i b (m-2k))^2 + 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{-i b (m-2k) + p - 2cz}{2\sqrt{-c}} \right) - \sqrt{c}\ e^{-\frac{(b i (2k-m) + p)^2 - 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{b i (2k-m) + p + 2cz}{2\sqrt{c}} \right) -$$

$$\left. \sqrt{c}\ e^{-\frac{(b i (m-2k) + p)^2 + 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{b i (m-2k) + p + 2cz}{2\sqrt{c}} \right) \right) /; m \in \mathbb{N}^+$$

01.20.21.1222.01

$$\int e^{p z} \sin^m(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2}\left(\frac{4 e^{p z} \cosh\left(c \sqrt{z}\right)}{p} - \frac{c e^{-\frac{c^2}{4 p}} \sqrt{\pi}\left(\operatorname{erfi}\left(\frac{c+2 p \sqrt{z}}{2\sqrt{p}}\right) - \operatorname{erfi}\left(\frac{2 p \sqrt{z}-c}{2\sqrt{p}}\right)\right)}{p^{3/2}}\right)\binom{m}{\frac{m}{2}}(1 - m \bmod 2) +$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i m \pi}{2}}\left(\frac{c e^{-\frac{c^2}{4(-2 b i k+i b m+p)}-i m \pi}\sqrt{\pi}\operatorname{erfi}\left(\frac{2(-2 b i k+i b m+p)\sqrt{z}-c}{2\sqrt{-2 b i k+i b m+p}}\right)}{(-2 b i k+i b m+p)^{3/2}} + \frac{2 e^{-\sqrt{z}\, c+(-2 b i k+i b m+p) z-i m \pi}}{-2 b i k+i b m+p} + \right.\right.$$

$$\left.\frac{2 e^{\sqrt{z}\, c+(2 i b k-i b m+p) z}}{2 i b k-i b m+p} - \frac{c e^{-\frac{c^2}{4(2 i b k-i b m+p)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{c+2(2 i b k-i b m+p)\sqrt{z}}{2\sqrt{2 i b k-i b m+p}}\right)}{(2 i b k-i b m+p)^{3/2}}\right) +$$

$$e^{-\frac{1}{2} i m \pi}\left(-\frac{c e^{-\frac{c^2}{4(-2 b i k+i b m+p)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{c+2(-2 b i k+i b m+p)\sqrt{z}}{2\sqrt{-2 b i k+i b m+p}}\right)}{(-2 b i k+i b m+p)^{3/2}} + \frac{c e^{i m \pi-\frac{c^2}{4(2 i b k-i b m+p)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{2(2 i b k-i b m+p)\sqrt{z}-c}{2\sqrt{2 i b k-i b m+p}}\right)}{(2 i b k-i b m+p)^{3/2}} + \right.$$

$$\left.\left.\frac{2 e^{\sqrt{z}\, c+(-2 b i k+i b m+p) z}}{-2 b i k+i b m+p} + \frac{2 e^{-\sqrt{z}\, c+(2 i b k-i b m+p) z+i m \pi}}{2 i b k-i b m+p}\right)\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \sin^m(b z) \cosh\left(c z^r\right)$

01.20.21.1223.01

$$\int e^{p z^2} \sin^m(b z) \cosh\left(c z^2\right) dz ==$$

$$\frac{2^{-m-2} \sqrt{\pi}\ (1 - m \bmod 2)}{(p-c)(c+p)} \binom{m}{\frac{m}{2}} \left(\sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{2 p z - 2 c z}{2 \sqrt{p-c}} \right) + (p-c) \sqrt{c+p}\ \operatorname{erfi}\left(\sqrt{c+p}\ z \right) \right) +$$

$$2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\frac{1}{(p-c)(c+p)} \left(e^{-\frac{2 i m (p-c) \pi - b^2 (2k-m)^2}{4 (p-c)}} \sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{-i b (2k-m) - 2 c z + 2 p z}{2 \sqrt{p-c}} \right) + \right. \right.$$

$$\left. e^{-\frac{-b^2 (2k-m)^2 - 2 i m (c+p) \pi}{4 (c+p)}} (p-c) \sqrt{c+p}\ \operatorname{erfi}\left(\frac{b i (2k-m) + 2 (c+p) z}{2 \sqrt{c+p}} \right) \right) +$$

$$\frac{1}{(p-c)(c+p)} \left(e^{-\frac{-b^2 (m-2k)^2 - 2 i m (p-c) \pi}{4 (p-c)}} \sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{-i b (m-2k) - 2 c z + 2 p z}{2 \sqrt{p-c}} \right) + \right.$$

$$\left. \left. e^{-\frac{2 i m (c+p) \pi - b^2 (m-2k)^2}{4 (c+p)}} (p-c) \sqrt{c+p}\ \operatorname{erfi}\left(\frac{b i (m-2k) + 2 (c+p) z}{2 \sqrt{c+p}} \right) \right) \right) /;\ m \in \mathbb{N}^+$$

01.20.21.1224.01

$$\int e^{p \sqrt{z}} \sin^m(b z) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{\left(p^2 - c^2\right)^2}$$

$$\left(2^{1-m} e^{p \sqrt{z}} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \left(\left(\sqrt{z}\ p^3 - p^2 - c^2 \sqrt{z}\ p - c^2 \right) \cosh\left(c \sqrt{z}\right) - c \left(-\sqrt{z}\ c^2 - 2 p + p^2 \sqrt{z} \right) \sinh\left(c \sqrt{z}\right) \right) \right) +$$

$$2^{-m-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i m \pi}{2}} \left(\frac{i e^{(p-c)\sqrt{z} - i b (m-2k) z}}{b (m-2k)} - \frac{e^{-\frac{i (p-c)^2}{4 b (m-2k)}} (p-c) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+p-2 i b (m-2k) \sqrt{z}}{2 \sqrt{-i b (m-2k)}} \right)}{2 (-i b (m-2k))^{3/2}} \right) + \right.$$

$$e^{\frac{i m \pi}{2}} \left(\frac{i e^{(c+p)\sqrt{z} - i b (m-2k) z}}{b (m-2k)} - \frac{e^{-\frac{i (c+p)^2}{4 b (m-2k)}} (c+p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+p-2 i b (m-2k) \sqrt{z}}{2 \sqrt{-i b (m-2k)}} \right)}{2 (-i b (m-2k))^{3/2}} \right) +$$

$$e^{-\frac{1}{2} i m \pi} \left(-\frac{i e^{\sqrt{z}\ (p-c) + b i (m-2k) z}}{b (m-2k)} - \frac{e^{\frac{i (p-c)^2}{4 b (m-2k)}} (p-c) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+p+2 b i (m-2k) \sqrt{z}}{2 \sqrt{i b (m-2k)}} \right)}{2 (i b (m-2k))^{3/2}} \right) +$$

$$\left. e^{-\frac{1}{2} i m \pi} \left(-\frac{i e^{\sqrt{z}\ (c+p) + b i (m-2k) z}}{b (m-2k)} - \frac{e^{\frac{i (c+p)^2}{4 b (m-2k)}} (c+p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+p+2 b i (m-2k) \sqrt{z}}{2 \sqrt{i b (m-2k)}} \right)}{2 (i b (m-2k))^{3/2}} \right) \right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z} \sin^m\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1225.01

$$\int e^{p z} \sin^m\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\left(e^{-\frac{p^2-2 i (c+b i (2 k-m)) m \pi}{4 (c+b i (2 k-m))}} \sqrt{c+b i (2 k-m)} \; (-c-i b (2 k-m)) \operatorname{erfi}\left(\frac{p+2 (c+b i (2 k-m)) z}{2 \sqrt{c+b i (2 k-m)}} \right) + \right. \right.$$

$$\left. e^{-\frac{p^2+2 i (-c-i b (2 k-m)) m \pi}{4 (-c-i b (2 k-m))}} (c+b i (2 k-m)) \sqrt{-c-i b (2 k-m)} \; \operatorname{erfi}\left(\frac{p-2 (c+b i (2 k-m)) z}{2 \sqrt{-c-i b (2 k-m)}} \right) \right) \Big/$$

$$((-c-i b (2 k-m)) (c+b i (2 k-m))) + \left(e^{-\frac{p^2+2 i m (c+b i (m-2 k)) \pi}{4 (c+b i (m-2 k))}} \sqrt{c+b i (m-2 k)} \; (-c-i b (m-2 k)) \right.$$

$$\operatorname{erfi}\left(\frac{p+2 (c+b i (m-2 k)) z}{2 \sqrt{c+b i (m-2 k)}} \right) + e^{-\frac{p^2-2 i m (-c-i b (m-2 k)) \pi}{4 (-c-i b (m-2 k))}} (c+b i (m-2 k)) \sqrt{-c-i b (m-2 k)}$$

$$\left. \left. \operatorname{erfi}\left(\frac{p-2 (c+b i (m-2 k)) z}{2 \sqrt{-c-i b (m-2 k)}} \right) \right) \Big/ ((-c-i b (m-2 k)) (c+b i (m-2 k))) \right) -$$

$$\frac{2^{-m-2} \sqrt{\pi} \; (1-m \bmod 2)}{c} \binom{m}{\frac{m}{2}} \left(\sqrt{-c} \; e^{\frac{p^2}{4 c}} \operatorname{erfi}\left(\frac{p-2 c z}{2 \sqrt{-c}} \right) - \sqrt{c} \; e^{-\frac{p^2}{4 c}} \operatorname{erfi}\left(\frac{p+2 c z}{2 \sqrt{c}} \right) \right) /; m \in \mathbb{N}^+$$

01.20.21.1226.01

$$\int e^{p z} \sin^m\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2}\left(\sqrt{\pi}\left(\frac{c\, e^{-\frac{c^2}{4p}} \operatorname{erfi}\left(\frac{2p\sqrt{z}-c}{2\sqrt{p}}\right)}{p^{3/2}} - \frac{c\, e^{-\frac{c^2}{4p}} \operatorname{erfi}\left(\frac{c+2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right) + \frac{4 e^{p z} \cosh\left(c\sqrt{z}\right)}{p}\right)\binom{m}{\frac{m}{2}}(1 - m \bmod 2) +$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i m \pi}{2}}\left(\frac{4 e^{p z - \frac{i m \pi}{2}} \cos\left(\frac{\pi m}{2} + (-i c + 2 b k - b m)\sqrt{z}\right)}{p} - \right.\right.$$

$$\frac{e^{-\frac{(c+2 i b k - i b m)^2}{4p}}(c + 2 i b k - i b m)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{c + b i (2k-m) + 2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} -$$

$$\left.\left.\frac{e^{-\frac{(i b (m-2k)-c)^2}{4p} - i m \pi}(i b (m-2k) - c)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{-c + b i (m-2k) + 2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right) +\right.$$

$$e^{-\frac{1}{2} i m \pi}\left(\frac{4 e^{\frac{i \pi m}{2} + p z} \cos\left(\frac{\pi m}{2} + (i c + 2 b k - b m)\sqrt{z}\right)}{p} - \right.$$

$$\left.\left.\frac{1}{p^{3/2}}\left(e^{i m \pi - \frac{(-c+2 i b k - i b m)^2}{4p}}(-c + 2 i b k - i b m)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{-c + b i (2k-m) + 2p\sqrt{z}}{2\sqrt{p}}\right)\right) -\right.\right.$$

$$\left.\left.\left.\frac{e^{-\frac{(c-2 i b k + i b m)^2}{4p}}(c - 2 i b k + i b m)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{c + b i (m-2k) + 2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right)\right)\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \sin^m\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1227.01

$$\int e^{p z^r} \sin^m(b z^r) \cosh(c z^r)\, dz ==$$

$$-\frac{2^{-m-1} z}{r}\left(\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r}, (-c-p) z^r\right)((-c-p) z^r)^{-1/r} + ((c-p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c-p) z^r\right)\right)(1 - m \bmod 2) + \right.$$

$$i^{-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}\left(e^{i m \pi}\,\Gamma\left(\frac{1}{r}, (-c-2 i b k + i b m - p) z^r\right)((-c-2 i b k + i b m - p) z^r)^{-1/r} + \right.$$

$$e^{i m \pi}((c-2 i b k + i b m - p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c-2 i b k + i b m - p) z^r\right) + ((-c+2 i b k - i b m - p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},$$

$$\left.\left.\left.(-c+2 i b k - i b m - p) z^r\right) + ((c+2 i b k - i b m - p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c+2 i b k - i b m - p) z^r\right)\right)\right) /; m \in \mathbb{N}^+$$

01.20.21.1228.01

$$\int e^{p z^2} \sin^m\left(b z^2\right) \cosh\left(c z^2\right) dz == 2^{-m-2}\left(\frac{\operatorname{erfi}\left(\sqrt{p-c}\, z\right)}{\sqrt{p-c}} + \frac{\operatorname{erfi}\left(\sqrt{c+p}\, z\right)}{\sqrt{c+p}}\right)\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2) +$$

$$2^{-m-2}\sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}\left(\left(\frac{\operatorname{erfi}\left(\sqrt{-c-2 i b k + i b m + p}\, z\right)}{\sqrt{-c-2 i b k + i b m + p}} + \frac{\operatorname{erfi}\left(\sqrt{c-2 i b k + i b m + p}\, z\right)}{\sqrt{c-2 i b k + i b m + p}} + \right.\right.$$

$$\left.\frac{\operatorname{erfi}\left(\sqrt{-c+2 i b k - i b m + p}\, z\right)}{\sqrt{-c+2 i b k - i b m + p}} + \frac{\operatorname{erfi}\left(\sqrt{c+2 i b k - i b m + p}\, z\right)}{\sqrt{c+2 i b k - i b m + p}}\right)\cos\left(\frac{m \pi}{2}\right) +$$

$$i\left(-\frac{\operatorname{erfi}\left(\sqrt{-c-2 i b k + i b m + p}\, z\right)}{\sqrt{-c-2 i b k + i b m + p}} + \frac{\operatorname{erfi}\left(\sqrt{-c+2 i b k - i b m + p}\, z\right)}{\sqrt{-c+2 i b k - i b m + p}} + \right.$$

$$\left.\left.\frac{\operatorname{erfi}\left(\sqrt{c+2 i b k - i b m + p}\, z\right)}{\sqrt{c+2 i b k - i b m + p}} - \frac{\operatorname{erfi}\left(\sqrt{c-2 i b k + i b m + p}\, z\right)}{\sqrt{c-2 i b k + i b m + p}}\right)\sin\left(\frac{m \pi}{2}\right)\right) /; m \in \mathbb{N}^+$$

01.20.21.1229.01

$$\int e^{p\sqrt{z}}\sin^m\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right)dz == \frac{1}{\left(p^2-c^2\right)^2}\left(2^{1-m}e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$
$$\left.\left(\left(p^2\left(p\sqrt{z}-1\right)-c^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left(c\sqrt{z}\right)-c\left(-\sqrt{z}\ c^2-2p+p^2\sqrt{z}\right)\sinh\left(c\sqrt{z}\right)\right)\right)+$$
$$2^{1-m}e^{p\sqrt{z}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(\left(\left(p^2\left(p\sqrt{z}-1\right)-(-c+2ibk-ibm)^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left((-c+2ibk-ibm)\sqrt{z}\right)-\right.\right.\right.$$
$$\left.\left.\left.(-c+2ibk-ibm)\left(-\sqrt{z}\ (-c+2ibk-ibm)^2-2p+p^2\sqrt{z}\right)\sinh\left((-c+2ibk-ibm)\sqrt{z}\right)\right)\right/$$
$$\left(p^2-(-c+2ibk-ibm)^2\right)^2+\left(\left(p^2\left(p\sqrt{z}-1\right)-(c+2ibk-ibm)^2\left(\sqrt{z}\ p+1\right)\right)\cosh\right.($$
$$\left.(c+2ibk-ibm)\sqrt{z}\right)-(c+2ibk-ibm)\left(-\sqrt{z}\ (c+2ibk-ibm)^2-2p+p^2\sqrt{z}\right)$$
$$\left.\sinh\left((c+2ibk-ibm)\sqrt{z}\right)\right)\Big/\left(p^2-(c+2ibk-ibm)^2\right)^2\Big)\cos\left(\frac{m\pi}{2}\right)+$$
$$\left(\left(i\left(p^2\left(p\sqrt{z}-1\right)-(-c+2ibk-ibm)^2\left(\sqrt{z}\ p+1\right)\right)\sinh\left((-c+2ibk-ibm)\sqrt{z}\right)-\right.\right.$$
$$\left.\left.i(-c+2ibk-ibm)\left(-\sqrt{z}\ (-c+2ibk-ibm)^2-2p+p^2\sqrt{z}\right)\cosh\left((-c+2ibk-ibm)\sqrt{z}\right)\right)\Big/\right.$$
$$\left(p^2-(-c+2ibk-ibm)^2\right)^2+\left(i\left(p^2\left(p\sqrt{z}-1\right)-(c+2ibk-ibm)^2\left(\sqrt{z}\ p+1\right)\right)\sinh\right.($$
$$\left.(c+2ibk-ibm)\sqrt{z}\right)-i(c+2ibk-ibm)\left(-\sqrt{z}\ (c+2ibk-ibm)^2-2p+p^2\sqrt{z}\right)$$
$$\left.\left.\cosh\left((c+2ibk-ibm)\sqrt{z}\right)\right)\Big/\left(p^2-(c+2ibk-ibm)^2\right)^2\right)\sin\left(\frac{m\pi}{2}\right)\Big)\Big/;\ m\in\mathbb{N}^+$$

Involving $e^{bz^r+e}\sin^m(az^r+q)\cosh(cz^r+g)$

01.20.21.1230.01

$$\int e^{bz^r+e}\sin^m(az^r+q)\cosh(cz^r+g)\,dz ==$$
$$-\frac{2^{-m-1}z}{r}\left(\binom{m}{\frac{m}{2}}\left(e^{e+g}\Gamma\left(\frac{1}{r},(-b-c)z^r\right)((-b-c)z^r)^{-1/r}+e^{e-g}((c-b)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(c-b)z^r\right)\right)(1-m \bmod 2)+\right.$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g+2ikq-imq+\frac{im\pi}{2}}\Gamma\left(\frac{1}{r},(-b-c-2iak+iam)z^r\right)((-b-c-2iak+iam)z^r)^{-1/r}+\right.$$
$$e^{e-g+2ikq-imq+\frac{im\pi}{2}}((-b+c-2iak+iam)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+c-2iak+iam)z^r\right)+$$
$$e^{e+g-2ikq+imq-\frac{im\pi}{2}}((-b-c+2iak-iam)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b-c+2iak-iam)z^r\right)+$$
$$\left.\left.e^{e-g-2ikq+imq-\frac{im\pi}{2}}((-b+c+2iak-iam)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+c+2iak-iam)z^r\right)\right)\right);\ m\in\mathbb{N}^+$$

01.20.21.1231.01

$$\int e^{b z^2+e} \sin^m\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz ==$$

$$2^{-m-2}\left(\frac{\operatorname{erfi}\left(\sqrt{b-c}\ z\right)}{\sqrt{b-c}}+\frac{e^{2 g}\operatorname{erfi}\left(\sqrt{b+c}\ z\right)}{\sqrt{b+c}}\right) e^{e-g}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)+2^{-m-2}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e-g+i(m-2k)q-\frac{i m\pi}{2}}\left(\frac{\operatorname{erfi}\left(\sqrt{b-c+a i (m-2k)}\ z\right)}{\sqrt{b-c+a i (m-2k)}}+\frac{e^{2\left(g-i(m-2k)q+\frac{i m\pi}{2}\right)}\operatorname{erfi}\left(\sqrt{b+c-i a (m-2k)}\ z\right)}{\sqrt{b+c-i a (m-2k)}}\right)+\right.$$

$$\left.e^{e-g-i(m-2k)q+\frac{i m\pi}{2}}\left(\frac{e^{2\left(g+i(m-2k)q-\frac{i m\pi}{2}\right)}\operatorname{erfi}\left(\sqrt{b+c+a i (m-2k)}\ z\right)}{\sqrt{b+c+a i (m-2k)}}+\frac{\operatorname{erfi}\left(\sqrt{b-c-i a (m-2k)}\ z\right)}{\sqrt{b-c-i a (m-2k)}}\right)\right) /;\ m\in\mathbb{N}^+$$

01.20.21.1232.01

$$\int e^{\sqrt{z}\ b+e} \sin^m\left(\sqrt{z}\ a+q\right) \cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-m}\left(\frac{e^{\sqrt{z}\ (b+c)+e+g}\left(\sqrt{z}\ b+c\sqrt{z}-1\right)}{(b+c)^2}+\frac{e^{\sqrt{z}\ (b-c)+e-g}\left(\sqrt{z}\ b-c\sqrt{z}-1\right)}{(c-b)^2}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)+$$

$$2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left(\frac{e^{e+g+i(m-2k)q+(b+c+a i (m-2k))\sqrt{z}-\frac{i m\pi}{2}}\left(\sqrt{z}\ b+(c+a i (m-2k))\sqrt{z}-1\right)}{(b+c+a i (m-2k))^2}+\right.$$

$$\frac{e^{e+g-i(m-2k)q+(b+c-i a (m-2k))\sqrt{z}+\frac{i m\pi}{2}}\left(\sqrt{z}\ b+(c-i a (m-2k))\sqrt{z}-1\right)}{(b+c-i a (m-2k))^2}+$$

$$\frac{e^{e-g-i(m-2k)q+(b-c-i a (m-2k))\sqrt{z}+\frac{i m\pi}{2}}\left(\sqrt{z}\ b-(c+a i (m-2k))\sqrt{z}-1\right)}{(-b+c+a i (m-2k))^2}+$$

$$\left.\frac{e^{e-g+i(m-2k)q+(b-c+a i (m-2k))\sqrt{z}-\frac{i m\pi}{2}}\left(\sqrt{z}\ b-(c-i a (m-2k))\sqrt{z}-1\right)}{(-b+c-i a (m-2k))^2}\right)\binom{m}{k} /;\ m\in\mathbb{N}^+$$

Involving $e^{b z^r+d z+e} \sin^m\left(a z^r+p z+q\right) \cosh\left(c z^r+f z+g\right)$

01.20.21.1233.01

$$\int e^{b z^2+d z+e} \sin^m\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$

$$2^{-m-2} \sqrt{\pi} \left(\frac{1}{(b-c)(b+c)} \left(\binom{m}{\frac{m}{2}} \left(\sqrt{b-c}\ (b+c)\, e^{-\frac{(d-f)^2}{4(b-c)}+e-g} \operatorname{erfi}\left(\frac{d-f+2bz-2cz}{2\sqrt{b-c}} \right) + \right. \right. \right.$$

$$\left. \left. \left. (b-c)\sqrt{b+c}\ e^{-\frac{(d+f)^2}{4(b+c)}+e+g} \operatorname{erfi}\left(\frac{d+f+2(b+c)z}{2\sqrt{b+c}} \right) \right) (1-m \bmod 2) \right) +$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\left(e^{-\frac{(d+f+i(2k-m)p)^2}{4(b+c+a i(2k-m))}+e+g+i(2k-m)q+\frac{i m \pi}{2}} \sqrt{b+c+a i(2k-m)}\ (b-c-2 i a k+i a m) \right.\right.$$

$$\operatorname{erfi}\left(\frac{d+f+i(2k-m)p+2(b+c+a i(2k-m))z}{2\sqrt{b+c+a i(2k-m)}} \right) +$$

$$e^{\frac{(-i d+i f+(m-2k)p)^2}{4(b-c-2 i a k+i a m)}+e-g-i(2k-m)q-\frac{i m \pi}{2}} (b+c+a i(2k-m)) \sqrt{b-c-2 i a k+i a m}$$

$$\left. \operatorname{erfi}\left(\frac{d-f-2 i k p+i m p+2 b z-2 c z-4 i a k z+2 i a m z}{2\sqrt{b-c-2 i a k+i a m}} \right) \right) \Big/ ((b+c+a i(2k-m))$$

$$(b-c-2 i a k+i a m)) + \left(e^{-\frac{(d+f+i(m-2k)p)^2}{4(b+c+a i(m-2k))}+e+g-i(2k-m)q-\frac{i m \pi}{2}} \sqrt{b+c+a i(m-2k)}\ (b-c-i a(m-2k)) \right.$$

$$\operatorname{erfi}\left(\frac{d+f+i(m-2k)p+2(b+c+a i(m-2k))z}{2\sqrt{b+c+a i(m-2k)}} \right) + e^{-\frac{(-d+f+i(m-2k)p)^2}{4(b-c-i a(m-2k))}+e-g+i(2k-m)q+\frac{i m \pi}{2}}$$

$$\left. (b+c+a i(m-2k)) \sqrt{b-c-i a(m-2k)}\ \operatorname{erfi}\left(\frac{d-f-i(m-2k)p+2bz-2(c+a i(m-2k))z}{2\sqrt{b-c-i a(m-2k)}} \right) \right) \Big/$$

$$\left. ((b-c-i a(m-2k))(b+c+a i(m-2k))) \right) /;\ m \in \mathbb{N}^+$$

01.20.21.1234.01

$$\int e^{\sqrt{z}\,b+d\,z+e}\sin^m\left(\sqrt{z}\,a+p\,z+q\right)\cosh\left(\sqrt{z}\,c+f\,z+g\right)dz ==$$

$$2^{-m-2}\,e^{e-g}\left(\sqrt{\pi}\left(-\frac{(b-c)\,e^{-\frac{(b-c)^2}{4(d-f)}}\,\text{erfi}\left(\frac{b-c+2(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}-\frac{(b+c)\,e^{2g-\frac{(b+c)^2}{4(d+f)}}\,\text{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\,(b-c)+(d-f)z}}{d-f}+\frac{2\,e^{\sqrt{z}\,(b+c)+2g+(d+f)z}}{d+f}\right)\binom{m}{\frac{m}{2}}(1-m\bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e-g-i(2k-m)q-\frac{i\pi m}{2}}\left(\frac{2\,e^{\sqrt{z}\,(b-c-2iak+iam)+(d-f-2ikp+imp)z}}{d-f-2ikp+imp}-\right.\right.$$

$$\left.\left(e^{-\frac{(b-c-2iak+iam)^2}{4(d-f-2ikp+imp)}}(b-c-2iak+iam)\sqrt{\pi}\,\text{erfi}\left(\frac{b-c+ai(m-2k)+2(d-f-2ikp+imp)\sqrt{z}}{2\sqrt{d-f-2ikp+imp}}\right)\right)\Big/$$

$$(d-f-2ikp+imp)^{3/2}+\frac{2\,e^{2g+4ikq-2imq+(d+f+2ikp-imp)z+(b+c+2iak-iam)\sqrt{z}+im\pi}}{d+f+2ikp-imp}-$$

$$\frac{1}{(d+f+2ikp-imp)^{3/2}}\left(e^{-\frac{(b+c+2iak-iam)^2}{4(d+f+2ikp-imp)}+2g+4ikq-2imq+im\pi}(b+c+2iak-iam)\right.$$

$$\left.\left.\sqrt{\pi}\,\text{erfi}\left(\frac{b+c+ai(2k-m)+2(d+f+2ikp-imp)\sqrt{z}}{2\sqrt{d+f+2ikp-imp}}\right)\right)\right)+$$

$$e^{e-g-i(m-2k)q+\frac{im\pi}{2}}\left(\frac{2\,e^{2g+2i(m-2k)q+(d+f-2ikp+imp)z+(b+c-2iak+iam)\sqrt{z}-im\pi}}{d+f-2ikp+imp}-\right.$$

$$\frac{1}{(d+f-2ikp+imp)^{3/2}}\left(e^{-\frac{(b+c+ai(m-2k))^2}{4(d+f-2ikp+imp)}+2g+2i(m-2k)q-im\pi}(b+c+ai(m-2k))\sqrt{\pi}\right.$$

$$\left.\left.\text{erfi}\left(\frac{b+c+ai(m-2k)+2(d+f-2ikp+imp)\sqrt{z}}{2\sqrt{d+f-2ikp+imp}}\right)\right)+\frac{2\,e^{\sqrt{z}\,(b-c+2iak-iam)+(d-f+2ikp-imp)z}}{d-f+2ikp-imp}-\right.$$

$$\left.\left(e^{-\frac{(b-c+2iak-iam)^2}{4(d-f+2ikp-imp)}}(b-c+2iak-iam)\sqrt{\pi}\,\text{erfi}\left(\frac{b-c+ai(2k-m)+2(d-f+2ikp-imp)\sqrt{z}}{2\sqrt{d-f+2ikp-imp}}\right)\right)\Big/\right.$$

$$\left.(d-f+2ikp-imp)^{3/2}\right)\Big/;\ m\in\mathbb{N}^+$$

Involving powers of sin and rational functions of exp

Involving $\sin^m(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1235.01

$$\int \frac{\sin^m(e\,z)\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}\,dz ==$$

$$2^{-m-1}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(\frac{1}{c+2\,i\,e\,k-i\,e\,m}\left(e^{(c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,i\,e\,k-i\,e\,m}{d},\,n;\,\frac{c+d+2\,i\,e\,k-i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.e^{(-c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,i\,e\,k+i\,e\,m}{d},\,n;\,\frac{-c+d-2\,i\,e\,k+i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+\right.\right.\right.$$

$$\left.\left.\frac{1}{-c+2\,i\,e\,k-i\,e\,m}\left(e^{(-c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,i\,e\,k-i\,e\,m}{d},\,n;\,\frac{-c+d+2\,i\,e\,k-i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{(c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,i\,e\,k+i\,e\,m}{d},\,n;\,\frac{c+d-2\,i\,e\,k+i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\cos\left(\frac{m\,\pi}{2}\right)+\right.$$

$$i\left(\frac{1}{c+2\,i\,e\,k-i\,e\,m}\left(e^{(-c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,i\,e\,k+i\,e\,m}{d},\,n;\,\frac{-c+d-2\,i\,e\,k+i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.\left.e^{(c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,i\,e\,k-i\,e\,m}{d},\,n;\,\frac{c+d+2\,i\,e\,k-i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+\right.$$

$$\left.\frac{1}{-c+2\,i\,e\,k-i\,e\,m}\left(e^{(c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,i\,e\,k+i\,e\,m}{d},\,n;\,\frac{c+d-2\,i\,e\,k+i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.\left.\left.e^{(-c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,i\,e\,k-i\,e\,m}{d},\,n;\,\frac{-c+d+2\,i\,e\,k-i\,e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\sin\left(\frac{m\,\pi}{2}\right)\right)\Bigg)a^{-n}+$$

$$\frac{1}{c}\left(2^{-m-1}\,a^{-n}\binom{m}{\frac{m}{2}}\left(e^{c\,z}\,{}_2F_1\left(\frac{c}{d},\,n;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,z}\,{}_2F_1\left(-\frac{c}{d},\,n;\,\frac{d-c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right.$$

$$\left.(1-m \bmod 2)\right)\Big/;\ n\in\mathbb{Z}\wedge n>0\wedge m\in\mathbb{Z}\wedge m>0$$

Involving $e^{p\,z}\sin^m(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1236.01

$$\int \frac{e^{p z} \sin^m(e z) \cosh(c z)}{\left(a + b e^{d z}\right)^n} dz ==$$

$$2^{-m-1} a^{-n} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\left(\left(e^{(c+2 i e k - i e m + p) z} (c + 2 i e k - i e m - p) \, {}_2F_1\left(\frac{c + 2 i e k - i e m + p}{d}, n; \right. \right. \right. \right.$$

$$\left. \left. \left. \left. \frac{c + d + 2 i e k - i e m + p}{d}; -\frac{b e^{d z}}{a} \right) - e^{(-c-2 i e k + i e m + p) z} (c + 2 i e k - i e m + p) \, {}_2F_1 \right. \right. \right.$$

$$\left. \left. \left(\frac{-c - 2 i e k + i e m + p}{d}, n; \frac{-c + d - 2 i e k + i e m + p}{d}; -\frac{b e^{d z}}{a} \right) \right) \Big/$$

$$((c + 2 i e k - i e m - p)(c + 2 i e k - i e m + p)) + \left(e^{(-c+2 i e k - i e m + p) z} (-c + 2 i e k - i e m - p) \right.$$

$$\left. {}_2F_1\left(\frac{-c + 2 i e k - i e m + p}{d}, n; \frac{-c + d + 2 i e k - i e m + p}{d}; -\frac{b e^{d z}}{a} \right) - e^{(c-2 i e k + i e m + p) z} \right.$$

$$\left. (-c + 2 i e k - i e m + p) \, {}_2F_1\left(\frac{c - 2 i e k + i e m + p}{d}, n; \frac{c + d - 2 i e k + i e m + p}{d}; -\frac{b e^{d z}}{a} \right) \right) \Big/$$

$$((-c + 2 i e k - i e m - p)(-c + 2 i e k - i e m + p)) \Big) \cos\left(\frac{m \pi}{2} \right) +$$

$$i \left(\left(e^{(-c-2 i e k + i e m + p) z} (c + 2 i e k - i e m + p) \, {}_2F_1\left(\frac{-c - 2 i e k + i e m + p}{d}, n; \frac{-c + d - 2 i e k + i e m + p}{d}; \right. \right. \right.$$

$$\left. \left. \left. -\frac{b e^{d z}}{a} \right) + e^{(c+2 i e k - i e m + p) z} (c + 2 i e k - i e m - p) \, {}_2F_1\left(\frac{c + 2 i e k - i e m + p}{d}, n; \right. \right. \right.$$

$$\left. \left. \left. \frac{c + d + 2 i e k - i e m + p}{d}; -\frac{b e^{d z}}{a} \right) \right) \Big/ ((c + 2 i e k - i e m - p)(c + 2 i e k - i e m + p)) + \right.$$

$$\left(e^{(c-2 i e k + i e m + p) z} (-c + 2 i e k - i e m + p) \, {}_2F_1\left(\frac{c - 2 i e k + i e m + p}{d}, n; \frac{c + d - 2 i e k + i e m + p}{d}; \right. \right.$$

$$\left. \left. -\frac{b e^{d z}}{a} \right) + e^{(-c+2 i e k - i e m + p) z} (-c + 2 i e k - i e m - p) \, {}_2F_1 \right.$$

$$\left. \left(\frac{-c + 2 i e k - i e m + p}{d}, n; \frac{-c + d + 2 i e k - i e m + p}{d}; -\frac{b e^{d z}}{a} \right) \right) \Big/$$

$$((-c + 2 i e k - i e m - p)(-c + 2 i e k - i e m + p)) \Big) \sin\left(\frac{m \pi}{2} \right) \Big) +$$

$$\frac{2^{-m-1} a^{-n}}{(c - p)(c + p)} \binom{m}{\frac{m}{2}} \left(e^{(c+p) z} (c - p) \, {}_2F_1\left(\frac{c + p}{d}, n; \frac{c + d + p}{d}; -\frac{b e^{d z}}{a} \right) - \right.$$

$$e^{(p-c) z} (c + p) \, {}_2F_1\left(\frac{p - c}{d}, n; \frac{-c + d + p}{d}; -\frac{b e^{d z}}{a} \right) \Big) (1 - m \bmod 2) \; /; \; n \in \mathbb{N}^+ \bigwedge m \in \mathbb{N}^+$$

Involving powers of sin and algebraic functions of exp

Involving $\left(a+b\,e^{d\,z}\right)^{\beta}\sin^{m}(e\,z)\cosh(c\,z)$

01.20.21.1237.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta}\sin^{m}(e\,z)\cosh(c\,z)\,dz == 2^{-m-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(\left(\frac{1}{c+2\,i\,e\,k-i\,e\,m}\left(e^{(c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,i\,e\,k-i\,e\,m}{d},-\beta;\frac{c+d+2\,i\,e\,k-i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.$$
$$\left.e^{(-c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,i\,e\,k+i\,e\,m}{d},-\beta;\frac{-c+d-2\,i\,e\,k+i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)+$$
$$\frac{1}{-c+2\,i\,e\,k-i\,e\,m}\left(e^{(-c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,i\,e\,k-i\,e\,m}{d},-\beta;\frac{-c+d+2\,i\,e\,k-i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)-\right.$$
$$\left.\left.e^{(c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,i\,e\,k+i\,e\,m}{d},-\beta;\frac{c+d-2\,i\,e\,k+i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\cos\left(\frac{m\,\pi}{2}\right)+$$
$$i\left(\frac{1}{c+2\,i\,e\,k-i\,e\,m}\left(e^{(-c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,i\,e\,k+i\,e\,m}{d},-\beta;\frac{-c+d-2\,i\,e\,k+i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$
$$\left.e^{(c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,i\,e\,k-i\,e\,m}{d},-\beta;\frac{c+d+2\,i\,e\,k-i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)+$$
$$\frac{1}{-c+2\,i\,e\,k-i\,e\,m}\left(e^{(c-2\,i\,e\,k+i\,e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,i\,e\,k+i\,e\,m}{d},-\beta;\frac{c+d-2\,i\,e\,k+i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)+\right.$$
$$\left.\left.e^{(-c+2\,i\,e\,k-i\,e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,i\,e\,k-i\,e\,m}{d},-\beta;\frac{-c+d+2\,i\,e\,k-i\,e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\sin\left(\frac{m\,\pi}{2}\right)\Bigg)+$$
$$\frac{2^{-m-1}}{c}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\left(e^{c\,z}\,{}_2F_1\left(\frac{c}{d},-\beta;\frac{c+d}{d};-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,z}\,{}_2F_1\left(-\frac{c}{d},-\beta;\frac{d-c}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)$$
$$(1-m \bmod 2)\ /;\ m\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\sin^{m}(e\,z)\cosh(c\,z)$

01.20.21.1238.01

$$\int e^{p z}\left(a+b\,e^{d z}\right)^{\beta}\sin^{m}(e z)\cosh(c z)\,dz ==$$

$$2^{-m-1}\left(a+b\,e^{d z}\right)^{\beta}\left(\frac{e^{d z}b}{a}+1\right)^{-\beta}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(\left(\left(e^{(c+2 iek-iem+p)z}(c+2iek-iem-p)\,{}_2F_1\right.\right.\right.$$
$$\left.\left(\frac{c+2iek-iem+p}{d},-\beta;\frac{c+d+2iek-iem+p}{d};-\frac{b\,e^{d z}}{a}\right)-e^{(-c-2iek+iem+p)z}\right.$$
$$\left.(c+2iek-iem+p)\,{}_2F_1\left(\frac{-c-2iek+iem+p}{d},-\beta;\frac{-c+d-2iek+iem+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$
$$((c+2iek-iem-p)(c+2iek-iem+p))+\left(e^{(-c+2iek-iem+p)z}(-c+2iek-iem-p)\right.$$
$${}_2F_1\left(\frac{-c+2iek-iem+p}{d},-\beta;\frac{-c+d+2iek-iem+p}{d};-\frac{b\,e^{d z}}{a}\right)-e^{(c-2iek+iem+p)z}$$
$$\left.(-c+2iek-iem+p)\,{}_2F_1\left(\frac{c-2iek+iem+p}{d},-\beta;\frac{c+d-2iek+iem+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$
$$\left.((-c+2iek-iem-p)(-c+2iek-iem+p))\right)\cos\left(\frac{m\pi}{2}\right)+$$
$$i\left(\left(e^{(-c-2iek+iem+p)z}(c+2iek-iem+p)\,{}_2F_1\left(\frac{-c-2iek+iem+p}{d},-\beta;\frac{-c+d-2iek+iem+p}{d};\right.\right.\right.$$
$$\left.-\frac{b\,e^{d z}}{a}\right)+e^{(c+2iek-iem+p)z}(c+2iek-iem-p)\,{}_2F_1$$
$$\left.\left(\frac{c+2iek-iem+p}{d},-\beta;\frac{c+d+2iek-iem+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$
$$((c+2iek-iem-p)(c+2iek-iem+p))+\left(e^{(c-2iek+iem+p)z}(-c+2iek-iem+p)\right.$$
$${}_2F_1\left(\frac{c-2iek+iem+p}{d},-\beta;\frac{c+d-2iek+iem+p}{d};-\frac{b\,e^{d z}}{a}\right)+e^{(-c+2iek-iem+p)z}$$
$$\left.(-c+2iek-iem-p)\,{}_2F_1\left(\frac{-c+2iek-iem+p}{d},-\beta;\frac{-c+d+2iek-iem+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$
$$\left.((-c+2iek-iem-p)(-c+2iek-iem+p))\right)\sin\left(\frac{m\pi}{2}\right)\Big)+$$
$$\frac{2^{-m-1}}{(c-p)(c+p)}\left(a+b\,e^{d z}\right)^{\beta}\left(\frac{e^{d z}b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\left(e^{(c+p)z}(c-p)\,{}_2F_1\left(\frac{c+p}{d},-\beta;\frac{c+d+p}{d};-\frac{b\,e^{d z}}{a}\right)-\right.$$
$$e^{(p-c)z}(c+p)$$
$${}_2F_1\left(\frac{p-c}{d},-\beta;\frac{-c+d+p}{d};-\frac{b\,e^{d z}}{a}\right)\Big)(1-m$$
$$\left.\bmod 2\right)\,/;\,m\in\mathbb{N}^{+}$$

Involving products of sin and exp

Involving $e^{p z} \sin(a z) \sin(b z) \cosh(c z)$

01.20.21.1239.01

$$\int e^{p z} \sin(a z) \sin(b z) \cosh(c z)\, dz ==$$
$$-\frac{1}{4} e^{p z}\left(\frac{(-a+b-i c)\sin((a-b+i c) z)-p\cos((a-b+i c) z)}{(a-b+i(c-p))(a-b+i(c+p))}+\frac{p\cos((a+b+i c) z)+(a+b+i c)\sin((a+b+i c) z)}{(a+b+i(c-p))(a+b+i(c+p))}+\right.$$
$$\left.\frac{(-a+b+i c)\sin((a-b-i c) z)-p\cos((a-b-i c) z)}{a^2-2(b+i c)a+b^2-c^2+p^2+2 i b c}+\frac{p\cos((a+b-i c) z)+(a+b-i c)\sin((a+b-i c) z)}{(a+b-i(c-p))(a+b-i(c+p))}\right)$$

Involving rational functions of sin and exp

Involving $\frac{e^{p z}\cosh(c z)}{a+b\sin(d z)}$

01.20.21.1240.01

$$\int \frac{e^{p z}\cosh(c z)}{a+b\sin(d z)}\, dz ==$$
$$-\frac{1}{2b\sqrt{a^2-b^2}}\left(i\left(\frac{1}{c+i d+p}\left(e^{(c+i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(c+i d+p)}{d},1;2-\frac{i(c+p)}{d};\frac{i b e^{i d z}}{a-\sqrt{a^2-b^2}}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(c+i d+p)}{d},1;2-\frac{i(c+p)}{d};\frac{i b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\right.$$
$$\frac{1}{c-i d-p}\left(e^{(-c+i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{d+i c-i p}{d},1;\frac{i(c-p)}{d}+2;\frac{i b e^{i d z}}{a-\sqrt{a^2-b^2}}\right)+\right.\right.$$
$$\left.\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{d+i c-i p}{d},1;\frac{i(c-p)}{d}+2;\frac{i b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $e^{p z}(a+b\sin(d z))^{-n}\cosh(c z)$

01.20.21.1241.01

$$\int \frac{e^{p z} \cosh(c z)}{(a + b \sin(d z))^2} dz ==$$

$$\frac{i}{2 b \left(a^2 - b^2\right)^{3/2}} \left(\frac{1}{-c + i d + p} \left(e^{(-c+i d+p) z} \left(-a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{d + i c - i p}{d}, 1; \frac{i (c - p)}{d} + 2; \frac{i b e^{i d z}}{a - \sqrt{a^2 - b^2}} \right) + \right. \right. \right.$$

$$a \left(a - \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{d + i c - i p}{d}, 1; \frac{i (c - p)}{d} + 2; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) +$$

$$\left(a^2 + \sqrt{a^2 - b^2}\ a - b^2 \right) {}_2F_1\left(\frac{d + i c - i p}{d}, 2; \frac{i (c - p)}{d} + 2; \frac{i b e^{i d z}}{a - \sqrt{a^2 - b^2}} \right) +$$

$$\left. \left. \left. \left(-a^2 + \sqrt{a^2 - b^2}\ a + b^2 \right) {}_2F_1\left(\frac{d + i c - i p}{d}, 2; \frac{i (c - p)}{d} + 2; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \right) +$$

$$\frac{1}{c + i d + p} \left(e^{(c+i d+p) z} \left(-a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i (c + i d + p)}{d}, 1; 2 - \frac{i (c + p)}{d}; \frac{i b e^{i d z}}{a - \sqrt{a^2 - b^2}} \right) + \right. \right.$$

$$a \left(a - \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i (c + i d + p)}{d}, 1; 2 - \frac{i (c + p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) +$$

$$\left(a^2 + \sqrt{a^2 - b^2}\ a - b^2 \right) {}_2F_1\left(-\frac{i (c + i d + p)}{d}, 2; 2 - \frac{i (c + p)}{d}; \frac{i b e^{i d z}}{a - \sqrt{a^2 - b^2}} \right) +$$

$$\left. \left. \left(-a^2 + \sqrt{a^2 - b^2}\ a + b^2 \right) {}_2F_1\left(-\frac{i (c + i d + p)}{d}, 2; 2 - \frac{i (c + p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \right)$$

Involving $\frac{e^{p z} \cosh(c z)}{a + b \sin^2(d z)}$

01.20.21.1242.01

$$\int \frac{e^{p z}\cosh(c z)}{a+b\sin^2(d z)}\,dz == \frac{1}{2\sqrt{a}\;b\sqrt{a+b}}$$
$$\left(-\frac{1}{-c-2\,i\,d+p}\left(e^{(-c-2\,i\,d+p)z}\left(\left(-2a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{i\,(p-c)}{2\,d}+1,\,1;\,\frac{i\,(p-c)}{2\,d}+2;\,\frac{b\,e^{-2\,i\,d\,z}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(2a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{i\,(p-c)}{2\,d}+1,\,1;\,\frac{i\,(p-c)}{2\,d}+2;\,\frac{b\,e^{-2\,i\,d\,z}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-$$
$$\frac{1}{c-2\,i\,d+p}\left(e^{(c-2\,i\,d+p)z}\left(\left(-2a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{i\,(c+p)}{2\,d}+1,\,1;\,\frac{i\,(c+p)}{2\,d}+2;\,\frac{b\,e^{-2\,i\,d\,z}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left.\left(2a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{i\,(c+p)}{2\,d}+1,\,1;\,\frac{i\,(c+p)}{2\,d}+2;\,\frac{b\,e^{-2\,i\,d\,z}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)$$

Involving $e^{p\,z}\left(a+b\sin^2(d\,z)\right)^{-n}\cosh(c\,z)$

01.20.21.1243.01

$$\int \frac{e^{p z}\cosh(c z)}{\left(a+b\sin^2(d z)\right)^2}\,dz == \frac{1}{4\,a^{3/2}\,b\,(a+b)^{3/2}}\left(-\frac{1}{-c+2\,i\,d\,+p}\right.$$
$$\left(e^{(-c+2\,i\,d+p)z}\left((2a+b)\left(-2a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{i\,(c-p)}{2\,d}+1,\,1;\,\frac{i\,(c-p)}{2\,d}+2;\,\frac{b\,e^{2\,i\,d\,z}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$(2a+b)\left(2a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{i\,(c-p)}{2\,d}+1,\,1;\,\frac{i\,(c-p)}{2\,d}+2;\,\frac{b\,e^{2\,i\,d\,z}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+$$
$$2\sqrt{a}\left(\left(2a^{3/2}-2\sqrt{a+b}\;a+2b\sqrt{a}\;-b\sqrt{a+b}\right){}_2F_1\left(\frac{i\,(c-p)}{2\,d}+1,\,2;\,\frac{i\,(c-p)}{2\,d}+\right.\right.$$
$$\left.\left.2;\,\frac{b\,e^{2\,i\,d\,z}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)-\left(2a^{3/2}+2\sqrt{a+b}\;a+2b\sqrt{a}\;+b\sqrt{a+b}\right)\right.$$
$$\left.\left.{}_2F_1\left(\frac{i\,(c-p)}{2\,d}+1,\,2;\,\frac{i\,(c-p)}{2\,d}+2;\,\frac{b\,e^{2\,i\,d\,z}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-\frac{1}{c+2\,i\,d\,+p}$$
$$\left(e^{(c+2\,i\,d+p)z}\left((2a+b)\left(-2a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1-\frac{i\,(c+p)}{2\,d},\,1;\,2-\frac{i\,(c+p)}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$(2a+b)\left(2a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1-\frac{i\,(c+p)}{2\,d},\,1;\,2-\frac{i\,(c+p)}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+$$
$$2\sqrt{a}\left(\left(2a^{3/2}-2\sqrt{a+b}\;a+2b\sqrt{a}\;-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(c+p)}{2\,d},\,2;\,2-\frac{i\,(c+p)}{2\,d};\right.\right.$$
$$\left.\left.\frac{b\,e^{2\,i\,d\,z}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)-\left(2a^{3/2}+2\sqrt{a+b}\;a+2b\sqrt{a}\;+b\sqrt{a+b}\right)\right.$$
$$\left.\left.\left.{}_2F_1\left(1-\frac{i\,(c+p)}{2\,d},\,2;\,2-\frac{i\,(c+p)}{2\,d};\,\frac{b\,e^{2\,i\,d\,z}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)$$

Involving $\frac{e^{p z} \sin(e z) \cosh(c z)}{a+b \sin(d z)}$

01.20.21.1244.01

$$\int \frac{e^{p z} \sin(e z) \cosh(c z)}{a + b \sin(d z)}\, dz ==$$

$$-\frac{1}{4} i \left(\left(i e^{(-c-i e+i d+p) z} \left(\left(a + \sqrt{a^2 - b^2}\right) {}_2F_1\left(-\frac{i(-c - i e + i d + p)}{d}, 1; 2 - \frac{i(-c - i e + p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(-\frac{i(-c - i e + i d + p)}{d}, 1; 2 - \frac{i(-c - i e + p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \Big/ \left(b \sqrt{a^2 - b^2} (-c - i e + i d + p) \right) + \frac{1}{b \sqrt{a^2 - b^2} (c - i e + i d + p)} \left(i e^{(c-i e+i d+p) z} \left(\left(a + \sqrt{a^2 - b^2}\right) {}_2F_1\left(-\frac{i(c - i e + i d + p)}{d}, 1; 2 - \frac{i(c - i e + p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(-\frac{i(c - i e + i d + p)}{d}, 1; 2 - \frac{i(c - i e + p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) - \left(i e^{(-c+i d+i e+p) z} \left(\left(a + \sqrt{a^2 - b^2}\right) {}_2F_1\left(-\frac{i(-c + i d + i e + p)}{d}, 1; 2 - \frac{i(-c + i e + p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(-\frac{i(-c + i d + i e + p)}{d}, 1; 2 - \frac{i(-c + i e + p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \Big/ \left(b \sqrt{a^2 - b^2} (-c + i d + i e + p) \right) - \frac{1}{b \sqrt{a^2 - b^2} (c + i d + i e + p)} \left(i e^{(c+i d+i e+p) z} \left(\left(a + \sqrt{a^2 - b^2}\right) {}_2F_1\left(-\frac{i(c + i d + i e + p)}{d}, 1; 2 - \frac{i(c + i e + p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(-\frac{i(c + i d + i e + p)}{d}, 1; 2 - \frac{i(c + i e + p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right)$$

Involving $e^{p z} \sin(e z) \cosh(c z) (a + b \sin(d z))^{-n}$

01.20.21.1245.01

$$\int \frac{e^{p z} \sin(e z) \cosh(c z)}{(a + b \sin(d z))^2} dz ==$$

$$-\frac{1}{4} i \left(\left(i e^{(-c+i d+i e+p) z} \left(-a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 1; 2 - \frac{i(-c+i e+p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$

$$a \left(a - \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 1; 2 - \frac{i(-c+i e+p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) +$$

$$\left(a^2 + \sqrt{a^2 - b^2}\, a - b^2 \right) {}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 2; 2 - \frac{i(-c+i e+p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) +$$

$$\left. \left(-a^2 + \sqrt{a^2 - b^2}\, a + b^2 \right) {}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 2; 2 - \frac{i(-c+i e+p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \Big/ \left(b \right.$$

$$\left. \left(a^2 - b^2 \right)^{3/2} (-c+i d+i e+p) \right) +$$

$$\left(i e^{(c+i d+i e+p) z} \left(-a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i(c+i d+i e+p)}{d}, 1; 2 - \frac{i(c+i e+p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$

$$a \left(a - \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i(c+i d+i e+p)}{d}, 1; 2 - \frac{i(c+i e+p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) + \left(a^2 + \sqrt{a^2 - b^2}\, a - b^2 \right)$$

$${}_2F_1\left(-\frac{i(c+i d+i e+p)}{d}, 2; 2 - \frac{i(c+i e+p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \left(-a^2 + \sqrt{a^2 - b^2}\, a + b^2 \right)$$

$$\left. \left. {}_2F_1\left(-\frac{i(c+i d+i e+p)}{d}, 2; 2 - \frac{i(c+i e+p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \Big/ \left(b \left(a^2 - b^2 \right)^{3/2} (c+i d+i e+p) \right) -$$

$$\left(i e^{(-c-i e+i d+p) z} \left(-a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i(-c-i e+i d+p)}{d}, 1; 2 - \frac{i(-c-i e+p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$

$$a \left(a - \sqrt{a^2 - b^2} \right) {}_2F_1\left(-\frac{i(-c-i e+i d+p)}{d}, 1; 2 - \frac{i(-c-i e+p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) +$$

$$\left(a^2 + \sqrt{a^2 - b^2}\, a - b^2 \right) {}_2F_1\left(-\frac{i(-c-i e+i d+p)}{d}, 2; 2 - \frac{i(-c-i e+p)}{d}; -\frac{i b e^{i d z}}{\sqrt{a^2 - b^2} - a} \right) +$$

$$\left. \left(-a^2 + \sqrt{a^2 - b^2}\, a + b^2 \right) {}_2F_1\left(-\frac{i(-c-i e+i d+p)}{d}, 2; 2 - \frac{i(-c-i e+p)}{d}; \frac{i b e^{i d z}}{a + \sqrt{a^2 - b^2}} \right) \right) \Big/ \left(b \right.$$

$$\left. \left(a^2 - b^2 \right)^{3/2} (-c-i e+i d+p) \right) -$$

$$\left(i\, e^{(c-i\,e+i\,d+p)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d+p)}{d},\,1;\,2-\frac{i\,(c-i\,e+p)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d+p)}{d},\,1;\,2-\frac{i\,(c-i\,e+p)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right)$$
$${}_2F_1\left(-\frac{i\,(c-i\,e+i\,d+p)}{d},\,2;\,2-\frac{i\,(c-i\,e+p)}{d};\,-\frac{i\,b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right)$$
$$\left.\left.{}_2F_1\left(-\frac{i\,(c-i\,e+i\,d+p)}{d},\,2;\,2-\frac{i\,(c-i\,e+p)}{d};\,\frac{i\,b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-i\,e+i\,d+p)\right)\Bigg)$$

Involving $\frac{e^{p\,z}\sin(e\,z)\cosh(c\,z)}{a+b\sin^2(d\,z)}$

01.20.21.1246.01

$$\int \frac{e^{p z} \sin(e z) \cosh(c z)}{a + b \sin^2(d z)}\, dz == -\frac{1}{4} i \left(\left(e^{(-c-2 i d-i e+p) z}\left(\left(2 a+2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(\frac{i (-c-i e+p)}{2 d}+1, 1; \frac{i (-c-i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a+2 \sqrt{a+b}\ \sqrt{a}-b}\right)+\left(-2 a+2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(\frac{i (-c-i e+p)}{2 d}+1, 1; \frac{i (-c-i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a-2 \sqrt{a+b}\ \sqrt{a}-b}\right)\right)\right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (-c-2 i d-i e+p)\right)+\left(e^{(c-2 i d-i e+p) z}\left(\left(2 a+2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(\frac{i (c-i e+p)}{2 d}+1, 1; \frac{i (c-i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a+2 \sqrt{a+b}\ \sqrt{a}-b}\right)+\left(-2 a+2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(\frac{i (c-i e+p)}{2 d}+1, 1; \frac{i (c-i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a-2 \sqrt{a+b}\ \sqrt{a}-b}\right)\right)\right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (c-2 i d-i e+p)\right)-\left(e^{(-c-2 i d+i e+p) z}\left(\left(2 a+2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(\frac{i (-c+i e+p)}{2 d}+1, 1; \frac{i (-c+i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a+2 \sqrt{a+b}\ \sqrt{a}-b}\right)+\left(-2 a+2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(\frac{i (-c+i e+p)}{2 d}+1, 1; \frac{i (-c+i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a-2 \sqrt{a+b}\ \sqrt{a}-b}\right)\right)\right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (-c-2 i d+i e+p)\right)-\left(e^{(c-2 i d+i e+p) z}\left(\left(2 a+2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(\frac{i (c+i e+p)}{2 d}+1, 1; \frac{i (c+i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a+2 \sqrt{a+b}\ \sqrt{a}-b}\right)+\left(-2 a+2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(\frac{i (c+i e+p)}{2 d}+1, 1; \frac{i (c+i e+p)}{2 d}+2; -\frac{b e^{-2 i d z}}{-2 a-2 \sqrt{a+b}\ \sqrt{a}-b}\right)\right)\right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (c-2 i d+i e+p)\right)\right)$$

Involving $e^{p z} \sin(e z) \cosh(c z) \left(a + b \sin^2(d z)\right)^{-n}$

01.20.21.1247.01

$$\int \frac{e^{p z} \sin(e z) \cosh(c z)}{\left(a + b \sin^2(d z)\right)^2}\, dz == -\frac{1}{4} i \left(\left(e^{(-c-i e+2 i d+p) z}\left((2 a+b)\left(2 a+2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(1-\frac{i (-c-i e+p)}{2 d}, 1; 2-\frac{i (-c-i e+p)}{2 d}; -\frac{b e^{2 i d z}}{-2 a+2 \sqrt{a+b}\ \sqrt{a}-b}\right)+(2 a+b)\left(-2 a+2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(1-\frac{i (-c-i e+p)}{2 d}, 1; 2-\frac{i (-c-i e+p)}{2 d}; -\frac{b e^{2 i d z}}{-2 a-2 \sqrt{a+b}\ \sqrt{a}-b}\right)+\right.\right.$$

$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}\ -b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-c-ie+p)}{2d},2;2-\frac{i(-c-ie+p)}{2d};\right.\right.$$
$$\left.-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}\ -b\sqrt{a+b}\right)$$
$${}_2F_1\left(1-\frac{i(-c-ie+p)}{2d},2;2-\frac{i(-c-ie+p)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)\Bigg)\Bigg)\Bigg/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(-c-ie+2id+p)\right)+\left(e^{(c-ie+2id+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(c-ie+p)}{2d},1;2-\frac{i(c-ie+p)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+(2a+b)$$
$$\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right){}_2F_1\left(1-\frac{i(c-ie+p)}{2d},1;2-\frac{i(c-ie+p)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}\ -b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c-ie+p)}{2d},2;2-\frac{i(c-ie+p)}{2d};\right.\right.$$
$$\left.-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}\ -b\sqrt{a+b}\right)$$
$${}_2F_1\left(1-\frac{i(c-ie+p)}{2d},2;2-\frac{i(c-ie+p)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)\Bigg)\Bigg)\Bigg/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(c-ie+2id+p)\right)-\left(e^{(-c+2id+ie+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(-c+ie+p)}{2d},1;2-\frac{i(-c+ie+p)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+(2a+b)$$
$$\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right){}_2F_1\left(1-\frac{i(-c+ie+p)}{2d},1;2-\frac{i(-c+ie+p)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}\ -b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-c+ie+p)}{2d},2;2-\right.\right.$$
$$\left.\frac{i(-c+ie+p)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}\ -b\sqrt{a+b}\right)$$
$${}_2F_1\left(1-\frac{i(-c+ie+p)}{2d},2;2-\frac{i(-c+ie+p)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)\Bigg)\Bigg)\Bigg/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(-c+2id+ie+p)\right)-\left(e^{(c+2id+ie+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(c+ie+p)}{2d},1;2-\frac{i(c+ie+p)}{2d};-\frac{be^{2idz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+(2a+b)$$
$$\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right){}_2F_1\left(1-\frac{i(c+ie+p)}{2d},1;2-\frac{i(c+ie+p)}{2d};-\frac{be^{2idz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+$$

$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}\ -b\sqrt{a+b}\right)\right.$$
$${}_2F_1\left(1-\frac{i(c+ie+p)}{2d},2;2-\frac{i(c+ie+p)}{2d};-\frac{b e^{2idz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+$$
$$\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}\ -b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c+ie+p)}{2d},2;2-\frac{i(c+ie+p)}{2d};\right.$$
$$\left.\left.\left.\left.-\frac{b e^{2idz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(c+2id+ie+p)\right)\Bigg)$$

Involving algebraic functions of sin and exp

Involving $e^{pz}(a+b\sin(dz))^{\beta}\cosh(cz)$

01.20.21.1248.01

$$\int e^{pz}(a+b\sin(dz))^{\beta}\cosh(cz)\,dz ==$$
$$\frac{1}{2}\left(\frac{1}{-c+p-id\beta}\left(e^{(p-c)z}\left(1-\frac{ib e^{idz}}{a-\sqrt{a^2-b^2}}\right)^{-\beta}\left(1-\frac{ib e^{idz}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}F_1\left(-\frac{i(p-c)}{d}-\beta;\right.\right.\right.$$
$$\left.\left.-\beta,-\beta;-\frac{i(p-c)}{d}-\beta+1;\frac{ib e^{idz}}{a+\sqrt{a^2-b^2}},-\frac{ib e^{idz}}{\sqrt{a^2-b^2}\ -a}\right)(a+b\sin(dz))^{\beta}\right)+$$
$$\frac{1}{c+p-id\beta}\left(e^{(c+p)z}\left(1-\frac{ib e^{idz}}{a-\sqrt{a^2-b^2}}\right)^{-\beta}\left(1-\frac{ib e^{idz}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}F_1\left(-\frac{i(c+p)}{d}-\beta;-\beta,-\beta;\right.\right.$$
$$\left.\left.\left.-\frac{i(c+p)}{d}-\beta+1;\frac{ib e^{idz}}{a+\sqrt{a^2-b^2}},-\frac{ib e^{idz}}{\sqrt{a^2-b^2}\ -a}\right)(a+b\sin(dz))^{\beta}\right)\right)$$

Involving $e^{pz}\left(a+b\sin^2(dz)\right)^{\beta}\cosh(cz)$

01.20.21.1249.01

$$\int e^{p z}\left(a+b \sin^2(d z)\right)^{\beta} \cosh(c z)\, dz ==$$

$$\frac{1}{2}\left(\frac{1}{-c+p-2 i d \beta}\left(e^{(p-c) z}\left(\frac{e^{2 i d z} b}{-2 a-b+2 \sqrt{a (a+b)}}+1\right)^{-\beta}\left(1-\frac{b e^{2 i d z}}{2 a+b+2 \sqrt{a (a+b)}}\right)^{-\beta}\left(a-\frac{1}{4} b e^{-2 i d z}\left(-1+e^{2 i d z}\right)^2\right)^{\beta}\right.\right.$$
$$\left.F_1\left(-\frac{i (p-c)}{2 d}-\beta;-\beta,-\beta;-\frac{i (p-c)}{2 d}-\beta+1;-\frac{b e^{2 i d z}}{-2 a-b-2 \sqrt{a (a+b)}},-\frac{b e^{2 i d z}}{-2 a-b+2 \sqrt{a (a+b)}}\right)\right)+$$
$$\frac{1}{c+p-2 i d \beta}\left(e^{(c+p) z}\left(\frac{e^{2 i d z} b}{-2 a-b+2 \sqrt{a (a+b)}}+1\right)^{-\beta}\left(1-\frac{b e^{2 i d z}}{2 a+b+2 \sqrt{a (a+b)}}\right)^{-\beta}\right.$$
$$\left(a-\frac{1}{4} b e^{-2 i d z}\left(-1+e^{2 i d z}\right)^2\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{i (c+p)}{2 d}-\beta;-\beta,-\beta;-\frac{i (c+p)}{2 d}-\beta+1;-\frac{b e^{2 i d z}}{-2 a-b-2 \sqrt{a (a+b)}},-\frac{b e^{2 i d z}}{-2 a-b+2 \sqrt{a (a+b)}}\right)\right)\right)$$

Involving $e^{p z} \sin(e z) \cosh(c z) (a+b \sin(d z))^{\beta}$

01.20.21.1250.01

$$\int e^{p z} \sin(e z) \cosh(c z) (a+b \sin(d z))^{\beta}\, dz ==$$

$$-\frac{1}{4} i\left(1-\frac{i b e^{-i d z}}{\sqrt{a^2-b^2}-a}\right)^{-\beta}\left(1+\frac{i b e^{-i d z}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}\left(\frac{1}{c+i e-p-i d \beta}\left(e^{(-c-i e+p) z} F_1\left(-\frac{i (c+i e-p-i d \beta)}{d};\right.\right.\right.$$
$$\left.\left.-\beta,-\beta;-\frac{\beta d-d+i (c+i e-p)}{d};-\frac{i b e^{-i d z}}{a+\sqrt{a^2-b^2}},-\frac{i b e^{-i d z}}{a-\sqrt{a^2-b^2}}\right)\right)+\frac{1}{-c+i e+p+i d \beta}$$
$$\left(e^{(-c+i e+p) z} F_1\left(\frac{i (-c+i e+p)}{d}-\beta;-\beta,-\beta;\frac{i (-c+i e+p)}{d}-\beta+1;-\frac{i b e^{-i d z}}{a+\sqrt{a^2-b^2}},-\frac{i b e^{-i d z}}{a-\sqrt{a^2-b^2}}\right)\right)+$$
$$\frac{1}{c+i e+p+i d \beta}\left(e^{(c+i e+p) z} F_1\left(\frac{i (c+i e+p)}{d}-\beta;-\beta,-\beta;\frac{i (c+i e+p)}{d}-\beta+1;\right.\right.$$
$$\left.-\frac{i b e^{-i d z}}{a+\sqrt{a^2-b^2}},-\frac{i b e^{-i d z}}{a-\sqrt{a^2-b^2}}\right)\right)-\frac{1}{c-i e+p+i d \beta}\left(e^{(c-i e+p) z}\right.$$
$$\left.\left.\left.F_1\left(\frac{i (c-i e+p)}{d}-\beta;-\beta,-\beta;\frac{i (c-i e+p)}{d}-\beta+1;-\frac{i b e^{-i d z}}{a+\sqrt{a^2-b^2}},-\frac{i b e^{-i d z}}{a-\sqrt{a^2-b^2}}\right)\right)\right)(a+b \sin(d z))^{\beta}$$

Involving $e^{p z} \sin(e z) \cosh(c z) \left(a+b \sin^2(d z)\right)^{\beta}$

01.20.21.1251.01

$$\int e^{p z} \sin(e z) \cosh(c z) \left(a + b \sin^2(d z)\right)^{\beta} dz ==$$

$$-\frac{1}{4} i \left(1 - \frac{b e^{-2 i d z}}{2 a + b - 2 \sqrt{a (a+b)}}\right)^{-\beta} \left(1 - \frac{b e^{-2 i d z}}{2 a + b + 2 \sqrt{a (a+b)}}\right)^{-\beta} \left(a - \frac{1}{4} b e^{2 i d z} \left(-1 + e^{-2 i d z}\right)^2\right)^{\beta}$$
$$\left(\frac{e^{(-c-i e+p) z}}{c + i e - p - 2 i d \beta} F_1\left(-\frac{i (c + i e - p - 2 i d \beta)}{2 d}; -\beta, -\beta; -\frac{i (c + i e - p)}{2 d} - \beta + 1; \frac{b e^{-2 i d z}}{2 a + b + 2 \sqrt{a (a+b)}}, \right.\right.$$
$$\left.\frac{b e^{-2 i d z}}{2 a + b - 2 \sqrt{a (a+b)}}\right) + \frac{e^{(c+i e+p) z}}{c + i e + p + 2 i d \beta} F_1\left(\frac{i (c + i e + p)}{2 d} - \beta; -\beta, -\beta; \frac{i (c + i e + p)}{2 d} - \beta + 1; \right.$$
$$\left.\frac{b e^{-2 i d z}}{2 a + b + 2 \sqrt{a (a+b)}}, \frac{b e^{-2 i d z}}{2 a + b - 2 \sqrt{a (a+b)}}\right) - \frac{e^{(c-i e+p) z}}{c - i e + p + 2 i d \beta} F_1\left(\frac{i (c - i e + p)}{2 d} - \beta; -\beta, \right.$$
$$\left.-\beta; \frac{i (c - i e + p)}{2 d} - \beta + 1; \frac{b e^{-2 i d z}}{2 a + b + 2 \sqrt{a (a+b)}}, \frac{b e^{-2 i d z}}{2 a + b - 2 \sqrt{a (a+b)}}\right) - \frac{e^{(-c+i e+p) z}}{c - i e - p - 2 i d \beta}$$
$$\left.F_1\left(\frac{i (-c + i e + p)}{2 d} - \beta; -\beta, -\beta; \frac{i (-c + i e + p)}{2 d} - \beta + 1; \frac{b e^{-2 i d z}}{2 a + b + 2 \sqrt{a (a+b)}}, \frac{b e^{-2 i d z}}{2 a + b - 2 \sqrt{a (a+b)}}\right)\right)$$

Involving cos and exp

Involving $e^{p z} \cos(c z) \cosh(a z)$

01.20.21.1252.01

$$\int e^{p z} \cos(c z) \cosh(a z) dz ==$$
$$\left(e^{p z} \left(\cosh(a z) \left(p \left(-a^2 + p^2 + c^2\right) \cos(c z) + c \left(a^2 + p^2 + c^2\right) \sin(c z)\right) + a \left(\left(a^2 - p^2 + c^2\right) \cos(c z) - 2 p c \sin(c z)\right) \sinh(a z)\right)\right) \Big/$$
$$\left(a^4 - 2 \left(p^2 - c^2\right) a^2 + \left(p^2 + c^2\right)^2\right)$$

01.20.21.1253.01

$$\int e^{c z} \cos(c z) \cosh(a z) dz ==$$
$$\frac{1}{a^4 + 4 c^4} \left(e^{c z} \left(\cosh(a z) \left(c \left(2 c^2 - a^2\right) \cos(c z) + c \left(a^2 + 2 c^2\right) \sin(c z)\right) + a \left(a^2 \cos(c z) - 2 c^2 \sin(c z)\right) \sinh(a z)\right)\right)$$

Involving $e^{p z} \cos(c z + d) \cosh(a z)$

01.20.21.1254.01

$$\int e^{p z} \cos(d + c z) \cosh(a z) dz == \left(e^{p z} \left(\cosh(a z) \left(p \left(-a^2 + c^2 + p^2\right) \cos(d + c z) + c \left(a^2 + c^2 + p^2\right) \sin(d + c z)\right) + \right.\right.$$
$$\left.\left.a \left(\left(a^2 + c^2 - p^2\right) \cos(d + c z) - 2 c p \sin(d + c z)\right) \sinh(a z)\right)\right) \Big/ \left(a^4 + 2 \left(c^2 - p^2\right) a^2 + \left(c^2 + p^2\right)^2\right)$$

Involving $e^{p z} \cos(c z) \cosh(a z + b)$

01.20.21.1255.01

$$\int e^{p z} \cos(c z) \cosh(b + a z)\, dz == \left(e^{p z} \left(\cosh(b + a z) \left(p \left(-a^2 + c^2 + p^2\right) \cos(c z) + c \left(a^2 + c^2 + p^2\right) \sin(c z)\right) + a \left(\left(a^2 + c^2 - p^2\right) \cos(c z) - 2 c p \sin(c z)\right) \sinh(b + a z)\right)\right) \Big/ \left(a^4 + 2 \left(c^2 - p^2\right) a^2 + \left(c^2 + p^2\right)^2\right)$$

Involving $e^{p z} \cos(c z + d) \cosh(a z + b)$

01.20.21.1256.01

$$\int e^{p z} \cos(d + c z) \cosh(b + a z)\, dz == \left(e^{p z} \left(\cosh(b + a z) \left(p \left(-a^2 + c^2 + p^2\right) \cos(d + c z) + c \left(a^2 + c^2 + p^2\right) \sin(d + c z)\right) + a \left(\left(a^2 + c^2 - p^2\right) \cos(d + c z) - 2 c p \sin(d + c z)\right) \sinh(b + a z)\right)\right) \Big/ \left(a^4 + 2 \left(c^2 - p^2\right) a^2 + \left(c^2 + p^2\right)^2\right)$$

Involving $e^{p z^r} \cos\left(b z^r\right) \cosh(c z)$

01.20.21.1257.01

$$\int e^{p z^2} \cos\left(b z^2\right) \cosh(c z)\, dz == \frac{1}{8} \sqrt{\pi} \left(\frac{1}{\sqrt{-i b + p}} e^{-\frac{c^2}{4(-i b + p)}} \left(\operatorname{erfi}\left(\frac{2(-i b + p) z - c}{2 \sqrt{-i b + p}}\right) + \operatorname{erfi}\left(\frac{c + 2(-i b + p) z}{2 \sqrt{-i b + p}}\right)\right) + \frac{1}{\sqrt{i b + p}} e^{-\frac{c^2}{4(i b + p)}} \left(\operatorname{erfi}\left(\frac{2(i b + p) z - c}{2 \sqrt{i b + p}}\right) + \operatorname{erfi}\left(\frac{c + 2(i b + p) z}{2 \sqrt{i b + p}}\right)\right)\right)$$

01.20.21.1258.01

$$\int e^{p \sqrt{z}} \cos\left(b \sqrt{z}\right) \cosh(c z)\, dz == \frac{1}{8} \left(\frac{8 e^{p \sqrt{z}} \cos\left(b \sqrt{z}\right) \sinh(c z)}{c} + \frac{c e^{-\frac{(b + i p)^2}{4 c}} (-i b + p) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2 \sqrt{z}\, c - i b + p}{2 \sqrt{-c}}\right)}{(-c)^{5/2}} + \frac{c e^{\frac{(i b + p)^2}{4 c}} (i b + p) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2 \sqrt{z}\, c + i b + p}{2 \sqrt{-c}}\right)}{(-c)^{5/2}} + \frac{e^{\frac{(b + i p)^2}{4 c}} i (b + i p) \sqrt{\pi} \operatorname{erfi}\left(\frac{2 \sqrt{z}\, c - i b + p}{2 \sqrt{c}}\right)}{c^{3/2}} - \frac{e^{\frac{(b - i p)^2}{4 c}} (i b + p) \sqrt{\pi} \operatorname{erfi}\left(\frac{2 \sqrt{z}\, c + i b + p}{2 \sqrt{c}}\right)}{c^{3/2}}\right)$$

Involving $e^{p z^r} \cos(b z) \cosh(c z)$

01.20.21.1259.01

$$\int e^{p z^2} \cos(b z) \cosh(c z)\, dz == \frac{1}{8 \sqrt{p}} \left(\sqrt{\pi} \left(e^{-\frac{(-c - i b)^2}{4 p}} \operatorname{erfi}\left(\frac{-c - i b + 2 p z}{2 \sqrt{p}}\right) + e^{-\frac{(i b - c)^2}{4 p}} \operatorname{erfi}\left(\frac{-c + i b + 2 p z}{2 \sqrt{p}}\right) + e^{-\frac{(c - i b)^2}{4 p}} \operatorname{erfi}\left(\frac{c - i b + 2 p z}{2 \sqrt{p}}\right) + e^{-\frac{(c + i b)^2}{4 p}} \operatorname{erfi}\left(\frac{c + i b + 2 p z}{2 \sqrt{p}}\right)\right)\right)$$

01.20.21.1260.01

$$\int e^{p\sqrt{z}}\cos(b\,z)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\left(\frac{8\,e^{p\sqrt{z}}\,(b\cosh(c\,z)\sin(b\,z)+c\cos(b\,z)\sinh(c\,z))}{b^2+c^2}-\frac{e^{\frac{p^2}{4c-4ib}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c-ib)\sqrt{z}}{2\sqrt{ib-c}}\right)}{(ib-c)^{3/2}}-\frac{e^{\frac{p^2}{-4c-4ib}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+ib)+p}{2\sqrt{c+ib}}\right)}{(c+ib)^{3/2}}-\right.$$

$$\left.\frac{e^{\frac{p^2}{4c+4ib}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c+ib)\sqrt{z}}{2\sqrt{-c-ib}}\right)}{(-c-ib)^{3/2}}-\frac{e^{\frac{p^2}{4ib-4c}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c-ib)+p}{2\sqrt{c-ib}}\right)}{(c-ib)^{3/2}}\right)$$

Involving $e^{p\,z}\cos(b\,z^r)\cosh(c\,z)$

01.20.21.1261.01

$$\int e^{p\,z}\cos\left(b\,z^2\right)\cosh(c\,z)\,dz ==$$

$$-\frac{1}{8\,b}\left(i\sqrt{\pi}\left(-\sqrt{-ib}\;e^{-\frac{i(p-c)^2}{4b}}\operatorname{erfi}\left(\frac{-c+p-2ibz}{2\sqrt{-ib}}\right)-\sqrt{-ib}\;e^{-\frac{i(c+p)^2}{4b}}\operatorname{erfi}\left(\frac{c+p-2ibz}{2\sqrt{-ib}}\right)+\sqrt{ib}\right.\right.$$

$$\left.\left.e^{\frac{i(p-c)^2}{4b}}\operatorname{erfi}\left(\frac{-c+p+2ibz}{2\sqrt{ib}}\right)+\sqrt{ib}\;e^{\frac{i(c+p)^2}{4b}}\operatorname{erfi}\left(\frac{c+p+2ibz}{2\sqrt{ib}}\right)\right)\right)$$

01.20.21.1262.01

$$\int e^{p\,z}\cos\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\left(\frac{8\,e^{p\,z}\cos\left(b\sqrt{z}\right)(p\cosh(c\,z)-c\sinh(c\,z))}{p^2-c^2}+\frac{b\,e^{\frac{b^2}{4p-4c}}\,i\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-ib+2(p-c)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}}+\frac{b\,e^{\frac{b^2}{4(c+p)}}\,i\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-ib+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}}-\right.$$

$$\left.\frac{ib\,e^{\frac{b^2}{4p-4c}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{ib+2(p-c)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}}-\frac{ib\,e^{\frac{b^2}{4(c+p)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{ib+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}}\right)$$

Involving $e^{p\,z}\cos(b\,z)\cosh(c\,z^r)$

01.20.21.1263.01

$$\int e^{p z} \cos(b z) \cosh\left(c z^2\right) dz ==$$
$$\frac{\sqrt{\pi}}{8 c}\left(e^{\frac{(b-i p)^2}{4 c}}\left(\sqrt{c}\left(e^{\frac{i b p}{c}} \operatorname{erfi}\left(\frac{-i b+p+2 c z}{2 \sqrt{c}}\right)+\operatorname{erfi}\left(\frac{i b+p+2 c z}{2 \sqrt{c}}\right)\right)-\sqrt{-c}\, e^{\frac{(i b+p)^2}{2 c}} \operatorname{erfi}\left(\frac{i b+p-2 c z}{2 \sqrt{-c}}\right)\right)-\right.$$
$$\left.\sqrt{-c}\, e^{-\frac{(b+i p)^2}{4 c}} \operatorname{erfi}\left(\frac{-i b+p-2 c z}{2 \sqrt{-c}}\right)\right)$$

01.20.21.1264.01

$$\int e^{p z} \cos(b z) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{8}\left(\frac{4 e^{(-i b+p) z} \cosh\left(c \sqrt{z}\right)}{-i b+p}+\frac{4 e^{(i b+p) z} \cosh\left(c \sqrt{z}\right)}{i b+p}-\frac{c e^{-\frac{c^2}{4(-i b+p)}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{c+2(i b-p)\sqrt{z}}{2\sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}}-\right.$$
$$\left.\frac{c e^{-\frac{c^2}{4(-i b+p)}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{c+2(-i b+p)\sqrt{z}}{2\sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}}-\frac{c e^{-\frac{c^2}{4(i b+p)}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{c+2(-i b-p)\sqrt{z}}{2\sqrt{i b+p}}\right)}{(i b+p)^{3/2}}-\frac{c e^{-\frac{c^2}{4(i b+p)}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{c+2(i b+p)\sqrt{z}}{2\sqrt{i b+p}}\right)}{(i b+p)^{3/2}}\right)$$

Involving $e^{p z^r} \cos(b z) \cosh\left(c z^r\right)$

01.20.21.1265.01

$$\int e^{p z^2} \cos(b z) \cosh\left(c z^2\right) dz ==$$
$$-\frac{\sqrt{\pi}}{8(c-p)(c+p)}\left(e^{\frac{b^2}{4 p-4 c}} \sqrt{p-c}\,(c+p) \operatorname{erfi}\left(\frac{-i b+2(p-c) z}{2\sqrt{p-c}}\right)+e^{\frac{b^2}{4 p-4 c}} \sqrt{p-c}\,(c+p) \operatorname{erfi}\left(\frac{i b+2(p-c) z}{2\sqrt{p-c}}\right)-\right.$$
$$\left.e^{\frac{b^2}{4(c+p)}}(c-p) \sqrt{c+p}\left(\operatorname{erfi}\left(\frac{-i b+2(c+p) z}{2\sqrt{c+p}}\right)+\operatorname{erfi}\left(\frac{i b+2(c+p) z}{2\sqrt{c+p}}\right)\right)\right)$$

01.20.21.1266.01

$$\int e^{p \sqrt{z}} \cos(b z) \cosh\left(c \sqrt{z}\right) dz ==$$
$$\frac{1}{8}\left(\frac{e^{-\frac{i(c-p)^2}{4 b}}(c-p) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{-c+p-2 i b \sqrt{z}}{2\sqrt{-i b}}\right)}{(-i b)^{3/2}}+\frac{\sqrt{-i b}\, e^{-\frac{i(c+p)^2}{4 b}}(c+p) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{c+p-2 i b \sqrt{z}}{2\sqrt{-i b}}\right)}{b^2}+\frac{8 e^{p \sqrt{z}} \cosh\left(c \sqrt{z}\right) \sin(b z)}{b}-\right.$$
$$\left.\frac{\sqrt{i b}\, e^{\frac{i(c-p)^2}{4 b}}(c-p) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{-c+p+2 i b \sqrt{z}}{2\sqrt{i b}}\right)}{b^2}-\frac{e^{\frac{i(c+p)^2}{4 b}}(c+p) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{c+p+2 i b \sqrt{z}}{2\sqrt{i b}}\right)}{(i b)^{3/2}}\right)$$

Involving $e^{p z} \cos\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1267.01

$$\int e^{p z} \cos\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{e^{\frac{p^2}{4(c+i b)}}\operatorname{erfi}\left(\frac{p-2 i b z-2 c z}{2\sqrt{-c-i b}}\right)}{\sqrt{-c-i b}}+\frac{e^{\frac{p^2}{4(c-i b)}}\operatorname{erfi}\left(\frac{p-2 c z+2 i b z}{2\sqrt{i b-c}}\right)}{\sqrt{i b-c}}+\frac{e^{-\frac{p^2}{4(c-i b)}}\operatorname{erfi}\left(\frac{p-2 i b z+2 c z}{2\sqrt{c-i b}}\right)}{\sqrt{-i b+c}}+\frac{e^{-\frac{p^2}{4(c+i b)}}\operatorname{erfi}\left(\frac{p+2 c z+2 i b z}{2\sqrt{c+i b}}\right)}{\sqrt{c+i b}}\right)$$

01.20.21.1268.01

$$\int e^{p z} \cos\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$\frac{1}{8}\left(\frac{8 e^{p z}\cos\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right)}{p}+\frac{(b-i c) e^{\frac{(b-i c)^2}{4 p}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-i c+2 i p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}+\frac{(b-i c) e^{\frac{(i c-b)^2}{4 p}}\sqrt{\pi}\operatorname{erf}\left(\frac{b-i c-2 i p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}-\right.$$

$$\left.\frac{(b+i c) e^{\frac{(b+i c)^2}{4 p}}\sqrt{\pi}\operatorname{erf}\left(\frac{-b-i c-2 i p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}-\frac{i (b+i c) e^{\frac{(b+i c)^2}{4 p}}\sqrt{\pi}\operatorname{erfi}\left(\frac{-c+i b+2 p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right)$$

Involving $e^{p z^r} \cos\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1269.01

$$\int e^{p z^r} \cos(b z^r) \cosh(c z^r)\, dz == -\frac{z}{4 r}\left(\Gamma\left(\frac{1}{r}, (c+i b-p) z^r\right)((c+i b-p) z^r)^{-1/r}+((c-i b-p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (c-i b-p) z^r\right)+\right.$$

$$\left.(-(c+i b+p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, -(c+i b+p) z^r\right)+(-(c-i b+p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, -(c-i b+p) z^r\right)\right)$$

01.20.21.1270.01

$$\int e^{p z^2} \cos\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\operatorname{erf}\left(\sqrt{c+i b-p}\, z\right)}{\sqrt{c+i b-p}}+\frac{\operatorname{erf}\left(\sqrt{c-i b-p}\, z\right)}{\sqrt{c-i b-p}}+\frac{\operatorname{erfi}\left(\sqrt{c+i b+p}\, z\right)}{\sqrt{c+i b+p}}+\frac{\operatorname{erfi}\left(\sqrt{c-i b+p}\, z\right)}{\sqrt{c-i b+p}}\right)$$

01.20.21.1271.01

$$\int e^{p \sqrt{z}} \cos\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$\frac{1}{2}\left(e^{(-c-i b+p)\sqrt{z}}\left(\frac{\sqrt{z}}{-c-i b+p}+\frac{1}{(b-i c+i p)^2}\right)+e^{(-c+i b+p)\sqrt{z}}\left(\frac{\sqrt{z}}{-c+i b+p}+\frac{1}{(b+i (c-p))^2}\right)+\right.$$

$$\left.e^{(c-i b+p)\sqrt{z}}\left(\frac{\sqrt{z}}{c-i b+p}+\frac{1}{(b+i (c+p))^2}\right)+e^{(c+i b+p)\sqrt{z}}\left(\frac{\sqrt{z}}{c+i b+p}+\frac{1}{(b-i (c+p))^2}\right)\right)$$

Involving $e^{b z^r+e} \cos\left(a z^r+q\right) \cosh\left(c z^r+g\right)$

01.20.21.1272.01

$$\int e^{b z^r+e} \cos(a z^r+q) \cosh(c z^r+g)\, dz ==$$
$$-\frac{z}{4r}\left(e^{e+g+i q}\,\Gamma\left(\frac{1}{r},(-b-c-i a) z^r\right)((-b-c-i a) z^r)^{-1/r}+e^{e+g-i q}((-b-c+i a) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+i a) z^r\right)+\right.$$
$$\left.e^{e-g+i q}((-b+c-i a) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-i a) z^r\right)+e^{e-g-i q}((-b+c+i a) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+i a) z^r\right)\right)$$

01.20.21.1273.01

$$\int e^{b z^2+e} \cos\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz == \frac{1}{8}\sqrt{\pi}$$
$$\left(\frac{e^{e-g-i q}\,\text{erfi}\left(\sqrt{b-c-i a}\ z\right)}{\sqrt{b-c-i a}}+\frac{e^{e-g+i q}\,\text{erfi}\left(\sqrt{b-c+i a}\ z\right)}{\sqrt{b-c+i a}}+\frac{e^{e+g-i q}\,\text{erfi}\left(\sqrt{b+c-i a}\ z\right)}{\sqrt{b+c-i a}}+\frac{e^{e+g+i q}\,\text{erfi}\left(\sqrt{b+c+i a}\ z\right)}{\sqrt{b+c+i a}}\right)$$

01.20.21.1274.01

$$\int e^{\sqrt{z}\ b+e} \cos\left(\sqrt{z}\ a+q\right) \cosh\left(\sqrt{z}\ c+g\right) dz ==$$
$$\frac{1}{2}\left(\frac{e^{\sqrt{z}\ (b-c-i a)+e-g-i q}\left((b-c-i a)\sqrt{z}-1\right)}{(b-c-i a)^2}+\frac{e^{\sqrt{z}\ (b-c+i a)+e-g+i q}\left((b-c+i a)\sqrt{z}-1\right)}{(b-c+i a)^2}+\right.$$
$$\left.\frac{e^{\sqrt{z}\ (b+c-i a)+e+g-i q}\left((b+c-i a)\sqrt{z}-1\right)}{(b+c-i a)^2}+\frac{e^{\sqrt{z}\ (b+c+i a)+e+g+i q}\left((b+c+i a)\sqrt{z}-1\right)}{(b+c+i a)^2}\right)$$

Involving $e^{b z^r+d z+e} \cos\left(a z^r+p z+q\right) \cosh\left(c z^r+f z+g\right)$

01.20.21.1275.01

$$\int e^{b z^2+d z+e} \cos\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$
$$\frac{1}{8}\sqrt{\pi}\left(\frac{1}{a^2+2 i c a+b^2-c^2}\left(\sqrt{b-c+i a}\ (b+c-i a)\, e^{-\frac{(d-f+i p)^2}{4(b-c+i a)}+e-g+i q}\,\text{erfi}\left(\frac{d-f+i p+2(b-c+i a) z}{2\sqrt{b-c+i a}}\right)+\right.\right.$$
$$\left.(b-c+i a)\sqrt{b+c-i a}\ e^{-\frac{(d+f-i p)^2}{4(b+c-i a)}+e+g-i q}\,\text{erfi}\left(\frac{d+f-i p-2 i a z+2 b z+2 c z}{2\sqrt{b+c-i a}}\right)\right)+$$
$$\frac{1}{a^2-2 i c a+b^2-c^2}\left(\sqrt{b-c-i a}\ (b+c+i a)\, e^{-\frac{(-d+f+i p)^2}{4(b-c-i a)}+e-g-i q}\,\text{erfi}\left(\frac{d-f-i p+2(b-c-i a) z}{2\sqrt{b-c-i a}}\right)+\right.$$
$$\left.\left.(b-c-i a)\sqrt{b+c+i a}\ e^{-\frac{(d+f+i p)^2}{4(b+c+i a)}+e+g+i q}\,\text{erfi}\left(\frac{d+f+i p+2 b z+2 c z+2 i a z}{2\sqrt{b+c+i a}}\right)\right)\right)$$

01.20.21.1276.01

$$\int e^{\sqrt{z}\,b+d\,z+e}\cos\left(\sqrt{z}\,a+p\,z+q\right)\cosh\left(\sqrt{z}\,c+f\,z+g\right)dz == \frac{1}{8}e^{e-g-i\,q}\left(2\left(\frac{e^{\sqrt{z}\,(b+c+i\,a)+2\,g+2\,i\,q+(d+f+i\,p)\,z}}{d+f+i\,p}+\frac{e^{\sqrt{z}\,(b-c-i\,a)+(d-f-i\,p)\,z}}{d-f-i\,p}+\frac{e^{\sqrt{z}\,(b+c-i\,a)+2\,g+(d+f-i\,p)\,z}}{d+f-i\,p}+\frac{e^{\sqrt{z}\,(b-c+i\,a)+2\,i\,q+(d-f+i\,p)\,z}}{d-f+i\,p}\right)-\right.$$

$$\frac{(b-c+i\,a)\,e^{2\,i\,q-\frac{(b-c+i\,a)^2}{4\,(d-f+i\,p)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b-c+i\,a+2\,(d-f+i\,p)\,\sqrt{z}}{2\sqrt{d-f+i\,p}}\right)}{(d-f+i\,p)^{3/2}}-$$

$$\frac{(b+c+i\,a)\,e^{-\frac{(b+c+i\,a)^2}{4\,(d+f+i\,p)}+2\,g+2\,i\,q}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+c+i\,a+2\,(d+f+i\,p)\,\sqrt{z}}{2\sqrt{d+f+i\,p}}\right)}{(d+f+i\,p)^{3/2}}-$$

$$\left.\frac{(b-c-i\,a)\,e^{\frac{(a+(b-c)\,i)^2}{4\,(d-f-i\,p)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b-c-i\,a+2\,(d-f-i\,p)\,\sqrt{z}}{2\sqrt{d-f-i\,p}}\right)}{(d-f-i\,p)^{3/2}}-\frac{(b+c-i\,a)\,e^{\frac{(a+(b+c)\,i)^2}{4\,(d+f-i\,p)}+2\,g}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}}{2\sqrt{d+f-i\,p}}\right)}{(d+f-i\,p)^{3/2}}\right)$$

Involving cos and rational functions of exp

Involving $\cos(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1277.01

$$\int\frac{\cos(e\,z)\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz == \frac{1}{4}a^{-n}\left(\frac{e^{(c+i\,e)\,z}}{c+i\,e}\left({}_2F_1\left(\frac{c+i\,e}{d},\,n;\,\frac{c+d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-2\,(c+i\,e)\,z}\,{}_2F_1\left(-\frac{c+i\,e}{d},\,n;\,\frac{-c+d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+\right.$$

$$\left.\frac{1}{c-i\,e}\left(e^{(c-i\,e)\,z}\,{}_2F_1\left(\frac{c-i\,e}{d},\,n;\,\frac{c+d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-(c-i\,e)\,z}\,{}_2F_1\left(-\frac{c-i\,e}{d},\,n;\,\frac{-c+d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\Big/;\,n\in\mathbb{N}^+$$

Involving $e^{p\,z}\cos(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1278.01

$$\int \frac{e^{p z} \cos(e z) \cosh(c z)}{\left(a + b\, e^{d z}\right)^n} dz ==$$
$$\frac{1}{4} a^{-n} \left(\frac{1}{(c - i e - p)(c - i e + p)} \left(e^{(c - i e + p) z} (c - i e - p)\, {}_2F_1\left(\frac{c - i e + p}{d}, n; \frac{c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right. \right.$$
$$e^{(-c + i e + p) z} (c - i e + p)\, {}_2F_1\left(\frac{-c + i e + p}{d}, n; \frac{-c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \Bigg) +$$
$$\frac{1}{(c + i e - p)(c + i e + p)} \left(e^{(c + i e + p) z} (c + i e - p)\, {}_2F_1\left(\frac{c + i e + p}{d}, n; \frac{c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right.$$
$$\left. \left. e^{(-c - i e + p) z} (c + i e + p)\, {}_2F_1\left(\frac{-c - i e + p}{d}, n; \frac{-c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right) /;\ n \in \mathbb{N}^+$$

Involving cos and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^\beta \cos(e z) \cosh(c z)$

01.20.21.1279.01

$$\int \left(a + b\, e^{d z}\right)^\beta \cos(e z) \cosh(c z)\, dz == \frac{1}{4} \left(a + b\, e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta}$$
$$\left(\frac{e^{(c + i e) z}}{c + i e} \left({}_2F_1\left(\frac{c + i e}{d}, -\beta; \frac{c + d + i e}{d}; -\frac{b\, e^{d z}}{a} \right) - e^{-2 (c + i e) z}\, {}_2F_1\left(-\frac{c + i e}{d}, -\beta; \frac{-c + d - i e}{d}; -\frac{b\, e^{d z}}{a} \right) \right) + \right.$$
$$\left. \frac{1}{c - i e} \left(e^{(c - i e) z}\, {}_2F_1\left(\frac{c - i e}{d}, -\beta; \frac{c + d - i e}{d}; -\frac{b\, e^{d z}}{a} \right) - e^{-(c - i e) z}\, {}_2F_1\left(-\frac{c - i e}{d}, -\beta; \frac{-c + d + i e}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right)$$

Involving $e^{p z} \left(a + b\, e^{d z}\right)^\beta \cos(e z) \cosh(c z)$

01.20.21.1280.01

$$\int e^{p z} \left(a + b\, e^{d z}\right)^\beta \cos(e z) \cosh(c z)\, dz ==$$
$$\frac{1}{4} \left(a + b\, e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta} \left(\frac{1}{(c - i e - p)(c - i e + p)} \left(e^{(c - i e + p) z} (c - i e - p)\, {}_2F_1\left(\frac{c - i e + p}{d}, -\beta; \frac{c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right. \right.$$
$$e^{(-c + i e + p) z} (c - i e + p)\, {}_2F_1\left(\frac{-c + i e + p}{d}, -\beta; \frac{-c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \Bigg) +$$
$$\frac{1}{(c + i e - p)(c + i e + p)} \left(e^{(c + i e + p) z} (c + i e - p)\, {}_2F_1\left(\frac{c + i e + p}{d}, -\beta; \frac{c + d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right.$$
$$\left. \left. e^{(-c - i e + p) z} (c + i e + p)\, {}_2F_1\left(\frac{-c - i e + p}{d}, -\beta; \frac{-c + d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right)$$

Involving powers of cos and exp

Involving $e^{p z} \cos^{\mu}(c z) \cosh(a z)$

01.20.21.1281.01

$$\int e^{p z} \cos^{\mu}(c z) \cosh(a z)\, dz ==$$
$$\frac{1}{2}\left(1+e^{2 i c z}\right)^{-\mu} \cos^{\mu}(c z)\left(\frac{e^{(p-a) z}}{-a+p-i c \mu}\, {}_2F_1\left(-\frac{i(-a+p-i c \mu)}{2c}, -\mu; 1-\frac{i(-a+p-i c \mu)}{2c}; -e^{2 i c z}\right)+\right.$$
$$\left.\frac{e^{(a+p) z}}{a+p-i c \mu}\, {}_2F_1\left(-\frac{i(a+p-i c \mu)}{2c}, -\mu; 1-\frac{i(a+p-i c \mu)}{2c}; -e^{2 i c z}\right)\right)$$

01.20.21.1282.01

$$\int e^{p z} \cos^{m}(c z) \cosh(a z)\, dz == \binom{m}{\frac{m}{2}} \frac{2^{-m} e^{p z}(1-m \bmod 2)(p \cosh(a z)-a \sinh(a z))}{p^2-a^2} + 2^{1-m} e^{p z} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}$$
$$\left(\cosh(a z)\left(p\left(-a^2+p^2+c^2(m-2k)^2\right)\cos(c(2k-m) z)+\left(a^2+p^2+c^2(m-2k)^2\right)c(2k-m)\sin(c(2k-m) z)\right)+\right.$$
$$\left.a\left(\left(a^2-p^2+c^2(m-2k)^2\right)\cos(c(2k-m) z)+2 p c(m-2k)\sin(c(2k-m) z)\right)\sinh(a z)\right) \Big/$$
$$\left(a^4+2\left(c^2(m-2k)^2-p^2\right)a^2+\left(p^2+c^2(m-2k)^2\right)^2\right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z} \cos^{\mu}(c z+d) \cosh(a z)$

01.20.21.1283.01

$$\int e^{p z} \cos^{\mu}(d+c z) \cosh(a z)\, dz ==$$
$$\frac{1}{2}\left(1+e^{2 i (d+c z)}\right)^{-\mu} \cos^{\mu}(d+c z)\left(\frac{e^{(a+p) z}}{a+p-i c \mu}\, {}_2F_1\left(-\frac{i(a+p)+c \mu}{2c}, -\mu; -\frac{i(a+p)}{2c}-\frac{\mu}{2}+1; -e^{2 i (d+c z)}\right)-\right.$$
$$\left.\frac{e^{(p-a) z}}{a-p+i c \mu}\, {}_2F_1\left(\frac{i(a-p+i c \mu)}{2c}, -\mu; \frac{i(a-p)}{2c}-\frac{\mu}{2}+1; -e^{2 i (d+c z)}\right)\right)$$

01.20.21.1284.01

$$\int e^{p z} \cos^{m}(d+c z) \cosh(a z)\, dz ==$$
$$\frac{2^{-m}\left(e^{p z}(p \cosh(a z)-a \sinh(a z))\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{p^2-a^2} + 2^{1-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\binom{m}{k}\left(e^{p z}\left(\cosh(a z)\left(p\left(-a^2+c^2(m-2k)^2+p^2\right)\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\cos((2k-m)(d+c z))+c(2k-m)\left(a^2+c^2(m-2k)^2+p^2\right)\sin((2k-m)(d+c z))\right)+\right.\right.\right.$$
$$\left.\left.\left.a\left(\left(a^2+c^2(m-2k)^2-p^2\right)\cos((2k-m)(d+c z))+2c(m-2k) p \sin((2k-m)(d+c z))\right)\sinh(a z)\right)\right) \Big/$$
$$\left(a^4+2\left(c^2(m-2k)^2-p^2\right)a^2+\left(c^2(m-2k)^2+p^2\right)^2\right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z} \cos^{\mu}(c z) \cosh(a z+b)$

01.20.21.1285.01

$$\int e^{p z} \cos^{\mu}(c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2} e^{-b} \left(1 + e^{2 i c z}\right)^{-\mu} \cos^{\mu}(c z) \left(\frac{e^{2 b + (a+p) z}}{a + p - i c \mu} {}_2F_1\left(-\frac{i (a+p) + c \mu}{2 c}, -\mu; -\frac{i (a+p)}{2 c} - \frac{\mu}{2} + 1; -e^{2 i c z}\right) - \frac{e^{(p-a) z}}{a - p + i c \mu} {}_2F_1\left(\frac{i (a - p + i c \mu)}{2 c}, -\mu; \frac{i (a-p)}{2 c} - \frac{\mu}{2} + 1; -e^{2 i c z}\right)\right)$$

01.20.21.1286.01

$$\int e^{p z} \cos^{m}(c z) \cosh(b + a z)\, dz ==$$

$$\frac{2^{-m} \left(e^{p z} (p \cosh(b + a z) - a \sinh(b + a z))\right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2)}{p^2 - a^2} + 2^{1-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\binom{m}{k} \left(e^{p z} \left(\cosh(b + a z)\right.\right.\right.$$
$$\left(p \left(-a^2 + c^2 (m - 2 k)^2 + p^2\right) \cos((2 k - m) c z) + c (2 k - m) \left(a^2 + c^2 (m - 2 k)^2 + p^2\right) \sin((2 k - m) c z)\right) +$$
$$\left.\left.\left. a \left(\left(a^2 + c^2 (m - 2 k)^2 - p^2\right) \cos((2 k - m) c z) + 2 c (m - 2 k)\, p \sin((2 k - m) c z)\right) \sinh(b + a z)\right)\right) \Big/$$
$$\left(a^4 + 2 \left(c^2 (m - 2 k)^2 - p^2\right) a^2 + \left(c^2 (m - 2 k)^2 + p^2\right)^2\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z} \cos^{\mu}(c z + d) \cosh(a z + b)$

01.20.21.1287.01

$$\int e^{p z} \cos^{\mu}(d + c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2} e^{-b} \left(1 + e^{2 i (d + c z)}\right)^{-\mu} \cos^{\mu}(d + c z) \left(\frac{e^{2 b + (a+p) z}}{a + p - i c \mu} {}_2F_1\left(-\frac{i (a+p) + c \mu}{2 c}, -\mu; -\frac{i (a+p)}{2 c} - \frac{\mu}{2} + 1; -e^{2 i (d + c z)}\right) - \frac{e^{(p-a) z}}{a - p + i c \mu} {}_2F_1\left(\frac{i (a - p + i c \mu)}{2 c}, -\mu; \frac{i (a-p)}{2 c} - \frac{\mu}{2} + 1; -e^{2 i c z}\right)\right)$$

01.20.21.1288.01

$$\int e^{p z} \cos^{m}(d + c z) \cosh(b + a z)\, dz == \binom{m}{\frac{m}{2}} \frac{2^{-m} e^{p z} (p \cosh(b + a z) - a \sinh(b + a z)) (1 - m \bmod 2)}{p^2 - a^2} +$$
$$2^{1-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} e^{p z} \left(\cosh(b + a z) \left(p \left(-a^2 + c^2 (m - 2 k)^2 + p^2\right) \cos((2 k - m) (d + c z)) + \right.\right.$$
$$\left. c (2 k - m) \left(a^2 + c^2 (m - 2 k)^2 + p^2\right) \sin((2 k - m) (d + c z))\right) +$$
$$\left. a \left(\left(a^2 + c^2 (m - 2 k)^2 - p^2\right) \cos((2 k - m) (d + c z)) + 2 c (m - 2 k)\, p \sin((2 k - m) (d + c z))\right) \sinh(b + a z)\right) \Big/$$
$$\left(a^4 + 2 \left(c^2 (m - 2 k)^2 - p^2\right) a^2 + \left(c^2 (m - 2 k)^2 + p^2\right)^2\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos^{m}\left(b z^r\right) \cosh(c z)$

01.20.21.1289.01

$$\int e^{p z^2} \cos^m\left(b z^2\right) \cosh(c z)\, dz == \frac{2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(e^{-\frac{c^2}{4p}} \operatorname{erfi}\left(\frac{2pz-c}{2\sqrt{p}}\right) + e^{-\frac{c^2}{4p}} \operatorname{erfi}\left(\frac{c+2pz}{2\sqrt{p}}\right)\right) (1 - m \bmod 2)}{\sqrt{p}} +$$

$$2^{-m-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\left(e^{-\frac{c^2}{4(-ibm+p+2ibs)}} \sqrt{-ibm+p+2ibs}\ (ibm+p-2ibs) \operatorname{erfi}\left(\frac{2(-ibm+p+2ibs)z-c}{2\sqrt{-ibm+p+2ibs}}\right) + \right.\right.$$

$$\left.\left. e^{-\frac{c^2}{4(ibm+p-2ibs)}} (-ibm+p+2ibs) \sqrt{ibm+p-2ibs}\ \operatorname{erfi}\left(\frac{c+2pz-2(2ibs-ibm)z}{2\sqrt{ibm+p-2ibs}}\right)\right) \Big/$$

$$((ibm+p-2ibs)(-ibm+p+2ibs)) + \left(e^{-\frac{c^2}{4(-ibm+p+2ibs)}} \sqrt{-ibm+p+2ibs}\ (ibm+p-2ibs) \right.$$

$$\operatorname{erfi}\left(\frac{c+2pz-2(ibm-2ibs)z}{2\sqrt{-ibm+p+2ibs}}\right) + e^{-\frac{c^2}{4(ibm+p-2ibs)}} (-ibm+p+2ibs) \sqrt{ibm+p-2ibs}$$

$$\left.\left. \operatorname{erfi}\left(\frac{2(ibm+p-2ibs)z-c}{2\sqrt{ibm+p-2ibs}}\right)\right) \Big/ ((ibm+p-2ibs)(-ibm+p+2ibs)) \right) /;\ m \in \mathbb{Z} \wedge m > 0$$

01.20.21.1290.01

$$\int e^{p\sqrt{z}} \cos^m\left(b\sqrt{z}\right) \cosh(cz)\, dz ==$$

$$2^{-m} \left(\frac{p\sqrt{\pi}}{4c^{3/2}} e^{-\frac{p^2}{4c}} \left(e^{\frac{p^2}{2c}} \operatorname{erf}\left(\frac{2c\sqrt{z}-p}{2\sqrt{c}}\right) - \operatorname{erfi}\left(\frac{2\sqrt{z}\,c+p}{2\sqrt{c}}\right)\right) + \frac{e^{p\sqrt{z}} \sinh(cz)}{c} \right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2) +$$

$$2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\frac{c\, e^{\frac{(p-ib(m-2k))^2}{4c}} (p - ib(m-2k)) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2\sqrt{z}\,c - ib(m-2k)+p}{2\sqrt{-c}}\right)}{(-c)^{5/2}} + \right.$$

$$\frac{c\, e^{\frac{(bi(m-2k)+p)^2}{4c}} (bi(m-2k)+p) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2\sqrt{z}\,c + bi(m-2k)+p}{2\sqrt{-c}}\right)}{(-c)^{5/2}} -$$

$$\frac{e^{\frac{(b(m-2k)+ip)^2}{4c}} (p - ib(m-2k)) \sqrt{\pi} \operatorname{erfi}\left(\frac{2\sqrt{z}\,c - ib(m-2k)+p}{2\sqrt{c}}\right)}{c^{3/2}} -$$

$$\left. \frac{e^{-\frac{(bi(m-2k)+p)^2}{4c}} (bi(m-2k)+p) \sqrt{\pi} \operatorname{erfi}\left(\frac{2\sqrt{z}\,c + bi(m-2k)+p}{2\sqrt{c}}\right)}{c^{3/2}} + \frac{8\, e^{p\sqrt{z}} \cos\left(b(2k-m)\sqrt{z}\right) \sinh(cz)}{c} \right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos^m(b z) \cosh(c z)$

01.20.21.1291.01

$$\int e^{p z^2} \cos^m(b z) \cosh(c z)\, dz == \frac{2^{-m-2}\, e^{-\frac{c^2}{4p}} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(\operatorname{erfi}\left(\frac{2pz-c}{2\sqrt{p}}\right) + \operatorname{erfi}\left(\frac{c+2pz}{2\sqrt{p}}\right)\right)(1 - m \bmod 2)}{\sqrt{p}} +$$

$$\frac{1}{\sqrt{p}}\left(2^{-m-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{(-c-ibm+2ibs)^2}{4p}}\operatorname{erfi}\left(\frac{-c-ibm+2ibs+2pz}{2\sqrt{p}}\right) + e^{-\frac{(c-ibm+2ibs)^2}{4p}}\operatorname{erfi}\left(\frac{c-ibm+2ibs+2pz}{2\sqrt{p}}\right) + e^{-\frac{(-c+ibm-2ibs)^2}{4p}}\operatorname{erfi}\left(\frac{-c+ibm-2ibs+2pz}{2\sqrt{p}}\right) + e^{-\frac{(c+ibm-2ibs)^2}{4p}}\operatorname{erfi}\left(\frac{c+ibm-2ibs+2pz}{2\sqrt{p}}\right)\right)\right) /; m \in \mathbb{Z} \wedge m > 0$$

01.20.21.1292.01

$$\int e^{p\sqrt{z}} \cos^m(b z) \cosh(c z)\, dz ==$$

$$2^{-m}\left(\frac{p\sqrt{\pi}}{4c^{3/2}} e^{-\frac{p^2}{4c}}\left(e^{\frac{p^2}{2c}}\operatorname{erf}\left(\frac{2c\sqrt{z}-p}{2\sqrt{c}}\right) - \operatorname{erfi}\left(\frac{2\sqrt{z}\,c+p}{2\sqrt{c}}\right)\right) + \frac{e^{p\sqrt{z}}\sinh(cz)}{c}\right)\binom{m}{\frac{m}{2}}(1 - m \bmod 2) +$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(-\frac{e^{\frac{p^2}{4c+8ibk-4ibm}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c+2ibk-ibm)\sqrt{z}}{2\sqrt{ib(m-2k)-c}}\right)}{(ib(m-2k)-c)^{3/2}} + \frac{2e^{\sqrt{z}\,p+(c-2ibk+ibm)z}}{c-2ibk+ibm} - \frac{2e^{p\sqrt{z}-(c-2ibk+ibm)z}}{c-2ibk+ibm} - \frac{2e^{p\sqrt{z}-(c-ib(m-2k))z}}{c+2ibk-ibm} - \frac{e^{\frac{p^2}{-4c+8ibk-4ibm}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+bi(m-2k))+p}{2\sqrt{c+bi(m-2k)}}\right)}{(c+bi(m-2k))^{3/2}} - \frac{e^{\frac{p^2}{4c-8ibk+4ibm}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c-2ibk+ibm)\sqrt{z}}{2\sqrt{-c-ib(m-2k)}}\right)}{(-c-ib(m-2k))^{3/2}} + \frac{2e^{\sqrt{z}\,p+(c-ib(m-2k))z}}{c-ib(m-2k)} - \frac{e^{\frac{p^2}{-4c-8ibk+4ibm}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c-ib(m-2k))+p}{2\sqrt{c-ib(m-2k)}}\right)}{(c-ib(m-2k))^{3/2}}\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z} \cos^m(b z^r) \cosh(c z)$

01.20.21.1293.01

$$\int e^{p z} \cos^m\left(b z^2\right) \cosh(c z)\, dz == \frac{2^{-m}\, e^{p z}\, (1 - m \bmod 2)\, (c \sinh(c z) - p \cosh(c z))}{(c - p)\, (c + p)} \binom{m}{\frac{m}{2}} +$$

$$2^{-m-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\left(e^{-\frac{(p-c)^2}{4\,(2\,i\,b\,s - i\,b\,m)}} \sqrt{2\,i\,b\,s - i\,b\,m}\ (i\,b\,m - 2\,i\,b\,s) \operatorname{erfi}\left(\frac{-c + p + 2\,(2\,i\,b\,s - i\,b\,m)\,z}{2\sqrt{2\,i\,b\,s - i\,b\,m}} \right) + e^{-\frac{(c+p)^2}{4\,(i\,b\,m - 2\,i\,b\,s)}} \right.\right.$$

$$\left.\left. (2\,i\,b\,s - i\,b\,m) \sqrt{i\,b\,m - 2\,i\,b\,s}\ \operatorname{erfi}\left(\frac{c + p - 2\,(2\,i\,b\,s - i\,b\,m)\,z}{2\sqrt{i\,b\,m - 2\,i\,b\,s}} \right) \right) \Big/ ((i\,b\,m - 2\,i\,b\,s)\,(2\,i\,b\,s - i\,b\,m)) +$$

$$\left(e^{-\frac{(c+p)^2}{4\,(2\,i\,b\,s - i\,b\,m)}} \sqrt{2\,i\,b\,s - i\,b\,m}\ (i\,b\,m - 2\,i\,b\,s) \operatorname{erfi}\left(\frac{c + p - 2\,(i\,b\,m - 2\,i\,b\,s)\,z}{2\sqrt{2\,i\,b\,s - i\,b\,m}} \right) + e^{-\frac{(p-c)^2}{4\,(i\,b\,m - 2\,i\,b\,s)}} (2\,i\,b\,s - i\,b\,m) \right.$$

$$\left. \sqrt{i\,b\,m - 2\,i\,b\,s}\ \operatorname{erfi}\left(\frac{-c + p + 2\,(i\,b\,m - 2\,i\,b\,s)\,z}{2\sqrt{i\,b\,m - 2\,i\,b\,s}} \right) \right) \Big/ ((i\,b\,m - 2\,i\,b\,s)\,(2\,i\,b\,s - i\,b\,m)) \Big) /;\ m \in \mathbb{N}^+$$

01.20.21.1294.01

$$\int e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh(c z)\, dz == \binom{m}{\frac{m}{2}} \frac{2^{-m}\, e^{p z}\, (p \cosh(c z) - c \sinh(c z))\, (1 - m \bmod 2)}{(p - c)\, (c + p)} + 2^{-m-1}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\frac{b\, e^{\frac{b^2 (m-2k)^2}{4\,(p-c)}}\, i\, (m - 2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\,(p-c)\sqrt{z} - i\,b\,(m-2k)}{2\sqrt{p-c}} \right)}{2\,(p-c)^{3/2}} + \frac{b\, e^{\frac{b^2 (m-2k)^2}{4\,(c+p)}}\, i\, (m - 2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\,(c+p)\sqrt{z} - i\,b\,(m-2k)}{2\sqrt{c+p}} \right)}{2\,(c+p)^{3/2}} + \right.$$

$$\frac{e^{(p-c)\,z - i\,b\,(m-2k)\sqrt{z}}}{p - c} + \frac{e^{b\,i\sqrt{z}\ (m-2k) + (p-c)\,z}}{p - c} - \frac{i\,b\, e^{\frac{b^2 (m-2k)^2}{4\,(p-c)}}\, (m - 2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,i\,(m-2k) + 2\,(p-c)\sqrt{z}}{2\sqrt{p-c}} \right)}{2\,(p-c)^{3/2}} +$$

$$\left. \frac{e^{(c+p)\,z - i\,b\,(m-2k)\sqrt{z}}}{c + p} + \frac{e^{b\,i\sqrt{z}\ (m-2k) + (c+p)\,z}}{c + p} - \frac{i\,b\, e^{\frac{b^2 (m-2k)^2}{4\,(c+p)}}\, (m - 2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,i\,(m-2k) + 2\,(c+p)\sqrt{z}}{2\sqrt{c+p}} \right)}{2\,(c+p)^{3/2}} \right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z} \cos^m(b z) \cosh\left(c z^r\right)$

01.20.21.1295.01

$$\int e^{p z} \cos^m(b z) \cosh\left(c z^2\right) dz ==$$

$$-\frac{2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(\sqrt{-c}\ e^{\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p-2cz}{2\sqrt{-c}}\right) - \sqrt{c}\ e^{-\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p+2cz}{2\sqrt{c}}\right)\right)(1-m \bmod 2)}{c} - \frac{1}{c}\left(\left(2^{-m-2}\sqrt{\pi}\right) \sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{s}\right.$$

$$\left(\left(\sqrt{-c}\ e^{\frac{(ibm+p-2ibs)^2}{4c}} \operatorname{erfi}\left(\frac{ibm+p-2ibs-2cz}{2\sqrt{-c}}\right) - \sqrt{c}\ e^{-\frac{(-ibm+p+2ibs)^2}{4c}} \operatorname{erfi}\left(\frac{-ibm+p+2ibs+2cz}{2\sqrt{c}}\right)\right) + \right.$$

$$\left(\sqrt{-c}\ e^{\frac{(-ibm+p+2ibs)^2}{4c}} \operatorname{erfi}\left(\frac{-ibm+p+2ibs-2cz}{2\sqrt{-c}}\right) - \sqrt{c}\right.$$

$$\left.\left.\left.\left.e^{-\frac{(ibm+p-2ibs)^2}{4c}} \operatorname{erfi}\left(\frac{ibm+p-2ibs+2cz}{2\sqrt{c}}\right)\right)\right)\right)\Big/; m \in \mathbb{Z} \wedge m > 0$$

01.20.21.1296.01

$$\int e^{p z} \cos^m(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2}\left(\frac{4 e^{p z} \cosh\left(c\sqrt{z}\right)}{p} - \frac{c\, e^{-\frac{c^2}{4p}} \sqrt{\pi}\left(\operatorname{erfi}\left(\frac{c+2p\sqrt{z}}{2\sqrt{p}}\right) + \operatorname{erfi}\left(\frac{c-2p\sqrt{z}}{2\sqrt{p}}\right)\right)}{p^{3/2}}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2) +$$

$$2^{-m-2} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k}\left(-\frac{c\, e^{-\frac{c^2}{4(p-ib(2k-m))}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c+2(ib(2k-m)-p)\sqrt{z}}{2\sqrt{p-ib(2k-m)}}\right)}{(p-ib(2k-m))^{3/2}} + \frac{2 e^{(p-ib(2k-m))z-c\sqrt{z}}}{p-ib(2k-m)} + \right.$$

$$\frac{2 e^{\sqrt{z}\,c+(bi(2k-m)+p)z}}{bi(2k-m)+p} - \frac{c\, e^{-\frac{c^2}{4(bi(2k-m)+p)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c+2(bi(2k-m)+p)\sqrt{z}}{2\sqrt{bi(2k-m)+p}}\right)}{(bi(2k-m)+p)^{3/2}} +$$

$$\frac{2 e^{(p-ib(m-2k))z-c\sqrt{z}}}{p-ib(m-2k)} - \frac{c\, e^{-\frac{c^2}{4(p-ib(m-2k))}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c+2(ib(m-2k)-p)\sqrt{z}}{2\sqrt{p-ib(m-2k)}}\right)}{(p-ib(m-2k))^{3/2}} +$$

$$\left.\frac{2 e^{\sqrt{z}\,c+(bi(m-2k)+p)z}}{bi(m-2k)+p} - \frac{c\, e^{-\frac{c^2}{4(bi(m-2k)+p)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c+2(bi(m-2k)+p)\sqrt{z}}{2\sqrt{bi(m-2k)+p}}\right)}{(bi(m-2k)+p)^{3/2}}\right)\Big/; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos^m(b z) \cosh\left(c z^r\right)$

01.20.21.1297.01

$$\int e^{p z^2} \cos^m(b z) \cosh\left(c z^2\right) dz ==$$

$$\frac{2^{-m-2} \sqrt{\pi}\ (1 - m \bmod 2)}{(p-c)(c+p)} \binom{m}{\frac{m}{2}} \left(\sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{2 p z - 2 c z}{2 \sqrt{p-c}} \right) + (p-c) \sqrt{c+p}\ \operatorname{erfi}\left(\sqrt{c+p}\ z \right) \right) +$$

$$\frac{2^{-m-2} \sqrt{\pi}}{(p-c)(c+p)} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{-\frac{(2 i b s - i b m)^2}{4(p-c)}} \sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{-i b m + 2 i b s + 2 (p-c) z}{2 \sqrt{p-c}} \right) + \right.$$

$$e^{-\frac{(i b m - 2 i b s)^2}{4(p-c)}} \sqrt{p-c}\ (c+p) \operatorname{erfi}\left(\frac{i b m - 2 i b s + 2 (p-c) z}{2 \sqrt{p-c}} \right) + e^{-\frac{(2 i b s - i b m)^2}{4(c+p)}} (p-c) \sqrt{c+p}$$

$$\left. \left. \operatorname{erfi}\left(\frac{-i b m + 2 i b s + 2 c z + 2 p z}{2 \sqrt{c+p}} \right) + e^{-\frac{(i b m - 2 i b s)^2}{4(c+p)}} (p-c) \sqrt{c+p}\ \operatorname{erfi}\left(\frac{i b m - 2 i b s + 2 c z + 2 p z}{2 \sqrt{c+p}} \right) \right) \right/; m \in \mathbb{N}^+$$

01.20.21.1298.01

$$\int e^{p \sqrt{z}} \cos^m(b z) \cosh\left(c \sqrt{z}\right) dz == 2^{-m} e^{(c+p)\sqrt{z}} \left(\frac{e^{-2 c \sqrt{z}} \left(-\sqrt{z}\ c + p \sqrt{z} - 1 \right)}{(p-c)^2} + \frac{\sqrt{z}}{c+p} - \frac{1}{(-c-p)^2} \right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2) +$$

$$2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(- \frac{e^{-\frac{i (c+p)^2}{b(8k-4m)}} (c+p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+p-2 i b (2k-m) \sqrt{z}}{2 \sqrt{-i b (2k-m)}} \right)}{(-i b (2k-m))^{3/2}} + \frac{e^{\frac{i (c-p)^2}{b(8k-4m)}} (c-p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+p+2 b i (2k-m) \sqrt{z}}{2 \sqrt{i b (2k-m)}} \right)}{(i b (2k-m))^{3/2}} + \right.$$

$$\frac{e^{\frac{i (c+p)^2}{b(8k-4m)}} \sqrt{-i b (m-2k)}\ (c+p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+p-2 i b (m-2k) \sqrt{z}}{2 \sqrt{-i b (m-2k)}} \right)}{b^2 (m-2k)^2} -$$

$$\frac{e^{\frac{i (c-p)^2}{4 b (m-2k)}} \sqrt{i b (m-2k)}\ (c-p) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+p+2 b i (m-2k) \sqrt{z}}{2 \sqrt{i b (m-2k)}} \right)}{b^2 (m-2k)^2} +$$

$$\left. \frac{8 e^{p \sqrt{z}} \cosh\left(c \sqrt{z}\right) \sin(2 b k z - b m z)}{2 b k - b m} \right) \Big/; m \in \mathbb{N}^+$$

Involving $e^{p z} \cos^m\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1299.01

$$\int e^{p z} \cos^m\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$2^{-m-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\left(e^{-\frac{p^2}{4(-c-i b m+2 i b s)}} \sqrt{-c-i b m+2 i b s}\ (c+i b m-2 i b s) \operatorname{erfi}\left(\frac{p+2(-c-i b m+2 i b s) z}{2 \sqrt{-c-i b m+2 i b s}} \right) + \right. \right.$$

$$\left. e^{-\frac{p^2}{4(c+i b m-2 i b s)}} (-c-i b m+2 i b s) \sqrt{c+i b m-2 i b s}\ \operatorname{erfi}\left(\frac{p-2(-c-i b m+2 i b s) z}{2 \sqrt{c+i b m-2 i b s}} \right) \right) \Big/$$

$$((c+i b m-2 i b s)(-c-i b m+2 i b s)) + \left(e^{-\frac{p^2}{4(c-i b m+2 i b s)}} \sqrt{c-i b m+2 i b s}\ (-c+i b m-2 i b s) \right.$$

$$\operatorname{erfi}\left(\frac{p-2(-c+i b m-2 i b s) z}{2 \sqrt{c-i b m+2 i b s}} \right) + e^{-\frac{p^2}{4(-c+i b m-2 i b s)}} (c-i b m+2 i b s) \sqrt{-c+i b m-2 i b s}$$

$$\left. \left. \operatorname{erfi}\left(\frac{p+2(-c+i b m-2 i b s) z}{2 \sqrt{-c+i b m-2 i b s}} \right) \right) \Big/ ((-c+i b m-2 i b s)(c-i b m+2 i b s)) \right) -$$

$$\frac{2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(\sqrt{-c}\ e^{\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p-2 c z}{2 \sqrt{-c}} \right) - \sqrt{c}\ e^{-\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p+2 c z}{2 \sqrt{c}} \right) \right) (1 - m \bmod 2)}{c} /; m \in$$

$\mathbb{Z} \wedge m >$
0

01.20.21.1300.01

$$\int e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2}\left(\frac{4 e^{p z} \cosh\left(c \sqrt{z}\right)}{p} + \frac{c e^{-\frac{c^2}{4 p}} \sqrt{\pi}\ \text{erfi}\left(\frac{2 p \sqrt{z}-c}{2\sqrt{p}}\right)}{p^{3/2}} - \frac{c e^{-\frac{c^2}{4 p}} \sqrt{\pi}\ \text{erfi}\left(\frac{c+2 p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right)\binom{m}{\frac{m}{2}}(1 - m \bmod 2) +$$

$$2^{-m-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{8 e^{p z} \cos\left(b (m-2 s) \sqrt{z}\right) \cosh\left(c \sqrt{z}\right)}{p} + \frac{e^{\frac{(-i c+b m-2 b s)^2}{4 p}} \sqrt{\pi}\ (-i c + b m - 2 b s) \text{erf}\left(\frac{-i c+b (m-2 s)+2 i p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} + \right.$$

$$\frac{e^{\frac{(i c-b m+2 b s)^2}{4 p}} \sqrt{\pi}\ (-i c + b m - 2 b s) \text{erf}\left(\frac{-i c+b (m-2 s)-2 i p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} -$$

$$\frac{e^{\frac{(i c+b (m-2 s))^2}{4 p}} \sqrt{\pi}\ (i c + b (m-2 s)) \text{erf}\left(\frac{-i c-b (m-2 s)-2 i p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} -$$

$$\left.\frac{i e^{\frac{(i c+b (m-2 s))^2}{4 p}} \sqrt{\pi}\ (i c + b (m-2 s)) \text{erfi}\left(\frac{-c+b i (m-2 s)+2 p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right) /; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos^m\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1301.01

$$\int e^{p z^r} \cos^m(b z^r) \cosh(c z^r) dz ==$$

$$-\frac{2^{-m-1} z}{r}\left(\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r}, (-c-p) z^r\right)((-c-p) z^r)^{-1/r} + ((c-p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (c-p) z^r\right)\right)(1 - m \bmod 2) +\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r}, (-c-2 i b k+i b m-p) z^r\right)((-c-2 i b k+i b m-p) z^r)^{-1/r} + ((c-2 i b k+i b m-p) z^r)^{-1/r}\right.$$

$$\Gamma\left(\frac{1}{r}, (c-2 i b k+i b m-p) z^r\right) + ((-c+2 i b k-i b m-p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-c+2 i b k-i b m-p) z^r\right) +$$

$$\left.\left.((c+2 i b k-i b m-p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (c+2 i b k-i b m-p) z^r\right)\right)\right) /; m \in \mathbb{N}^+$$

01.20.21.1302.01

$$\int e^{p z^2} \cos^m\left(b z^2\right) \cosh\left(c z^2\right) dz == 2^{-m-2} \left(\frac{\operatorname{erfi}\left(\sqrt{p-c}\ z\right)}{\sqrt{p-c}} + \frac{\operatorname{erfi}\left(\sqrt{c+p}\ z\right)}{\sqrt{c+p}} \right) \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) +$$

$$2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\frac{\operatorname{erfi}\left(\sqrt{-c-2 i b k+i b m+p}\ z\right)}{\sqrt{-c-2 i b k+i b m+p}} + \frac{\operatorname{erfi}\left(\sqrt{c-2 i b k+i b m+p}\ z\right)}{\sqrt{c-2 i b k+i b m+p}} + \right.$$

$$\left. \frac{\operatorname{erfi}\left(\sqrt{-c+2 i b k-i b m+p}\ z\right)}{\sqrt{-c+2 i b k-i b m+p}} + \frac{\operatorname{erfi}\left(\sqrt{c+2 i b k-i b m+p}\ z\right)}{\sqrt{c+2 i b k-i b m+p}} \right) /; m \in \mathbb{N}^+$$

01.20.21.1303.01

$$\int e^{p \sqrt{z}} \cos^m\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{\left(p^2-c^2\right)^2} \left(2^{1-m} e^{p \sqrt{z}} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \right.$$

$$\left. \left(\left(p^2 \left(p \sqrt{z}-1\right)-c^2 \left(\sqrt{z}\ p+1\right)\right) \cosh\left(c \sqrt{z}\right)-c \left(-\sqrt{z}\ c^2-2 p+p^2 \sqrt{z}\right) \sinh\left(c \sqrt{z}\right)\right)\right) +$$

$$2^{1-m} e^{p \sqrt{z}} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\left(\left(p^2 \left(p \sqrt{z}-1\right)-(-c+2 i b k-i b m)^2 \left(\sqrt{z}\ p+1\right)\right) \cosh\left((-c+2 i b k-i b m) \sqrt{z}\right)- \right.\right.$$

$$\left.\left. (-c+2 i b k-i b m) \left(-\sqrt{z}\ (-c+2 i b k-i b m)^2-2 p+p^2 \sqrt{z}\right) \sinh\left((-c+2 i b k-i b m) \sqrt{z}\right)\right) \Big/ \right.$$

$$\left. \left(p^2-(-c+2 i b k-i b m)^2\right)^2+\left(\left(p^2 \left(p \sqrt{z}-1\right)-(c+2 i b k-i b m)^2 \left(\sqrt{z}\ p+1\right)\right)\right.\right.$$

$$\left. \cosh\left((c+2 i b k-i b m) \sqrt{z}\right)-(c+2 i b k-i b m) \left(-\sqrt{z}\ (c+2 i b k-i b m)^2-2 p+p^2 \sqrt{z}\right)\right.$$

$$\left.\left. \sinh\left((c+2 i b k-i b m) \sqrt{z}\right)\right) \Big/ \left(p^2-(c+2 i b k-i b m)^2\right)^2 \right) /; m \in \mathbb{N}^+$$

Involving $e^{b z^r+e} \cos^m\left(a z^r+g\right) \cosh\left(c z^r+g\right)$

01.20.21.1304.01

$$\int e^{b z^r+e} \cos^m(a z^r+q) \cosh(c z^r+g)\, dz ==$$

$$-\frac{2^{-m-1} z}{r}\left(\binom{m}{\frac{m}{2}}\left(e^{e+g}\,\Gamma\left(\frac{1}{r},(-b-c)z^r\right)((-b-c)z^r)^{-1/r}+e^{e-g}\,((c-b)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)z^r\right)\right)(1-m \bmod 2)+\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e+g+2ikq-imq}\,\Gamma\left(\frac{1}{r},(-b-c-2iak+iam)z^r\right)((-b-c-2iak+iam)z^r)^{-1/r}+\right.$$

$$e^{e-g+2ikq-imq}\,((-b+c-2iak+iam)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-2iak+iam)z^r\right)+$$

$$e^{e+g-2ikq+imq}\,((-b-c+2iak-iam)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+2iak-iam)z^r\right)+$$

$$\left.\left.e^{e-g-2ikq+imq}\,((-b+c+2iak-iam)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+2iak-iam)z^r\right)\right)\right/;\ m\in\mathbb{N}^+$$

01.20.21.1305.01

$$\int e^{b z^2+e} \cos^m\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz == 2^{-m-2}\left(\frac{\operatorname{erfi}\left(\sqrt{b-c}\ z\right)}{\sqrt{b-c}}+\frac{e^{2g}\operatorname{erfi}\left(\sqrt{b+c}\ z\right)}{\sqrt{b+c}}\right)e^{e-g}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e-g+i(m-2k)q}\left(\frac{\operatorname{erfi}\left(\sqrt{b-c+ai(m-2k)}\ z\right)}{\sqrt{b-c+ai(m-2k)}}+\frac{e^{2(g-i(m-2k)q)}\operatorname{erfi}\left(\sqrt{b+c-ia(m-2k)}\ z\right)}{\sqrt{b+c-ia(m-2k)}}\right)+\right.$$

$$\left.e^{e-g-i(m-2k)q}\left(\frac{e^{2(g+i(m-2k)q)}\operatorname{erfi}\left(\sqrt{b+c+ai(m-2k)}\ z\right)}{\sqrt{b+c+ai(m-2k)}}+\frac{\operatorname{erfi}\left(\sqrt{b-c-ia(m-2k)}\ z\right)}{\sqrt{b-c-ia(m-2k)}}\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1306.01

$$\int e^{\sqrt{z}\,b+e}\cos^m\left(\sqrt{z}\,a+q\right)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-m}\left(\frac{e^{\sqrt{z}\,(b+c)+e+g}\left(\sqrt{z}\,b+c\sqrt{z}-1\right)}{(b+c)^2}+\frac{e^{\sqrt{z}\,(b-c)+e-g}\left(\sqrt{z}\,b-c\sqrt{z}-1\right)}{(c-b)^2}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)+$$

$$2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\frac{e^{e+g+i\,(m-2\,k)\,q+(b+c+a\,i\,(m-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b+(c+a\,i\,(m-2\,k))\,\sqrt{z}-1\right)}{(b+c+a\,i\,(m-2\,k))^2}+\right.$$

$$\frac{e^{e+g-i\,(m-2\,k)\,q+(b+c-i\,a\,(m-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b+(c-i\,a\,(m-2\,k))\,\sqrt{z}-1\right)}{(b+c-i\,a\,(m-2\,k))^2}+$$

$$\frac{e^{e-g-i\,(m-2\,k)\,q+(b-c-i\,a\,(m-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b-(c+a\,i\,(m-2\,k))\,\sqrt{z}-1\right)}{(-b+c+a\,i\,(m-2\,k))^2}+$$

$$\left.\frac{e^{e-g+i\,(m-2\,k)\,q+(b-c+a\,i\,(m-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b-(c-i\,a\,(m-2\,k))\,\sqrt{z}-1\right)}{(-b+c-i\,a\,(m-2\,k))^2}\right)\binom{m}{k}/;\ m\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\cos^m\left(a\,z^r+p\,z+q\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1307.01

$$\int e^{b z^2+d z+e} \cos^m\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{(b-c)(b+c)}\left(2^{-m-2}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{b-c}\,(b+c)\,e^{-\frac{(d-f)^2-4(b-c)(e-g)}{4(b-c)}}\operatorname{erfi}\left(\frac{d-f+2bz-2cz}{2\sqrt{b-c}}\right)+\right.\right.$$

$$\left.\left.(b-c)\sqrt{b+c}\;e^{-\frac{(d+f)^2-4(b+c)(e+g)}{4(b+c)}}\operatorname{erfi}\left(\frac{d+f+2(b+c)z}{2\sqrt{b+c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\left(e^{-\frac{(d-f-imp+2ips)^2-4(b-c-iam+2ias)(e-g-imq+2iqs)}{4(b-c-iam+2ias)}}\sqrt{b-c-iam+2ias}\right.\right.$$

$$(b+c+iam-2ias)\operatorname{erfi}\left(\frac{d-f-imp+2ips+2(b-c-iam+2ias)z}{2\sqrt{b-c-iam+2ias}}\right)+$$

$$e^{-\frac{(d+f+imp-2ips)^2-4(b+c+iam-2ias)(e+g+imq-2iqs)}{4(b+c+iam-2ias)}}(b-c-iam+2ias)\sqrt{b+c+iam-2ias}$$

$$\left.\operatorname{erfi}\left(\frac{d+f+imp-2ips+2bz-2(-c-iam+2ias)z}{2\sqrt{b+c+iam-2ias}}\right)\right)\Big/((b+c+iam-2ias)(b-c-iam+$$

$$2ias))+\left(e^{-\frac{(d+f-imp+2ips)^2-4(b+c-iam+2ias)(e+g-imq+2iqs)}{4(b+c-iam+2ias)}}\sqrt{b+c-iam+2ias}\;(b-c+iam-2ias)\right.$$

$$\operatorname{erfi}\left(\frac{d+f-imp+2ips+2bz-2(-c+iam-2ias)z}{2\sqrt{b+c-iam+2ias}}\right)+e^{-\frac{(d-f+imp-2ips)^2-4(b-c+iam-2ias)(e-g+imq-2iqs)}{4(b-c+iam-2ias)}}$$

$$\left.(b+c-iam+2ias)\sqrt{b-c+iam-2ias}\;\operatorname{erfi}\left(\frac{d-f+imp-2ips+2(b-c+iam-2ias)z}{2\sqrt{b-c+iam-2ias}}\right)\right)\Big/$$

$$\left.((b-c+iam-2ias)(b+c-iam+2ias))\right)/;\, m\in\mathbb{N}^+$$

01.20.21.1308.01

$$\int e^{\sqrt{z}\ b+d\,z+e}\cos^m\left(\sqrt{z}\ a+p\,z+q\right)\cosh\left(\sqrt{z}\ c+f\,z+g\right)dz ==$$

$$2^{-m-2}\,e^{e-g}\left(-\frac{(b-c)\,e^{-\frac{(b-c)^2}{4(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c+2(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}+\frac{2\,e^{\sqrt{z}\ (b-c)+(d-f)z}}{d-f}+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b+c)+2g+(d+f)z}}{d+f}-\frac{(b+c)\,e^{2g-\frac{(b+c)^2}{4(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)+2^{-m-2}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(2\,e^{e-g-i\,m\,q-2\,i\,q\,s}\left(\frac{e^{2g+4\,i\,q\,s+(d+f-i\,m\,p+2\,i\,p\,s)z+(b+c-i\,a\,m+2\,i\,a\,s)\sqrt{z}}}{d+f-i\,m\,p+2\,i\,p\,s}+\frac{e^{2\,i\,m\,q+(d-f+i\,m\,p-2\,i\,p\,s)z+(b-c+i\,a\,m-2\,i\,a\,s)\sqrt{z}}}{d-f+i\,m\,p-2\,i\,p\,s}+\right.\right.$$

$$\left.\frac{e^{2g+2\,i\,m\,q+(d+f+i\,m\,p-2\,i\,p\,s)z+(b+c+i\,a\,m-2\,i\,a\,s)\sqrt{z}}}{d+f+i\,m\,p-2\,i\,p\,s}+\frac{e^{4\,i\,q\,s+(d-f-i\,m\,p+2\,i\,p\,s)z+(b-c-i\,a\,m+2\,i\,a\,s)\sqrt{z}}}{d-f-i\,m\,p+2\,i\,p\,s}\right)-$$

$$\frac{1}{(d-f-i\,m\,p+2\,i\,p\,s)^{3/2}}\left(e^{-\frac{(b-c-i\,a\,m+2\,i\,a\,s)^2}{4(d-f-i\,m\,p+2\,i\,p\,s)}+e-g-i\,m\,q+2\,i\,q\,s}\sqrt{\pi}\ (b-c-i\,a\,m+2\,i\,a\,s)\right.$$

$$\left.\operatorname{erfi}\left(\frac{b-c-i\,a\,m+2\,i\,a\,s+2(d-f-i\,m\,p+2\,i\,p\,s)\sqrt{z}}{2\sqrt{d-f-i\,m\,p+2\,i\,p\,s}}\right)\right)-$$

$$\frac{1}{(d+f-i\,m\,p+2\,i\,p\,s)^{3/2}}\left(e^{-\frac{(b+c-i\,a\,m+2\,i\,a\,s)^2}{4(d+f-i\,m\,p+2\,i\,p\,s)}+e+g-i\,m\,q+2\,i\,q\,s}\sqrt{\pi}\ (b+c-i\,a\,m+2\,i\,a\,s)\right.$$

$$\left.\operatorname{erfi}\left(\frac{b+c-i\,a\,m+2\,i\,a\,s+2(d+f-i\,m\,p+2\,i\,p\,s)\sqrt{z}}{2\sqrt{d+f-i\,m\,p+2\,i\,p\,s}}\right)\right)-$$

$$\frac{1}{(d-f+i\,m\,p-2\,i\,p\,s)^{3/2}}\left(e^{-\frac{(b-c+i\,a\,m-2\,i\,a\,s)^2}{4(d-f+i\,m\,p-2\,i\,p\,s)}+e-g+i\,m\,q-2\,i\,q\,s}\sqrt{\pi}\ (b-c+i\,a\,m-2\,i\,a\,s)\right.$$

$$\left.\operatorname{erfi}\left(\frac{b-c+i\,a\,m-2\,i\,a\,s+2(d-f+i\,m\,p-2\,i\,p\,s)\sqrt{z}}{2\sqrt{d-f+i\,m\,p-2\,i\,p\,s}}\right)\right)-$$

$$\left(e^{-\frac{(b+c+a\,i\,(m-2\,s))^2}{4(d+f+i\,p\,(m-2\,s))}+e+g+i\,m\,q-2\,i\,q\,s}\sqrt{\pi}\ (b+c+a\,i\,(m-2\,s))\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b+c+i\,a\,m-2\,i\,a\,s+2(d+f+i\,p\,(m-2\,s))\sqrt{z}}{2\sqrt{d+f+i\,p\,(m-2\,s)}}\right)\right)\Big/(d+f+i\,p\,(m-2\,s))^{3/2}\right)/;\ m\in\mathbb{N}^+$$

Involving powers of cos and rational functions of exp

Involving $\cos^m(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1309.01

$$\int \frac{\cos^m(e\,z)\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}\,dz ==$$

$$2^{-m-1}\,a^{-n}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{i\,e\,(2\,k-m)-c}\left(e^{(i\,e\,(2\,k-m)-c)\,z}\,{}_2F_1\left(\frac{i\,e\,(2\,k-m)-c}{d},\,n;\,\frac{-c+d+e\,i\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.e^{(c-i\,e\,(2\,k-m))\,z}\,{}_2F_1\left(\frac{c-i\,e\,(2\,k-m)}{d},\,n;\,\frac{c+d-i\,e\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{c+e\,i\,(2\,k-m)}\left(e^{(c+e\,i\,(2\,k-m))\,z}\,{}_2F_1\left(\frac{c+e\,i\,(2\,k-m)}{d},\,n;\,\frac{c+d+e\,i\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.\left.e^{(-c-i\,e\,(2\,k-m))\,z}\,{}_2F_1\left(\frac{-c-i\,e\,(2\,k-m)}{d},\,n;\,\frac{-c+d-i\,e\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)+$$

$$\frac{2^{-m-1}\,a^{-n}\,(1-m\bmod 2)}{c}\binom{m}{\frac{m}{2}}\left(e^{c\,z}\,{}_2F_1\left(\frac{c}{d},\,n;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,z}\,{}_2F_1\left(-\frac{c}{d},\,n;\,\frac{d-c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/;\,n\in$$

$$\mathbb{N}^+\bigwedge m\in$$

$$\mathbb{N}^+$$

Involving $e^{p\,z}\cos^m(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1310.01

$$\int \frac{e^{p z} \cos^m(e z) \cosh(c z)}{\left(a + b\, e^{d z}\right)^n} dz == 2^{-m-1}$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\left(e^{(-c+e i (2k-m)+p) z} (-c + e i (2k-m) - p)\, {}_2F_1\left(\frac{-c + e i (2k-m) + p}{d}, n; \frac{-c + d + e i (2k-m) + p}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(c-i e (2k-m)+p) z} (-c + e i (2k-m) + p)\, {}_2F_1\left(\frac{c - i e (2k-m) + p}{d}, n; \frac{c + d - i e (2k-m) + p}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/ ((-c + e i (2k-m) - p)(-c + e i (2k-m) + p)) + \left(e^{(c+e i (2k-m)+p) z} (c + e i (2k-m) - p)\, {}_2F_1\left(\frac{c + e i (2k-m) + p}{d}, n; \frac{c + d + e i (2k-m) + p}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(-c-i e (2k-m)+p) z} (c + e i (2k-m) + p)\, {}_2F_1\left(\frac{-c - i e (2k-m) + p}{d}, n; \frac{-c + d - i e (2k-m) + p}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/ ((c + e i (2k-m) - p)(c + e i (2k-m) + p))\right) a^{-n} + \frac{1}{(c-p)(c+p)} \binom{m}{\frac{m}{2}} \left(e^{(c+p) z} (c-p)\, {}_2F_1\left(\frac{c+p}{d}, n; \frac{c+d+p}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(p-c) z} (c+p)\, {}_2F_1\left(\frac{p-c}{d}, n; \frac{-c+d+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right) (1 - m \bmod 2)\, 2^{-m-1} a^{-n}\right) /; n \in \mathbb{N}^+ \wedge m \in \mathbb{N}^+$$

Involving powers of cos and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^{\beta} \cos^m(e z) \cosh(c z)$

01.20.21.1311.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta}\cos^{m}(e\,z)\cosh(c\,z)\,dz == 2^{-m-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{1}{i\,e\,(2\,k-m)-c}\left(e^{(i\,e\,(2\,k-m)-c)\,z}\,{}_2F_1\left(\frac{i\,e\,(2\,k-m)-c}{d},\,-\beta;\,\frac{-c+d+e\,i\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$
$$\left.e^{(c-i\,e\,(2\,k-m))\,z}\,{}_2F_1\left(\frac{c-i\,e\,(2\,k-m)}{d},\,-\beta;\,\frac{c+d-i\,e\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$
$$\frac{1}{c+e\,i\,(2\,k-m)}\left(e^{(c+e\,i\,(2\,k-m))\,z}\,{}_2F_1\left(\frac{c+e\,i\,(2\,k-m)}{d},\,-\beta;\,\frac{c+d+e\,i\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$
$$\left.\left.e^{(-c-i\,e\,(2\,k-m))\,z}\,{}_2F_1\left(\frac{-c-i\,e\,(2\,k-m)}{d},\,-\beta;\,\frac{-c+d-i\,e\,(2\,k-m)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)+$$
$$\frac{2^{-m-1}}{c}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\left(e^{c\,z}\,{}_2F_1\left(\frac{c}{d},\,-\beta;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,z}\,{}_2F_1\left(-\frac{c}{d},\,-\beta;\,\frac{d-c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)$$
$$(1-m \bmod 2)\,/;\,m\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cos^{m}(e\,z)\cosh(c\,z)$

01.20.21.1312.01

$$\int e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cos^{m}(e\,z)\cosh(c\,z)\,dz == 2^{-m-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$
$$\left(\left(\left(e^{(-c+e\,i\,(2\,k-m)+p)\,z}\,(-c+e\,i\,(2\,k-m)-p)\,{}_2F_1\left(\frac{-c+e\,i\,(2\,k-m)+p}{d},\,-\beta;\,\frac{-c+d+e\,i\,(2\,k-m)+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.$$
$$\left.\left.e^{(c-i\,e\,(2\,k-m)+p)\,z}\,(-c+e\,i\,(2\,k-m)+p)\,{}_2F_1\left(\frac{c-i\,e\,(2\,k-m)+p}{d},\,-\beta;\,\frac{c+d-i\,e\,(2\,k-m)+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$
$$\left((-c+e\,i\,(2\,k-m)-p)\,(-c+e\,i\,(2\,k-m)+p)\right)+\left(e^{(c+e\,i\,(2\,k-m)+p)\,z}\,(c+e\,i\,(2\,k-m)-p)\right.$$
$${}_2F_1\left(\frac{c+e\,i\,(2\,k-m)+p}{d},\,-\beta;\,\frac{c+d+e\,i\,(2\,k-m)+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(-c-i\,e\,(2\,k-m)+p)\,z}$$
$$\left.(c+e\,i\,(2\,k-m)+p)\,{}_2F_1\left(\frac{-c-i\,e\,(2\,k-m)+p}{d},\,-\beta;\,\frac{-c+d-i\,e\,(2\,k-m)+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$
$$\left.\left((c+e\,i\,(2\,k-m)-p)\,(c+e\,i\,(2\,k-m)+p)\right)\right)+\frac{1}{(c-p)\,(c+p)}\,2^{-m-1}$$
$$\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\left(e^{(c+p)\,z}\,(c-p)\,{}_2F_1\left(\frac{c+p}{d},\,-\beta;\,\frac{c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$
$$\left.e^{(p-c)\,z}\,(c+p)\,{}_2F_1\left(\frac{p-c}{d},\,-\beta;\,\frac{-c+d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)(1-m \bmod 2)\,/;\,m\in\mathbb{N}^{+}$$

Involving products of cos and exp

Involving $e^{p z} \cos(a z) \cos(b z) \cosh(c z)$

01.20.21.1313.01

$$\int e^{p z} \cos(a z) \cos(b z) \cosh(c z)\, dz ==$$
$$\frac{1}{4} e^{p z} \left(\frac{p \cos((a-b+i c) z) + (a-b+i c) \sin((a-b+i c) z)}{(a-b+i (c-p)) (a-b+i (c+p))} + \frac{p \cos((a+b+i c) z) + (a+b+i c) \sin((a+b+i c) z)}{(a+b+i (c-p)) (a+b+i (c+p))} + \right.$$
$$\frac{p \cosh((c+i a+i b) z) - i (a+b-i c) \sinh((c+i a+i b) z)}{(a+b-i (c-p)) (a+b-i (c+p))} +$$
$$\left. \frac{p \cosh((c-i b+i a) z) - (c-i b+i a) \sinh((c-i b+i a) z)}{(-c-i a+i b+p) (c-i b+i a+p)} \right)$$

Involving rational functions of cos and exp

Involving $\frac{e^{p z} \cosh(c z)}{a+b \cos(d z)}$

01.20.21.1314.01

$$\int \frac{e^{p z} \cosh(c z)}{a+b \cos(d z)}\, dz ==$$
$$\frac{1}{2 b \sqrt{a^2-b^2}} \left(\frac{1}{-c+i d+p} \left(e^{(-c+i d+p) z} \left(\left(a+\sqrt{a^2-b^2} \right) {}_2F_1\left(-\frac{i (-c+i d+p)}{d}, 1; 2-\frac{i (p-c)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a} \right) + \right. \right. \right.$$
$$\left. \left. \left. \left(\sqrt{a^2-b^2}-a \right) {}_2F_1\left(-\frac{i (-c+i d+p)}{d}, 1; 2-\frac{i (p-c)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}} \right) \right) \right) + \right.$$
$$\frac{1}{c+i d+p} \left(e^{(c+i d+p) z} \left(\left(a+\sqrt{a^2-b^2} \right) {}_2F_1\left(-\frac{i (c+i d+p)}{d}, 1; 2-\frac{i (c+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a} \right) + \right. \right.$$
$$\left. \left. \left. \left. \left(\sqrt{a^2-b^2}-a \right) {}_2F_1\left(-\frac{i (c+i d+p)}{d}, 1; 2-\frac{i (c+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}} \right) \right) \right) \right) \right)$$

Involving $e^{p z} (a+b \cos(d z))^{-n} \cosh(c z)$

01.20.21.1315.01

$$\int \frac{e^{p z} \cosh(c z)}{(a + b \cos(d z))^2} dz ==$$

$$\frac{1}{2}\left(\left(e^{(-c+i d+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-c+i d+p)}{d}, 1; 2-\frac{i(p-c)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$${}_2F_1\left(-\frac{i(-c+i d+p)}{d}, 1; 2-\frac{i(p-c)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i(-c+i d+p)}{d}, 2; 2-\frac{i(p-c)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(-\frac{i(-c+i d+p)}{d}, 2; 2-\frac{i(p-c)}{d};\right.\right.$$
$$\left.\left.-\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i(-c+i d+p)}{d}, 2; 2-\frac{i(p-c)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\left.\left.\left.{}_2F_1\left(-\frac{i(-c+i d+p)}{d}, 2; 2-\frac{i(p-c)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(-c+i d+p)\right)+$$
$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+i d+p)}\left(e^{(c+i d+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(c+i d+p)}{d}, 1; 2-\frac{i(c+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(c+i d+p)}{d}, 1; 2-\frac{i(c+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i(c+i d+p)}{d}, 2; 2-\frac{i(c+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\left.{}_2F_1\left(-\frac{i(c+i d+p)}{d}, 2; 2-\frac{i(c+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i(c+i d+p)}{d}, 2;\right.\right.$$
$$\left.\left.\left.2-\frac{i(c+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(-\frac{i(c+i d+p)}{d}, 2; 2-\frac{i(c+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\frac{e^{p z} \cosh(c z)}{a+b \cos^2(d z)}$

01.20.21.1316.01

$$\int \frac{e^{p z} \cosh(c z)}{a + b \cos^2(d z)}\, dz == \frac{1}{2\sqrt{a}\, b \sqrt{a+b}}$$
$$\left(-\frac{1}{c + 2 i d + p}\left(e^{(c+2 i d+p) z}\left(\left(2a - 2\sqrt{a+b}\,\sqrt{a} + b\right) {}_2F_1\left(1 - \frac{i(c+p)}{2d}, 1; 2 - \frac{i(c+p)}{2d}; -\frac{b e^{2 i d z}}{2a + 2\sqrt{a+b}\,\sqrt{a} + b}\right) + \right.\right.\right.$$
$$\left.\left.\left.\left(-2a - 2\sqrt{a+b}\,\sqrt{a} - b\right) {}_2F_1\left(1 - \frac{i(c+p)}{2d}, 1; 2 - \frac{i(c+p)}{2d}; -\frac{b e^{2 i d z}}{2a - 2\sqrt{a+b}\,\sqrt{a} + b}\right)\right)\right) - \frac{1}{-c + 2 i d + p}$$
$$\left(e^{(-c+2 i d+p) z}\left(\left(2a - 2\sqrt{a+b}\,\sqrt{a} + b\right) {}_2F_1\left(1 - \frac{i(p-c)}{2d}, 1; 2 - \frac{i(p-c)}{2d}; -\frac{b e^{2 i d z}}{2a + 2\sqrt{a+b}\,\sqrt{a} + b}\right) + \right.\right.$$
$$\left.\left.\left.\left(-2a - 2\sqrt{a+b}\,\sqrt{a} - b\right) {}_2F_1\left(1 - \frac{i(p-c)}{2d}, 1; 2 - \frac{i(p-c)}{2d}; -\frac{b e^{2 i d z}}{2a - 2\sqrt{a+b}\,\sqrt{a} + b}\right)\right)\right)\right)$$

01.20.21.1317.01

$$\int \frac{e^{p z} \cosh(c z)}{a + b \cosh^2(c z)}\, dz ==$$
$$\frac{1}{2\sqrt{a}\, b \sqrt{a+b}}\left(-\frac{1}{c+p}\left(e^{(c+p) z}\left(\left(2a - 2\sqrt{a+b}\,\sqrt{a} + b\right) {}_2F_1\left(\frac{c+p}{2c}, 1; \frac{3c+p}{2c}; -\frac{b e^{2 c z}}{2a + 2\sqrt{a+b}\,\sqrt{a} + b}\right) - \right.\right.\right.$$
$$\left.\left.\left.\left(2a + 2\sqrt{a+b}\,\sqrt{a} + b\right) {}_2F_1\left(\frac{c+p}{2c}, 1; \frac{3c+p}{2c}; -\frac{b e^{2 c z}}{2a - 2\sqrt{a+b}\,\sqrt{a} + b}\right)\right)\right) -$$
$$\frac{1}{3c+p}\left(e^{(3c+p) z}\left(\left(2a - 2\sqrt{a+b}\,\sqrt{a} + b\right) {}_2F_1\left(\frac{3c+p}{2c}, 1; \frac{5c+p}{2c}; -\frac{b e^{2 c z}}{2a + 2\sqrt{a+b}\,\sqrt{a} + b}\right) - \right.\right.$$
$$\left.\left.\left.\left(2a + 2\sqrt{a+b}\,\sqrt{a} + b\right) {}_2F_1\left(\frac{3c+p}{2c}, 1; \frac{5c+p}{2c}; -\frac{b e^{2 c z}}{2a - 2\sqrt{a+b}\,\sqrt{a} + b}\right)\right)\right)\right)$$

Involving $e^{p z}\left(a + b \cos^2(d z)\right)^{-n} \cosh(c z)$

01.20.21.1318.01

$$\int \frac{e^{p z}\cosh(c z)}{\left(a+b\cos^2(d z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left(e^{(-c+2 i d+p) z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(p-c)}{2d},1;2-\frac{i(p-c)}{2d};-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(p-c)}{2d},1;2-\frac{i(p-c)}{2d};-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(p-c)}{2d},2;2-\frac{i(p-c)}{2d};\right.\right.$$
$$\left.-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(p-c)}{2d},\right.$$
$$\left.\left.\left.\left.2;2-\frac{i(p-c)}{2d};-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-c+2 i d+p)\right)-$$
$$\left(e^{(c+2 i d+p) z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(c+p)}{2d},1;2-\frac{i(c+p)}{2d};-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(c+p)}{2d},1;2-\frac{i(c+p)}{2d};-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c+p)}{2d},2;2-\frac{i(c+p)}{2d};\right.\right.$$
$$\left.-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(1-\frac{i(c+p)}{2d},2;2-\frac{i(c+p)}{2d};-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(c+2 i d+p)\right)\right)$$

Involving $\frac{e^{p z}\cos(e z)\cosh(c z)}{a+b\cos(d z)}$

01.20.21.1319.01

$$\int \frac{e^{p z} \cos(e z) \cosh(c z)}{a + b \cos(d z)} dz ==$$

$$\frac{1}{4}\left(\left(e^{(-c+i d+i e+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 1; 2-\frac{i(-c+i e+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 1; 2-\frac{i(-c+i e+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}(-c+i d+i e+p)\right)+\right.$$

$$\left(e^{(c+i d+i e+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(c+i d+i e+p)}{d}, 1; 2-\frac{i(c+i e+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(c+i d+i e+p)}{d}, 1; 2-\frac{i(c+i e+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}(c+i d+i e+p)\right)+$$

$$\left(e^{(-c-i e+i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-c-i e+i d+p)}{d}, 1; 2-\frac{i(-c-i e+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-c-i e+i d+p)}{d}, 1; 2-\frac{i(-c-i e+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}(-c-i e+i d+p)\right)+$$

$$\left(e^{(c-i e+i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(c-i e+i d+p)}{d}, 1; 2-\frac{i(c-i e+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(c-i e+i d+p)}{d}, 1; 2-\frac{i(c-i e+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}(c-i e+i d+p)\right)\right)$$

Involving $e^{p z} \cos(e z) \cosh(c z) (a + b \cos(d z))^{-n}$

01.20.21.1320.01

$$\int \frac{e^{p z} \cos(e z) \cosh(c z)}{(a + b \cos(d z))^2} dz ==$$

$$\frac{1}{4}\left(\left(e^{(-c+i d+i e+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 1; 2-\frac{i(-c+i e+p)}{d}; \frac{b e^{i d z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-c+i d+i e+p)}{d}, 1; 2-\frac{i(-c+i e+p)}{d}; -\frac{b e^{i d z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.\right.$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-c+i\,d\,+i\,e\,+p)}{d},\,2;\,2-\frac{i\,(-c+i\,e\,+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(-c+i\,d\,+i\,e\,+p)}{d},\,2;\,2-\frac{i\,(-c+i\,e\,+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$

$$\left({}_2F_1\left(-\frac{i\,(-c+i\,d\,+i\,e\,+p)}{d},\,2;\,2-\frac{i\,(-c+i\,e\,+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)+{}_2F_1\left(-\frac{i\,(-c+i\,d\,+i\,e\,+p)}{d},\right.\right.$$

$$\left.\left.2;\,2-\frac{i\,(-c+i\,e\,+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg/\left(b\left(a^2-b^2\right)^{3/2}(-c+i\,d\,+i\,e\,+p)\right)+$$

$$\left(e^{(c+i\,d\,+i\,e\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,+p)}{d},\,1;\,2-\frac{i\,(c+i\,e\,+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$\left.a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,+p)}{d},\,1;\,2-\frac{i\,(c+i\,e\,+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,+p)}{d},\,2;\,2-\frac{i\,(c+i\,e\,+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.\left.{}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,+p)}{d},\,2;\,2-\frac{i\,(c+i\,e\,+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-\right.$$

$$\left.a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,+p)}{d},\,2;\,2-\frac{i\,(c+i\,e\,+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)+{}_2F_1\left(-\frac{i\,(c+i\,d\,+i\,e\,+p)}{d},\right.\right.\right.$$

$$\left.\left.\left.2;\,2-\frac{i\,(c+i\,e\,+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Bigg)\Bigg/\left(b\left(a^2-b^2\right)^{3/2}(c+i\,d\,+i\,e\,+p)\right)+$$

$$\left(e^{(-c-i\,e+i\,d\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,+p)}{d},\,1;\,2-\frac{i\,(-c-i\,e+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$\left.a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,+p)}{d},\,1;\,2-\frac{i\,(-c-i\,e+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,+p)}{d},\,2;\,2-\frac{i\,(-c-i\,e+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$ {}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,+p)}{d},\,2;\,2-\frac{i\,(-c-i\,e+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)-a\,\sqrt{a^2-b^2}$$

$$\left({}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,+p)}{d},\,2;\,2-\frac{i\,(-c-i\,e+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)+{}_2F_1\left(-\frac{i\,(-c-i\,e+i\,d\,+p)}{d},\right.$$

$$\left.2;\,2-\frac{i\,(-c-i\,e+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg/\left(b\left(a^2-b^2\right)^{3/2}(-c-i\,e+i\,d\,+p)\right)+$$

$$\left(e^{(c-i\,e+i\,d\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\,\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,+p)}{d},\,1;\,2-\frac{i\,(c-i\,e+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,+p)}{d},\,1;\,2-\frac{i\,(c-i\,e+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,+p)}{d},\,2;\,2-\frac{i\,(c-i\,e+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,+p)}{d},\,2;\,2-\frac{i\,(c-i\,e+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\,\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,+p)}{d},\,2;\,2-\frac{i\,(c-i\,e+p)}{d};\,\frac{b\,e^{i\,d\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(-\frac{i\,(c-i\,e+i\,d\,+p)}{d},\,2;\,2-\frac{i\,(c-i\,e+p)}{d};\,-\frac{b\,e^{i\,d\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Bigg/\left(b\left(a^2-b^2\right)^{3/2}(c-i\,e+i\,d\,+p)\right)\right)$$

Involving $\frac{e^{p\,z}\cos(e\,z)\cosh(c\,z)}{a+b\cos^2(d\,z)}$

01.20.21.1321.01

$$\int \frac{e^{p z}\cos(e z)\cosh(c z)}{a+b\cos^2(d z)}\,dz == \frac{1}{4}\left(-\left(e^{(-c+2 i d+i e+p) z}\right.\right.$$
$$\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-c+i e+p)}{2d},1;2-\frac{i(-c+i e+p)}{2d};-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-c+i e+p)}{2d},1;2-\frac{i(-c+i e+p)}{2d};\right.\right.$$
$$\left.\left.\left.-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(-c+2 i d+i e+p)\right)-$$
$$\left(e^{(c+2 i d+i e+p) z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(c+i e+p)}{2d},1;2-\frac{i(c+i e+p)}{2d};-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(c+i e+p)}{2d},1;2-\frac{i(c+i e+p)}{2d};-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(c+2 i d+i e+p)\right)-\left(e^{(-c-i e+2 i d+p) z}\right.$$
$$\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-c-i e+p)}{2d},1;2-\frac{i(-c-i e+p)}{2d};-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-c-i e+p)}{2d},1;2-\frac{i(-c-i e+p)}{2d};-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-c-i e+2 i d+p)\right)-\left(e^{(c-i e+2 i d+p) z}\right.$$
$$\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(c-i e+p)}{2d},1;2-\frac{i(c-i e+p)}{2d};-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(c-i e+p)}{2d},1;2-\frac{i(c-i e+p)}{2d};\right.\right.$$
$$\left.\left.\left.-\frac{b e^{2 i d z}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(c-i e+2 i d+p)\right)\Big)$$

Involving $e^{p z}\cos(e z)\cosh(c z)\left(a+b\cos^2(d z)\right)^{-n}$

01.20.21.1322.01

$$\int \frac{e^{p z}\cos(e z)\cosh(c z)}{\left(a+b\cos^2(d z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(-\left(e^{(-c+2 i d+i e+p) z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-c+i e+p)}{2d},1;2-\frac{i(-c+i e+p)}{2d};\right.\right.\right.$$
$$\left.\left.\left.-\frac{b e^{2 i d z}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$

$$
{}_2F_1\left(1-\frac{i\,(-c+i\,e+p)}{2\,d},\,1;\,2-\frac{i\,(-c+i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(-c+i\,e+p)}{2\,d},\,2;\,2-\frac{i\,(-c+i\,e+p)}{2\,d};\right.\right.
$$

$$
\left.-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)
$$

$$
\left.\left.{}_2F_1\left(1-\frac{i\,(-c+i\,e+p)}{2\,d},\,2;\,2-\frac{i\,(-c+i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-c+2\,i\,d+i\,e+p)\right)-\left(e^{(c+2\,i\,d+i\,e+p)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)\right.\right.
$$

$$
{}_2F_1\left(1-\frac{i\,(c+i\,e+p)}{2\,d},\,1;\,2-\frac{i\,(c+i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2\,a-b)
$$

$$
\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(c+i\,e+p)}{2\,d},\,1;\,2-\frac{i\,(c+i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(c+i\,e+p)}{2\,d},\,2;\,2-\frac{i\,(c+i\,e+p)}{2\,d};\right.\right.
$$

$$
\left.-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)
$$

$$
\left.\left.{}_2F_1\left(1-\frac{i\,(c+i\,e+p)}{2\,d},\,2;\,2-\frac{i\,(c+i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(c+2\,i\,d+i\,e+p)\right)-\left(e^{(-c-i\,e+2\,i\,d+p)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)\right.\right.
$$

$$
{}_2F_1\left(1-\frac{i\,(-c-i\,e+p)}{2\,d},\,1;\,2-\frac{i\,(-c-i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2\,a-b)
$$

$$
\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(-c-i\,e+p)}{2\,d},\,1;\,2-\frac{i\,(-c-i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(-c-i\,e+p)}{2\,d},\,2;\,2-\right.\right.
$$

$$
\left.\frac{i\,(-c-i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)
$$

$$
\left.\left.{}_2F_1\left(1-\frac{i\,(-c-i\,e+p)}{2\,d},\,2;\,2-\frac{i\,(-c-i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-c-i\,e+2\,i\,d+p)\right)-\left(e^{(c-i\,e+2\,i\,d+p)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)\right.\right.
$$

$$
{}_2F_1\left(1-\frac{i\,(c-i\,e+p)}{2\,d},\,1;\,2-\frac{i\,(c-i\,e+p)}{2\,d};\,-\frac{b\,e^{2\,i\,d\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2\,a-b)
$$

$$\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right){}_2F_1\left(1-\frac{i(c-ie+p)}{2d},\,1;\,2-\frac{i(c-ie+p)}{2d};\,-\frac{b\,e^{2idz}}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\ a-2b\sqrt{a}\ +b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c-ie+p)}{2d},\,2;\,2-\frac{i(c-ie+p)}{2d};\right.\right.$$
$$\left.-\frac{b\,e^{2idz}}{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\ a+2b\sqrt{a}\ +b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(c-ie+p)}{2d},\right.$$
$$\left.\left.\left.2;\,2-\frac{i(c-ie+p)}{2d};\,-\frac{b\,e^{2idz}}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(c-ie+2id+p)\right)\Bigg)$$

Involving algebraic functions of cos and exp

Involving $e^{pz}(a+b\cos(dz))^{\beta}\cosh(cz)$

01.20.21.1323.01

$$\int e^{pz}(a+b\cos(dz))^{\beta}\cosh(cz)\,dz==$$
$$\frac{1}{2(c+p-id\beta)(c-p+id\beta)}\left(\left(\frac{e^{idz}b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{idz}b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}be^{-idz}\left(1+e^{2idz}\right)\right)^{\beta}\right.$$
$$\left(e^{(c+p)z}(c-p+id\beta)F_1\left(-\frac{i(c+p-id\beta)}{d};\,-\beta,\,-\beta;\,-\frac{i(c+id+p-id\beta)}{d};\,-\frac{be^{idz}}{a+\sqrt{a^2-b^2}},\,\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\left.\left.e^{(p-c)z}(c+p-id\beta)F_1\left(\frac{i(c-p+id\beta)}{d};\,-\beta,\,-\beta;\,-\frac{i(-c+id+p-id\beta)}{d};\,-\frac{be^{idz}}{a+\sqrt{a^2-b^2}},\,\frac{be^{idz}}{\sqrt{a^2-b^2}-a}\right)\right)\right)$$

Involving $e^{pz}\left(a+b\cos^2(dz)\right)^{\beta}\cosh(cz)$

01.20.21.1324.01

$$\int e^{pz}\left(a+b\cos^2(dz)\right)^{\beta}\cosh(cz)\,dz==$$
$$\left(\left(\frac{e^{2idz}b}{2a+b-2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2idz}b}{2a+b+2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}be^{-2idz}\left(1+e^{2idz}\right)^2+a\right)^{\beta}\right.$$
$$\left(e^{(c+p)z}(c-p+2id\beta)F_1\left(-\frac{i(c+p-2id\beta)}{2d};\,-\beta,\,-\beta;\,-\frac{i(c+p)}{2d}-\beta+1;\,-\frac{be^{2idz}}{2a+b+2\sqrt{a(a+b)}},\right.\right.$$
$$\left.-\frac{be^{2idz}}{2a+b-2\sqrt{a(a+b)}}\right)-e^{(p-c)z}(c+p-2id\beta)F_1\left(\frac{i(c-p+2id\beta)}{2d};\,-\beta,\,-\beta;\,-\frac{i(p-c)}{2d}-\beta+1;\right.$$
$$\left.\left.\left.-\frac{be^{2idz}}{2a+b+2\sqrt{a(a+b)}},\,-\frac{be^{2idz}}{2a+b-2\sqrt{a(a+b)}}\right)\right)\right)\Big/\left(2(c+p-2id\beta)(c-p+2id\beta)\right)$$

Involving $e^{p z} \cos(e z) \cosh(c z) (a + b \cos(d z))^{\beta}$ DONE

01.20.21.1325.01

$$\int e^{p z} (a + b \cos(d z))^{\beta} \cos(e z) \cosh(c z)\, dz == \frac{1}{4}\left(\frac{e^{i d z} b}{a - \sqrt{a^2 - b^2}} + 1\right)^{-\beta}\left(\frac{e^{i d z} b}{a + \sqrt{a^2 - b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-i d z}\left(1 + e^{2 i d z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(c+i e+p) z}}{c + i e + p - i d \beta} F_1\left(-\frac{i (c + i e + p - i d \beta)}{d}; -\beta, -\beta; -\frac{i (c + i d + i e + p - i d \beta)}{d}; -\frac{b e^{i d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{i d z}}{\sqrt{a^2 - b^2} - a}\right) + \right.$$
$$\frac{e^{(c-i e+p) z}}{c - i e + p - i d \beta} F_1\left(-\frac{i (c - i e + p - i d \beta)}{d}; -\beta, -\beta; -\frac{i (c - i e + i d + p - i d \beta)}{d}; -\frac{b e^{i d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{i d z}}{\sqrt{a^2 - b^2} - a}\right) -$$
$$\frac{e^{(-c-i e+p) z}}{c + i e - p + i d \beta} F_1\left(\frac{i (c + i e - p + i d \beta)}{d}; -\beta, -\beta;\right.$$
$$\left. -\frac{i (-c - i e + i d + p - i d \beta)}{d}; -\frac{b e^{i d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{i d z}}{\sqrt{a^2 - b^2} - a}\right) - \frac{e^{(-c+i e+p) z}}{c - i e - p + i d \beta}$$
$$\left.\left. F_1\left(-\frac{i (-c + i e + p - i d \beta)}{d}; -\beta, -\beta; -\frac{i (-c + i d + i e + p - i d \beta)}{d}; -\frac{b e^{i d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{i d z}}{\sqrt{a^2 - b^2} - a}\right)\right)\right)$$

Involving $e^{p z} \cos(e z) \cosh(c z) \left(a + b \cos^2(d z)\right)^{\beta}$ DONE

01.20.21.1326.01

$$\int e^{p z}\left(a+b\cos^2(d z)\right)^{\beta}\cos(e z)\cosh(c z)\,dz ==$$
$$\frac{1}{4}\left(\frac{e^{2 i d z} b}{2a+b-2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2 i d z} b}{2a+b+2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4} b e^{-2 i d z}\left(1+e^{2 i d z}\right)^2+a\right)^{\beta}$$
$$\left(\frac{1}{-c+i e+p-2 i d \beta}\left(e^{(-c+i e+p) z} F_1\left(-\frac{i(-c+i e+p-2 i d \beta)}{2d};-\beta,-\beta;-\frac{i(-c+i e+p)}{2d}-\beta+1;\right.\right.\right.$$
$$\left.\left.-\frac{b e^{2 i d z}}{2a+b+2\sqrt{a(a+b)}},-\frac{b e^{2 i d z}}{2a+b-2\sqrt{a(a+b)}}\right)\right)+$$
$$\frac{1}{c+i e+p-2 i d \beta}\left(e^{(c+i e+p) z} F_1\left(-\frac{i(c+i e+p-2 i d \beta)}{2d};-\beta,-\beta;-\frac{i(c+i e+p)}{2d}-\beta+1;\right.\right.$$
$$\left.\left.-\frac{b e^{2 i d z}}{2a+b+2\sqrt{a(a+b)}},-\frac{b e^{2 i d z}}{2a+b-2\sqrt{a(a+b)}}\right)\right)+$$
$$\frac{1}{c-i e+p-2 i d \beta}\left(e^{(c-i e+p) z} F_1\left(-\frac{i(c-i e+p-2 i d \beta)}{2d};-\beta,-\beta;-\frac{i(c-i e+p)}{2d}-\beta+1;\right.\right.$$
$$\left.\left.-\frac{b e^{2 i d z}}{2a+b+2\sqrt{a(a+b)}},-\frac{b e^{2 i d z}}{2a+b-2\sqrt{a(a+b)}}\right)\right)-$$
$$\frac{1}{c+i e-p+2 i d \beta}\left(e^{(-c-i e+p) z} F_1\left(\frac{i(c+i e-p+2 i d \beta)}{2d};-\beta,-\beta;\frac{i(c+i e-p+2 d i(\beta-1))}{2d};\right.\right.$$
$$\left.\left.\left.-\frac{b e^{2 i d z}}{2a+b+2\sqrt{a(a+b)}},-\frac{b e^{2 i d z}}{2a+b-2\sqrt{a(a+b)}}\right)\right)\right)$$

Involving rational functions of sin, cos and exp

Involving $e^{p z}\cosh(d z)(a\sin(e z)+b\cos(e z))^{-n}$

01.20.21.1327.01

$$\int\frac{e^{p z}\cosh(d z)}{a\sin(e z)+b\cos(e z)}\,dz == \frac{1}{b+i a}\left(\frac{e^{(d+i e+p) z}}{d+i e+p}{}_2F_1\left(-\frac{i(d+i e+p)}{2e},1;-\frac{i(d+3 i e+p)}{2e};\frac{(a+i b)e^{2 i e z}}{a-i b}\right)-\right.$$
$$\left.\frac{e^{(-d+i e+p) z}}{d-i e-p}{}_2F_1\left(\frac{e+i d-i p}{2e},1;\frac{i(d-3 i e-p)}{2e};\frac{(a+i b)e^{2 i e z}}{a-i b}\right)\right)$$

01.20.21.1328.01

$$\int\frac{e^{p z}\cosh(d z)}{(a\sin(e z)+b\cos(e z))^2}\,dz == -\frac{2}{(a-i b)^2}\left(\frac{e^{(d+2 i e+p) z}}{d+2 i e+p}{}_2F_1\left(1-\frac{i(d+p)}{2e},2;2-\frac{i(d+p)}{2e};\frac{(a+i b)e^{2 i e z}}{a-i b}\right)-\right.$$
$$\left.\frac{e^{(-d+2 i e+p) z}}{d-2 i e-p}{}_2F_1\left(\frac{i(d-p)}{2e}+1,2;\frac{i(d-p)}{2e}+2;\frac{(a+i b)e^{2 i e z}}{a-i b}\right)\right)$$

Involving $e^{p z}\cosh(d z)(a+b\sin(e z)+c\cos(e z))^{-n}$

01.20.21.1329.01

$$\int \frac{e^{p z} \cosh(d z)}{a + b \sin(e z) + c \cos(e z)}\, dz == -\frac{1}{2 (c + i b) \sqrt{a^2 - b^2 - c^2}}$$

$$\left(\frac{1}{d - i e - p}\left(e^{(-d+i e+p) z}\left(\left(a + \sqrt{a^2 - b^2 - c^2}\right) {}_2F_1\left(\frac{e + i d - i p}{e}, 1; \frac{i (d - p)}{e} + 2; \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right) + \right.\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a^2 - b^2 - c^2} - a\right) {}_2F_1\left(\frac{e + i d - i p}{e}, 1; \frac{i (d - p)}{e} + 2; \frac{i (b + i c)\, e^{i e z}}{a + \sqrt{a^2 - b^2 - c^2}}\right)\right)\right) -$$

$$\frac{1}{d + i e + p}\left(e^{(d+i e+p) z}\left(\left(a + \sqrt{a^2 - b^2 - c^2}\right) {}_2F_1\left(-\frac{i (d + i e + p)}{e}, 1; 2 - \frac{i (d + p)}{e}; \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right) + \right.\right.$$

$$\left.\left.\left.\left(\sqrt{a^2 - b^2 - c^2} - a\right) {}_2F_1\left(-\frac{i (d + i e + p)}{e}, 1; 2 - \frac{i (d + p)}{e}; \frac{i (b + i c)\, e^{i e z}}{a + \sqrt{a^2 - b^2 - c^2}}\right)\right)\right)\right)$$

01.20.21.1330.01

$$\int \frac{e^{p z} \cosh(d z)}{(a + b \sin(e z) + c \cos(e z))^2}\, dz ==$$

$$\frac{1}{2}\left(\left(e^{(-d+i e+p) z}\left({}_2F_1\left(-\frac{i (-d + i e + p)}{e}, 2; 2 - \frac{i (p - d)}{e}; \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right) a^2 - {}_2F_1\left(-\frac{i (-d + i e + p)}{e}, \right.\right.\right.\right.$$

$$\left.\left.\left.\left. 2; 2 - \frac{i (p - d)}{e}; -\frac{(c - i b)\, e^{i e z}}{a + \sqrt{a^2 - b^2 - c^2}}\right) a^2 + \left(a - \sqrt{a^2 - b^2 - c^2}\right)\right.\right.\right.$$

$${}_2F_1\left(-\frac{i (-d + i e + p)}{e}, 1; 2 - \frac{i (p - d)}{e}; -\frac{(c - i b)\, e^{i e z}}{a + \sqrt{a^2 - b^2 - c^2}}\right) a +$$

$$\sqrt{a^2 - b^2 - c^2}\ {}_2F_1\left(-\frac{i (-d + i e + p)}{e}, 2; 2 - \frac{i (p - d)}{e}; \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right) a +$$

$$\sqrt{a^2 - b^2 - c^2}\ {}_2F_1\left(-\frac{i (-d + i e + p)}{e}, 2; 2 - \frac{i (p - d)}{e}; -\frac{(c - i b)\, e^{i e z}}{a + \sqrt{a^2 - b^2 - c^2}}\right) a -$$

$$a\left(a + \sqrt{a^2 - b^2 - c^2}\right) {}_2F_1\left(-\frac{i (-d + i e + p)}{e}, 1; 2 - \frac{i (p - d)}{e}; \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right) -$$

$$b^2\, {}_2F_1\left(-\frac{i (-d + i e + p)}{e}, 2; 2 - \frac{i (p - d)}{e}; \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right) -$$

$$c^2\,{}_2F_1\left(-\frac{i\,(-d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(p-d)}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)+$$

$$b^2\,{}_2F_1\left(-\frac{i\,(-d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(p-d)}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)+$$

$$c^2\,{}_2F_1\left(-\frac{i\,(-d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(p-d)}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left((-c-i\,b)\left(a^2-b^2-c^2\right)^{3/2}(-d+i\,e\,+p)\right)+\left(e^{(d+i\,e\,+p)\,z}\left({}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)\right.\right.$$

$$a^2-{}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a^2+$$

$$\left(a-\sqrt{a^2-b^2-c^2}\right){}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,1;\,2-\frac{i\,(d+p)}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a+$$

$$\sqrt{a^2-b^2-c^2}\;{}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2-b^2-c^2}\;{}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2-b^2-c^2}\right){}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,1;\,2-\frac{i\,(d+p)}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)-$$

$$b^2\,{}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)-$$

$$c^2\,{}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,\frac{(c-i\,b)\,e^{i\,e\,z}}{\sqrt{a^2-b^2-c^2}\;-a}\right)+$$

$$b^2\,{}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)+$$

$$\left.\left.c^2\,{}_2F_1\left(-\frac{i\,(d+i\,e\,+p)}{e},\,2;\,2-\frac{i\,(d+p)}{e};\,-\frac{(c-i\,b)\,e^{i\,e\,z}}{a+\sqrt{a^2-b^2-c^2}}\right)\right)\right)\Bigg/\left((-c-i\,b)\left(a^2-b^2-c^2\right)^{3/2}(d+i\,e\,+p)\right)\Bigg)$$

Involving $e^{p z} \cosh(d z) \left(a \sin^2(e z) + b \cos^2(e z)\right)^{-n}$

01.20.21.1331.01

$$\int \frac{e^{p z} \cosh(d z)}{a \sin^2(e z) + b \cos^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(-\left(i e^{(-d+2 i e+p) z}\left(\left(\sqrt{-a}+i\sqrt{b}\right)^2 {}_2F_1\left(1-\frac{i(p-d)}{2e}, 1; 2-\frac{i(p-d)}{2e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)-\left(\sqrt{-a}-i\sqrt{b}\right)^2\right.\right.\right.$$

$$\left.\left.\left. {}_2F_1\left(1-\frac{i(p-d)}{2e}, 1; 2-\frac{i(p-d)}{2e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)\right)\right) \Big/ \left(\sqrt{-a}\sqrt{b}(b-a)(-d+2 i e+p)\right)-$$

$$\left(i e^{(d+2 i e+p) z}\left(\left(\sqrt{-a}+i\sqrt{b}\right)^2 {}_2F_1\left(1-\frac{i(d+p)}{2e}, 1; 2-\frac{i(d+p)}{2e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}-i\sqrt{b}\right)^2}\right)-\left(\sqrt{-a}-i\sqrt{b}\right)^2\right.\right.$$

$$\left.\left. {}_2F_1\left(1-\frac{i(d+p)}{2e}, 1; 2-\frac{i(d+p)}{2e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i\sqrt{b}\right)^2}\right)\right)\right) \Big/ \left(\sqrt{-a}\sqrt{b}(b-a)(d+2 i e+p)\right)\Bigg)$$

01.20.21.1332.01

$$\int \frac{e^{p z} \cosh(d z)}{\left(a \sin^2(e z) + b \cos^2(e z)\right)^2} dz ==$$

$$\frac{1}{2}\left(-\left(i e^{(-d+2 i e+p) z}\left((-a-b)\,{}_2F_1\left(1-\frac{i (p-d)}{2 e}, 1; 2-\frac{i (p-d)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}-i \sqrt{b}\right)^2}\right)\left(\sqrt{-a}+i \sqrt{b}\right)^2 - \left(\sqrt{-a}-i \sqrt{b}\right)^2 (-a-b)\,{}_2F_1\left(1-\frac{i (p-d)}{2 e}, 1; 2-\frac{i (p-d)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i \sqrt{b}\right)^2}\right) - 2 i \sqrt{-a} \sqrt{b}\left({}_2F_1\left(1-\frac{i (p-d)}{2 e}, 2; 2-\frac{i (p-d)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i \sqrt{b}\right)^2}\right)\left(\sqrt{-a}+i \sqrt{b}\right)^2 + \left(\sqrt{-a}-i \sqrt{b}\right)^2 {}_2F_1\left(1-\frac{i (p-d)}{2 e}, 2; 2-\frac{i (p-d)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i \sqrt{b}\right)^2}\right)\right)\right) \Big/ \left(2 (-a)^{3/2} b^{3/2} (b-a) (-d+2 i e+p)\right) - \left(i e^{(d+2 i e+p) z}\left((-a-b)\,{}_2F_1\left(1-\frac{i (d+p)}{2 e}, 1; 2-\frac{i (d+p)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}-i \sqrt{b}\right)^2}\right)\left(\sqrt{-a}+i \sqrt{b}\right)^2 - \left(\sqrt{-a}-i \sqrt{b}\right)^2 (-a-b)\,{}_2F_1\left(1-\frac{i (d+p)}{2 e}, 1; 2-\frac{i (d+p)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i \sqrt{b}\right)^2}\right) - 2 i \sqrt{-a} \sqrt{b}\left({}_2F_1\left(1-\frac{i (d+p)}{2 e}, 2; 2-\frac{i (d+p)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i \sqrt{b}\right)^2}\right)\left(\sqrt{-a}+i \sqrt{b}\right)^2 + \left(\sqrt{-a}-i \sqrt{b}\right)^2 {}_2F_1\left(1-\frac{i (d+p)}{2 e}, 2; 2-\frac{i (d+p)}{2 e}; \frac{(b-a) e^{2 i e z}}{\left(\sqrt{-a}+i \sqrt{b}\right)^2}\right)\right)\right) \Big/ \left(2 (-a)^{3/2} b^{3/2} (b-a) (d+2 i e+p)\right)\right)$$

Involving $e^{p z} \cosh(d z)\left(a + b \sin^2(e z) + c \cos^2(e z)\right)^{-n}$

01.20.21.1333.01

$$\int \frac{e^{p z} \cosh(d z)}{a + b \sin^2(e z) + c \cos^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(\left(e^{(-d+2 i e+p) z}\left(\left(2 a+b+c+2\sqrt{(a+b)(a+c)}\right){}_2F_1\left(1-\frac{i(p-d)}{2e}, 1; 2-\frac{i(p-d)}{2e}; \frac{(c-b) e^{2 i e z}}{-2 a-b-c+2\sqrt{(a+b)(a+c)}}\right)+\left(-2 a-b-c+2\sqrt{(a+b)(a+c)}\right){}_2F_1\left(1-\frac{i(p-d)}{2e}, 1; 2-\frac{i(p-d)}{2e}; \frac{(c-b) e^{2 i e z}}{-2 a-b-c-2\sqrt{(a+b)(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a+b)(a+c)}\ (c-b)(-d+2 i e+p)\right)+\left(e^{(d+2 i e+p) z}\left(\left(2 a+b+c+2\sqrt{(a+b)(a+c)}\right){}_2F_1\left(1-\frac{i(d+p)}{2e}, 1; 2-\frac{i(d+p)}{2e}; \frac{(c-b) e^{2 i e z}}{-2 a-b-c+2\sqrt{(a+b)(a+c)}}\right)+\left(-2 a-b-c+2\sqrt{(a+b)(a+c)}\right){}_2F_1\left(1-\frac{i(d+p)}{2e}, 1; 2-\frac{i(d+p)}{2e}; \frac{(c-b) e^{2 i e z}}{-2 a-b-c-2\sqrt{(a+b)(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a+b)(a+c)}\ (c-b)(d+2 i e+p)\right)\right)$$

01.20.21.1334.01

$$\int \frac{e^{p z}\cosh(d z)}{\left(a+b\sin^2(e z)+c\cos^2(e z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left(\left((c-b)\,e^{(-d+2ie+p)z}\left(2\sqrt{(a+b)(a+c)}\left(\frac{{}_2F_1\left(1-\frac{i(p-d)}{2e},\,2;\,2-\frac{i(p-d)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)}{2a+b+c+2\sqrt{(a+b)(a+c)}}-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{{}_2F_1\left(1-\frac{i(p-d)}{2e},\,2;\,2-\frac{i(p-d)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\frac{(2a+b+c)\,{}_2F_1\left(1-\frac{i(p-d)}{2e},\,1;\,2-\frac{i(p-d)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)}{2a+b+c+2\sqrt{(a+b)(a+c)}}-\right.\right.\right.$$

$$\left.\left.\left.\frac{(2a+b+c)\,{}_2F_1\left(1-\frac{i(p-d)}{2e},\,1;\,2-\frac{i(p-d)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)}{2a+b+c-2\sqrt{(a+b)(a+c)}}\right)\right)\right/\left(2\left((a+b)(a+c)\right)^{3/2}(-d+2ie+p)\right)-$$

$$\left(\left((c-b)\,e^{(d+2ie+p)z}\left(2\sqrt{(a+b)(a+c)}\left(\frac{{}_2F_1\left(1-\frac{i(d+p)}{2e},\,2;\,2-\frac{i(d+p)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)}{2a+b+c+2\sqrt{(a+b)(a+c)}}-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{{}_2F_1\left(1-\frac{i(d+p)}{2e},\,2;\,2-\frac{i(d+p)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\frac{(2a+b+c)\,{}_2F_1\left(1-\frac{i(d+p)}{2e},\,1;\,2-\frac{i(d+p)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}}\right)}{2a+b+c+2\sqrt{(a+b)(a+c)}}-\right.\right.\right.$$

$$\left.\left.\left.\frac{(2a+b+c)\,{}_2F_1\left(1-\frac{i(d+p)}{2e},\,1;\,2-\frac{i(d+p)}{2e};\,\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)}{2a+b+c-2\sqrt{(a+b)(a+c)}}\right)\right)\right/\left(2\left((a+b)(a+c)\right)^{3/2}(d+2ie+p)\right)\right)$$

Involving $e^{p z}\cosh(d z)\left(a\sin^2(e z)+b\sin(2ez)+c\cos^2(e z)\right)^{-n}$

01.20.21.1335.01

$$\int \frac{e^{p z} \cosh(d z)}{a \sin^2(e z) + b \sin(2 e z) + c \cos^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(-\left((-a-2 i b+c)\, e^{(-d+2 i e+p) z}\left(\left(a+c+2\sqrt{a c-b^2}\right){}_2F_1\left(1-\frac{i (p-d)}{2 e}, 1; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c+2\sqrt{a c-b^2}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-a-c+2\sqrt{a c-b^2}\right){}_2F_1\left(1-\frac{i (p-d)}{2 e}, 1; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c-2\sqrt{a c-b^2}}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{a c-b^2}\left(-a-c+2\sqrt{a c-b^2}\right)\left(a+c+2\sqrt{a c-b^2}\right)(-d+2 i e+p)\right)-$$

$$\left((-a-2 i b+c)\, e^{(d+2 i e+p) z}\left(\left(a+c+2\sqrt{a c-b^2}\right){}_2F_1\left(1-\frac{i (d+p)}{2 e}, 1; 2-\frac{i (d+p)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c+2\sqrt{a c-b^2}}\right)+\right.\right.$$

$$\left.\left.\left(-a-c+2\sqrt{a c-b^2}\right){}_2F_1\left(1-\frac{i (d+p)}{2 e}, 1; 2-\frac{i (d+p)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c-2\sqrt{a c-b^2}}\right)\right)\right)\Bigg/$$

$$\left.\left(\sqrt{a c-b^2}\left(-a-c+2\sqrt{a c-b^2}\right)\left(a+c+2\sqrt{a c-b^2}\right)(d+2 i e+p)\right)\right)$$

01.20.21.1336.01

$$\int \frac{e^{p z} \cosh(d z)}{\left(a \sin^2(e z) + b \sin(2 e z) + c \cos^2(e z)\right)^2}\, dz ==$$

$$\frac{1}{2}\left(\left(\left((-a-2 i b+c)\, e^{(-d+2 i e+p) z}\left(-4\,{}_2F_1\left(1-\frac{i (p-d)}{2 e}, 2; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c+2\sqrt{a c-b^2}}\right) b^2+\right.\right.\right.\right.$$

$$4\,{}_2F_1\left(1-\frac{i (p-d)}{2 e}, 2; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c-2\sqrt{a c-b^2}}\right) b^2+$$

$$(-a-c)\left(a+c+2\sqrt{a c-b^2}\right){}_2F_1\left(1-\frac{i (p-d)}{2 e}, 1; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c+2\sqrt{a c-b^2}}\right)+$$

$$(-a-c)\left(-a-c+2\sqrt{a c-b^2}\right){}_2F_1\left(1-\frac{i (p-d)}{2 e}, 1; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c-2\sqrt{a c-b^2}}\right)+$$

$$4 a c\,{}_2F_1\left(1-\frac{i (p-d)}{2 e}, 2; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c+2\sqrt{a c-b^2}}\right)+$$

$$\left.\left.\left.\left.2 a\sqrt{a c-b^2}\;{}_2F_1\left(1-\frac{i (p-d)}{2 e}, 2; 2-\frac{i (p-d)}{2 e}; \frac{(-a-2 i b+c)\, e^{2 i e z}}{-a-c+2\sqrt{a c-b^2}}\right)+\right.\right.\right.\right.$$

$$2\,c\,\sqrt{a\,c-b^2}\;{}_2F_1\left(1-\frac{i\,(p-d)}{2\,e},\,2;\,2-\frac{i\,(p-d)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\,\sqrt{a\,c-b^2}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(1-\frac{i\,(p-d)}{2\,e},\,2;\,2-\frac{i\,(p-d)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)+$$

$$2\,a\,\sqrt{a\,c-b^2}\;{}_2F_1\left(1-\frac{i\,(p-d)}{2\,e},\,2;\,2-\frac{i\,(p-d)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)+$$

$$2\,c\,\sqrt{a\,c-b^2}\;{}_2F_1\left(1-\frac{i\,(p-d)}{2\,e},\,2;\,2-\frac{i\,(p-d)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(a\,c-b^2\right)^{3/2}\left(-a-c+2\,\sqrt{a\,c-b^2}\right)\left(a+c+2\,\sqrt{a\,c-b^2}\right)(-d+2\,i\,e\,+p)\right)+$$

$$\Bigg(\left(-a-2\,i\,b+c\right)e^{(d+2\,i\,e+p)\,z}\left(-4\,{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\,\sqrt{a\,c-b^2}}\right)b^2+$$

$$4\,{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)b^2+$$

$$(-a-c)\left(a+c+2\,\sqrt{a\,c-b^2}\right){}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,1;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\,\sqrt{a\,c-b^2}}\right)+$$

$$(-a-c)\left(-a-c+2\,\sqrt{a\,c-b^2}\right){}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,1;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\,\sqrt{a\,c-b^2}}\right)+$$

$$2\,a\,\sqrt{a\,c-b^2}\;{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\,\sqrt{a\,c-b^2}}\right)+$$

$$2\,c\,\sqrt{a\,c-b^2}\;{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c+2\,\sqrt{a\,c-b^2}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)+$$

$$2\,a\,\sqrt{a\,c-b^2}\;{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)+$$

$$2\,c\,\sqrt{a\,c-b^2}\;{}_2F_1\left(1-\frac{i\,(d+p)}{2\,e},\,2;\,2-\frac{i\,(d+p)}{2\,e};\,\frac{(-a-2\,i\,b+c)\,e^{2\,i\,e\,z}}{-a-c-2\,\sqrt{a\,c-b^2}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(a\,c-b^2\right)^{3/2}\left(-a-c+2\,\sqrt{a\,c-b^2}\right)\left(a+c+2\,\sqrt{a\,c-b^2}\right)(d+2\,i\,e\,+p)\right)$$

Involving algebraic functions of sin, cos and exp

Involving $e^{p\,z}\cosh(d\,z)\,(a\sin(e\,z)+b\cos(e\,z))^{\beta}$

01.20.21.1337.01

$$\int e^{p\,z}\cosh(d\,z)\,(a\sin(e\,z)+b\cos(e\,z))^{\beta}\,dz==$$

$$\frac{1}{2}\left(-\frac{1}{d-p+i\,e\,\beta}\left(2^{-\beta}\,e^{(p-d)\,z}\left(\frac{e^{2\,i\,e\,z}\,(b-i\,a)}{b+i\,a}+1\right)^{-\beta}\left(e^{-i\,e\,z}\left(b\left(1+e^{2\,i\,e\,z}\right)-i\,a\left(-1+e^{2\,i\,e\,z}\right)\right)\right)^{\beta}\right.\right.$$

$${}_2F_1\left(-\frac{i\,(-d+p-i\,e\,\beta)}{2\,e},\,-\beta;\,\frac{1}{2}\left(-\frac{i\,(p-d)}{e}-\beta+2\right);\,\frac{(b-i\,a)\,e^{2\,i\,e\,z}}{-b-i\,a}\right)\Bigg)-$$

$$\frac{1}{-d-p+i\,e\,\beta}\left(2^{-\beta}\,e^{(d+p)\,z}\left(\frac{e^{2\,i\,e\,z}\,(b-i\,a)}{b+i\,a}+1\right)^{-\beta}\left(e^{-i\,e\,z}\left(b\left(1+e^{2\,i\,e\,z}\right)-i\,a\left(-1+e^{2\,i\,e\,z}\right)\right)\right)^{\beta}\right.$$

$$\left.\left.{}_2F_1\left(-\frac{i\,(d+p-i\,e\,\beta)}{2\,e},\,-\beta;\,\frac{1}{2}\left(-\frac{i\,(d+p)}{e}-\beta+2\right);\,\frac{(b-i\,a)\,e^{2\,i\,e\,z}}{-b-i\,a}\right)\right)\right)$$

Involving $e^{p\,z}\cosh(d\,z)\,(a+b\sin(e\,z)+c\cos(e\,z))^{\beta}$

01.20.21.1338.01

$$\int e^{p z} \cosh(d z)\,(a + b \sin(e z) + c \cos(e z))^{\beta}\, dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d - p + i e \beta}\left(2^{-\beta}\, e^{(p-d) z}\left(1 - \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right)^{-\beta}\left(\frac{e^{i e z}\,(c - i b)}{a + \sqrt{a^2 - b^2 - c^2}} + 1\right)^{-\beta}\right.\right.$$
$$\left(e^{-i e z}\left(2\, e^{i e z} a + c\, e^{2 i e z} + c - i b\left(-1 + e^{2 i e z}\right)\right)\right)^{\beta}$$
$$\left.F_1\left(-\frac{i\,(p - d)}{e} - \beta; -\beta, -\beta; -\frac{i\,(p - d)}{e} - \beta + 1; -\frac{(c - i b)\, e^{i e z}}{a + \sqrt{a^2 - b^2 - c^2}}, \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right)\right) - \frac{1}{-d - p + i e \beta}$$
$$\left(2^{-\beta}\, e^{(d+p) z}\left(1 - \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right)^{-\beta}\left(\frac{e^{i e z}\,(c - i b)}{a + \sqrt{a^2 - b^2 - c^2}} + 1\right)^{-\beta}\left(e^{-i e z}\left(2\, e^{i e z} a + c\, e^{2 i e z} + c - i b\left(-1 + e^{2 i e z}\right)\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(-\frac{i\,(d + p)}{e} - \beta; -\beta, -\beta; -\frac{i\,(d + p)}{e} - \beta + 1; -\frac{(c - i b)\, e^{i e z}}{a + \sqrt{a^2 - b^2 - c^2}}, \frac{(c - i b)\, e^{i e z}}{\sqrt{a^2 - b^2 - c^2} - a}\right)\right)\right)$$

Involving $e^{p z} \cosh(d z)\left(a \sin^2(e z) + b \cos^2(e z)\right)^{\beta}$

01.20.21.1339.01

$$\int e^{p z} \cosh(d z)\left(a \sin^2(e z) + b \cos^2(e z)\right)^{\beta} dz == \frac{1}{2}$$
$$\left(-\frac{1}{d - p + 2 i e \beta}\left(4^{-\beta}\, e^{(p-d) z}\left(1 - \frac{(b - a)\, e^{2 i e z}}{-a - b + 2\sqrt{a b}}\right)^{-\beta}\left(\frac{e^{2 i e z}\,(b - a)}{a + b + 2\sqrt{a b}} + 1\right)^{-\beta}\left(e^{-2 i e z}\left(b\left(1 + e^{2 i e z}\right)^2 - a\left(-1 + e^{2 i e z}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(-\frac{i\,(p - d)}{2 e} - \beta; -\beta, -\beta; -\frac{i\,(p - d)}{2 e} - \beta + 1; -\frac{(b - a)\, e^{2 i e z}}{a + b + 2\sqrt{a b}}, \frac{(b - a)\, e^{2 i e z}}{-a - b + 2\sqrt{a b}}\right)\right) - \frac{1}{-d - p + 2 i e \beta}$$
$$\left(4^{-\beta}\, e^{(d+p) z}\left(1 - \frac{(b - a)\, e^{2 i e z}}{-a - b + 2\sqrt{a b}}\right)^{-\beta}\left(\frac{e^{2 i e z}\,(b - a)}{a + b + 2\sqrt{a b}} + 1\right)^{-\beta}\left(e^{-2 i e z}\left(b\left(1 + e^{2 i e z}\right)^2 - a\left(-1 + e^{2 i e z}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(-\frac{i\,(d + p)}{2 e} - \beta; -\beta, -\beta; -\frac{i\,(d + p)}{2 e} - \beta + 1; -\frac{(b - a)\, e^{2 i e z}}{a + b + 2\sqrt{a b}}, \frac{(b - a)\, e^{2 i e z}}{-a - b + 2\sqrt{a b}}\right)\right)\right)$$

Involving $e^{p z} \cosh(d z)\left(a + b \sin^2(e z) + c \cos^2(e z)\right)^{\beta}$

01.20.21.1340.01

$$\int e^{pz}\cosh(dz)\left(a+b\sin^2(ez)+c\cos^2(ez)\right)^{\beta}dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d-p+2ie\beta}\left(4^{-\beta}e^{(p-d)z}\left(1-\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2iez}(c-b)}{2a+b+c+2\sqrt{(a+b)(a+c)}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2iez}\left(-b\left(-1+e^{2iez}\right)^2+4ae^{2iez}+c\left(1+e^{2iez}\right)^2\right)\right)^{\beta}F_1\left(-\frac{i(p-d)}{2e}-\beta;-\beta,-\beta;\right.$$
$$\left.\left.-\frac{i(p-d)}{2e}-\beta+1;\frac{(c-b)e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}},\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)\right)-$$
$$\frac{1}{-d-p+2ie\beta}\left(4^{-\beta}e^{(d+p)z}\left(1-\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2iez}(c-b)}{2a+b+c+2\sqrt{(a+b)(a+c)}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2iez}\left(-b\left(-1+e^{2iez}\right)^2+4ae^{2iez}+c\left(1+e^{2iez}\right)^2\right)\right)^{\beta}F_1\left(-\frac{i(d+p)}{2e}-\beta;-\beta,-\beta;\right.$$
$$\left.\left.\left.-\frac{i(d+p)}{2e}-\beta+1;\frac{(c-b)e^{2iez}}{-2a-b-c-2\sqrt{(a+b)(a+c)}},\frac{(c-b)e^{2iez}}{-2a-b-c+2\sqrt{(a+b)(a+c)}}\right)\right)\right)$$

Involving $e^{pz}\cosh(dz)\left(a\sin^2(ez)+b\sin(2ez)+c\cos^2(ez)\right)^{\beta}$

01.20.21.1341.01

$$\int e^{pz}\cosh(dz)\left(a\sin^2(ez)+b\sin(2ez)+c\cos^2(ez)\right)^{\beta}dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d-p+2ie\beta}\left(4^{-\beta}e^{(p-d)z}\left(1-\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)^{-\beta}\left(\frac{e^{2iez}(-a-2ib+c)}{a+c+2\sqrt{ac-b^2}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2iez}\left(\left(1+e^{2iez}\right)\left(c\left(1+e^{2iez}\right)-2ib\left(-1+e^{2iez}\right)\right)-a\left(-1+e^{2iez}\right)^2\right)\right)^{\beta}$$
$$\left.F_1\left(-\frac{i(p-d)}{2e}-\beta;-\beta,-\beta;-\frac{i(p-d)}{2e}-\beta+1;-\frac{(-a-2ib+c)e^{2iez}}{a+c+2\sqrt{ac-b^2}},\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)\right)-$$
$$\frac{1}{-d-p+2ie\beta}\left(4^{-\beta}e^{(d+p)z}\left(1-\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)^{-\beta}\left(\frac{e^{2iez}(-a-2ib+c)}{a+c+2\sqrt{ac-b^2}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2iez}\left(\left(1+e^{2iez}\right)\left(c\left(1+e^{2iez}\right)-2ib\left(-1+e^{2iez}\right)\right)-a\left(-1+e^{2iez}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{i(d+p)}{2e}-\beta;-\beta,-\beta;-\frac{i(d+p)}{2e}-\beta+1;-\frac{(-a-2ib+c)e^{2iez}}{a+c+2\sqrt{ac-b^2}},\frac{(-a-2ib+c)e^{2iez}}{-a-c+2\sqrt{ac-b^2}}\right)\right)\right)$$

Involving tan and exp

01.20.21.1342.01

$$\int e^{b z} \tan(a z) \cosh(c z)\, dz == \frac{1}{2}\left(-\frac{e^{(b-c+2 i a) z}}{2 a - i b + i c}\, {}_2F_1\left(\frac{2 a - i b + i c}{2 a}, 1; \frac{4 a - i b + i c}{2 a}; -e^{2 i a z}\right) - \frac{e^{(b+c+2 i a) z}}{2 a - i (b + c)}\, {}_2F_1\left(\frac{2 a - i (b + c)}{2 a}, 1; \frac{4 a - i (b + c)}{2 a}; -e^{2 i a z}\right) + \frac{e^{(b-c) z}\, i}{b - c}\, {}_2F_1\left(-\frac{i (b - c)}{2 a}, 1; 1 - \frac{i (b - c)}{2 a}; -e^{2 i a z}\right) + \frac{e^{(b+c) z}\, i}{b + c}\, {}_2F_1\left(-\frac{i (b + c)}{2 a}, 1; 1 - \frac{i (b + c)}{2 a}; -e^{2 i a z}\right)\right)$$

01.20.21.1343.01

$$\int e^{b z} \tan(c z) \cosh(c z)\, dz == -\frac{1}{2} i \left(-\frac{e^{(b-c) z}\, {}_2F_1\left(\frac{i (c-b)}{2 c}, 1; \left(1 + \frac{i}{2}\right) - \frac{i b}{2 c}; -e^{2 i c z}\right)}{b - c} + \frac{e^{(b+c (1+2 i)) z}\, {}_2F_1\left(-\frac{i (b+c (1+2 i))}{2 c}, 1; -\frac{i (b+c (1+4 i))}{2 c}; -e^{2 i c z}\right)}{b + c (1 + 2 i)} + \frac{e^{(b-(1-2 i) c) z}\, {}_2F_1\left(\left(1 + \frac{i}{2}\right) - \frac{i b}{2 c}, 1; \left(2 + \frac{i}{2}\right) - \frac{i b}{2 c}; -e^{2 i c z}\right)}{b - (1 - 2 i) c} - \frac{e^{(b+c) z}\, {}_2F_1\left(-\frac{i (b+c)}{2 c}, 1; 1 - \frac{i (b+c)}{2 c}; -e^{2 i c z}\right)}{b + c}\right)$$

Involving cot and exp

01.20.21.1344.01

$$\int e^{b z} \cot(a z) \cosh(c z)\, dz == \frac{1}{2}\left(-\frac{e^{(b-c+2 i a) z}}{2 a - i b + i c}\, {}_2F_1\left(\frac{2 a - i b + i c}{2 a}, 1; \frac{4 a - i b + i c}{2 a}; e^{2 i a z}\right) - \frac{e^{(b+c+2 i a) z}}{2 a - i (b + c)}\, {}_2F_1\left(\frac{2 a - i (b + c)}{2 a}, 1; \frac{4 a - i (b + c)}{2 a}; e^{2 i a z}\right) - \frac{i\, e^{(b-c) z}}{b - c}\, {}_2F_1\left(-\frac{i (b - c)}{2 a}, 1; 1 - \frac{i (b - c)}{2 a}; e^{2 i a z}\right) - \frac{i\, e^{(b+c) z}}{b + c}\, {}_2F_1\left(-\frac{i (b + c)}{2 a}, 1; 1 - \frac{i (b + c)}{2 a}; e^{2 i a z}\right)\right)$$

01.20.21.1345.01

$$\int e^{b z} \cot(c z) \cosh(c z)\, dz == -\frac{1}{2} i \left(\frac{e^{(b-c) z}\, {}_2F_1\left(\frac{i (c-b)}{2 c}, 1; \left(1 + \frac{i}{2}\right) - \frac{i b}{2 c}; e^{2 i c z}\right)}{b - c} + \frac{e^{(b+c) z}\, {}_2F_1\left(-\frac{i (b+c)}{2 c}, 1; 1 - \frac{i (b+c)}{2 c}; e^{2 i c z}\right)}{b + c} + \frac{e^{(b+c (1+2 i)) z}\, {}_2F_1\left(-\frac{i (b+c (1+2 i))}{2 c}, 1; -\frac{i (b+c (1+4 i))}{2 c}; e^{2 i c z}\right)}{b + c (1 + 2 i)} + \frac{e^{(b-(1-2 i) c) z}\, {}_2F_1\left(\left(1 + \frac{i}{2}\right) - \frac{i b}{2 c}, 1; \left(2 + \frac{i}{2}\right) - \frac{i b}{2 c}; e^{2 i c z}\right)}{b - (1 - 2 i) c}\right)$$

Involving csc and exp

01.20.21.1346.01

$$\int e^{b z} \csc(a z) \cosh(c z)\, dz == -\frac{1}{a^2 - 2 i b a - b^2 + c^2}\left(e^{(b-c+i a) z}\left((a - i (b + c))\, {}_2F_1\left(\frac{a - i b + i c}{2 a}, 1; \frac{3 a - i b + i c}{2 a}; e^{2 i a z}\right) + (a - i (b - c))\, e^{2 c z}\, {}_2F_1\left(\frac{a - i (b + c)}{2 a}, 1; \frac{3 a - i (b + c)}{2 a}; e^{2 i a z}\right)\right)\right)$$

01.20.21.1347.01

$$\int e^{b z} \csc(c z) \cosh(c z)\, dz == -\frac{1}{(b-(1-i)c)(b+c(1+i))}\left(i\left((b-(1-i)c)\, e^{(b+c(1+i))z}\, {}_2F_1\left(-\frac{i(b+c(1+i))}{2c}, 1; -\frac{i(b+c(1+3i))}{2c}; e^{2icz}\right) + (b+c(1+i))\, e^{(b-(1-i)c)z}\, {}_2F_1\left(-\frac{i(b-(1-i)c)}{2c}, 1; -\frac{i(b-(1-3i)c)}{2c}; e^{2icz}\right)\right)\right)$$

Involving sec and exp

01.20.21.1348.01

$$\int e^{b z} \sec(a z) \cosh(c z)\, dz == \frac{1}{(b-c+ia)(a-i(b+c))}\left(e^{(b-c+ia)z}\left((a-i(b+c))\, {}_2F_1\left(\frac{a-ib+ic}{2a}, 1; \frac{3a-ib+ic}{2a}; -e^{2iaz}\right) + (a-i(b-c))\, e^{2cz}\, {}_2F_1\left(\frac{a-i(b+c)}{2a}, 1; \frac{3a-i(b+c)}{2a}; -e^{2iaz}\right)\right)\right)$$

01.20.21.1349.01

$$\int e^{b z} \sec(c z) \cosh(c z)\, dz == \frac{1}{(b-(1-i)c)(b+c(1+i))}\left((b-(1-i)c)\, e^{(b+c(1+i))z}\, {}_2F_1\left(-\frac{i(b+c(1+i))}{2c}, 1; -\frac{i(b+c(1+3i))}{2c}; -e^{2icz}\right) + (b+c(1+i))\, e^{(b-(1-i)c)z}\, {}_2F_1\left(-\frac{i(b-(1-i)c)}{2c}, 1; -\frac{i(b-(1-3i)c)}{2c}; -e^{2icz}\right)\right)$$

Involving trigonometric, exponential and a power functions

Involving sin, exp and power

Involving $z^{\alpha-1}\, e^{p z} \sin(c z) \cosh(a z)$

01.20.21.1350.01

$$\int z^{\alpha-1}\, e^{pz} \sin(c z) \cosh(a z)\, dz == \frac{1}{4} i z^{\alpha}\left(-\Gamma(\alpha, (a-p+ic)z)((a-p+ic)z)^{-\alpha} + (-(a+p+ic)z)^{-\alpha}\Gamma(\alpha, -(a+p+ic)z) + ((a-p-ic)z)^{-\alpha}\Gamma(\alpha, (a-p-ic)z) - (-(a+p-ic)z)^{-\alpha}\Gamma(\alpha, -(a+p-ic)z)\right)$$

Involving $z^{\alpha-1}\, e^{p z} \sin(c z + d) \cosh(a z)$

01.20.21.1351.01

$$\int z^{\alpha-1}\, e^{pz} \sin(d + c z) \cosh(a z)\, dz == \frac{1}{4} i e^{-id} z^{\alpha}\left(-E_{1-\alpha}((a+ic-p)z) + e^{2id} E_{1-\alpha}((a-ic-p)z) + e^{2id} E_{1-\alpha}(-(a+ic+p)z) - E_{1-\alpha}(-(a-ic+p)z)\right)$$

Involving $z^{\alpha-1}\, e^{p z} \sin(c z) \cosh(a z + b)$

01.20.21.1352.01

$$\int z^{\alpha-1}\, e^{p\,z} \sin(c\,z) \cosh(b+a\,z)\, dz == \frac{1}{4} i\, e^{-b}\, z^{\alpha} \left(-E_{1-\alpha}((a+i\,c-p)\,z) + E_{1-\alpha}((a-i\,c-p)\,z) + e^{2\,b}\,(E_{1-\alpha}(-(a+i\,c+p)\,z) - E_{1-\alpha}(-(a-i\,c+p)\,z))\right)$$

Involving $z^{\alpha-1}\, e^{p\,z} \sin(c\,z+d) \cosh(a\,z+b)$

01.20.21.1353.01

$$\int z^{\alpha-1}\, e^{p\,z} \sin(d+c\,z) \cosh(b+a\,z)\, dz == \frac{1}{4} i\, e^{-b-i\,d}\, z^{\alpha} \left(-E_{1-\alpha}((a+i\,c-p)\,z) + e^{2\,i\,d}\, E_{1-\alpha}((a-i\,c-p)\,z) + e^{2\,b}\left(e^{2\,i\,d}\, E_{1-\alpha}(-(a+i\,c+p)\,z) - E_{1-\alpha}(-(a-i\,c+p)\,z)\right)\right)$$

Involving $z^n e^{p\,z^r} \sin\left(b\,z^r\right) \cosh(c\,z)$

01.20.21.1354.01

$$\int z^n\, e^{p\,z^2} \sin\left(b\,z^2\right) \cosh(c\,z)\, dz == \frac{i}{8\sqrt{-i\,b+p}\,\sqrt{i\,b+p}}$$

$$\left(-e^{\frac{c^2}{4\,i\,b-4\,p}} \sqrt{i\,b+p} \left(\sum_{q=0}^{n} 2^{q-n}\,(-c)^{n-q}\,(-i\,b+p)^{-n-\frac{1}{2}}\,(c+2\,(-i\,b+p)\,z)^{q+1} \left(-\frac{(c+2\,(-i\,b+p)\,z)^2}{-i\,b+p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.\right.$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(c+2\,(-i\,b+p)\,z)^2}{4\,(-i\,b+p)}\right) + \sum_{q=0}^{n} 2^{q-n}\,c^{n-q}\,(-i\,b+p)^{-n-\frac{1}{2}} \left(-\frac{(c+2\,i\,b\,z-2\,p\,z)^2}{-i\,b+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(2\,(-i\,b+p)\,z-c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2\,i\,b\,z-2\,p\,z)^2}{4\,(-i\,b+p)}\right)\right) + e^{\frac{c^2}{-4\,i\,b-4\,p}} \sqrt{-i\,b+p}\right.$$

$$\sum_{q=0}^{n} 2^{q-n}\,(-c)^{n-q}\,(i\,b+p)^{-n-\frac{1}{2}}\,(c+2\,(i\,b+p)\,z)^{q+1} \left(-\frac{(c+2\,(i\,b+p)\,z)^2}{i\,b+p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2\,(i\,b+p)\,z)^2}{4\,(i\,b+p)}\right) +$$

$$e^{\frac{c^2}{-4\,i\,b-4\,p}} \sqrt{-i\,b+p} \sum_{q=0}^{n} 2^{q-n}\,c^{n-q}\,(i\,b+p)^{-n-\frac{1}{2}} \left(-\frac{(c-2\,i\,b\,z-2\,p\,z)^2}{i\,b+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.(2\,(i\,b+p)\,z-c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2\,i\,b\,z-2\,p\,z)^2}{4\,(i\,b+p)}\right)\right) /;\, n \in \mathbb{N}$$

01.20.21.1355.01

$$\int z^n e^{p\sqrt{z}} \sin\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$i\,2^{-2n-3}\,c^{-2(n+1)}\,e^{-\frac{b^2+4ipb+2p^2}{4c}}\left(e^{\frac{2b^2+6ipb+p^2}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}-(-1)^{r-q}\,4^r\,(-ib+p)^{2n-q-r}\left(\frac{\left(b+i\left(2\sqrt{z}\,c+p\right)\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\right.$$

$$\left(2\sqrt{z}\,c-ib+p\right)^{q+r}\binom{n}{r}\binom{r}{q}\left((b+ip)\left(b+i\left(2\sqrt{z}\,c+p\right)\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(b+i\left(2\sqrt{z}\,c+p\right)\right)^2}{4c}\right)-\right.$$

$$\left.2c\sqrt{\frac{\left(b+i\left(2\sqrt{z}\,c+p\right)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(b+i\left(2\sqrt{z}\,c+p\right)\right)^2}{4c}\right)\right)+$$

$$e^{\frac{p(2ib+3p)}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}-(-1)^{r-q}\,4^r\,(-ib+p)^{2n-q-r}\left(-2\sqrt{z}\,c-ib+p\right)^{q+r}\left(\frac{\left(-2\sqrt{z}\,c-ib+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left((b+ip)\left(b+i\left(p-2c\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\sqrt{z}\,c-ib+p\right)^2}{4c}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(-2\sqrt{z}\,c-ib+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\sqrt{z}\,c-ib+p\right)^2}{4c}\right)\right)-$$

$$e^{\frac{3p(2ib+p)}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(ib+p)^{2n-q-r}\left(-2\sqrt{z}\,c+ib+p\right)^{q+r}\left(\frac{\left(-2\sqrt{z}\,c+ib+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left((ib+p)\left(-2\sqrt{z}\,c+ib+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\sqrt{z}\,c+ib+p\right)^2}{4c}\right)-\right.$$

$$\left.2c\sqrt{\frac{\left(-2\sqrt{z}\,c+ib+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\sqrt{z}\,c+ib+p\right)^2}{4c}\right)\right)-$$

$$e^{\frac{2b^2+2ipb+p^2}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r(ib+p)^{2n-q-r}\left(2\sqrt{z}\,c+ib+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\,c+ib+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left((ib+p)\left(2\sqrt{z}\,c+ib+p\right)\Gamma\left(\frac{1}{2}(q+r+1),-\frac{\left(2\sqrt{z}\,c+ib+p\right)^2}{4c}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,c+ib+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),-\frac{\left(2\sqrt{z}\,c+ib+p\right)^2}{4c}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\sin(b\,z)\cosh(c\,z)$

01.20.21.1356.01

$$\int z^n\,e^{p\,z^2}\sin(b\,z)\cosh(c\,z)\,dz==$$

$$\frac{1}{8\sqrt{p}}\left(ie^{\frac{b^2-c^2}{2p}}\left(e^{\frac{(c-ib)^2}{4p}}\sum_{q=0}^{n}2^{q-n}(-c-ib)^{n-q}p^{-n-\frac{1}{2}}(c+ib+2pz)^{q+1}\left(-\frac{(c+ib+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+ib+2pz)^2}{4p}\right)-e^{\frac{(c+ib)^2}{4p}}$$

$$\sum_{q=0}^{n}2^{q-n}(ib-c)^{n-q}p^{-n-\frac{1}{2}}(c-ib+2pz)^{q+1}\left(-\frac{(c-ib+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-ib+2pz)^2}{4p}\right)-$$

$$e^{\frac{(c-ib)^2}{4p}}\sum_{q=0}^{n}2^{q-n}(c+ib)^{n-q}p^{-n-\frac{1}{2}}\left(-\frac{(c+ib-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}(-c-ib+2pz)^{q+1}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(c+ib-2pz)^2}{4p}\right)+e^{\frac{(c+ib)^2}{4p}}\sum_{q=0}^{n}2^{q-n}(c-ib)^{n-q}p^{-n-\frac{1}{2}}\left(-\frac{(c-ib-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(-c+ib+2pz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-ib-2pz)^2}{4p}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.1357.01

$$\int z^n\,e^{p\sqrt{z}}\sin(b\,z)\cosh(c\,z)\,dz==$$

$$-i\,2^{-2n-3}\left(e^{\frac{p^2}{4c-4ib}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r\,p^{2n-q-r}\left(p-2(c-ib)\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2(c-ib)\sqrt{z}\right)^2}{c-ib}\right)^{\frac{1}{2}(-q-r-1)}\right.\right.$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(p-2(c-i b)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\ \frac{\left(p-2(c-i b)\sqrt{z}\right)^2}{4(c-i b)}\right)-\right.$$

$$\left.2(c-i b)\sqrt{\frac{\left(p-2(c-i b)\sqrt{z}\right)^2}{c-i b}}\ \Gamma\left(\frac{1}{2}(q+r+2),\ \frac{\left(p-2(c-i b)\sqrt{z}\right)^2}{4(c-i b)}\right)\right)\Bigg)(i b-c)^{-2(n+1)}-$$

$$(-c-i b)^{-2(n+1)}\, e^{\frac{p^2}{4c+4i b}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(p-2(c+i b)\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2(c+i b)\sqrt{z}\right)^2}{c+i b}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(p-2(c+i b)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\ \frac{\left(p-2(c+i b)\sqrt{z}\right)^2}{4(c+i b)}\right)-\right.$$

$$\left.2(c+i b)\sqrt{\frac{\left(p-2(c+i b)\sqrt{z}\right)^2}{c+i b}}\ \Gamma\left(\frac{1}{2}(q+r+2),\ \frac{\left(p-2(c+i b)\sqrt{z}\right)^2}{4(c+i b)}\right)\right)+$$

$$(c+i b)^{-2(n+1)}\, e^{\frac{p^2}{-4c-4i b}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\,(c+i b)+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\,(c+i b)+p\right)^2}{c+i b}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\,(c+i b)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\,(c+i b)+p\right)^2}{4(c+i b)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,(c+i b)+p\right)^2}{c+i b}}\ (c+i b)\,\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(2\sqrt{z}\,(c+i b)+p\right)^2}{4(c+i b)}\right)\right)-$$

$$(c-i b)^{-2(n+1)}\, e^{\frac{p^2}{4i b-4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\,(c-i b)+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\,(c-i b)+p\right)^2}{c-i b}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\,(c-i b)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\,(c-i b)+p\right)^2}{4(c-i b)}\right)+\right.$$

Involving $z^n e^{p z} \sin(b z^r) \cosh(c z)$

01.20.21.1358.01

$$\int z^n e^{p z} \sin\left(b z^2\right) \cosh(c z)\, dz ==$$

$$\frac{1}{8 b} e^{-\frac{i (c+p)^2}{4 b}} \left(\sqrt{i b} \left(e^{\frac{i \left(c^2+p^2\right)}{2 b}} \sum_{q=0}^{n} 2^{q-n} (i b)^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p+2 i b z)^{q+1} \left(\frac{i (-c+p+2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.\right.$$

$$\Gamma\left(\frac{q+1}{2}, \frac{i (-c+p+2 i b z)^2}{4 b} \right) + e^{\frac{i (c+p)^2}{2 b}} \sum_{q=0}^{n} 2^{q-n} (i b)^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p+2 i b z)^{q+1}$$

$$\left. \left(\frac{i (c+p+2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (c+p+2 i b z)^2}{4 b} \right) \right) + \sqrt{-i b}\ e^{\frac{i c p}{b}}$$

$$\sum_{q=0}^{n} 2^{q-n} (-i b)^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p-2 i b z)^{q+1} \left(-\frac{i (c-p+2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (c-p+2 i b z)^2}{4 b} \right) +$$

$$\sqrt{-i b} \sum_{q=0}^{n} 2^{q-n} (-i b)^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p-2 i b z)^{q+1} \left(-\frac{i (c+p-2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (c+p-2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N}$$

01.20.21.1359.01

$$\int z^n e^{p z} \sin\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$-i 2^{-2 n-3} \left(-e^{\frac{b^2}{4 p-4 c}} \left(\sum_{r=0}^{n} \sum_{q=0}^{r} -(-1)^{r-q} 4^r (-i b)^{2 n-q-r} \left(\frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{c-p} \right)^{\frac{1}{2}(-q-r-1)} \left(-i b+2 (p-c) \sqrt{z}\right)^{q+r} \right.\right.$$

$$\binom{n}{r} \binom{r}{q} \left(b \left(b-2 i (c-p) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(q+r+1), \frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{4 (c-p)} \right) + \right.$$

$$\left.\left.\left. 2 \sqrt{\frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{c-p}}\ (c-p) \Gamma\left(\frac{1}{2}(q+r+2), \frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{4 (c-p)} \right) \right) \right) (p-c)^{-2 (n+1)} +$$

$$e^{\frac{b^2}{4p-4c}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}-(-1)^{r-q}\,4^r\,(i\,b)^{2n-q-r}\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^{q+r}\left(\frac{\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^2}{c-p}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\right.$$

$$\binom{r}{q}\left(b\left(b+2\,i\,(c-p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\ \frac{\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^2}{4\,(c-p)}\right)+\right.$$

$$\left.\left.2\sqrt{\frac{\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^2}{c-p}}\ (c-p)\,\Gamma\left(\frac{1}{2}\,(q+r+2),\ \frac{\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^2}{4\,(c-p)}\right)\right)\right)(p-c)^{-2\,(n+1)}+$$

$$e^{\frac{b^2}{4\,(c+p)}}\,(c+p)^{-2\,(n+1)}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}-(-1)^{r-q}\,4^r\,(i\,b)^{2n-q-r}\left(\frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-q-r-1)}\left(i\,b+2\,(c+p)\,\sqrt{z}\right)^{q+r}\right.$$

$$\binom{n}{r}\binom{r}{q}\left(b\left(b-2\,i\,(c+p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\ \frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)-\right.$$

$$\left.2\,(c+p)\sqrt{\frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}}\ \Gamma\left(\frac{1}{2}\,(q+r+2),\ \frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\right)-$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}-(-1)^{r-q}\,4^r\,(-i\,b)^{2n-q-r}\left(\frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-q-r-1)}\left(-i\,b+2\,(c+p)\,\sqrt{z}\right)^{q+r}$$

$$\binom{n}{r}\binom{r}{q}\left(b\left(b+2\,i\,(c+p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\ \frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)-\right.$$

$$\left.\left.\left.2\,(c+p)\sqrt{\frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}}\ \Gamma\left(\frac{1}{2}\,(q+r+2),\ \frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1360.01

$$\int z^n e^{p z} \sin(b z) \cosh\left(c z^2\right) dz ==$$

$$-i\, 2^{-n-4} (-c)^{-n-1} e^{-\frac{b^2+4 i p b+2 p^2}{4 c}} \left(e^{\frac{p (2 i b+3 p)}{4 c}} \sum_{q=0}^{n} (i b-p)^{n-q} (-i b+p-2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(-i b+p-2 c z)^2}{4 c}\right) - \right.$$

$$2^n e^{\frac{3 p (2 i b+p)}{4 c}} \sum_{q=0}^{n} 2^{-n} (-i b-p)^{n-q} (i b+p-2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(i b+p-2 c z)^2}{4 c}\right) +$$

$$(-1)^n e^{\frac{2 b^2+2 i p b+p^2}{4 c}} \left(2^n \sum_{q=0}^{n} 2^{-n} (-i b-p)^{n-q} (i b+p+2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(-\frac{(i b+p+2 c z)^2}{4 c}\right) - \right.$$

$$\left.\left. e^{\frac{i b p}{c}} \sum_{q=0}^{n} (i b-p)^{n-q} (-i b+p+2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(b+i (p+2 c z))^2}{4 c}\right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.1361.01

$$\int z^n e^{p z} \sin(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$-i\, 2^{-2 n-3} \left(-e^{-\frac{c^2}{4 (-i b+p)}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c)^{-h-j+2 n} \left(2 (-i b+p) \sqrt{z}-c\right)^{h+j} \left(-\frac{\left(2 (-i b+p) \sqrt{z}-c\right)^2}{-i b+p} \right)^{\frac{1}{2}(-h-j-1)} \right. \right.$$

$$\binom{j}{h} \binom{n}{j} \left(2 (-i b+p) \sqrt{-\frac{\left(2 (-i b+p) \sqrt{z}-c\right)^2}{-i b+p}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2 (-i b+p) \sqrt{z}-c\right)^2}{4 (-i b+p)}\right) - \right.$$

$$\left.\left.\left. c \left(2 (-i b+p) \sqrt{z}-c\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2 (-i b+p) \sqrt{z}-c\right)^2}{4 (-i b+p)}\right) \right) \right) (-i b+p)^{-2 n-2} -$$

$$e^{-\frac{c^2}{4 (-i b+p)}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j c^{-h-j+2 n} \left(c+2 (-i b+p) \sqrt{z}\right)^{h+j} \left(-\frac{\left(c+2 (-i b+p) \sqrt{z}\right)^2}{-i b+p} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left(c \left(c+2 (-i b+p) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(c+2 (-i b+p) \sqrt{z}\right)^2}{4 (-i b+p)}\right) + \right.$$

$$\left.\left. 2 \sqrt{-\frac{\left(c+2 (-i b+p) \sqrt{z}\right)^2}{-i b+p}}\ (-i b+p) \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(c+2 (-i b+p) \sqrt{z}\right)^2}{4 (-i b+p)}\right) \right) \right) (-i b+p)^{-2 n-2} +$$

$$e^{-\frac{c^2}{4(i b+p)}} (i b+p)^{-2 n-2} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c)^{-h-j+2 n} \left(2 (i b+p) \sqrt{z}-c\right)^{h+j} \left(-\frac{\left(2 (i b+p) \sqrt{z}-c\right)^2}{i b+p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2 (i b+p) \sqrt{-\frac{\left(2 (i b+p) \sqrt{z}-c\right)^2}{i b+p}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2 (i b+p) \sqrt{z}-c\right)^2}{4 (i b+p)}\right)-\right.$$

$$\left. c \left(2 (i b+p) \sqrt{z}-c\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2 (i b+p) \sqrt{z}-c\right)^2}{4 (i b+p)}\right)\right)+$$

$$e^{-\frac{c^2}{4(i b+p)}} (i b+p)^{-2 n-2} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j c^{-h-j+2 n} \left(c+2 (i b+p) \sqrt{z}\right)^{h+j} \left(-\frac{\left(c+2 (i b+p) \sqrt{z}\right)^2}{i b+p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c \left(c+2 (i b+p) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(c+2 (i b+p) \sqrt{z}\right)^2}{4 (i b+p)}\right)+\right.$$

$$\left. 2 \sqrt{-\frac{\left(c+2 (i b+p) \sqrt{z}\right)^2}{i b+p}}\ (i b+p) \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(c+2 (i b+p) \sqrt{z}\right)^2}{4 (i b+p)}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n\, e^{p z^r} \sin(b z) \cosh\left(c z^r\right)$

01.20.21.1362.01

$$\int z^n e^{p z^2} \sin(b z) \cosh\left(c z^2\right) dz ==$$

$$\frac{i}{8 \sqrt{p-c}\, \sqrt{c+p}} e^{\frac{b^2}{4p-4c}} \left(-\sqrt{c+p} \sum_{q=0}^{n} 2^{q-n} (i b)^{n-q} (p-c)^{-n-\frac{1}{2}} \left(\frac{(i b+2(c-p) z)^2}{c-p} \right)^{\frac{1}{2}(-q-1)} (-i b+2(p-c) z)^{q+1} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(i b+2(c-p) z)^2}{4(c-p)} \right) + \sqrt{c+p} \sum_{q=0}^{n} 2^{q-n} (-i b)^{n-q} (p-c)^{-n-\frac{1}{2}} (i b-2 c z+2 p z)^{q+1}$$

$$\left(\frac{(i b-2 c z+2 p z)^2}{c-p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(i b-2 c z+2 p z)^2}{4(c-p)} \right) + e^{\frac{c b^2}{2c^2-2p^2}} \sqrt{p-c}$$

$$\left(\sum_{q=0}^{n} 2^{q-n} (-i b)^{n-q} (c+p)^{-n-\frac{1}{2}} \left(\frac{(b-2 i (c+p) z)^2}{c+p} \right)^{\frac{1}{2}(-q-1)} (i b+2(c+p) z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(b-2 i (c+p) z)^2}{4(c+p)} \right) - \right.$$

$$\sum_{q=0}^{n} 2^{q-n} (i b)^{n-q} (c+p)^{-n-\frac{1}{2}} \left(\frac{(b+2 i (c+p) z)^2}{c+p} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \left. (-i b+2(c+p) z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(b+2 i (c+p) z)^2}{4(c+p)} \right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.1363.01

$$\int z^n e^{p \sqrt{z}} \sin(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$i (-1)^{n-1} 2^{-2n-3} b^{-2n-2} \left(-e^{\frac{i (p-c)^2}{4b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (p-c)^{-h-j+2n} \left(-c+p+2 i b \sqrt{z}\right)^{h+j} \left(\frac{i \left(-c+p+2 i b \sqrt{z}\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((p-c) \left(-c+p+2 i b \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i \left(-c+p+2 i b \sqrt{z}\right)^2}{4b} \right) + \right.$$

$$\left. 2 \sqrt{\frac{i \left(-c+p+2 i b \sqrt{z}\right)^2}{b}}\, b i \Gamma\left(\frac{1}{2}(h+j+2), \frac{i \left(-c+p+2 i b \sqrt{z}\right)^2}{4b} \right) \right) -$$

$$\left. e^{\frac{i (c+p)^2}{4b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c+p)^{-h-j+2n} \left(c+p+2 i b \sqrt{z}\right)^{h+j} \left(\frac{i \left(c+p+2 i b \sqrt{z}\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \right)$$

$$\binom{n}{j}\left((c+p)\left(c+p+2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(c+p+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+p+2\,i\,b\,\sqrt{z}\right)^2}{b}}\ b\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(c+p+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)+$$

$$e^{-\frac{i(p-c)^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p-c)^{-h-j+2n}\left(-c+p-2\,i\,b\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((p-c)\left(-c+p-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-\right.$$

$$\left.2\,i\,b\sqrt{-\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)+$$

$$e^{-\frac{i(c+p)^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+p)^{-h-j+2n}\left(c+p-2\,i\,b\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c+p-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+p)\left(c+p-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(c+p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-\right.$$

$$\left.\left.2\,i\,b\sqrt{-\frac{i\left(c+p-2\,i\,b\,\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(c+p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\ e^{p\,z}\ \sin\left(b\,z^r\right)\sinh\left(c\,z^r\right)$

01.20.21.1364.01

$$\int z^n e^{p z} \sin\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$-\frac{1}{8} i \left(\frac{1}{\sqrt{-c-i b}} \left(e^{\frac{p^2}{4c+4ib}} \sum_{q=0}^{n} 2^{q-n} (-c-i b)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2(c+i b) z)^{q+1} \left(\frac{(p-2(c+i b) z)^2}{c+i b} \right)^{\frac{1}{2}(-q-1)} \right.\right.$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2(c+i b) z)^2}{4(c+i b)} \right) \right) - \frac{1}{\sqrt{c+i b}} \left(e^{\frac{p^2}{-4c-4ib}} \sum_{q=0}^{n} 2^{q-n} (c+i b)^{-n-\frac{1}{2}} (-p)^{n-q} \right.$$

$$\left.\left. (p+2cz+2ibz)^{q+1} \left(-\frac{(p+2cz+2ibz)^2}{c+i b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2cz+2ibz)^2}{4(c+i b)} \right) \right) - \right.$$

$$\frac{1}{\sqrt{i b-c}} \left(e^{\frac{p^2}{4c-4ib}} \sum_{q=0}^{n} 2^{q-n} (i b-c)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2cz+2ibz)^{q+1} \left(\frac{(p-2cz+2ibz)^2}{c-i b} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cz+2ibz)^2}{4(c-ib)} \right) \right) + \frac{1}{\sqrt{c-i b}} \left(e^{\frac{p^2}{4ib-4c}} \sum_{q=0}^{n} 2^{q-n} (c-i b)^{-n-\frac{1}{2}} (-p)^{n-q} \right.$$

$$\left.\left. \left. (p+2(c-ib)z)^{q+1} \left(-\frac{(p+2(c-ib)z)^2}{c-i b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(c-ib)z)^2}{4(c-ib)} \right) \right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.1365.01

$$\int z^n e^{p z} \sin\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$-i 2^{-2n-3} p^{-2n-2} \left(-e^{-\frac{(-c-ib)^2}{4p}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-c-i b)^{-h-j+2n} \left(-c-i b+2p\sqrt{z}\right)^{h+j} \left(-\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((-c-i b)\left(-c-i b+2p\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{4p} \right) + \right.$$

$$\left.\left. 2\sqrt{-\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{p}}\ p \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{4p} \right) \right) + \right.$$

$$\left. e^{-\frac{(ib-c)^2}{4p}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b-c)^{-h-j+2n} \left(-c+i b+2p\sqrt{z}\right)^{h+j} \left(-\frac{\left(-c+i b+2p\sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-j-1)} \right)$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b-c)\left(-c+i\,b+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c+i\,b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)-$$

$$e^{-\frac{(c-i\,b)^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-i\,b)^{-h-j+2\,n}\left(c-i\,b+2\,p\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-i\,b)\left(c-i\,b+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c+i\,b)^{-h-j+2\,n}\left(c+i\,b+2\,p\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c+i\,b)\left(c+i\,b+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\sin\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1366.01

$$\int z^{\alpha-1}\,e^{p\,z^r}\sin(b\,z^r)\cosh(c\,z^r)\,dz==$$

$$\frac{i\,z^\alpha}{4\,r}\left(-\Gamma\left(\frac{\alpha}{r},(-c+i\,b-p)\,z^r\right)\left((-c+i\,b-p)\,z^r\right)^{-\frac{\alpha}{r}}-\left((c+i\,b-p)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(c+i\,b-p)\,z^r\right)+\right.$$

$$\left.\left((-c-i\,b-p)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-c-i\,b-p)\,z^r\right)+\left((c-i\,b-p)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(c-i\,b-p)\,z^r\right)\right)$$

01.20.21.1367.01

$$\int z^n e^{p z^2} \sin(b z^2) \cosh(c z^2)\, dz ==$$
$$\frac{1}{8} i z^{n+1} \left(\Gamma\left(\frac{n+1}{2}, (-c - i b - p) z^2\right) \left((-c - i b - p) z^2\right)^{\frac{1}{2}(-n-1)} - \left((-c + i b - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-c + i b - p) z^2\right) + \left((c - i b - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c - i b - p) z^2\right) - \left((c + i b - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c + i b - p) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1368.01

$$\int z^n e^{p \sqrt{z}} \sin(b \sqrt{z}) \cosh(c \sqrt{z})\, dz ==$$
$$\frac{1}{2} i \left(\Gamma\left(2 (n+1), (-c - i b - p) \sqrt{z}\right) (-c - i b - p)^{-2(n+1)} - (-c + i b - p)^{-2(n+1)} \Gamma\left(2 (n+1), (-c + i b - p) \sqrt{z}\right) + (c - i b - p)^{-2(n+1)} \Gamma\left(2 (n+1), (c - i b - p) \sqrt{z}\right) - (c + i b - p)^{-2(n+1)} \Gamma\left(2 (n+1), (c + i b - p) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r + e} \sin(a z^r + q) \cosh(c z^r + g)$

01.20.21.1369.01

$$\int z^{\alpha-1} e^{b z^r + e} \sin(a z^r + q) \cosh(c z^r + g)\, dz ==$$
$$-\frac{z^\alpha}{4 r} \left(e^{e+g+i q - \frac{i\pi}{2}} \Gamma\left(\frac{\alpha}{r}, (-b - c - i a) z^r\right) ((-b - c - i a) z^r)^{-\frac{\alpha}{r}} + e^{e+g-i q + \frac{i\pi}{2}} ((-b - c + i a) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b - c + i a) z^r\right) + e^{e-g+i q - \frac{i\pi}{2}} ((-b + c - i a) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b + c - i a) z^r\right) + e^{e-g-i q + \frac{i\pi}{2}} ((-b + c + i a) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b + c + i a) z^r\right)\right)$$

01.20.21.1370.01

$$\int z^n e^{b z^2 + e} \sin(a z^2 + q) \cosh(c z^2 + g)\, dz ==$$
$$\frac{1}{8} i z^{n+1} \left(e^{e+g+i q} \Gamma\left(\frac{n+1}{2}, (-b - c - i a) z^2\right) \left((-b - c - i a) z^2\right)^{\frac{1}{2}(-n-1)} - e^{e+g-i q} \left((-b - c + i a) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b - c + i a) z^2\right) + e^{e-g+i q} \left((-b + c - i a) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b + c - i a) z^2\right) - e^{e-g-i q} \left((-b + c + i a) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b + c + i a) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1371.01

$$\int z^n e^{\sqrt{z}\, b + e} \sin(\sqrt{z}\, a + q) \cosh(\sqrt{z}\, c + g)\, dz ==$$
$$\frac{1}{2} i \left(e^{e+g+i q} \Gamma\left(2 (n+1), (-b - c - i a) \sqrt{z}\right) (-b - c - i a)^{-2(n+1)} - (-b - c + i a)^{-2(n+1)} e^{e+g-i q} \Gamma\left(2 (n+1), (-b - c + i a) \sqrt{z}\right) + (-b + c - i a)^{-2(n+1)} e^{e-g+i q} \Gamma\left(2 (n+1), (-b + c - i a) \sqrt{z}\right) - (-b + c + i a)^{-2(n+1)} e^{e-g-i q} \Gamma\left(2 (n+1), (-b + c + i a) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n e^{b z^r + d z + e} \sin(a z^r + p z + q) \cosh(c z^r + f z + g)$

01.20.21.1372.01

$$\int z^n e^{b z^2+d z+e} \sin\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$

$$-\frac{1}{8}\left((b-c-i a)^{-n-1} e^{-\frac{(d-f-i p)^2}{4(b-c-i a)}+e-g-i q+\frac{i \pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d+f+i p)^{n-j} (d-f-i p+2(b-c-i a) z)^{j+1}\right.$$

$$\left(-\frac{(d-f-i p+2(b-c-i a) z)^2}{b-c-i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f-i p+2(b-c-i a) z)^2}{4(b-c-i a)}\right)+$$

$$(b-c+i a)^{-n-1} e^{-\frac{(d-f+i p)^2}{4(b-c+i a)}+e-g+i q-\frac{i \pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d+f-i p)^{n-j} (d-f+i p+2(b-c+i a) z)^{j+1}$$

$$\left(-\frac{(d-f+i p+2(b-c+i a) z)^2}{b-c+i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f+i p+2(b-c+i a) z)^2}{4(b-c+i a)}\right)+$$

$$(b+c-i a)^{-n-1} e^{-\frac{(d+f-i p)^2}{4(b+c-i a)}+e+g-i q+\frac{i \pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d-f+i p)^{n-j} (d+f-i p+2(b+c-i a) z)^{j+1}$$

$$\left(-\frac{(d+f-i p+2(b+c-i a) z)^2}{b+c-i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f-i p+2(b+c-i a) z)^2}{4(b+c-i a)}\right)+$$

$$(b+c+i a)^{-n-1} e^{-\frac{(d+f+i p)^2}{4(b+c+i a)}+e+g+i q-\frac{i \pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d-f-i p)^{n-j} (d+f+i p+2(b+c+i a) z)^{j+1}$$

$$\left.\left(-\frac{(d+f+i p+2(b+c+i a) z)^2}{b+c+i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f+i p+2(b+c+i a) z)^2}{4(b+c+i a)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1373.01

$$\int z^n e^{\sqrt{z}\ b+d z+e} \sin\left(\sqrt{z}\ a+p z+q\right) \cosh\left(\sqrt{z}\ c+f z+g\right) dz ==$$

$$2^{-2n-3}\left(e^{-\frac{(b-c+i a)^2}{4(d-f+i p)}+e-g+i q-\frac{i \pi}{2}} (d-f+i p)^{-2n-2} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (b-c+i a)^{-h-i+2n} \left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^{h+i}\right.$$

$$\left(-\frac{\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^2}{d-f+i p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left((b-c+i a)\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^2}{4(d-f+i p)}\right)+2\sqrt{-\frac{\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^2}{d-f+i p}}\right.\right.$$

$$(d-f+i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b-c+i\,a+2(d-f+i\,p)\sqrt{z}\right)^2}{4(d-f+i\,p)}\right)+$$

$$e^{-\frac{(b+c+i\,a)^2}{4(d+f+i\,p)}+e+g+i\,q-\frac{i\,\pi}{2}}(d+f+i\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c+i\,a)^{-h-i+2n}\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{d+f+i\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+c+i\,a)\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{4(d+f+i\,p)}\right)+2\sqrt{-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{d+f+i\,p}}\right.$$

$$\left.(d+f+i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{4(d+f+i\,p)}\right)\right)+$$

$$e^{-\frac{(b-c-i\,a)^2}{4(d-f-i\,p)}+e-g-i\,q+\frac{i\,\pi}{2}}(d-f-i\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c-i\,a)^{-h-i+2n}\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{d-f-i\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b-c-i\,a)\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{4(d-f-i\,p)}\right)+2\sqrt{-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{d-f-i\,p}}\right.$$

$$\left.(d-f-i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{4(d-f-i\,p)}\right)\right)+$$

$$e^{-\frac{(b+c-i\,a)^2}{4(d+f-i\,p)}+e+g-i\,q+\frac{i\,\pi}{2}}(d+f-i\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c-i\,a)^{-h-i+2n}\left(b+c-i\,a+2(d+f-i\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{d+f-i\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+c-i\,a)\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p)}\right)+2\sqrt{-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{d+f-i\,p}}$$

$$\left.\left.(d+f-i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving powers of sin, exp and power

Involving $z^{\alpha-1}\,e^{p\,z}\,\sin^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.1374.01

$$\int z^{\alpha-1}\,e^{p\,z}\sin^{m}(c\,z)\cosh(a\,z)\,dz==$$

$$2^{-m-1}\,z^{\alpha}\left(((a-p)\,z)^{-\alpha}\,(-(a+p)\,z)^{-\alpha}\binom{m}{\frac{m}{2}}(\Gamma(\alpha,-(a+p)\,z)\,((a-p)\,z)^{\alpha}+(-(a+p)\,z)^{\alpha}\,\Gamma(\alpha,(a-p)\,z))\,(m\bmod 2-1)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,((a-p+c\,i\,(2\,k-m))\,z)^{-\alpha}\,(-(a+p+c\,i\,(2\,k-m))\,z)^{-\alpha}$$

$$(-(a+p-2\,i\,c\,k+i\,c\,m)\,z)^{-\alpha}\,((a-p+c\,i\,(m-2\,k))\,z)^{-\alpha}\binom{m}{k}$$

$$\left(\left(\left(\Gamma(\alpha,(a-p+c\,i\,(m-2\,k))\,z)\left(\cos\left(\frac{m\,\pi}{2}\right)+i\sin\left(\frac{m\,\pi}{2}\right)\right)(-(a+p-2\,i\,c\,k+i\,c\,m)\,z)^{\alpha}+((a-p+c\,i\,(m-2\,k))\,z)^{\alpha}\right.\right.\right.$$

$$\left.\left.\left.\Gamma(\alpha,-(a+p-2\,i\,c\,k+i\,c\,m)\,z)\left(\cos\left(\frac{m\,\pi}{2}\right)-i\sin\left(\frac{m\,\pi}{2}\right)\right)\right)(-(a+p+2\,i\,c\,k-i\,c\,m)\,z)^{\alpha}+\right.\right.$$

$$(-(a+p-2\,i\,c\,k+i\,c\,m)\,z)^{\alpha}\,((a-p+c\,i\,(m-2\,k))\,z)^{\alpha}\,\Gamma(\alpha,-(a+p+2\,i\,c\,k-i\,c\,m)\,z)$$

$$\left.\left.\left(\cos\left(\frac{m\,\pi}{2}\right)+i\sin\left(\frac{m\,\pi}{2}\right)\right)\right)((a-p+c\,i\,(2\,k-m))\,z)^{\alpha}+\right.$$

$$(-(a+p+c\,i\,(2\,k-m))\,z)^{\alpha}\,(-(a+p-2\,i\,c\,k+i\,c\,m)\,z)^{\alpha}\,((a-p+c\,i\,(m-2\,k))\,z)^{\alpha}$$

$$\left.\left.\Gamma(\alpha,(a-p+c\,i\,(2\,k-m))\,z)\left(\cos\left(\frac{m\,\pi}{2}\right)-i\sin\left(\frac{m\,\pi}{2}\right)\right)\right)\right)\Bigg)/;\,m\in\mathbb{N}^{+}$$

01.20.21.1375.01

$$\int z^n e^{p z} \sin^{\mu}(c z) \cosh(a z)\, dz ==$$

$$\frac{1}{2}\left(1-e^{2 i c z}\right)^{-\mu} n!\, \sin^{\mu}(c z)\left(e^{(a+p) z}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a+p-i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i(p+a)+c\mu}{2c}, \ldots, -\frac{i(p+a)+c\mu}{2c}, -\mu;\right.\right.$$

$$\left. 1-\frac{i(p+a)+c\mu}{2c}, \ldots, 1-\frac{i(p+a)+c\mu}{2c}; e^{2 i c z}\right) + e^{(p-a) z}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-a+p-i c \mu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(-\frac{i(p-a)+c\mu}{2c}, \ldots, -\frac{i(p-a)+c\mu}{2c}, -\mu; 1-\frac{i(p-a)+c\mu}{2c}, \ldots, 1-\frac{i(p-a)+c\mu}{2c}; e^{2 i c z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z}\, \sin^{\mu}(c z+d)\cosh(a z)$

01.20.21.1376.01

$$\int z^{\alpha-1} e^{p z} \sin^{m}(d+c z)\cosh(a z)\, dz ==$$

$$2^{-m-1} z^{\alpha}\left(((a-p) z)^{-\alpha}(-(a+p) z)^{-\alpha}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\Gamma(\alpha, -(a+p) z)((a-p) z)^{\alpha}+(-(a+p) z)^{\alpha}\Gamma(\alpha,(a-p) z)\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k((a+c i(2k-m)-p) z)^{-\alpha}((a+c i(m-2k)-p) z)^{-\alpha}$$

$$(-(a+c i(2k-m)+p) z)^{-\alpha}(-(a-2 i c k+i c m+p) z)^{-\alpha}\binom{m}{k}$$

$$\left(\left(\left(\Gamma(\alpha, -(a-2 i c k+i c m+p) z)((a+2 i c k-i c m-p) z)^{\alpha}+(-(a-2 i c k+i c m+p) z)^{\alpha}\Gamma(\alpha,(a+2 i c k-\right.\right.\right.\right.$$

$$\left.\left.\left.\left. i c m-p) z)\right)\left(\cos\left(d(m-2k)-\frac{m\pi}{2}\right)+i\sin\left(d(m-2k)-\frac{m\pi}{2}\right)\right)(-(a+c i(2k-m)+p)\right.\right.\right.$$

$$\left.\left.\left. z)^{\alpha}+((a+c i(2k-m)-p) z)^{\alpha}(-(a-2 i c k+i c m+p) z)^{\alpha}\Gamma(\alpha, -(a+c i(2k-m)+p) z)\right.\right.\right.$$

$$\left.\left.\left.\left(\cos\left(\frac{1}{2}(4 d k-2 d m+m\pi)\right)+i\sin\left(\frac{1}{2}(4 d k-2 d m+m\pi)\right)\right)\right)\right)((a+c i(m-2k)-p) z)^{\alpha}+$$

$$((a+c i(2k-m)-p) z)^{\alpha}(-(a+c i(2k-m)+p) z)^{\alpha}(-(a-2 i c k+i c m+p) z)^{\alpha}$$

$$\left.\left.\Gamma(\alpha,(a+c i(m-2k)-p) z)\left(\cos\left(\frac{1}{2}(4 d k-2 d m+m\pi)\right)+i\sin\left(\frac{1}{2}(4 d k-2 d m+m\pi)\right)\right)\right)\right) /; m \in \mathbb{N}^{+}$$

01.20.21.1377.01

$$\int z^n e^{p z} \sin^{\mu}(d + c z) \cosh(a z)\, dz ==$$

$$\frac{1}{2}\left(1 - e^{2 i (d+c z)}\right)^{-\mu} n!\, \sin^{\mu}(d + c z)\left(e^{(-a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p - i a + c \mu}{2 c}, \ldots, -\frac{i p - i a + c \mu}{2 c}, -\mu; 1 - \frac{i p - i a + c \mu}{2 c}, \ldots, 1 - \frac{i p - i a + c \mu}{2 c}; e^{2 i (d+c z)}\right) + e^{(a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + i a + c \mu}{2 c}, \ldots, -\frac{i p + i a + c \mu}{2 c}, -\mu; 1 - \frac{i p + i a + c \mu}{2 c}, \ldots, 1 - \frac{i p + i a + c \mu}{2 c}; e^{2 i (d+c z)}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z}\, \sin^{\mu}(c z) \cosh(a z + b)$

01.20.21.1378.01

$$\int z^{\alpha-1} e^{p z} \sin^{m}(c z) \cosh(b + a z)\, dz ==$$

$$2^{-m-1} z^{\alpha}\left(((a - p) z)^{-\alpha} (-(a + p) z)^{-\alpha} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) (\Gamma(\alpha, -(a + p) z) (\cosh(b) + \sinh(b)) ((a - p) z)^{\alpha} + (-(a + p) z)^{\alpha} \Gamma(\alpha, (a - p) z) (\cosh(b) - \sinh(b))) - \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k ((a + c i (2 k - m) - p) z)^{-\alpha} ((a + c i (m - 2 k) - p) z)^{-\alpha} (-(a + c i (2 k - m) + p) z)^{-\alpha} (-(a - 2 i c k + i c m + p) z)^{-\alpha} \binom{m}{k} \left(\left(\left(\cos\left(\frac{m \pi}{2}\right) - i \sin\left(\frac{m \pi}{2}\right)\right) \left(\Gamma(\alpha, -(a - 2 i c k + i c m + p) z) (\cosh(b) + \sinh(b)) ((a + 2 i c k - i c m - p) z)^{\alpha} + (-(a - 2 i c k + i c m + p) z)^{\alpha} \Gamma(\alpha, (a + 2 i c k - i c m - p) z) (\cosh(b) - \sinh(b))\right) (-(a + c i (2 k - m) + p) z)^{\alpha} + ((a + c i (2 k - m) - p) z)^{\alpha} (-(a - 2 i c k + i c m + p) z)^{\alpha} \Gamma(\alpha, -(a + c i (2 k - m) + p) z) \left(\cosh\left(b + \frac{i m \pi}{2}\right) + \sinh\left(b + \frac{i m \pi}{2}\right)\right)\right) ((a + c i (m - 2 k) - p) z)^{\alpha} + ((a + c i (2 k - m) - p) z)^{\alpha} (-(a + c i (2 k - m) + p) z)^{\alpha} (-(a - 2 i c k + i c m + p) z)^{\alpha} \Gamma(\alpha, (a + c i (m - 2 k) - p) z) \left(\cosh\left(b - \frac{i m \pi}{2}\right) - \sinh\left(b - \frac{i m \pi}{2}\right)\right)\right)\right) /; m \in \mathbb{N}^{+}$$

01.20.21.1379.01

$$\int z^n e^{p z} \sin^{\mu}(c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2}\left(1 - e^{2 i c z}\right)^{-\mu} n!\, \sin^{\mu}(c z)\left(e^{-b+(-a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p - i a + c \mu}{2 c}, \ldots, -\frac{i p - i a + c \mu}{2 c},\right.\right.$$

$$\left. -\mu; 1 - \frac{i p - i a + c \mu}{2 c}, \ldots, 1 - \frac{i p - i a + c \mu}{2 c}; e^{2 i c z}\right) + e^{b+(a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a - i c \mu)^{-j-1}}{(n-j)!}$$

$$\left.\left. {}_{j+2}F_{j+1}\left(-\frac{i p + i a + c \mu}{2 c}, \ldots, -\frac{i p + i a + c \mu}{2 c}, -\mu; 1 - \frac{i p + i a + c \mu}{2 c}, \ldots, 1 - \frac{i p + i a + c \mu}{2 c}; e^{2 i c z}\right)\right) /; n \in \mathbb{N}\right.$$

Involving $z^{\alpha-1}\, e^{p z} \sin^{\mu}(c z + d) \cosh(a z + b)$

01.20.21.1380.01

$$\int z^{\alpha-1} e^{p z} \sin^{m}(d + c z) \cosh(b + a z)\, dz ==$$

$$2^{-m-1} z^{\alpha}\left(((a - p) z)^{-\alpha} (-(a + p) z)^{-\alpha} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) (\Gamma(\alpha, -(a + p) z) (\cosh(b) + \sinh(b)) ((a - p) z)^{\alpha} + \right.$$

$$(-(a + p) z)^{\alpha} \Gamma(\alpha, (a - p) z) (\cosh(b) - \sinh(b))) - \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k ((a + c i (2 k - m) - p) z)^{-\alpha}$$

$$((a + c i (m - 2 k) - p) z)^{-\alpha} (-(a + c i (2 k - m) + p) z)^{-\alpha} (-(a - 2 i c k + i c m + p) z)^{-\alpha} \binom{m}{k}$$

$$\left(\left(\left(\cos\left(d (m - 2 k) - \frac{m \pi}{2}\right) + i \sin\left(d (m - 2 k) - \frac{m \pi}{2}\right)\right) \left(\Gamma(\alpha, -(a - 2 i c k + i c m + p) z)\right.\right.\right.$$

$$(\cosh(b) + \sinh(b)) ((a + 2 i c k - i c m - p) z)^{\alpha} + (-(a - 2 i c k + i c m + p) z)^{\alpha}$$

$$\left.\Gamma(\alpha, (a + 2 i c k - i c m - p) z) (\cosh(b) - \sinh(b))\right) (-(a + c i (2 k - m) + p) z)^{\alpha} +$$

$$((a + c i (2 k - m) - p) z)^{\alpha} (-(a - 2 i c k + i c m + p) z)^{\alpha} \Gamma(\alpha, -(a + c i (2 k - m) + p) z)$$

$$\left.\left.\left(\cosh\left(b + \frac{1}{2} i (4 d k - 2 d m + m \pi)\right) + \sinh\left(b + \frac{1}{2} i (4 d k - 2 d m + m \pi)\right)\right)\right) ((a + c i (m - 2 k) - p) z)^{\alpha} +$$

$$((a + c i (2 k - m) - p) z)^{\alpha} (-(a + c i (2 k - m) + p) z)^{\alpha} (-(a - 2 i c k + i c m + p) z)^{\alpha} \Gamma(\alpha, (a + c i (m - 2 k) - p) z)$$

$$\left.\left.\left.\left(\cosh\left(b - \frac{1}{2} i (4 d k - 2 d m + m \pi)\right) - \sinh\left(b - \frac{1}{2} i (4 d k - 2 d m + m \pi)\right)\right)\right)\right) /; m \in \mathbb{N}^{+}$$

01.20.21.1381.01

$$\int z^n e^{p z} \sin^{\mu}(d+c z) \cosh(b+a z)\, dz ==$$

$$\frac{1}{2} n! \sin^{\mu}(d+c z) \left(1-e^{2 i (d+c z)}\right)^{-\mu} \left(e^{-b+(-a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p-a-i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p-i a+c \mu}{2 c}, \right.\right.$$

$$\left. \ldots, -\frac{i p-i a+c \mu}{2 c}, -\mu; 1-\frac{i p-i a+c \mu}{2 c}, \ldots, 1-\frac{i p-i a+c \mu}{2 c}; e^{2 i (d+c z)}\right) +$$

$$e^{b+(a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p+a-i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p+i a+c \mu}{2 c}, \ldots, -\frac{i p+i a+c \mu}{2 c}, -\mu; \right.$$

$$\left. \left. 1-\frac{i p+i a+c \mu}{2 c}, \ldots, 1-\frac{i p+i a+c \mu}{2 c}; e^{2 i (d+c z)}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n e^{p z^r} \sin^m(b z^r) \cosh(c z)$

01.20.21.1382.01

$$\int z^n e^{p z^2} \sin^m\left(b z^2\right) \cosh(c z)\, dz ==$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-2} e^{-\frac{c^2}{4 p}} \left(e^{\frac{c^2}{4 p}} \sqrt{p} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(-\left(e^{\frac{c^2}{8 i b k-4 i b m-4 p}} \sum_{q=0}^{n} 2^{q-n} c^{n-q} (-2 b i k+i b m+p)^{-n-\frac{1}{2}} \right.\right.\right.\right.$$

$$\left.\left.\left.\left. \left(-\frac{(c+4 i b k z-2 i b m z-2 p z)^2}{-2 b i k+i b m+p} \right)^{\frac{1}{2}(-q-1)} (2 (-2 b i k+i b m+p) z-c)^{q+1} \right.\right.\right.\right.$$

$$\left.\left.\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+4 i b k z-2 i b m z-2 p z)^2}{4 (-2 b i k+i b m+p)} \right) \right) \middle/ \left(\sqrt{-2 b i k+i b m+p} \right) - \right.\right.\right.$$

$$\left.\left.\left(e^{\frac{c^2}{8 i b k-4 i b m-4 p}} \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (-2 b i k+i b m+p)^{-n-\frac{1}{2}} (c+2 (-2 b i k+i b m+p) z)^{q+1} \right.\right.\right.$$

$$\left.\left.\left. \left(-\frac{(c+2 (-2 b i k+i b m+p) z)^2}{-2 b i k+i b m+p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2 (-2 b i k+i b m+p) z)^2}{4 (-2 b i k+i b m+p)} \right) \right) \middle/ \right.\right.$$

$$\left.\left. \left(\sqrt{-2 b i k+i b m+p} \right) - \frac{1}{\sqrt{2 i b k-i b m+p}} \left(e^{\frac{c^2}{-8 b i k+4 i b m-4 p}+i m \pi} \right.\right.\right.$$

$$\left.\left.\left. \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (2 i b k-i b m+p)^{-n-\frac{1}{2}} (c+2 (2 i b k-i b m+p) z)^{q+1} \right.\right.\right.$$

$$\left.\left.\left. \left(-\frac{(c+2 (2 i b k-i b m+p) z)^2}{2 i b k-i b m+p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2 (2 i b k-i b m+p) z)^2}{4 (2 i b k-i b m+p)} \right) \right) - \right.\right.$$

$$\frac{1}{\sqrt{2\,i\,b\,k-i\,b\,m+p}}\left(e^{\frac{c^2}{-8\,b\,i\,k+4\,i\,b\,m-4\,p}+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,c^{n-q}\,(2\,i\,b\,k-i\,b\,m+p)^{-n-\frac{1}{2}}\right.$$

$$\left(-\frac{(c-2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^2}{2\,i\,b\,k-i\,b\,m+p}\right)^{\frac{1}{2}(-q-1)}\,(2\,(2\,i\,b\,k-i\,b\,m+p)\,z-c)^{q+1}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^2}{4\,(2\,i\,b\,k-i\,b\,m+p)}\right)\right)\right)(-i)^m+$$

$$\binom{m}{\frac{m}{2}}(m\bmod 2-1)\left(\sum_{q=0}^{n}2^{q-n}\,(-c)^{n-q}\,p^{-n-\frac{1}{2}}\,(c+2\,p\,z)^{q+1}\left(-\frac{(c+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+2\,p\,z)^2}{4\,p}\right)+\right.$$

$$\sum_{q=0}^{n}2^{q-n}\,c^{n-q}\,p^{-n-\frac{1}{2}}\left(-\frac{(c-2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\,(2\,p\,z-c)^{q+1}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-2\,p\,z)^2}{4\,p}\right)\right)\right)/;\,m\in\mathbb{Z}\wedge m>0\wedge n\in\mathbb{N}$$

01.20.21.1383.01

$$\int z^n\,e^{p\sqrt{z}}\,\sin^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz==2^{-m-2\,n-2}\,c^{-2\,(n+1)}\,e^{-\frac{p^2}{4\,c}}$$

$$\left(-e^{\frac{p^2}{2\,c}}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2\,n-q-r}\left(p-2\,c\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\right.$$

$$\left(p\left(p-2\,c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)-2\,c\sqrt{\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)\right)-$$

$$\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2\,n-q-r}\left(2\sqrt{z}\;c+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\;c+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\;c+p\right)\right.$$

$$\Gamma\left(\frac{1}{2}(q+r+1),-\frac{\left(2\sqrt{z}\;c+p\right)^2}{4\,c}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\;c+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),-\frac{\left(2\sqrt{z}\;c+p\right)^2}{4\,c}\right)\Bigg)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{b^2\,(m-2\,k)^2+p^2+2\,b\,i\,(2\,k+m)\,p+2\,\pi\,i\,c\,m}{4\,c}}\binom{m}{k}\left(e^{\frac{p\,(4\,i\,b\,m+3\,p)}{4\,c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(-2\,b\,i\,k+i\,b\,m+p)^{2\,n-q-r}\right.$$

$$\left(-2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^{q+r}\left(\frac{\left(-2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left((-2\,b\,i\,k+\right.$$

$$\left.i\,b\,m+p\right)\left(-2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{4\,c}\right)-$$

$$2\,c\sqrt{\frac{\left(-2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{\frac{3\,p^2+8\,i\,b\,k\,p+4\,\pi\,i\,c\,m}{4\,c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(2\,i\,b\,k-i\,b\,m+p)^{2\,n-q-r}\left(-2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p\right)^{q+r}$$

$$\left(\frac{\left(-2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}$$

$$\left((2\,i\,b\,k-i\,b\,m+p)\left(-2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p\right)^2}{4\,c}\right)-\right.$$

$$\left.2\,c\sqrt{\frac{\left(-2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\sqrt{z}\,c+2\,i\,b\,k-i\,b\,m+p\right)^2}{4\,c}\right)\right)+$$

$$e^{\frac{2\,b^2\,(m-2\,k)^2+p^2}{4\,c}}\left(e^{\frac{2\,i\,b\,k\,p}{c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(-2\,b\,i\,k+i\,b\,m+p)^{2\,n-q-r}\left(2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^{q+r}\right.$$

$$\left(-\frac{\left(2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left((-2\,b\,i\,k+i\,b\,m+p)\right.$$

$$\left(2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,-\frac{\left(2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{4\,c}\right)+$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\,-\frac{\left(2\sqrt{z}\,c-2\,i\,b\,k+i\,b\,m+p\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{\frac{i m (\pi c + b p)}{c}} \sum_{r=0}^{n} \sum_{q=0}^{r} (-1)^{r-q} 4^r (2 i b k - i b m + p)^{2 n - q - r} \left(2 \sqrt{z}\, c + 2 i b k - i b m + p\right)^{q+r}$$

$$\left(-\frac{\left(2 \sqrt{z}\, c + 2 i b k - i b m + p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)} \binom{n}{r} \binom{r}{q}$$

$$\left((2 i b k - i b m + p) \left(2 \sqrt{z}\, c + 2 i b k - i b m + p\right) \Gamma\left(\frac{1}{2}(q + r + 1), -\frac{\left(2 \sqrt{z}\, c + 2 i b k - i b m + p\right)^2}{4 c}\right) + 2 \sqrt{-\frac{\left(2 \sqrt{z}\, c + 2 i b k - i b m + p\right)^2}{c}}\, c\, \Gamma\left(\frac{1}{2}(q + r + 2), -\frac{\left(2 \sqrt{z}\, c + 2 i b k - i b m + p\right)^2}{4 c}\right)\right)\Bigg)\Bigg)\Bigg) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^n e^{p z^r} \sin^m(b z) \cosh(c z)$

01.20.21.1384.01

$$\int z^n e^{p z^2} \sin^m(b z) \cosh(c z)\, dz == \frac{1}{\sqrt{p}}$$

$$\left(2^{-m-2} e^{-\frac{c^2}{4p}} \left(\binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} p^{-n-\frac{1}{2}} (c + 2 p z)^{q+1} \left(-\frac{(c+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2pz)^2}{4p}\right) + \right.\right.$$

$$\binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} c^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(c-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)} (2pz - c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2pz)^2}{4p}\right) -$$

$$e^{\frac{c^2}{4p}} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-\frac{c^2 - b^2 (m-2k)^2 + i m p \pi}{2p}} \binom{m}{k}$$

$$\left(e^{\frac{(c+2ibk-ibm)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (-c + 2ibk - ibm)^{n-q} p^{-n-\frac{1}{2}} (c - 2ibk + ibm + 2pz)^{q+1} \right.$$

$$\left(-\frac{(c-2ibk+ibm+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2ibk+ibm+2pz)^2}{4p}\right) +$$

$$e^{\frac{(c-2ibk+ibm)^2}{4p} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (-c - 2ibk + ibm)^{n-q} p^{-n-\frac{1}{2}} (c + 2ibk - ibm + 2pz)^{q+1}$$

$$\left(-\frac{(c+2ibk-ibm+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2ibk-ibm+2pz)^2}{4p}\right) +$$

$$e^{\frac{(c+2ibk-ibm)^2}{4p} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (c - 2ibk + ibm)^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(c-2ibk+ibm-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$(-c + 2ibk - ibm + 2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2ibk+ibm-2pz)^2}{4p}\right) +$$

$$e^{\frac{(c-2ibk+ibm)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (c + 2ibk - ibm)^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(c+2ibk-ibm-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)} (-c - 2ibk +$$

$$\left.\left.\left.\left.ibm + 2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2ibk-ibm-2pz)^2}{4p}\right)\right)\right)\right) /; m \in \mathbb{Z} \wedge m > 0 \wedge n \in \mathbb{N}$$

01.20.21.1385.01

$$\int z^n e^{p\sqrt{z}} \sin^m(b z)\cosh(c z)\,dz == (-i)^m 2^{-m-2n-2}\left(-i^m c^{-2(n+1)} e^{-\frac{p^2}{4c}}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\left(e^{\frac{p^2}{2c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(p-2c\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(p-2c\sqrt{z}\right)\Gamma\left(\right.\right.\right.$$

$$\left.\left.\left.\frac{1}{2}(q+r+1),\frac{\left(p-2c\sqrt{z}\right)^2}{4c}\right)-2c\sqrt{\frac{\left(p-2c\sqrt{z}\right)^2}{c}}\,\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(p-2c\sqrt{z}\right)^2}{4c}\right)\right)+$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(2\sqrt{z}\,c+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\,c+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\,c+p\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(q+r+1),-\frac{\left(2\sqrt{z}\,c+p\right)^2}{4c}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\,c+p\right)^2}{c}}\,c\,\Gamma\left(\frac{1}{2}(q+r+2),-\frac{\left(2\sqrt{z}\,c+p\right)^2}{4c}\right)\right)\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{p^2}{4c+8ibk-4ibm}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(p-2(c+2ibk-ibm)\sqrt{z}\right)^{q+r}\right.\right.$$

$$\left(\frac{\left(p-2(c+2ibk-ibm)\sqrt{z}\right)^2}{c+bi(2k-m)}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(p-2(c+2ibk-ibm)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(p-2(c+2ibk-ibm)\sqrt{z}\right)^2}{4(c+bi(2k-m))}\right)-2(c+bi(2k-m))$$

$$\left.\left.\left.\sqrt{\frac{\left(p-2(c+2ibk-ibm)\sqrt{z}\right)^2}{c+bi(2k-m)}}\,\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(p-2(c+2ibk-ibm)\sqrt{z}\right)^2}{4(c+bi(2k-m))}\right)\right)\right)\right)$$

$$(-c-2ibk+ibm)^{-2(n+1)}+e^{\frac{p^2}{4c-8ibk+4ibm}+im\pi}(-c+2ibk-ibm)^{-2(n+1)}$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(p-2(c-2ibk+ibm)\sqrt{z}\right)^{q+r}$$

$$\left(\frac{\left(p-2\left(c-2\,i\,b\,k+i\,b\,m\right)\sqrt{z}\right)^2}{c-2\,i\,b\,k+i\,b\,m}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(p-2\left(c-2\,i\,b\,k+i\,b\,m\right)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(q+r+1),\ \frac{\left(p-2\left(c-2\,i\,b\,k+i\,b\,m\right)\sqrt{z}\right)^2}{4\left(c-2\,i\,b\,k+i\,b\,m\right)}\right)-2\left(c-2\,i\,b\,k+i\,b\,m\right)$$

$$\left.\sqrt{\frac{\left(p-2\left(c-2\,i\,b\,k+i\,b\,m\right)\sqrt{z}\right)^2}{c-2\,i\,b\,k+i\,b\,m}}\ \Gamma\left(\frac{1}{2}(q+r+2),\ \frac{\left(p-2\left(c-2\,i\,b\,k+i\,b\,m\right)\sqrt{z}\right)^2}{4\left(c-2\,i\,b\,k+i\,b\,m\right)}\right)\right)+$$

$$e^{\frac{p^2}{-4c+8\,i\,b\,k-4\,i\,b\,m}}\left(c-2\,i\,b\,k+i\,b\,m\right)^{-2(n+1)}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\ \left(c-2\,i\,b\,k+i\,b\,m\right)+p\right)^{q+r}$$

$$\left(-\frac{\left(2\sqrt{z}\ \left(c-2\,i\,b\,k+i\,b\,m\right)+p\right)^2}{c-2\,i\,b\,k+i\,b\,m}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\ \left(c-2\,i\,b\,k+i\,b\,m\right)+p\right)\right.$$

$$\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\ \left(c-2\,i\,b\,k+i\,b\,m\right)+p\right)^2}{4\left(c-2\,i\,b\,k+i\,b\,m\right)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ \left(c-2\,i\,b\,k+i\,b\,m\right)+p\right)^2}{c-2\,i\,b\,k+i\,b\,m}}$$

$$\left.\left(c-2\,i\,b\,k+i\,b\,m\right)\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(2\sqrt{z}\ \left(c-2\,i\,b\,k+i\,b\,m\right)+p\right)^2}{4\left(c-2\,i\,b\,k+i\,b\,m\right)}\right)\right)+$$

$$e^{\frac{p^2}{-4c-8\,i\,b\,k+4\,i\,b\,m}+i\,m\,\pi}\left(c+2\,i\,b\,k-i\,b\,m\right)^{-2(n+1)}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\ \left(c+2\,i\,b\,k-i\,b\,m\right)+p\right)^{q+r}$$

$$\left(-\frac{\left(2\sqrt{z}\ \left(c+2\,i\,b\,k-i\,b\,m\right)+p\right)^2}{c+2\,i\,b\,k-i\,b\,m}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\ \left(c+2\,i\,b\,k-i\,b\,m\right)+p\right)\right.$$

$$\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\ \left(c+2\,i\,b\,k-i\,b\,m\right)+p\right)^2}{4\left(c+2\,i\,b\,k-i\,b\,m\right)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ \left(c+2\,i\,b\,k-i\,b\,m\right)+p\right)^2}{c+2\,i\,b\,k-i\,b\,m}}$$

$$\left.\left.\left.\left(c+2\,i\,b\,k-i\,b\,m\right)\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(2\sqrt{z}\ \left(c+2\,i\,b\,k-i\,b\,m\right)+p\right)^2}{4\left(c+2\,i\,b\,k-i\,b\,m\right)}\right)\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n e^{p z} \sin^m(b z^r) \cosh(c z)$

01.20.21.1386.01

$$\int z^n e^{p z} \sin^m\left(b z^2\right) \cosh(c z)\, dz == 2^{-m-2}$$

$$\left(\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(-\frac{1}{\sqrt{i b (2k-m)}} \left(e^{i\left(\frac{(c+p)^2}{b(8k-4m)}+m\pi\right)} \sum_{q=0}^{n} 2^{q-n} (i b (2k-m))^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p+2 b i (2k-m) z)^{q+1} \right.\right.\right.$$

$$\left.\left(-\frac{i (c+p+2 b i (2k-m) z)^2}{b (m-2k)}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (c+p+2 b i (2k-m) z)^2}{b (8k-4m)}\right)\right) -$$

$$\frac{1}{\sqrt{i b (2k-m)}} \left(e^{i\left(\frac{(c-p)^2}{b(8k-4m)}+m\pi\right)} \sum_{q=0}^{n} 2^{q-n} (i b (2k-m))^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p+2 b i (2k-m) z)^{q+1} \right.$$

$$\left.\left(-\frac{i (c-p+2 b i (m-2k) z)^2}{b (m-2k)}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (c-p+2 b i (m-2k) z)^2}{4 b (m-2k)}\right)\right) -$$

$$\frac{1}{\sqrt{i b (m-2k)}} \left(e^{\frac{i (c-p)^2}{4 b (m-2k)}} \sum_{q=0}^{n} 2^{q-n} (i b (m-2k))^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p+2 b i (m-2k) z)^{q+1} \right.$$

$$\left.\left(\frac{i (-c+p+2 b i (m-2k) z)^2}{b (m-2k)}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (-c+p+2 b i (m-2k) z)^2}{b (8k-4m)}\right)\right) -$$

$$\frac{1}{\sqrt{i b (m-2k)}} \left(e^{\frac{i (c+p)^2}{4 b (m-2k)}} \sum_{q=0}^{n} 2^{q-n} (i b (m-2k))^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p+2 b i (m-2k) z)^{q+1} \right.$$

$$\left.\left.\left.\left(\frac{i (c+p+2 b i (m-2k) z)^2}{b (m-2k)}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (c+p+2 b i (m-2k) z)^2}{b (8k-4m)}\right)\right)\right)\right)$$

$$(-i)^m + 2\left(\frac{(-(c+p) z)^{-n} \Gamma(n+1, -(c+p) z)}{c+p} - z\left((c-p) z\right)^{-n-1} \Gamma(n+1, (c-p) z)\right)$$

$$z^n$$

$$\binom{m}{\frac{m}{2}}$$

$$\left.(1 - m \bmod 2)\right) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1387.01

$$\int z^n e^{p z} \sin^m\left(b \sqrt{z}\right) \cosh(c z)\, dz == 2^{-m-2}$$

$$\left((-i)^m 4^{-n} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{i m \pi - \frac{b^2 (m-2k)^2}{4(c-p)}} \left(\sum_{r=0}^{n} \sum_{q=0}^{r} (-1)^{r-q} 4^r (i b (2k-m))^{2n-q-r} \left(\frac{\left(b i (m-2k) + 2(c-p)\sqrt{z}\right)^2}{c-p}\right)^{\frac{1}{2}(-q-r-1)} \right.\right.\right.$$

$$\left.\left.\left. \left(b i (2k-m) + 2(p-c)\sqrt{z}\right)^{q+r} \binom{n}{r}\binom{r}{q} \left(2(p-c)\sqrt{\frac{\left(b i (m-2k) + 2(c-p)\sqrt{z}\right)^2}{c-p}}\right.\right.\right.\right.$$

$$\left.\left.\left.\left. \Gamma\left(\frac{1}{2}(q+r+2), \frac{\left(b i (m-2k) + 2(c-p)\sqrt{z}\right)^2}{4(c-p)}\right) - i b (m-2k)\left(b i (2k-m) + 2(p-c)\sqrt{z}\right)\right.\right.\right.\right.$$

$$\left.\left.\left.\left. \Gamma\left(\frac{1}{2}(q+r+1), \frac{\left(b i (m-2k) + 2(c-p)\sqrt{z}\right)^2}{4(c-p)}\right)\right)\right)\right) (p-c)^{-2(n+1)} +$$

$$e^{-\frac{b^2 (m-2k)^2}{4(c-p)}} \left(\sum_{r=0}^{n} \sum_{q=0}^{r} (-1)^{r-q} 4^r (i b (m-2k))^{2n-q-r} \left(b i (m-2k) + 2(p-c)\sqrt{z}\right)^{q+r} \right.$$

$$\left. \left(-\frac{\left(b i (m-2k) + 2(p-c)\sqrt{z}\right)^2}{p-c}\right)^{\frac{1}{2}(-q-r-1)} \binom{n}{r}\binom{r}{q} \left(b i (m-2k)\left(b i (m-2k) + 2(p-c)\sqrt{z}\right)\right.\right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(q+r+1), -\frac{\left(b i (m-2k) + 2(p-c)\sqrt{z}\right)^2}{4(p-c)}\right) + 2\sqrt{-\frac{\left(b i (m-2k) + 2(p-c)\sqrt{z}\right)^2}{p-c}}\right.\right.$$

$$\left.\left. (p-c)\,\Gamma\left(\frac{1}{2}(q+r+2), -\frac{\left(b i (m-2k) + 2(p-c)\sqrt{z}\right)^2}{4(p-c)}\right)\right)\right) (p-c)^{-2(n+1)} +$$

$$e^{\frac{b^2 (m-2k)^2}{4(c+p)}} (c+p)^{-2(n+1)} \left(e^{i m \pi} \sum_{r=0}^{n} \sum_{q=0}^{r} (-1)^{r-q} 4^r (i b (2k-m))^{2n-q-r} \left(\frac{\left(b (2k-m) - 2 i (c+p)\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-q-r-1)} \right.$$

$$\left(b\,i\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)^{q+r}\binom{n}{r}\binom{r}{q}\left(2\,(c+p)\sqrt{\frac{\left(b\,(2\,k-m)-2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(q+r+2),\ \frac{\left(b\,(2\,k-m)-2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)-i\,b\,(m-2\,k)$$

$$\left.\left(b\,i\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\ \frac{\left(b\,(2\,k-m)-2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\right)+$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(i\,b\,(m-2\,k))^{2\,n-q-r}\left(\frac{\left(b\,(2\,k-m)+2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\left(b\,i\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^{q+r}\binom{n}{r}\binom{r}{q}\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(q+r+1),\ -\frac{\left(b\,i\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)+2\sqrt{\frac{\left(b\,(2\,k-m)+2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}}$$

$$\left.\left.\left.(c+p)\,\Gamma\left(\frac{1}{2}\,(q+r+2),\ -\frac{\left(b\,i\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\right)\right)-$$

$$2\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,-(c+p)\,z)\,(-c-p)^{-n-1}+(c-p)^{-n-1}\,\Gamma(n+1,\,(c-p)\,z)\right)$$

$$\left.(1-m \bmod 2)\right)/;\ m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1388.01

$$\int z^n e^{p z} \sin^m(b z) \cosh\left(c z^2\right) dz == 2^{-m-2} e^{-\frac{p^2}{4c}}$$

$$\left(4 e^{\frac{p^2}{2c}} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{-n+q-2} (-c)^{-n-1} (-p)^{n-q} (p - 2 c z)^{q+1} \left(\frac{(p-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cz)^2}{4c}\right) + \right.$$

$$4 \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{-n+q-2} c^{-n-1} (-p)^{n-q} (p + 2 c z)^{q+1} \left(-\frac{(p+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2cz)^2}{4c}\right) -$$

$$e^{\frac{p^2}{4c}} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k 2^{-n-1} (-c)^{-n} c^{-n-1} e^{-\frac{b^2 (m-2k)^2 + 2 b i (2k+m) p + 2\left(p^2 + \pi i c m\right)}{4c}} \binom{m}{k}$$

$$\left(e^{\frac{2 b^2 (m-2k)^2 + p^2}{4c}} \left(e^{\frac{i m (\pi c + b p)}{c}} \sum_{q=0}^{n} (i b (m-2k) - p)^{n-q} (2 i b k - i b m + p + 2 c z)^{q+1} \binom{n}{q} \right.\right.$$

$$E_{\frac{1-q}{2}}\left(-\frac{(2 i b k - i b m + p + 2 c z)^2}{4c}\right) + 2^n e^{\frac{2 i b k p}{c}} \sum_{q=0}^{n} 2^{-q} \left(i b \left(k - \frac{m}{2}\right) - \frac{p}{2}\right)^{n-q}$$

$$\left.\left.(b i (m-2k) + p + 2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(-\frac{(b i (m-2k) + p + 2 c z)^2}{4c}\right)\right) (-c)^n - c^n e^{\frac{3p^2 + 8 i b k p + 4 \pi i c m}{4c}} \right.$$

$$\sum_{q=0}^{n} (i b (m-2k) - p)^{n-q} (2 i b k - i b m + p - 2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(2 i b k - i b m + p - 2 c z)^2}{4c}\right) -$$

$$2^n c^n e^{\frac{p (4 i b m + 3 p)}{4c}} \sum_{q=0}^{n} 2^{-q} \left(i b \left(k - \frac{m}{2}\right) - \frac{p}{2}\right)^{n-q} (b i (m-2k) + p - 2 c z)^{q+1}$$

$$\left.\left.\binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(b i (m-2k) + p - 2 c z)^2}{4c}\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1389.01

$$\int z^n e^{p z} \sin^m(b z) \cosh\left(c \sqrt{z}\right) dz == 2^{-m-2n-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(e^{-\frac{c^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c)^{-h-i+2n} \left(2 p \sqrt{z} - c\right)^{h+i} \left(-\frac{\left(2 p \sqrt{z} - c\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4p}\right) - c \left(2 p \sqrt{z} - c\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4p}\right)\right) +$$

$$e^{-\frac{c^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,c^{-h-i+2n}\left(c+2p\sqrt{z}\right)^{h+i}\left(-\frac{\left(c+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(c\left(c+2p\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+2p\sqrt{z}\right)^2}{4p}\right)+2\sqrt{-\frac{\left(c+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+2p\sqrt{z}\right)^2}{4p}\right)\right)$$

$$p^{-2(n+1)}+2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{im\pi}{2}-\frac{c^2}{4(p-ib(m-2k))}}\left(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c)^{-h-i+2n}\left(2(p-ib(m-2k))\sqrt{z}-c\right)^{h+i}\right.\right.$$

$$\left(-\frac{\left(2(p-ib(m-2k))\sqrt{z}-c\right)^2}{p-ib(m-2k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(2(p-ib(m-2k))\right.$$

$$\sqrt{-\frac{\left(2(p-ib(m-2k))\sqrt{z}-c\right)^2}{p-ib(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2(p-ib(m-2k))\sqrt{z}-c\right)^2}{4(p-ib(m-2k))}\right)-c$$

$$\left.\left.\left.\left(2(p-ib(m-2k))\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2(p-ib(m-2k))\sqrt{z}-c\right)^2}{4(p-ib(m-2k))}\right)\right)\right)\right)$$

$$(p-ib(m-2k))^{-2(n+1)}+e^{\frac{im\pi}{2}-\frac{c^2}{4(p-ib(m-2k))}}\left(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,c^{-h-i+2n}\left(c+2(p-ib(m-2k))\sqrt{z}\right)^{h+i}\right.$$

$$\left(-\frac{\left(c+2(p-ib(m-2k))\sqrt{z}\right)^2}{p-ib(m-2k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(c\left(c+2(p-ib(m-2k))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+2(p-ib(m-2k))\sqrt{z}\right)^2}{4(p-ib(m-2k))}\right)+2\sqrt{-\frac{\left(c+2(p-ib(m-2k))\sqrt{z}\right)^2}{p-ib(m-2k)}}$$

$$\left.\left.(p-ib(m-2k))\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+2(p-ib(m-2k))\sqrt{z}\right)^2}{4(p-ib(m-2k))}\right)\right)\right)(p-ib(m-2k))^{-2(n+1)}+$$

$$e^{-\frac{c^2}{4(b\,i\,(m-2k)+p)}-\frac{i\,m\,\pi}{2}}(b\,i\,(m-2k)+p)^{-2(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c)^{-h-i+2n}\left(2\,(b\,i\,(m-2k)+p)\,\sqrt{z}-c\right)^{h+i}$$

$$\left(-\frac{\left(2\,(b\,i\,(m-2k)+p)\,\sqrt{z}-c\right)^2}{b\,i\,(m-2k)+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(2\,(b\,i\,(m-2k)+p)\right.$$

$$\sqrt{-\frac{\left(2\,(b\,i\,(m-2k)+p)\,\sqrt{z}-c\right)^2}{b\,i\,(m-2k)+p}}\;\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2\,(b\,i\,(m-2k)+p)\,\sqrt{z}-c\right)^2}{4\,(b\,i\,(m-2k)+p)}\right)-$$

$$\left.c\left(2\,(b\,i\,(m-2k)+p)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2\,(b\,i\,(m-2k)+p)\,\sqrt{z}-c\right)^2}{4\,(b\,i\,(m-2k)+p)}\right)\right)+$$

$$e^{-\frac{c^2}{4(b\,i\,(m-2k)+p)}-\frac{i\,m\,\pi}{2}}(b\,i\,(m-2k)+p)^{-2(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,c^{-h-i+2n}\left(c+2\,(b\,i\,(m-2k)+p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(c+2\,(b\,i\,(m-2k)+p)\,\sqrt{z}\right)^2}{b\,i\,(m-2k)+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(c\left(c+2\,(b\,i\,(m-2k)+p)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+i+1),-\frac{\left(c+2\,(b\,i\,(m-2k)+p)\,\sqrt{z}\right)^2}{4\,(b\,i\,(m-2k)+p)}\right)+2\sqrt{-\frac{\left(c+2\,(b\,i\,(m-2k)+p)\,\sqrt{z}\right)^2}{b\,i\,(m-2k)+p}}$$

$$\left.(b\,i\,(m-2k)+p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+2\,(b\,i\,(m-2k)+p)\,\sqrt{z}\right)^2}{4\,(b\,i\,(m-2k)+p)}\right)\right)\Big/;\ m\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sin^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1390.01

$$\int z^n e^{p z^2} \sin^m(b z) \cosh\left(c z^2\right) dz ==$$

$$2^{-m-2}\left(z^{n+1}\binom{m}{\frac{m}{2}}\left(-\left((c-p) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2}, (c-p) z^2\right)-\left(-(c+p) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2}, -(c+p) z^2\right)\right)(1-m \bmod 2)-\right.$$

$$(-i)^m \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \frac{1}{\sqrt{p-c}\,\sqrt{c+p}}\left((-1)^k e^{\frac{b^2 (m-2k)^2}{4(c+p)}}\binom{m}{k}\right.$$

$$\left(e^{-\frac{c b^2 (m-2k)^2}{2(c-p)(c+p)}}\sqrt{c+p}\sum_{q=0}^{n}\left(i b\left(k-\frac{m}{2}\right)\right)^{n-q}(p-c)^{-n-\frac{1}{2}}\left(\frac{(b i (2k-m)+2(c-p) z)^2}{c-p}\right)^{\frac{1}{2}(-q-1)}(-2 b i k+i b m-\right.$$

$$\left.2 c z+2 p z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b i (2k-m)+2(c-p) z)^2}{4(c-p)}\right)+e^{-\frac{-2 i m \pi c^2+b^2 (m-2k)^2 c+2 i m p^2 \pi}{2\left(c^2-p^2\right)}}\right.$$

$$\sqrt{c+p}\sum_{q=0}^{n}2^{q-n}(i b(m-2k))^{n-q}(p-c)^{-n-\frac{1}{2}}\left(\frac{(b i (m-2k)+2(c-p) z)^2}{c-p}\right)^{\frac{1}{2}(-q-1)}$$

$$(b i (2k-m)+2(p-c) z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b i (m-2k)+2(c-p) z)^2}{4(c-p)}\right)+$$

$$\sqrt{p-c}\left(e^{i m \pi}\sum_{q=0}^{n}2^{q-n}(i b(m-2k))^{n-q}(c+p)^{-n-\frac{1}{2}}\left(\frac{(b(2k-m)-2 i (c+p) z)^2}{c+p}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(b i (2k-m)+2(c+p) z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b(2k-m)-2 i (c+p) z)^2}{4(c+p)}\right)+$$

$$\sum_{q=0}^{n}\left(i b\left(k-\frac{m}{2}\right)\right)^{n-q}(c+p)^{-n-\frac{1}{2}}\left(\frac{(b(2k-m)+2 i (c+p) z)^2}{c+p}\right)^{\frac{1}{2}(-q-1)}(b i (m-2k)+2(c+p) z)^{q+1}$$

$$\left.\left.\left.\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(b i (m-2k)+2(c+p) z)^2}{4(c+p)}\right)\right)\right)\right)\right) /;\ m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

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$$\int z^n e^{p \sqrt{z}} \sin^m(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2 n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k (i b (m-2k))^{-2(n+1)}\binom{m}{k}\left(e^{\frac{i (p-c)^2}{4 b (m-2k)}-\frac{i m \pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i (p-c)^{-h-i+2 n}\right.$$

$$\left(-c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(\frac{i\left(-c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((p-c)\left(-c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\ \frac{i\left(-c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)+2\,b\,i\,(m-2\,k)\right.$$

$$\left.\sqrt{\frac{i\left(-c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+i+2),\ \frac{i\left(-c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{i\,(c+p)^2}{4\,b\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c+p)^{-h-i+2\,n}\left(c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^{h+i}$$

$$\left(\frac{i\left(c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((c+p)\left(c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\ \frac{i\left(c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)+2\,b\,i\,(m-2\,k)\right.$$

$$\left.\sqrt{\frac{i\left(c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+i+2),\ \frac{i\left(c+p+2\,b\,i\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)\right)+e^{\frac{i\,m\,\pi}{2}-\frac{i\,(p-c)^2}{4\,b\,(m-2\,k)}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c)^{-h-i+2\,n}\left(-c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(-\frac{i\left(-c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((p-c)\left(-c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\ -\frac{i\left(-c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)-\right.$$

$$\left.2\,i\,b\,(m-2\,k)\sqrt{-\frac{i\left(-c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}}\ \Gamma\left(\right.\right.$$

$$\frac{1}{2}(h+i+2),\ -\frac{i\left(-c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\Bigg)\Bigg)+e^{\frac{i\,m\,\pi}{2}-\frac{i\,(c+p)^2}{4\,b\,(m-2\,k)}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c+p)^{-h-i+2\,n}\left(c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(-\frac{i\left(c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\Bigg((c+p)\left(c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\ -\frac{i\left(c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)-2\,i\,b$$

$$(m-2\,k)\sqrt{-\frac{i\left(c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{i\left(c+p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\ (c-p)\,\sqrt{z}\right)(c-p)^{-2\,(n+1)}+(c+p)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\ (-c-p)\,\sqrt{z}\right)\right)$$

$$(1-$$

$$m \bmod 2)\ /;\ m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin^m\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

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$$\int z^n e^{p z} \sin^m\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$2^{-m-2}\left(\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{1}{\sqrt{-c-2ibk+ibm}}\left(e^{\frac{p^2}{4c+8ibk-4ibm}}\sum_{q=0}^{n}2^{q-n}(-c-2ibk+ibm)^{-n-\frac{1}{2}}\right.\right.\right.\right.$$

$$(-p)^{n-q}(p-2(c+2ibk-ibm)z)^{q+1}\left(\frac{(p-2(c+2ibk-ibm)z)^2}{c+bi(2k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p-2(c+2ibk-ibm)z)^2}{4(c+bi(2k-m))}\right)\right)-\frac{1}{\sqrt{c-2ibk+ibm}}$$

$$\left(e^{\frac{p^2}{-4c+8ibk-4ibm}}\sum_{q=0}^{n}2^{q-n}(c-2ibk+ibm)^{-n-\frac{1}{2}}(-p)^{n-q}(p+2(c-2ibk+ibm)z)^{q+1}\right.$$

$$\left.\left(-\frac{(p+2(c-2ibk+ibm)z)^2}{c-2ibk+ibm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+2(c-2ibk+ibm)z)^2}{4(c-2ibk+ibm)}\right)\right)-$$

$$\frac{1}{\sqrt{-c+2ibk-ibm}}\left(e^{\frac{p^2}{4c-8ibk+4ibm}+im\pi}\sum_{q=0}^{n}2^{q-n}(-c+2ibk-ibm)^{-n-\frac{1}{2}}(-p)^{n-q}\right.$$

$$(p-2(c-2ibk+ibm)z)^{q+1}\left(\frac{(p-2(c-2ibk+ibm)z)^2}{c-2ibk+ibm}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p-2(c-2ibk+ibm)z)^2}{4(c-2ibk+ibm)}\right)\right)-\frac{1}{\sqrt{c+2ibk-ibm}}$$

$$\left(e^{\frac{p^2}{-4c-8ibk+4ibm}+im\pi}\sum_{q=0}^{n}2^{q-n}(c+2ibk-ibm)^{-n-\frac{1}{2}}(-p)^{n-q}(p+2(c+2ibk-ibm)z)^{q+1}\right.$$

$$\left.\left.\left.\left.\left(-\frac{(p+2(c+2ibk-ibm)z)^2}{c+2ibk-ibm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+2(c+2ibk-ibm)z)^2}{4(c+2ibk-ibm)}\right)\right)\right)\right)(-i)^m+$$

$$(-c)^{-n-1}e^{-\frac{p^2}{4c}}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\left(e^{\frac{p^2}{2c}}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(p-2cz)^{q+1}\left(\frac{(p-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p-2cz)^2}{4c}\right)-\right.$$

$$\left.(-1)^n\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(p+2cz)^{q+1}\left(-\frac{(p+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+2cz)^2}{4c}\right)\right)/;\ m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n e^{p z} \sin^m\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz == 2^{-m-2 n-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(e^{-\frac{c^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c)^{-h-i+2 n} \left(2 p \sqrt{z} - c\right)^{h+i} \left(-\frac{\left(2 p \sqrt{z} - c\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left(2 p \sqrt{-\frac{\left(2 p \sqrt{z} - c\right)^2}{p}} \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4 p}\right) - c \left(2 p \sqrt{z} - c\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4 p}\right) \right) +$$

$$e^{-\frac{c^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i c^{-h-i+2 n} \left(c + 2 p \sqrt{z}\right)^{h+i} \left(-\frac{\left(c + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left(c \left(c + 2 p \sqrt{z}\right) \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(c + 2 p \sqrt{z}\right)^2}{4 p}\right) + 2 \sqrt{-\frac{\left(c + 2 p \sqrt{z}\right)^2}{p}} \; p \, \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(c + 2 p \sqrt{z}\right)^2}{4 p}\right) \right) \right)$$

$$p^{-2(n+1)} + 2^{-m-2 n-2} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \right) \left(e^{-\frac{(i b (m-2 k)-c)^2}{4 p} - \frac{i m \pi}{2}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (i b (m-2 k) - c)^{-h-i+2 n} \right.$$

$$\left(-c + b i (m-2 k) + 2 p \sqrt{z} \right)^{h+i} \left(-\frac{\left(-c + b i (m-2 k) + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i}$$

$$\left((i b (m-2 k) - c) \left(-c + b i (m-2 k) + 2 p \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-c + b i (m-2 k) + 2 p \sqrt{z}\right)^2}{4 p}\right) + 2 \right.$$

$$\left. \left. \sqrt{-\frac{\left(-c + b i (m-2 k) + 2 p \sqrt{z}\right)^2}{p}} \; p \, \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(-c + b i (m-2 k) + 2 p \sqrt{z}\right)^2}{4 p}\right) \right) + \right.$$

$$\left. e^{-\frac{(c+b i (m-2 k))^2}{4 p} - \frac{i m \pi}{2}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (c + b i (m-2 k))^{-h-i+2 n} \left(c + b i (m-2 k) + 2 p \sqrt{z}\right)^{h+i} \right)$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((c+b\,i\,(m-2\,k))\left(c+b\,i\,(m-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+b\,i\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(c+b\,i\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+b\,i\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{(-c-i\,b\,(m-2\,k))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c-i\,b\,(m-2\,k))^{-h-i+2\,n}\left(-c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-c-i\,b\,(m-2\,k))\left(-c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(-c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(-c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{(c-i\,b\,(m-2\,k))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c-i\,b\,(m-2\,k))^{-h-i+2\,n}\left(c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((c-i\,b\,(m-2\,k))\left(c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.\left.p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c-i\,b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right)p^{-2\,(n+1)}\;/;\;m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\, z^r}\, \sin^m(b\, z^r)\cosh(c\, z^r)$

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$$\int z^{\alpha-1}\, e^{p\, z^r}\, \sin^m(b\, z^r)\cosh(c\, z^r)\, dz ==$$

$$-\frac{2^{-m-1}\, z^{\alpha}}{r}\left(\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{\alpha}{r}, (c-p)\, z^r\right)((c-p)\, z^r)^{-\frac{\alpha}{r}} + (-(c+p)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, -(c+p)\, z^r\right)\right)(1-m \bmod 2) + i^{-m}\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{i\, m\, \pi}\,\Gamma\left(\frac{\alpha}{r}, (c-2\, i\, b\, k+i\, b\, m-p)\, z^r\right)((c-2\, i\, b\, k+i\, b\, m-p)\, z^r)^{-\frac{\alpha}{r}} + ((c+2\, i\, b\, k-i\, b\, m-p)\, z^r)^{-\frac{\alpha}{r}}\right.$$

$$\Gamma\left(\frac{\alpha}{r}, (c+2\, i\, b\, k-i\, b\, m-p)\, z^r\right) + (-(c-2\, i\, b\, k+i\, b\, m+p)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, -(c-2\, i\, b\, k+i\, b\, m+p)\, z^r\right) +$$

$$\left.\left.e^{i\, m\, \pi}\,(-(c+2\, i\, b\, k-i\, b\, m+p)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, -(c+2\, i\, b\, k-i\, b\, m+p)\, z^r\right)\right)\right) /;\ m\in\mathbb{N}^+$$

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$$\int z^n\, e^{p\, z^2}\, \sin^m\left(b\, z^2\right)\cosh\left(c\, z^2\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2}, (-c-p)\, z^2\right)\left((-c-p)\, z^2\right)^{\frac{1}{2}(-n-1)} + \left((c-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2}, (c-p)\, z^2\right)\right)(1-m \bmod 2)\, z^{n+1} -$$

$$2^{-m-2}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\, m\, \pi}{2}}\,\Gamma\left(\frac{n+1}{2}, (-c+b\, i\, (m-2\, k)-p)\, z^2\right)\left((-c+b\, i\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)} +\right.\right.$$

$$e^{\frac{i\, m\, \pi}{2}}\left((c+b\, i\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2}, (c+b\, i\, (m-2\, k)-p)\, z^2\right) +$$

$$e^{-\frac{1}{2}i\, m\, \pi}\left((-c-i\, b\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2}, (-c-i\, b\, (m-2\, k)-p)\, z^2\right) +$$

$$\left.\left.e^{-\frac{1}{2}i\, m\, \pi}\left((c-i\, b\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2}, (c-i\, b\, (m-2\, k)-p)\, z^2\right)\right)\right) z^{n+1} /;\ m\in\mathbb{N}^+ \bigwedge n\in\mathbb{N}$$

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$$\int z^n e^{p\sqrt{z}} \sin^m\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right) dz ==$$

$$-2^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2(n+1),(-c-p)\sqrt{z}\right)(-c-p)^{-2(n+1)}+(c-p)^{-2(n+1)}\Gamma\left(2(n+1),(c-p)\sqrt{z}\right)\right)(1-m \bmod 2)-$$

$$2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i m\pi}{2}}\Gamma\left(2(n+1),(-c+b\,i\,(m-2k)-p)\sqrt{z}\right)(-c+b\,i\,(m-2k)-p)^{-2(n+1)}+\right.$$

$$e^{\frac{i m\pi}{2}}(c+b\,i\,(m-2k)-p)^{-2(n+1)}\Gamma\left(2(n+1),(c+b\,i\,(m-2k)-p)\sqrt{z}\right)+$$

$$e^{-\frac{1}{2}i m\pi}(-c-i\,b\,(m-2k)-p)^{-2(n+1)}\Gamma\left(2(n+1),(-c-i\,b\,(m-2k)-p)\sqrt{z}\right)+$$

$$\left.e^{-\frac{1}{2}i m\pi}(c-i\,b\,(m-2k)-p)^{-2(n+1)}\Gamma\left(2(n+1),(c-i\,b\,(m-2k)-p)\sqrt{z}\right)\right)/;\ m\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\sin^m\left(a\,z^r+q\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1397.01

$$\int z^{\alpha-1}\,e^{b\,z^r+e}\sin^m(a\,z^r+q)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{2^{-m-1}\,z^\alpha}{r}\left(\binom{m}{\frac{m}{2}}\left(e^{e+g}\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}+e^{e-g}((c-b)\,z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)\right)(1-m \bmod 2)+\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g+2i\,k\,q-i\,m\,q+\frac{i m\pi}{2}}\Gamma\left(\frac{\alpha}{r},(-b-c-2\,i\,a\,k+i\,a\,m)\,z^r\right)((-b-c-2\,i\,a\,k+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-g+2i\,k\,q-i\,m\,q+\frac{i m\pi}{2}}((-b+c-2\,i\,a\,k+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c-2\,i\,a\,k+i\,a\,m)\,z^r\right)+$$

$$e^{e+g-2i\,k\,q+i\,m\,q-\frac{i m\pi}{2}}((-b-c+2\,i\,a\,k-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-c+2\,i\,a\,k-i\,a\,m)\,z^r\right)+$$

$$\left.\left.e^{e-g-2i\,k\,q+i\,m\,q-\frac{i m\pi}{2}}((-b+c+2\,i\,a\,k-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c+2\,i\,a\,k-i\,a\,m)\,z^r\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1398.01

$$\int z^n\, e^{b\,z^2+e} \sin^m\left(a\,z^2+q\right) \cosh\left(c\,z^2+g\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^{e+g}\,\Gamma\left(\frac{n+1}{2},\,(-b-c)\,z^2\right)\left((-b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{e-g}\left((c-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-b)\,z^2\right)\right)(1-m \bmod 2)$$

$$z^{n+1}-2^{-m-2}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g-i\,(m-2\,k)\,q+\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{n+1}{2},\,(-b-c+a\,i\,(m-2\,k))\,z^2\right)\left((-b-c+a\,i\,(m-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$e^{e-g-i\,(m-2\,k)\,q+\frac{i\,m\,\pi}{2}}\left((-b+c+a\,i\,(m-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b+c+a\,i\,(m-2\,k))\,z^2\right)+$$

$$e^{e+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\left((-b-c-i\,a\,(m-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b-c-i\,a\,(m-2\,k))\,z^2\right)+e^{e-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}$$

$$\left.\left.\left((-b+c-i\,a\,(m-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b+c-i\,a\,(m-2\,k))\,z^2\right)\right)\right)z^{n+1}\;/;\;m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

01.20.21.1399.01

$$\int z^n\, e^{\sqrt{z}\;b+e} \sin^m\left(\sqrt{z}\;a+q\right) \cosh\left(\sqrt{z}\;c+g\right) dz ==$$

$$-2^{-m}\binom{m}{\frac{m}{2}}\left(e^{e+g}\,\Gamma\left(2\,(n+1),\,(-b-c)\,\sqrt{z}\right)(-b-c)^{-2\,(n+1)}+(c-b)^{-2\,(n+1)}\,e^{e-g}\,\Gamma\left(2\,(n+1),\,(c-b)\,\sqrt{z}\right)\right)(1-m \bmod 2)-$$

$$2^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g-i\,(m-2\,k)\,q+\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\,(-b-c+a\,i\,(m-2\,k))\,\sqrt{z}\right)(-b-c+a\,i\,(m-2\,k))^{-2\,(n+1)}+\right.$$

$$e^{e-g-i\,(m-2\,k)\,q+\frac{i\,m\,\pi}{2}}\,(-b+c+a\,i\,(m-2\,k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b+c+a\,i\,(m-2\,k))\,\sqrt{z}\right)+$$

$$e^{e+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(-b-c-i\,a\,(m-2\,k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b-c-i\,a\,(m-2\,k))\,\sqrt{z}\right)+$$

$$\left.e^{e-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(-b+c-i\,a\,(m-2\,k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b+c-i\,a\,(m-2\,k))\,\sqrt{z}\right)\right)/;\;m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\, e^{b\,z^2+d\,z+e} \sin^m\left(a\,z^2+p\,z+q\right) \cosh\left(c\,z^2+f\,z+g\right)$

01.20.21.1400.01

$$\int z^n\, e^{b\,z^2+d\,z+e} \sin^m\left(a\,z^2+p\,z+q\right) \cosh\left(c\,z^2+f\,z+g\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left((b-c)^{-n-1}\,e^{-\frac{(d-f)^2}{4\,(b-c)}+e-g}\sum_{j=0}^{n}2^{j-n}\,(f-d)^{n-j}\,(d-f+2\,(b-c)\,z)^{j+1}\right.$$

$$\left(-\frac{(d-f+2\,(b-c)\,z)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d-f+2\,(b-c)\,z)^2}{4\,(b-c)}\right)+(b+c)^{-n-1}\,e^{-\frac{(d+f)^2}{4\,(b+c)}+e+g}$$

$$\left.\sum_{j=0}^{n}2^{j-n}\,(-d-f)^{n-j}\,(d+f+2\,(b+c)\,z)^{j+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+f+2\,(b+c)\,z)^2}{4\,(b+c)}\right)\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(d-f+i(2k-m)p)^2}{4(b-c+ai(2k-m))}+e-g+i(2k-m)q+\frac{im\pi}{2}}(b-c+ai(2k-m))^{-n-1}\right.$$

$$\sum_{j=0}^{n}2^{j-n}(-d+f-i(2k-m)p)^{n-j}(d-f+i(2k-m)p+2(b-c+ai(2k-m))z)^{j+1}$$

$$\left(-\frac{(d-f+i(2k-m)p+2(b-c+ai(2k-m))z)^2}{b-c+ai(2k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d-f+i(2k-m)p+2(b-c+ai(2k-m))z)^2}{4(b-c+ai(2k-m))}\right)+$$

$$e^{-\frac{(d+f+i(2k-m)p)^2}{4(b+c+ai(2k-m))}+e+g+i(2k-m)q+\frac{im\pi}{2}}(b+c+ai(2k-m))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-d-f-i(2k-m)p)^{n-j}(d+f+i(2k-m)p+2(b+c+ai(2k-m))z)^{j+1}$$

$$\left(-\frac{(d+f+i(2k-m)p+2(b+c+ai(2k-m))z)^2}{b+c+ai(2k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\right.$$

$$\left.\frac{j+1}{2},-\frac{(d+f+i(2k-m)p+2(b+c+ai(2k-m))z)^2}{4(b+c+ai(2k-m))}\right)+$$

$$e^{-\frac{(d-f+i(m-2k)p)^2}{4(b-c+ai(m-2k))}+e-g+i(m-2k)q-\frac{im\pi}{2}}(b-c+ai(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d+f-i(m-2k)p)^{n-j}$$

$$(d-f+i(m-2k)p+2(b-c+ai(m-2k))z)^{j+1}$$

$$\left(-\frac{(d-f+i(m-2k)p+2(b-c+ai(m-2k))z)^2}{b-c+ai(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d-f+i(m-2k)p+2(b-c+ai(m-2k))z)^2}{4(b-c+ai(m-2k))}\right)+$$

$$e^{-\frac{(d+f+i(m-2k)p)^2}{4(b+c+ai(m-2k))}+e+g+i(m-2k)q-\frac{im\pi}{2}}(b+c+ai(m-2k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-d-f-i(m-2k)p)^{n-j}(d+f+i(m-2k)p+2(b+c+ai(m-2k))z)^{j+1}$$

$$\left(-\frac{(d+f+i(m-2k)p+2(b+c+ai(m-2k))z)^2}{b+c+ai(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d+f+i(m-2k)p+2(b+c+ai(m-2k))z)^2}{4(b+c+ai(m-2k))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1401.01

$$\int z^n e^{\sqrt{z}\,b+d\,z+e} \sin^m\left(\sqrt{z}\,a+p\,z+q\right)\cosh\left(\sqrt{z}\,c+f\,z+g\right)dz = 2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(e^{-\frac{(b-c)^2}{4\,(d-f)}+e-g}\,(d-f)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c)^{-h-i+2\,n}\left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left((b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\;(d-f)\,\Gamma\left(\frac{1}{2}\,(h+i+2),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)+e^{-\frac{(b+c)^2}{4\,(d+f)}+e+g}$$

$$(d+f)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c)^{-h-i+2\,n}\left(b+c+2\,(d+f)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b+c)\left(b+c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}\,(h+i+2),-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\right)\right)+$$

$$2^{-m-2\,n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(b-c+a\,i\,(2\,k-m))^2}{4\,(d-f+i\,(2\,k-m)\,p)}+e-g+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(d-f+i\,(2\,k-m)\,p)^{-2\,n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c+a\,i\,(2\,k-m))^{-h-i+2\,n}\left(b-c+a\,i\,(2\,k-m)+2\,(d-f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c+a\,i\,(2\,k-m)+2\,(d-f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b-c+a\,i\,(2\,k-m))\left(b-c+a\,i\,(2\,k-m)+2\,(d-f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\right($$

$$\frac{1}{2}(h+i+1),\ -\frac{\left(b-c+a\,i\,(2k-m)+2\,(d-f+i\,(2k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(2k-m)\,p)}\Bigg)+$$

$$2\,(d-f+i\,(2k-m)\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{\left(b-c+a\,i\,(2k-m)+2\,(d-f+i\,(2k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(2k-m)\,p)}\right)$$

$$\sqrt{-\frac{\left(b-c+a\,i\,(2k-m)+2\,(d-f+i\,(2k-m)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}}\Bigg)+$$

$$e^{-\frac{(b+c+a\,i\,(2k-m))^2}{4\,(d+f+i\,(2k-m)\,p)}+e+g+i\,(2k-m)\,q+\frac{i\,m\,\pi}{2}}\,(d+f+i\,(2k-m)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c+a\,i\,(2k-m))^{-h-i+2\,n}$$

$$\left(b+c+a\,i\,(2k-m)+2\,(d+f+i\,(2k-m)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+a\,i\,(2k-m)+2\,(d+f+i\,(2k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b+c+a\,i\,(2k-m))\left(b+c+a\,i\,(2k-m)+2\,(d+f+i\,(2k-m)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+1),\ -\frac{\left(b+c+a\,i\,(2k-m)+2\,(d+f+i\,(2k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2k-m)\,p)}\Bigg)+$$

$$2\,(d+f+i\,(2k-m)\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{\left(b+c+a\,i\,(2k-m)+2\,(d+f+i\,(2k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2k-m)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+c+a\,i\,(2k-m)+2\,(d+f+i\,(2k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2k-m)\,p}}\Bigg)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k))^2}{4\,(d-f+i\,(m-2\,k)\,p)}+e-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d-f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c+a\,i\,(m-2\,k))^{-h-i+2\,n}$$

$$\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b-c+a\,i\,(m-2\,k))\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)+2\,(d-f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\right)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k))^2}{4\,(d+f+i\,(m-2\,k)\,p)}+e+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d+f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c+a\,i\,(m-2\,k))^{-h-i+2\,n}$$

$$\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+c+a\,i\,(m-2\,k))\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)+2\,(d+f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving cos, exp and power

Involving $z^{\alpha-1}\, e^{p\, z}\, \cos(c\, z)\, \cosh(a\, z)$

01.20.21.1402.01

$$\int z^{\alpha-1}\, e^{p\, z}\, \cos(c\, z)\, \cosh(a\, z)\, dz == -\frac{1}{4}\, z^{\alpha}\, (E_{1-\alpha}((a + i\, c\, - p)\, z) + E_{1-\alpha}((a - i\, c - p)\, z) + E_{1-\alpha}(-(a + i\, c\, + p)\, z) + E_{1-\alpha}(-(a - i\, c + p)\, z))$$

Involving $z^{\alpha-1}\, e^{p\, z}\, \cos(c\, z + d)\, \cosh(a\, z)$

01.20.21.1403.01

$$\int z^{\alpha-1}\, e^{p\, z}\, \cos(d + c\, z)\, \cosh(a\, z)\, dz == -\frac{1}{4}\, e^{-i\, d}\, z^{\alpha}\, \left(E_{1-\alpha}((a + i\, c\, - p)\, z) + e^{2\, i\, d}\, E_{1-\alpha}((a - i\, c - p)\, z) + e^{2\, i\, d}\, E_{1-\alpha}(-(a + i\, c\, + p)\, z) + E_{1-\alpha}(-(a - i\, c + p)\, z)\right)$$

Involving $z^{\alpha-1}\, e^{p\, z}\, \cos(c\, z)\, \cosh(a\, z + b)$

01.20.21.1404.01

$$\int z^{\alpha-1}\, e^{p\, z}\, \cos(c\, z)\, \cosh(b + a\, z)\, dz == -\frac{1}{4}\, e^{-b}\, z^{\alpha}\, \left(E_{1-\alpha}((a + i\, c\, - p)\, z) + E_{1-\alpha}((a - i\, c - p)\, z) + e^{2\, b}\, (E_{1-\alpha}(-(a + i\, c\, + p)\, z) + E_{1-\alpha}(-(a - i\, c + p)\, z))\right)$$

Involving $z^{\alpha-1}\, e^{p\, z}\, \cos(c\, z + d)\, \cosh(a\, z + b)$

01.20.21.1405.01

$$\int z^{\alpha-1}\, e^{p\, z}\, \cos(d + c\, z)\, \cosh(b + a\, z)\, dz == -\frac{1}{4}\, e^{-b-i\, d}\, z^{\alpha}\, \left(E_{1-\alpha}((a + i\, c\, - p)\, z) + e^{2\, i\, d}\, E_{1-\alpha}((a - i\, c - p)\, z) + e^{2\, b}\, \left(e^{2\, i\, d}\, E_{1-\alpha}(-(a + i\, c\, + p)\, z) + E_{1-\alpha}(-(a - i\, c + p)\, z)\right)\right)$$

Involving $z^{n}\, e^{p\, z^{r}}\, \cos\left(b\, z^{r}\right)\, \cosh(c\, z)$

01.20.21.1406.01

$$\int z^n e^{p z^2} \cos\left(b z^2\right) \cosh(c z)\, dz == -\frac{1}{8 \sqrt{-i b+p}\ \sqrt{i b+p}}$$

$$\left(e^{\frac{c^2}{4 i b-4 p}} \sqrt{i b+p} \left(\sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (-i b+p)^{-n-\frac{1}{2}} (c+2 (-i b+p) z)^{q+1} \left(-\frac{(c+2 (-i b+p) z)^2}{-i b+p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\right.\right.$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(c+2 (-i b+p) z)^2}{4 (-i b+p)}\right)+\sum_{q=0}^{n} 2^{q-n} c^{n-q} (-i b+p)^{-n-\frac{1}{2}} \left(-\frac{(c+2 i b z-2 p z)^2}{-i b+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(2 (-i b+p) z-c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2 i b z-2 p z)^2}{4 (-i b+p)}\right)\right)+e^{\frac{c^2}{-4 i b-4 p}} \sqrt{-i b+p}\right.$$

$$\sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (i b+p)^{-n-\frac{1}{2}} (c+2 (i b+p) z)^{q+1} \left(-\frac{(c+2 (i b+p) z)^2}{i b+p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2 (i b+p) z)^2}{4 (i b+p)}\right)+$$

$$e^{\frac{c^2}{-4 i b-4 p}} \sqrt{-i b+p} \sum_{q=0}^{n} 2^{q-n} c^{n-q} (i b+p)^{-n-\frac{1}{2}} \left(-\frac{(c-2 i b z-2 p z)^2}{i b+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.(2 (i b+p) z-c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2 i b z-2 p z)^2}{4 (i b+p)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1407.01

$$\int z^n e^{p \sqrt{z}} \cos\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$2^{-2 n-3} c^{-2 (n+1)} e^{-\frac{b^2+4 i p b+2 p^2}{4 c}} \left(e^{\frac{2 b^2+6 i p b+p^2}{4 c}} \sum_{r=0}^{n} \sum_{q=0}^{r} -(-1)^{r-q} 4^r (-i b+p)^{2 n-q-r} \left(\frac{\left(b+i \left(2 \sqrt{z}\ c+p\right)\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\right.$$

$$\left(2 \sqrt{z}\ c-i b\ +p\right)^{q+r} \binom{n}{r} \binom{r}{q} \left((b+i p) \left(b+i \left(2 \sqrt{z}\ c+p\right)\right) \Gamma\left(\frac{1}{2} (q+r+1), \frac{\left(b+i \left(2 \sqrt{z}\ c+p\right)\right)^2}{4 c}\right)-\right.$$

$$\left.\left.2 c \sqrt{\frac{\left(b+i \left(2 \sqrt{z}\ c+p\right)\right)^2}{c}}\ \Gamma\left(\frac{1}{2} (q+r+2), \frac{\left(b+i \left(2 \sqrt{z}\ c+p\right)\right)^2}{4 c}\right)\right)+\right.$$

$$\left.e^{\frac{p (2 i b+3 p)}{4 c}} \sum_{r=0}^{n} \sum_{q=0}^{r} -(-1)^{r-q} 4^r (-i b+p)^{2 n-q-r} \left(-2 \sqrt{z}\ c-i b\ +p\right)^{q+r} \left(\frac{\left(-2 \sqrt{z}\ c-i b\ +p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\right.$$

$$\binom{n}{r}\binom{r}{q}\left((b+i\,p)\left(b+i\left(p-2\,c\,\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\,\sqrt{z}\;c-i\,b\;+p\right)^2}{4\,c}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(-2\,\sqrt{z}\;c-i\,b\;+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\,\sqrt{z}\;c-i\,b\;+p\right)^2}{4\,c}\right)\right)+$$

$$e^{\frac{3\,p\,(2\,i\,b+p)}{4\,c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(i\,b+p)^{2\,n-q-r}\left(-2\,\sqrt{z}\;c+i\,b\;+p\right)^{q+r}\left(\frac{\left(-2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left((i\,b+p)\left(-2\,\sqrt{z}\;c+i\,b\;+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{4\,c}\right)-\right.$$

$$\left.2\,c\sqrt{\frac{\left(-2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{4\,c}\right)\right)+$$

$$e^{\frac{2\,b^2+2\,i\,p\,b+p^2}{4\,c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(i\,b+p)^{2\,n-q-r}\left(2\,\sqrt{z}\;c+i\,b\;+p\right)^{q+r}\left(-\frac{\left(2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left((i\,b+p)\left(2\,\sqrt{z}\;c+i\,b\;+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,-\frac{\left(2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{4\,c}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\,-\frac{\left(2\,\sqrt{z}\;c+i\,b\;+p\right)^2}{4\,c}\right)\right)\right)\text{/; }n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\cos(b\,z)\cosh(c\,z)$

01.20.21.1408.01

$$\int z^n e^{p z^2} \cos(b z) \cosh(c z)\, dz ==$$

$$-\frac{1}{8\sqrt{p}}\left(e^{\frac{b^2-c^2}{2p}}\left(e^{\frac{(c-ib)^2}{4p}}\sum_{q=0}^{n} 2^{q-n}(-c-ib)^{n-q}p^{-n-\frac{1}{2}}(c+ib+2pz)^{q+1}\left(-\frac{(c+ib+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+ib+2pz)^2}{4p}\right)+e^{\frac{(c+ib)^2}{4p}}$$

$$\sum_{q=0}^{n} 2^{q-n}(ib-c)^{n-q}p^{-n-\frac{1}{2}}(c-ib+2pz)^{q+1}\left(-\frac{(c-ib+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-ib+2pz)^2}{4p}\right)+$$

$$e^{\frac{(c-ib)^2}{4p}}\sum_{q=0}^{n} 2^{q-n}(c+ib)^{n-q}p^{-n-\frac{1}{2}}\left(-\frac{(c+ib-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}(-c-ib+2pz)^{q+1}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(c+ib-2pz)^2}{4p}\right)+e^{\frac{(c+ib)^2}{4p}}\sum_{q=0}^{n} 2^{q-n}(c-ib)^{n-q}p^{-n-\frac{1}{2}}\left(-\frac{(c-ib-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(-c+ib+2pz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-ib-2pz)^2}{4p}\right)\right)\right) /; n\in\mathbb{N}$$

01.20.21.1409.01

$$\int z^n e^{p\sqrt{z}} \cos(b z) \cosh(c z)\, dz ==$$

$$2^{-2n-3}\left(e^{\frac{p^2}{4c-4ib}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(p-2(c-ib)\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2(c-ib)\sqrt{z}\right)^2}{c-ib}\right)^{\frac{1}{2}(-q-r-1)}\right.\right.$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(p-2(c-ib)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(p-2(c-ib)\sqrt{z}\right)^2}{4(c-ib)}\right)-\right.$$

$$\left.\left.2(c-ib)\sqrt{\frac{\left(p-2(c-ib)\sqrt{z}\right)^2}{c-ib}}\,\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(p-2(c-ib)\sqrt{z}\right)^2}{4(c-ib)}\right)\right)\right)(ib-c)^{-2(n+1)}+$$

$$(-c-ib)^{-2(n+1)}e^{\frac{p^2}{4c+4ib}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(p-2(c+ib)\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2(c+ib)\sqrt{z}\right)^2}{c+ib}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(p-2(c+i\,b)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\ \frac{\left(p-2(c+i\,b)\sqrt{z}\right)^2}{4(c+i\,b)}\right)-\right.$$

$$\left.2(c+i\,b)\sqrt{\frac{\left(p-2(c+i\,b)\sqrt{z}\right)^2}{c+i\,b}}\ \Gamma\left(\frac{1}{2}(q+r+2),\ \frac{\left(p-2(c+i\,b)\sqrt{z}\right)^2}{4(c+i\,b)}\right)\right)+$$

$$(c+i\,b)^{-2(n+1)}\,e^{\frac{p^2}{-4c-4ib}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\ (c+i\,b)+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\ (c+i\,b)+p\right)^2}{c+i\,b}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\ (c+i\,b)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\ (c+i\,b)+p\right)^2}{4(c+i\,b)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\ (c+i\,b)+p\right)^2}{c+i\,b}}\ (c+i\,b)\,\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(2\sqrt{z}\ (c+i\,b)+p\right)^2}{4(c+i\,b)}\right)\right)+$$

$$(c-i\,b)^{-2(n+1)}\,e^{\frac{p^2}{4ib-4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\ (c-i\,b)+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\ (c-i\,b)+p\right)^2}{c-i\,b}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\ (c-i\,b)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\ (c-i\,b)+p\right)^2}{4(c-i\,b)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\ (c-i\,b)+p\right)^2}{c-i\,b}}\ (c-i\,b)\,\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(2\sqrt{z}\ (c-i\,b)+p\right)^2}{4(c-i\,b)}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cos\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1410.01

$$\int z^n e^{p z} \cos\left(b z^2\right) \cosh(c z)\, dz ==$$

$$-\frac{i}{8 b} e^{-\frac{i (c+p)^2}{4 b}} \left(-\sqrt{i b} \left(e^{\frac{i \left(c^2+p^2\right)}{2 b}} \sum_{q=0}^{n} 2^{q-n} (i b)^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p+2 i b z)^{q+1} \left(\frac{i (-c+p+2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \right.\right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (-c+p+2 i b z)^2}{4 b}\right) + e^{\frac{i (c+p)^2}{2 b}} \sum_{q=0}^{n} 2^{q-n} (i b)^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p+2 i b z)^{q+1}$$

$$\left.\left(\frac{i (c+p+2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (c+p+2 i b z)^2}{4 b}\right)\right) + \sqrt{-i b}\ e^{\frac{i c p}{b}}$$

$$\sum_{q=0}^{n} 2^{q-n} (-i b)^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p-2 i b z)^{q+1} \left(-\frac{i (c-p+2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (c-p+2 i b z)^2}{4 b}\right) +$$

$$\sqrt{-i b} \sum_{q=0}^{n} 2^{q-n} (-i b)^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p-2 i b z)^{q+1} \left(-\frac{i (c+p-2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (c+p-2 i b z)^2}{4 b}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1411.01

$$\int z^n e^{p z} \cos\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$2^{-2 n-3} \left(e^{\frac{b^2}{4 p-4 c}} \left(\sum_{r=0}^{n} \sum_{q=0}^{r} -(-1)^{r-q} 4^r (-i b)^{2 n-q-r} \left(\frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{c-p}\right)^{\frac{1}{2}(-q-r-1)} \left(-i b+2 (p-c) \sqrt{z}\right)^{q+r} \right.\right.$$

$$\binom{n}{r} \binom{r}{q} \left(b \left(b-2 i (c-p) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(q+r+1), \frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{4 (c-p)}\right) + \right.$$

$$\left.\left.\left.2 \sqrt{\frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{c-p}} (c-p) \Gamma\left(\frac{1}{2}(q+r+2), \frac{\left(i b+2 (c-p) \sqrt{z}\right)^2}{4 (c-p)}\right)\right)\right) (p-c)^{-2 (n+1)} +$$

$$e^{\frac{b^2}{4 p-4 c}} \left(\sum_{r=0}^{n} \sum_{q=0}^{r} -(-1)^{r-q} 4^r (i b)^{2 n-q-r} \left(i b+2 (p-c) \sqrt{z}\right)^{q+r} \left(\frac{\left(i b+2 (p-c) \sqrt{z}\right)^2}{c-p}\right)^{\frac{1}{2}(-q-r-1)} \binom{n}{r}\right.$$

$$\binom{r}{q}\left(b\left(b+2\,i\,(c-p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\ \frac{\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^2}{4\,(c-p)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^2}{c-p}}\ (c-p)\,\Gamma\left(\frac{1}{2}\,(q+r+2),\ \frac{\left(i\,b+2\,(p-c)\,\sqrt{z}\right)^2}{4\,(c-p)}\right)\right)(p-c)^{-2\,(n+1)}+$$

$$e^{\frac{b^2}{4\,(c+p)}}\,(c+p)^{-2\,(n+1)}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}-(-1)^{r-q}\,4^r\,(-i\,b)^{2\,n-q-r}\left(\frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}\,(-q-r-1)}\left(-i\,b+2\,(c+p)\,\sqrt{z}\right)^{q+r}\right.$$

$$\binom{n}{r}\binom{r}{q}\left(b\left(b+2\,i\,(c+p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\ \frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)-\right.$$

$$\left.2\,(c+p)\sqrt{\frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}}\ \Gamma\left(\frac{1}{2}\,(q+r+2),\ \frac{\left(b+2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\right)+$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}-(-1)^{r-q}\,4^r\,(i\,b)^{2\,n-q-r}\left(\frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}\,(-q-r-1)}\left(i\,b+2\,(c+p)\,\sqrt{z}\right)^{q+r}\binom{n}{r}$$

$$\binom{r}{q}\left(b\left(b-2\,i\,(c+p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\ \frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)-\right.$$

$$\left.\left.2\,(c+p)\sqrt{\frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{c+p}}\ \Gamma\left(\frac{1}{2}\,(q+r+2),\ \frac{\left(b-2\,i\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cos(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1412.01

$$\int z^n e^{p z} \cos(b z) \cosh\left(c z^2\right) dz ==$$

$$2^{-n-4} (-c)^{-n-1} e^{-\frac{b^2+4 i p b+2 p^2}{4 c}} \left(-e^{\frac{p (2 i b+3 p)}{4 c}} \sum_{q=0}^{n} (i b-p)^{n-q} (-i b+p-2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(-i b+p-2 c z)^2}{4 c}\right)-\right.$$

$$2^n e^{\frac{3 p (2 i b+p)}{4 c}} \sum_{q=0}^{n} 2^{-n} (-i b-p)^{n-q} (i b+p-2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(i b+p-2 c z)^2}{4 c}\right)+$$

$$(-1)^n e^{\frac{2 b^2+2 i p b+p^2}{4 c}} \left(e^{\frac{i b p}{c}} \sum_{q=0}^{n} (i b-p)^{n-q} (-i b+p+2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(b+i (p+2 c z))^2}{4 c}\right)+\right.$$

$$\left.\left.2^n \sum_{q=0}^{n} 2^{-n} (-i b-p)^{n-q} (i b+p+2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(-\frac{(i b+p+2 c z)^2}{4 c}\right)\right)\right) /; n \in \mathbb{N}$$

01.20.21.1413.01

$$\int z^n e^{p z} \cos(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-2 n-3} \left(e^{-\frac{c^2}{4 (-i b+p)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k c^{-h-k+2 n} \left(\frac{\left(i c+2 (b+i p) \sqrt{z}\right)^2}{-i b+p}\right)^{\frac{1}{2}(-h-k-1)} \left(c+2 (-i b+p) \sqrt{z}\right)^{h+k}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c \left(c+2 (-i b+p) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(i c+2 (b+i p) \sqrt{z}\right)^2}{4 (-i b+p)}\right)+\right.$$

$$\left.\left.\left.2 \sqrt{\frac{\left(i c+2 (b+i p) \sqrt{z}\right)^2}{-i b+p}} (-i b+p) \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(i c+2 (b+i p) \sqrt{z}\right)^2}{4 (-i b+p)}\right)\right)\right) (-i b+p)^{-2 (n+1)}+$$

$$e^{-\frac{c^2}{4 (-i b+p)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c)^{-h-k+2 n} \left(\frac{\left(i c+2 (-b-i p) \sqrt{z}\right)^2}{-i b+p}\right)^{\frac{1}{2}(-h-k-1)} \left(2 (-i b+p) \sqrt{z}-c\right)^{h+k}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2 (-i b+p) \sqrt{\frac{\left(i c+2 (-b-i p) \sqrt{z}\right)^2}{-i b+p}} \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(i c+2 (-b-i p) \sqrt{z}\right)^2}{4 (-i b+p)}\right)-\right.$$

$$\left.\left.\left.c \left(2 (-i b+p) \sqrt{z}-c\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(i c+2 (-b-i p) \sqrt{z}\right)^2}{4 (-i b+p)}\right)\right)\right) (-i b+p)^{-2 (n+1)}+$$

$$e^{-\frac{c^2}{4(i b+p)}}(i b+p)^{-2(n+1)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(\frac{\left(i c+2(i p-b)\sqrt{z}\right)^2}{i b+p}\right)^{\frac{1}{2}(-h-k-1)}\left(c+2(i b+p)\sqrt{z}\right)^{h+k}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2(i b+p)\sqrt{\frac{\left(i c+2(i p-b)\sqrt{z}\right)^2}{i b+p}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(i c+2(i p-b)\sqrt{z}\right)^2}{4(i b+p)}\right)-\right.$$

$$\left.\left.i c\left(i c+2(i p-b)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(i c+2(i p-b)\sqrt{z}\right)^2}{4(i b+p)}\right)\right)+\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(\frac{\left(i c+2(b-i p)\sqrt{z}\right)^2}{i b+p}\right)^{\frac{1}{2}(-h-k-1)}\left(2(i b+p)\sqrt{z}-c\right)^{h+k}\binom{k}{h}$$

$$\binom{n}{k}\left(2(i b+p)\sqrt{\frac{\left(i c+2(b-i p)\sqrt{z}\right)^2}{i b+p}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(i c+2(b-i p)\sqrt{z}\right)^2}{4(i b+p)}\right)-\right.$$

$$\left.\left.\left.c\left(2(i b+p)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(i c+2(b-i p)\sqrt{z}\right)^2}{4(i b+p)}\right)\right)\right)\right)\Big/;\; n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\cos(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1414.01

$$\int z^n e^{p z^2} \cos(b z) \cosh\left(c z^2\right) dz == -\frac{1}{8 \sqrt{p-c}\, \sqrt{c+p}}\, e^{\frac{b^2}{4p-4c}}$$

$$\left(\sqrt{c+p} \sum_{q=0}^{n} 2^{q-n} (i b)^{n-q} (p-c)^{-n-\frac{1}{2}} \left(\frac{(i b+2(c-p) z)^2}{c-p}\right)^{\frac{1}{2}(-q-1)} (-i b+2(p-c) z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(i b+2(c-p) z)^2}{4(c-p)}\right) + \right.$$

$$\sqrt{c+p} \sum_{q=0}^{n} 2^{q-n} (-i b)^{n-q} (p-c)^{-n-\frac{1}{2}} (i b-2 c z+2 p z)^{q+1}$$

$$\left(\frac{(i b-2 c z+2 p z)^2}{c-p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(i b-2 c z+2 p z)^2}{4(c-p)}\right) + e^{\frac{c b^2}{2c^2-2p^2}} \sqrt{p-c}$$

$$\left(\sum_{q=0}^{n} 2^{q-n} (i b)^{n-q} (c+p)^{-n-\frac{1}{2}} \left(\frac{(b+2 i (c+p) z)^2}{c+p}\right)^{\frac{1}{2}(-q-1)} (-i b+2(c+p) z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(b+2 i (c+p) z)^2}{4(c+p)}\right) + \right.$$

$$\sum_{q=0}^{n} 2^{q-n} (-i b)^{n-q} (c+p)^{-n-\frac{1}{2}} \left(\frac{(b-2 i (c+p) z)^2}{c+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(i b+2(c+p) z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(b-2 i (c+p) z)^2}{4(c+p)}\right)\right)\right) /; n \in \mathbb{N}$$

01.20.21.1415.01

$$\int z^n e^{p \sqrt{z}} \cos(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$(-1)^n 2^{-2n-3} b^{-2n-2} \left(-e^{-\frac{i (c+p)^2}{4b}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c+p)^{-h-k+2n} \left(c+p-2 i b \sqrt{z}\right)^{h+k} \left(\frac{i \left(2 \sqrt{z}\, b+i c+i p\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left((c+p)\left(c+p-2 i b \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{i \left(2 \sqrt{z}\, b+i c+i p\right)^2}{4b}\right) - \right.$$

$$\left.\left.2 i b \sqrt{\frac{i \left(2 \sqrt{z}\, b+i c+i p\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{i \left(2 \sqrt{z}\, b+i c+i p\right)^2}{4b}\right)\right) -$$

$$e^{\frac{i (p-c)^2}{4b}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (p-c)^{-h-k+2n} \left(-c+p+2 i b \sqrt{z}\right)^{h+k} \left(\frac{i \left(-c+p+2 i b \sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((p-c)\left(-c+p+2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{i\left(2\sqrt{z}\;b+i\,c-i\,p\right)^2}{4\,b}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(-c+p+2\,i\,b\,\sqrt{z}\right)^2}{b}}\;b\,i\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{i\left(2\sqrt{z}\;b+i\,c-i\,p\right)^2}{4\,b}\right)\right)-$$

$$e^{\frac{i\,(c+p)^2}{4\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+p)^{-h-k+2\,n}\left(c+p+2\,i\,b\,\sqrt{z}\right)^{h+k}\left(\frac{i\left(c+p+2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left((c+p)\left(c+p+2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{i\left(-2\sqrt{z}\;b+i\,c+i\,p\right)^2}{4\,b}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(c+p+2\,i\,b\,\sqrt{z}\right)^2}{b}}\;b\,i\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{i\left(-2\sqrt{z}\;b+i\,c+i\,p\right)^2}{4\,b}\right)\right)-$$

$$e^{-\frac{i\,(p-c)^2}{4\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p-c)^{-h-k+2\,n}\left(-c+p-2\,i\,b\,\sqrt{z}\right)^{h+k}\left(-\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((p-c)\left(-c+p-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-\right.$$

$$\left.\left.2\,i\,b\sqrt{-\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+k+2),-\frac{i\left(-c+p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cos\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1416.01

$$\int z^n e^{p z} \cos\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$-\frac{1}{8}\left(\frac{1}{\sqrt{-c-i b}}\left(e^{\frac{p^2}{4c+4ib}} \sum_{q=0}^{n} 2^{q-n} (-c-i b)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2(c+i b) z)^{q+1} \left(\frac{(p-2(c+i b) z)^2}{c+i b}\right)^{\frac{1}{2}(-q-1)} \right.\right.$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2(c+i b) z)^2}{4(c+i b)}\right)\right) + \frac{1}{\sqrt{c+i b}}\left(e^{\frac{p^2}{-4c-4ib}} \sum_{q=0}^{n} 2^{q-n} (c+i b)^{-n-\frac{1}{2}} (-p)^{n-q} \right.$$

$$\left.(p+2cz+2ibz)^{q+1}\left(-\frac{(p+2cz+2ibz)^2}{c+i b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2cz+2ibz)^2}{4(c+i b)}\right)\right) +$$

$$\frac{1}{\sqrt{i b-c}}\left(e^{\frac{p^2}{4c-4ib}} \sum_{q=0}^{n} 2^{q-n} (ib-c)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2cz+2ibz)^{q+1} \left(\frac{(p-2cz+2ibz)^2}{c-i b}\right)^{\frac{1}{2}(-q-1)} \right.$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cz+2ibz)^2}{4(c-ib)}\right)\right) + \frac{1}{\sqrt{c-i b}}\left(e^{\frac{p^2}{4ib-4c}} \sum_{q=0}^{n} 2^{q-n} (c-ib)^{-n-\frac{1}{2}} (-p)^{n-q} \right.$$

$$\left.\left.(p+2(c-ib)z)^{q+1}\left(-\frac{(p+2(c-ib)z)^2}{c-i b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(c-ib)z)^2}{4(c-ib)}\right)\right)\right) /; n \in \mathbb{N}$$

01.20.21.1417.01

$$\int z^n e^{p z} \cos\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-2n-3} p^{-2(n+1)}\left(e^{-\frac{(-c-ib)^2}{4p}} \sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h} 4^i (-c-i b)^{-h-i+2n} \left(-c-i b+2p\sqrt{z}\right)^{h+i}\left(-\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \right.$$

$$\binom{i}{h}\binom{n}{i}\left((-c-i b)\left(-c-i b+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{4p}\right) + \right.$$

$$\left.2\sqrt{-\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{p}}\; p\,\Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(-c-i b+2p\sqrt{z}\right)^2}{4p}\right)\right) +$$

$$\left.e^{-\frac{(ib-c)^2}{4p}} \sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h} 4^i (ib-c)^{-h-i+2n} \left(-c+i b+2p\sqrt{z}\right)^{h+i}\left(-\frac{\left(-c+i b+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\right)$$

$$\binom{i}{h}\binom{n}{i}\left((i\,b-c)\left(-c+i\,b+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(-c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c+i\,b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(-c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(c-i\,b)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c-i\,b)^{-h-i+2\,n}\left(c-i\,b+2\,p\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((c-i\,b)\left(c-i\,b+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c-i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(c+i\,b)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c+i\,b)^{-h-i+2\,n}\left(c+i\,b+2\,p\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((c+i\,b)\left(c+i\,b+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right)/;\nu\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\cos\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1418.01

$$\int z^{\alpha-1}\,e^{p\,z^r}\cos(b\,z^r)\cosh(c\,z^r)\,dz==$$

$$\frac{1}{4\,r}z^{\alpha}\left(-\Gamma\left(\frac{\alpha}{r},(c+i\,b-p)\,z^r\right)\left((c+i\,b-p)\,z^r\right)^{-\frac{\alpha}{r}}-\left((c-i\,b-p)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(c-i\,b-p)\,z^r\right)-\right.$$

$$\left.\left(-(c+i\,b+p)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},-(c+i\,b+p)\,z^r\right)-\left(-(c-i\,b+p)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},-(c-i\,b+p)\,z^r\right)\right)$$

01.20.21.1419.01

$$\int z^n e^{p z^2} \cos\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$
$$-\frac{1}{8} z^{n+1} \left(\Gamma\left(\frac{n+1}{2}, (-c - i b - p) z^2\right) \left((-c - i b - p) z^2\right)^{\frac{1}{2}(-n-1)} + \left((-c + i b - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-c + i b - p) z^2\right) + \left((c - i b - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c - i b - p) z^2\right) + \left((c + i b - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c + i b - p) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1420.01

$$\int z^n e^{p \sqrt{z}} \cos\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$
$$\frac{1}{2} \left(-(-c - i b - p)^{-2(n+1)} \Gamma\left(2(n+1), (-c - i b - p) \sqrt{z}\right) - (-c + i b - p)^{-2(n+1)} \Gamma\left(2(n+1), (-c + i b - p) \sqrt{z}\right) - (c - i b - p)^{-2(n+1)} \Gamma\left(2(n+1), (c - i b - p) \sqrt{z}\right) - (c + i b - p)^{-2(n+1)} \Gamma\left(2(n+1), (c + i b - p) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r+e} \cos\left(a z^r+q\right) \cosh\left(c z^r+g\right)$

01.20.21.1421.01

$$\int z^{\alpha-1} e^{b z^r+e} \cos(a z^r+q) \cosh(c z^r+g) dz ==$$
$$-\frac{z^\alpha}{4 r} \left(e^{e+g+i q} \Gamma\left(\frac{\alpha}{r}, (-b-c-i a) z^r\right) \left((-b-c-i a) z^r\right)^{-\frac{\alpha}{r}} + e^{e+g-i q} \left((-b-c+i a) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b-c+i a) z^r\right) + e^{e-g+i q} \left((-b+c-i a) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b+c-i a) z^r\right) + e^{e-g-i q} \left((-b+c+i a) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b+c+i a) z^r\right)\right)$$

01.20.21.1422.01

$$\int z^n e^{b z^2+e} \cos\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz ==$$
$$-\frac{1}{8} z^{n+1} \left(e^{e+g+i q} \Gamma\left(\frac{n+1}{2}, (-b-c-i a) z^2\right) \left((-b-c-i a) z^2\right)^{\frac{1}{2}(-n-1)} + e^{e+g-i q} \left((-b-c+i a) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-c+i a) z^2\right) + e^{e-g+i q} \left((-b+c-i a) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+c-i a) z^2\right) + e^{e-g-i q} \left((-b+c+i a) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+c+i a) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1423.01

$$\int z^n e^{\sqrt{z}\, b+e} \cos\left(\sqrt{z}\, a+q\right) \cosh\left(\sqrt{z}\, c+g\right) dz ==$$
$$\frac{1}{2} \left(-(-b-c-i a)^{-2(n+1)} e^{e+g+i q} \Gamma\left(2(n+1), (-b-c-i a) \sqrt{z}\right) - (-b-c+i a)^{-2(n+1)} e^{e+g-i q} \Gamma\left(2(n+1), (-b-c+i a) \sqrt{z}\right) - (-b+c-i a)^{-2(n+1)} e^{e-g+i q} \Gamma\left(2(n+1), (-b+c-i a) \sqrt{z}\right) - (-b+c+i a)^{-2(n+1)} e^{e-g-i q} \Gamma\left(2(n+1), (-b+c+i a) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n e^{b z^r+d z+e} \cos\left(a z^r+p z+q\right) \cosh\left(c z^r+f z+g\right)$

01.20.21.1424.01

$$\int z^n e^{b z^2+d z+e} \cos\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$

$$-\frac{1}{8}\left((b-c-i a)^{-n-1} e^{-\frac{(d-f-i p)^2}{4(b-c-i a)}+e-g-i q} \sum_{j=0}^{n} 2^{j-n} (-d+f+i p)^{n-j} (d-f-i p+2(b-c-i a) z)^{j+1}\right.$$

$$\left(-\frac{(d-f-i p+2(b-c-i a) z)^2}{b-c-i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f-i p+2(b-c-i a) z)^2}{4(b-c-i a)}\right)+$$

$$(b-c+i a)^{-n-1} e^{-\frac{(d-f+i p)^2}{4(b-c+i a)}+e-g+i q} \sum_{j=0}^{n} 2^{j-n} (-d+f-i p)^{n-j} (d-f+i p+2(b-c+i a) z)^{j+1}$$

$$\left(-\frac{(d-f+i p+2(b-c+i a) z)^2}{b-c+i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f+i p+2(b-c+i a) z)^2}{4(b-c+i a)}\right)+$$

$$(b+c-i a)^{-n-1} e^{-\frac{(d+f-i p)^2}{4(b+c-i a)}+e+g-i q} \sum_{j=0}^{n} 2^{j-n} (-d-f+i p)^{n-j} (d+f-i p+2(b+c-i a) z)^{j+1}$$

$$\left(-\frac{(d+f-i p+2(b+c-i a) z)^2}{b+c-i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f-i p+2(b+c-i a) z)^2}{4(b+c-i a)}\right)+$$

$$(b+c+i a)^{-n-1} e^{-\frac{(d+f+i p)^2}{4(b+c+i a)}+e+g+i q} \sum_{j=0}^{n} 2^{j-n} (-d-f-i p)^{n-j} (d+f+i p+2(b+c+i a) z)^{j+1}$$

$$\left.\left(-\frac{(d+f+i p+2(b+c+i a) z)^2}{b+c+i a}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f+i p+2(b+c+i a) z)^2}{4(b+c+i a)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1425.01

$$\int z^n e^{\sqrt{z}\, b+d z+e} \cos\left(\sqrt{z}\, a+p z+q\right) \cosh\left(\sqrt{z}\, c+f z+g\right) dz ==$$

$$2^{-2n-3}\left(e^{-\frac{(b-c+i a)^2}{4(d-f+i p)}+e-g+i q} (d-f+i p)^{-2n-2} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (b-c+i a)^{-h-i+2n} \left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^{h+i}\right.$$

$$\left(-\frac{\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^2}{d-f+i p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left((b-c+i a)\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^2}{4(d-f+i p)}\right)+2\sqrt{-\frac{\left(b-c+i a+2(d-f+i p)\sqrt{z}\right)^2}{d-f+i p}}\right.\right.$$

$$(d-f+i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b-c+i\,a+2(d-f+i\,p)\sqrt{z}\right)^2}{4(d-f+i\,p)}\right)+$$

$$e^{-\frac{(b+c+i\,a)^2}{4(d+f+i\,p)}+e+g+i\,q}(d+f+i\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c+i\,a)^{-h-i+2n}\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{d+f+i\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+c+i\,a)\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{4(d+f+i\,p)}\right)+2\sqrt{-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{d+f+i\,p}}\right.$$

$$\left.(d+f+i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b+c+i\,a+2(d+f+i\,p)\sqrt{z}\right)^2}{4(d+f+i\,p)}\right)\right)+$$

$$e^{-\frac{(b-c-i\,a)^2}{4(d-f-i\,p)}+e-g-i\,q}(d-f-i\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c-i\,a)^{-h-i+2n}\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{d-f-i\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b-c-i\,a)\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{4(d-f-i\,p)}\right)+2\sqrt{-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{d-f-i\,p}}\right.$$

$$\left.(d-f-i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b-c-i\,a+2(d-f-i\,p)\sqrt{z}\right)^2}{4(d-f-i\,p)}\right)\right)+$$

$$e^{-\frac{(b+c-i\,a)^2}{4(d+f-i\,p)}+e+g-i\,q}(d+f-i\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c-i\,a)^{-h-i+2n}\left(b+c-i\,a+2(d+f-i\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{d+f-i\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+c-i\,a)\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p)}\right)+2\sqrt{-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{d+f-i\,p}}$$

$$\left.(d+f-i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b+c-i\,a+2\,(d+f-i\,p)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p)}\right)\right)/;\,n\in\mathbb{N}$$

Involving powers of cos, exp and power

Involving $z^{\alpha-1}\,e^{p\,z}\cos^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.1426.01

$$\int z^{\alpha-1}\,e^{p\,z}\cos^{m}(c\,z)\cosh(a\,z)\,dz==$$

$$2^{-1-m}\,z^{\alpha}\left(\binom{m}{\frac{m}{2}}\left(E_{1-\alpha}((a-p)\,z)+E_{1-\alpha}(-(a+p)\,z)\right)(m\bmod 2-1)-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(E_{1-\alpha}(-(a+p-2\,i\,c\,k+i\,c\,m)\,z)+\right.\right.$$

$$\left.\left.E_{1-\alpha}((a-p+2\,i\,c\,k-i\,c\,m)\,z)+E_{1-\alpha}(-(a+p+2\,i\,c\,k-i\,c\,m)\,z)+E_{1-\alpha}((a-p+c\,i\,(m-2\,k))\,z)\right)\right)/;\,m\in\mathbb{N}^{+}$$

01.20.21.1427.01

$$\int z^{n}\,e^{p\,z}\cos^{\mu}(c\,z)\cosh(a\,z)\,dz==$$

$$\frac{1}{2}\,e^{p\,z}\left(1+e^{2\,i\,c\,z}\right)^{-\mu}\cos^{\mu}(c\,z)\,n!\left(e^{-a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a+p-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,(-a+p-i\,c\,\mu)}{2\,c},\ldots,-\frac{i\,(-a+p-i\,c\,\mu)}{2\,c},\right.\right.$$

$$\left.-\mu;\,1-\frac{i\,(-a+p-i\,c\,\mu)}{2\,c},\ldots,1-\frac{i\,(-a+p-i\,c\,\mu)}{2\,c};-e^{2\,i\,c\,z}\right)+e^{a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a+p-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}$$

$$\left.\left(-\frac{i\,(a+p-i\,c\,\mu)}{2\,c},\ldots,-\frac{i\,(a+p-i\,c\,\mu)}{2\,c},-\mu;\,1-\frac{i\,(a+p-i\,c\,\mu)}{2\,c},\ldots,1-\frac{i\,(a+p-i\,c\,\mu)}{2\,c};-e^{2\,i\,c\,z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z}\cos^{\mu}(c\,z+d)\cosh(a\,z)$

01.20.21.1428.01

$$\int z^{\alpha-1}\, e^{p\,z} \cos^m(d+c\,z)\cosh(a\,z)\,dz == 2^{-m-1}\, z^{\alpha}\left(\binom{m}{\frac{m}{2}}\left(E_{1-\alpha}((a-p)\,z)+E_{1-\alpha}(-(a+p)\,z)\right)(m \bmod 2-1)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-i\,d\,(2\,k+m)}\binom{m}{k}\left(e^{2\,i\,d\,m}\left(E_{1-\alpha}((a+2\,i\,c\,k-i\,c\,m-p)\,z)+E_{1-\alpha}(-(a-2\,i\,c\,k+i\,c\,m+p)\,z)\right)+\right.$$

$$\left.\left. e^{4\,i\,d\,k}\left(E_{1-\alpha}((a+c\,i\,(m-2\,k)-p)\,z)+E_{1-\alpha}(-(a+2\,i\,c\,k-i\,c\,m+p)\,z)\right)\right)\right/;\ m\in\mathbb{N}^+$$

01.20.21.1429.01

$$\int z^n\, e^{p\,z}\cos^{\mu}(d+c\,z)\cosh(a\,z)\,dz ==$$

$$\frac{1}{2}\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}\cos^{\mu}(d+c\,z)\,n!\left(e^{(p-a)\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a+p-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{-i\,a+i\,p+c\,\mu}{2\,c},\right.\right.$$

$$\left.\ldots,-\frac{-i\,a+i\,p+c\,\mu}{2\,c},-\mu;1-\frac{-i\,a+i\,p+c\,\mu}{2\,c},\ldots,1-\frac{-i\,a+i\,p+c\,\mu}{2\,c};-e^{2\,i\,(d+c\,z)}\right)+$$

$$e^{(a+p)\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a+p-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a+i\,p+c\,\mu}{2\,c},\ldots,-\frac{i\,a+i\,p+c\,\mu}{2\,c},-\mu;\right.$$

$$\left.\left.1-\frac{i\,a+i\,p+c\,\mu}{2\,c},\ldots,1-\frac{i\,a+i\,p+c\,\mu}{2\,c};-e^{2\,i\,(d+c\,z)}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z}\cos^{\mu}(c\,z)\cosh(a\,z+b)$

01.20.21.1430.01

$$\int z^{\alpha-1}\, e^{p\,z}\cos^m(c\,z)\cosh(b+a\,z)\,dz == 2^{-m-1}\, z^{\alpha}\left(e^{-b}\binom{m}{\frac{m}{2}}\left(E_{1-\alpha}((a-p)\,z)+e^{2\,b}\,E_{1-\alpha}(-(a+p)\,z)\right)(m \bmod 2-1)-\right.$$

$$e^{-b}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(E_{1-\alpha}((a+2\,i\,c\,k-i\,c\,m-p)\,z)+E_{1-\alpha}((a+c\,i\,(m-2\,k)-p)\,z)+\right.$$

$$\left.\left.e^{2\,b}\,E_{1-\alpha}(-(a-2\,i\,c\,k+i\,c\,m+p)\,z)+e^{2\,b}\,E_{1-\alpha}(-(a+2\,i\,c\,k-i\,c\,m+p)\,z)\right)\right/;\ m\in\mathbb{N}^+$$

01.20.21.1431.01

$$\int z^n e^{p z} \cos^{\mu}(c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2}\left(1 + e^{2 i c z}\right)^{-\mu} \cos^{\mu}(c z)\, n! \left(e^{(p-a) z - b} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-a + p - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-i a + i p + c \mu}{2 c}, \ldots, -\frac{-i a + i p + c \mu}{2 c}, \right.\right.$$

$$\left. -\mu; 1 - \frac{-i a + i p + c \mu}{2 c}, \ldots, 1 - \frac{-i a + i p + c \mu}{2 c}; -e^{2 i c z} \right) + e^{b + (a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (a + p - i c \mu)^{-j-1}}{(n-j)!}$$

$$\left. {}_{j+2}F_{j+1}\left(-\frac{i a + i p + c \mu}{2 c}, \ldots, -\frac{i a + i p + c \mu}{2 c}, -\mu; 1 - \frac{i a + i p + c \mu}{2 c}, \ldots, 1 - \frac{i a + i p + c \mu}{2 c}; -e^{2 i c z} \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z} \cos^{\mu}(c z + d) \cosh(a z + b)$

01.20.21.1432.01

$$\int z^{\alpha-1} e^{p z} \cos^{m}(d + c z) \cosh(b + a z)\, dz == 2^{-m-1} z^{\alpha} \left(e^{-b} \binom{m}{\frac{m}{2}} \left(E_{1-\alpha}((a-p) z) + e^{2 b} E_{1-\alpha}(-(a+p) z) \right) (m \bmod 2 - 1) - \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{-b - i d (2k+m)} \binom{m}{k} \left(e^{2 i d m} \left(E_{1-\alpha}((a + 2 i c k - i c m - p) z) + e^{2 b} E_{1-\alpha}(-(a - 2 i c k + i c m + p) z) \right) + \right.$$

$$\left. \left. e^{4 i d k} \left(E_{1-\alpha}((a + c i (m - 2k) - p) z) + e^{2 b} E_{1-\alpha}(-(a + 2 i c k - i c m + p) z) \right) \right) \right) /;\ m \in \mathbb{N}^{+}$$

01.20.21.1433.01

$$\int z^n e^{p z} \cos^{\mu}(d + c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2}\left(1 + e^{2 i (d + c z)}\right)^{-\mu} \cos^{\mu}(d + c z)\, n! \left(e^{(p-a) z - b} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-a + p - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-i a + i p + c \mu}{2 c}, \right.\right.$$

$$\left. \ldots, -\frac{-i a + i p + c \mu}{2 c}, -\mu; 1 - \frac{-i a + i p + c \mu}{2 c}, \ldots, 1 - \frac{-i a + i p + c \mu}{2 c}; -e^{2 i (d + c z)} \right) +$$

$$e^{b + (a+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (a + p - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i a + i p + c \mu}{2 c}, \ldots, -\frac{i a + i p + c \mu}{2 c}, -\mu; \right.$$

$$\left. \left. 1 - \frac{i a + i p + c \mu}{2 c}, \ldots, 1 - \frac{i a + i p + c \mu}{2 c}; -e^{2 i (d + c z)} \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^n e^{p z^r} \cos^{m}\left(b z^r\right) \cosh(c z)$

01.20.21.1434.01

$$\int z^n e^{p z^2} \cos^m\left(b z^2\right) \cosh(c z)\, dz ==$$

$$2^{-m-2}\left(e^{-\frac{c^2}{4p}} p^{-n-1}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{q=0}^{n} 2^{q-n}(-c)^{n-q}(c+2pz)^{q+1}\left(-\frac{(c+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c+2pz)^2}{4p}\right)+\right.\right.$$

$$\sum_{q=0}^{n} 2^{q-n} c^{n-q}\left(-\frac{(c-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}(2pz-c)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c-2pz)^2}{4p}\right)\Bigg)-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\Bigg(e^{-\frac{c^2 p}{2\left(b^2(m-2k)^2+p^2\right)}}\binom{m}{k}$$

$$\Bigg(e^{\frac{c^2}{4(b i(m-2k)+p)}}\sqrt{-2bik+ibm+p}\sum_{q=0}^{n}2^{q-n}(-c)^{n-q}(bi(2k-m)+p)^{-n-\frac{1}{2}}(c+2(bi(2k-m)+p)z)^{q+1}$$

$$\left(-\frac{(c+2(bi(2k-m)+p)z)^2}{bi(2k-m)+p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c+2(bi(2k-m)+p)z)^2}{4(bi(2k-m)+p)}\right)+e^{\frac{ic^2}{-8bk+4bm+4ip}}$$

$$\sqrt{bi(2k-m)+p}\left(\sum_{q=0}^{n}2^{q-n}(-c)^{n-q}(-2bik+ibm+p)^{-n-\frac{1}{2}}(c+2(-2bik+ibm+p)z)^{q+1}\right.$$

$$\left(-\frac{(c+2(-2bik+ibm+p)z)^2}{-2bik+ibm+p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c+2(-2bik+ibm+p)z)^2}{4(-2bik+ibm+p)}\right)+$$

$$\sum_{q=0}^{n}2^{q-n}c^{n-q}(-2bik+ibm+p)^{-n-\frac{1}{2}}\left(-\frac{(c+2i(2bk-bm+ip)z)^2}{-2bik+ibm+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.(2(-2bik+ibm+p)z-c)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{i(c+2i(2bk-bm+ip)z)^2}{8bk-4bm+4ip}\right)\right)+$$

$$e^{\frac{c^2}{4(bi(m-2k)+p)}}\sqrt{bi(m-2k)+p}\sum_{q=0}^{n}2^{q-n}c^{n-q}(bi(2k-m)+p)^{-n-\frac{1}{2}}\left(-\frac{(c-2ib(2k-m)z-2pz)^2}{bi(2k-m)+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(2(bi(2k-m)+p)z-c)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{i(c-2ib(2k-m)z-2pz)^2}{8bk-4bm-4ip}\right)\right)\right)\Bigg/$$

$$\left.\left(\sqrt{bi(2k-m)+p}\ \sqrt{bi(m-2k)+p}\right)\right) /;\ m\in\mathbb{Z}\wedge m>0\wedge n\in\mathbb{N}$$

01.20.21.1435.01

$$\int z^n e^{p\sqrt{z}} \cos^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$2^{-m-2n-2}\,c^{-2(n+1)}\,e^{-\frac{p^2}{4c}}\left(e^{\frac{p^2}{4c}}\,c^{2(n+1)}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} c^{-2(n+1)}\,e^{-\frac{(p+b\,i\,(m-2u))^2}{4c}}\binom{m}{u}\left(e^{\frac{(p+b\,i\,(m-2u))^2}{2c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p+b\,i\,(m-2u))^{-h-k+2n}\right.\right.$$

$$\left(-2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)^{h+k}\left(\frac{\left(-2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((p+b\,i\,(m-2u))\left(-2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(-2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)^2}{4c}\right)-\right.$$

$$\left.2c\sqrt{\frac{\left(-2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(-2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)^2}{4c}\right)\right)+$$

$$e^{\frac{p^2-b^2(m-2u)^2}{2c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p-i\,b\,(m-2u))^{-h-k+2n}\left(-2\sqrt{z}\,c+p-i\,b\,(m-2u)\right)^{h+k}$$

$$\left(\frac{\left(-2\sqrt{z}\,c+p-i\,b\,(m-2u)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((p-i\,b\,(m-2u))\left(-2\sqrt{z}\,c+p-i\,b\,(m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(-2\sqrt{z}\,c+p-i\,b\,(m-2u)\right)^2}{4c}\right)-\right.$$

$$\left.2c\sqrt{\frac{\left(-2\sqrt{z}\,c+p-i\,b\,(m-2u)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(-2\sqrt{z}\,c+p-i\,b\,(m-2u)\right)^2}{4c}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p+b\,i\,(m-2u))^{-h-k+2n}\left(2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)^{h+k}$$

$$\left(-\frac{\left(2\sqrt{z}\,c+p+b\,i\,(m-2u)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((p+b\,i\,(m-2\,u))\left(2\sqrt{z}\;c+p+b\,i\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\sqrt{z}\;c+p+b\,i\,(m-2\,u)\right)^2}{4\,c}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(2\sqrt{z}\;c+p+b\,i\,(m-2\,u)\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\sqrt{z}\;c+p+b\,i\,(m-2\,u)\right)^2}{4\,c}\right)\right)+$$

$$e^{\frac{i\,b\,p\,(m-2\,u)}{c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p-i\,b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)+i\left(2\sqrt{z}\;c+p\right)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\sqrt{z}\;c+p-i\,b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left((p-i\,b\,(m-2\,u))\left(2\sqrt{z}\;c+p-i\,b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\sqrt{z}\;c+p-i\,b\,(m-2\,u)\right)^2}{4\,c}\right)+\right.$$

$$\left.\left.2\sqrt{\frac{\left(b\,(m-2\,u)+i\left(2\sqrt{z}\;c+p\right)\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\sqrt{z}\;c+p-i\,b\,(m-2\,u)\right)^2}{4\,c}\right)\right)\right)-$$

$$e^{\frac{p^2}{2\,c}}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p-2\,c\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p-2\,c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)-2\,c\sqrt{\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)\right)-$$

$$\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(2\sqrt{z}\;c+p\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;c+p\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(2\sqrt{z}\;c+p\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\sqrt{z}\;c+p\right)^2}{4\,c}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\;c+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\sqrt{z}\;c+p\right)^2}{4\,c}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\, e^{p\, z^r} \cos^m(b\, z) \cosh(c\, z)$

01.20.21.1436.01

$$\int z^n\, e^{p\, z^2} \cos^m(b\, z) \cosh(c\, z)\, dz ==$$

$$2^{-m-2}\, p^{-n-1} \left(e^{-\frac{c^2}{4\, p}} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \left(\sum_{q=0}^{n} 2^{q-n}\, (-c)^{n-q}\, (c + 2\, p\, z)^{q+1} \left(-\frac{(c+2\, p\, z)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2\, p\, z)^2}{4\, p} \right) + \right.\right.$$

$$\left.\left. \sum_{q=0}^{n} 2^{q-n}\, c^{n-q} \left(-\frac{(c-2\, p\, z)^2}{p} \right)^{\frac{1}{2}(-q-1)} (2\, p\, z - c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2\, p\, z)^2}{4\, p} \right) \right) -$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{\frac{b^2\, (m-2k)^2 - c^2}{2\, p}} \binom{m}{k} \left(e^{\frac{(c+2\, i\, b\, k - i\, b\, m)^2}{4\, p}} \sum_{q=0}^{n} \left(i\, b \left(k - \frac{m}{2} \right) - \frac{c}{2} \right)^{n-q} (c - 2\, i\, b\, k + i\, b\, m + 2\, p\, z)^{q+1} \right.$$

$$\left(-\frac{(c - 2\, i\, b\, k + i\, b\, m + 2\, p\, z)^2}{p} \right)^{-\frac{q}{2} - \frac{1}{2}} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c - 2\, i\, b\, k + i\, b\, m + 2\, p\, z)^2}{4\, p} \right) +$$

$$e^{\frac{(c - 2\, i\, b\, k + i\, b\, m)^2}{4\, p}} \sum_{q=0}^{n} \left(-\frac{c}{2} - i\, b\, k + \frac{i\, b\, m}{2} \right)^{n-q} (c + 2\, i\, b\, k - i\, b\, m + 2\, p\, z)^{q+1}$$

$$\left(-\frac{(c + 2\, i\, b\, k - i\, b\, m + 2\, p\, z)^2}{p} \right)^{-\frac{q}{2} - \frac{1}{2}} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c + 2\, i\, b\, k - i\, b\, m + 2\, p\, z)^2}{4\, p} \right) +$$

$$e^{\frac{(c - 2\, i\, b\, k + i\, b\, m)^2}{4\, p}} \sum_{q=0}^{n} 2^{q-n}\, (c + b\, i\, (2\, k - m))^{n-q} \left(-\frac{(c + 2\, i\, b\, k - i\, b\, m - 2\, p\, z)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$(-c - 2\, i\, b\, k + i\, b\, m + 2\, p\, z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c + 2\, i\, b\, k - i\, b\, m - 2\, p\, z)^2}{4\, p} \right) +$$

$$e^{\frac{(c + 2\, i\, b\, k - i\, b\, m)^2}{4\, p}} \sum_{q=0}^{n} 2^{q-n}\, (c + b\, i\, (m - 2\, k))^{n-q} \left(-\frac{(c + b\, i\, (m - 2\, k) - 2\, p\, z)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left. (-c + 2\, i\, b\, k - i\, b\, m + 2\, p\, z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c + b\, i\, (m - 2\, k) - 2\, p\, z)^2}{4\, p} \right) \right) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge n \in \mathbb{N}$$

01.20.21.1437.01

$$\int z^n\, e^{p\, \sqrt{z}} \cos^m(b\, z) \cosh(c\, z)\, dz == 2^{-m-2\, n-2}\, c^{-2\, (n+1)}\, e^{-\frac{p^2}{4\, c}}$$

$$\left(e^{\frac{p^2}{4\, c}}\, c^{2\, (n+1)} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{u} \left(e^{\frac{p^2}{4\, c - 4\, i\, b\, (m-2\, u)}}\, (i\, b\, (m - 2\, u) - c)^{-2\, (n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, p^{-h-k+2\, n} \left(p - 2\, (c - i\, b\, (m - 2\, u))\, \sqrt{z} \right)^{h+k} \right. \right.$$

$$\left(\frac{\left(p-2\left(c-i\,b\,(m-2\,u)\right)\sqrt{z}\right)^2}{c-i\,b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p-2\left(c-i\,b\,(m-2\,u)\right)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(p-2\left(c-i\,b\,(m-2\,u)\right)\sqrt{z}\right)^2}{4\left(c-i\,b\,(m-2\,u)\right)}\right)-2\left(c-i\,b\,(m-2\,u)\right)\right.$$

$$\left.\sqrt{\frac{\left(p-2\left(c-i\,b\,(m-2\,u)\right)\sqrt{z}\right)^2}{c-i\,b\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(p-2\left(c-i\,b\,(m-2\,u)\right)\sqrt{z}\right)^2}{4\left(c-i\,b\,(m-2\,u)\right)}\right)\right)+$$

$$e^{\frac{p^2}{4c+4\,b\,i\,(m-2\,u)}}\left(-c-i\,b\,(m-2\,u)\right)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p-2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p-2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{c+b\,i\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p-2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(p-2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{4\left(c+b\,i\,(m-2\,u)\right)}\right)-2\left(c+b\,i\,(m-2\,u)\right)\right.$$

$$\left.\sqrt{\frac{\left(p-2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{c+b\,i\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(p-2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{4\left(c+b\,i\,(m-2\,u)\right)}\right)\right)+$$

$$e^{-\frac{p^2}{4c+4\,b\,i\,(m-2\,u)}}\left(c+b\,i\,(m-2\,u)\right)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{c+b\,i\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(p+2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{4\left(c+b\,i\,(m-2\,u)\right)}\right)+2\sqrt{-\frac{\left(p+2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{c+b\,i\,(m-2\,u)}}\right.$$

$$\left.\left(c+b\,i\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(p+2\left(c+b\,i\,(m-2\,u)\right)\sqrt{z}\right)^2}{4\left(c+b\,i\,(m-2\,u)\right)}\right)\right)+$$

$$e^{\frac{p^2}{-4c+4ibm-8ibu}}(c-ib(m-2u))^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p+2(c-ib(m-2u))\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p+2(c-ib(m-2u))\sqrt{z}\right)^2}{ib(m-2u)-c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2(c-ib(m-2u))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(p+2(c-ib(m-2u))\sqrt{z}\right)^2}{4ib(m-2u)-4c}\right)+2\sqrt{\frac{\left(p+2(c-ib(m-2u))\sqrt{z}\right)^2}{ib(m-2u)-c}}$$

$$\left.(c-ib(m-2u))\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(p+2(c-ib(m-2u))\sqrt{z}\right)^2}{4ib(m-2u)-4c}\right)\right)-$$

$$e^{\frac{p^2}{2c}}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p-2c\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p-2c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(p-2c\sqrt{z}\right)^2}{4c}\right)-2c\sqrt{\frac{\left(p-2c\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(p-2c\sqrt{z}\right)^2}{4c}\right)\right)-$$

$$\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(2\sqrt{z}\ c+p\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\ c+p\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(2\sqrt{z}\ c+p\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(2\sqrt{z}\ c+p\right)^2}{4c}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\ c+p\right)^2}{c}}\ c\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(2\sqrt{z}\ c+p\right)^2}{4c}\right)\right)/;\ m\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\, e^{p\,z}\cos^m\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1438.01

$$\int z^n e^{p z} \cos^m\left(b z^2\right) \cosh(c z)\, dz ==$$

$$2^{-m-2}\left(2\binom{m}{\frac{m}{2}}\left(E_{-n}((c-p) z)+E_{-n}(-(c+p) z)\right)(m \bmod 2-1) z^{n+1}+\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(i b (2 k-m))^{3/2}} e^{\frac{i (c+p)^2}{b (8 k-4 m)}}\right.$$

$$\binom{m}{k}\left(-i b e^{\frac{i c p}{b m-2 b k}}(2 k-m)\sum_{q=0}^{n} 2^{q-n}(i b (2 k-m))^{-n-\frac{1}{2}}(c-p)^{n-q}(-c+p+2 b i (2 k-m) z)^{q+1}\right.$$

$$\left(\frac{i (-c+p+2 b i (2 k-m) z)^2}{b (2 k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{i (-c+p+2 b i (2 k-m) z)^2}{b (8 k-4 m)}\right)+b i (m-2 k)$$

$$\sum_{q=0}^{n} 2^{q-n}(i b (2 k-m))^{-n-\frac{1}{2}}(-c-p)^{n-q}(c+p+2 b i (2 k-m) z)^{q+1}\left(\frac{i (c+p+2 b i (2 k-m) z)^2}{b (2 k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{i (c+p+2 b i (2 k-m) z)^2}{b (8 k-4 m)}\right)+e^{-\frac{i (c+p)^2}{b (4 k-2 m)}}\sqrt{i b (2 k-m)}\ \sqrt{i b (m-2 k)}$$

$$\left(e^{\frac{i c p}{2 b k-b m}}\sum_{q=0}^{n} 2^{q-n}(i b (m-2 k))^{-n-\frac{1}{2}}(c-p)^{n-q}\left(\frac{i (c-p+2 b i (2 k-m) z)^2}{b (m-2 k)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(-c+p-4 i b k z+2 i b m z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(-c+p-4 i b k z+2 i b m z)^2}{8 i b k-4 i b m}\right)+$$

$$\sum_{q=0}^{n} 2^{q-n}(i b (m-2 k))^{-n-\frac{1}{2}}(-c-p)^{n-q}(c+p+2 b i (m-2 k) z)^{q+1}\left(\frac{i (c+p+2 b i (m-2 k) z)^2}{b (m-2 k)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(c+p-4 i b k z+2 i b m z)^2}{8 i b k-4 i b m}\right)\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1439.01

$$\int z^n e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$2^{-m-2}\left(2\binom{m}{\frac{m}{2}}\left(\Gamma(n+1, -(c+p) z)(-c-p)^{-n-1}+(c-p)^{-n-1}\Gamma(n+1, (c-p) z)\right)(m \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{u}\left(e^{\frac{b^2 (m-2 u)^2}{4 (p-c)}}(p-c)^{-2 (n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k (i b (m-2 u))^{-h-k+2 n}\right.$$

$$\left(\frac{\left(2\,i\,\sqrt{z}\,\,(c-p)+b\,(m-2\,u)\right)^2}{p-c}\right)^{\frac{1}{2}(-h-k-1)}\left(2\,\sqrt{z}\,\,(p-c)+b\,i\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,i\,(m-2\,u)\left(2\,\sqrt{z}\,\,(p-c)+b\,i\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,i\,\sqrt{z}\,\,(c-p)+b\,(m-2\,u)\right)^2}{4\,(p-c)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(2\,i\,\sqrt{z}\,\,(c-p)+b\,(m-2\,u)\right)^2}{p-c}}\,\,(p-c)\,\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,i\,\sqrt{z}\,\,(c-p)+b\,(m-2\,u)\right)^2}{4\,(p-c)}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,u)^2}{4\,(p-c)}}\,(p-c)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(2\,i\,\sqrt{z}\,\,(p-c)+b\,(m-2\,u)\right)^2}{p-c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(p-c)\,\sqrt{z}\,\,-i\,b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(2\,(p-c)\sqrt{\frac{\left(2\,i\,\sqrt{z}\,\,(p-c)+b\,(m-2\,u)\right)^2}{p-c}}\,\,\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,i\,\sqrt{z}\,\,(p-c)+b\,(m-2\,u)\right)^2}{4\,(p-c)}\right)-\right.$$

$$\left.i\,b\,(m-2\,u)\left(2\,(p-c)\,\sqrt{z}\,\,-i\,b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,i\,\sqrt{z}\,\,(p-c)+b\,(m-2\,u)\right)^2}{4\,(p-c)}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,u)^2}{4\,(c+p)}}\,(c+p)^{-2\,(n+1)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(2\,i\,\sqrt{z}\,\,(c+p)+b\,(m-2\,u)\right)^2}{c+p}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2\,(c+p)\,\sqrt{z}\,\,-i\,b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(2\,(c+p)\sqrt{\frac{\left(2\,i\,\sqrt{z}\,\,(c+p)+b\,(m-2\,u)\right)^2}{c+p}}\,\,\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,i\,\sqrt{z}\,\,(c+p)+b\,(m-2\,u)\right)^2}{4\,(c+p)}\right)-\right.$$

$$\left.\left.i\,b\,(m-2\,u)\left(2\,(c+p)\,\sqrt{z}\,\,-i\,b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,i\,\sqrt{z}\,\,(c+p)+b\,(m-2\,u)\right)^2}{4\,(c+p)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(i\,b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)-2\,i\,(c+p)\,\sqrt{z}\right)^{2}}{c+p}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,\sqrt{z}\;(c+p)+b\,i\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,i\,(m-2\,u)\left(2\,\sqrt{z}\;(c+p)+b\,i\,(m-2\,u)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b\,(m-2\,u)-2\,i\,(c+p)\,\sqrt{z}\right)^{2}}{4\,(c+p)}\right)+2\,\sqrt{\frac{\left(b\,(m-2\,u)-2\,i\,(c+p)\,\sqrt{z}\right)^{2}}{c+p}}$$

$$\left.\left.(c+p)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b\,(m-2\,u)-2\,i\,(c+p)\,\sqrt{z}\right)^{2}}{4\,(c+p)}\right)\right)\right)\Bigg)\Bigg)\Bigg

01.20.21.1440.01

$$\int z^n e^{p z} \cos^m(b z) \cosh\left(c z^2\right) dz ==$$

$$2^{-m-2} c^{-n-1} \left(e^{-\frac{p^2}{4c}} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \left(\sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p + 2 c z)^{q+1} \left(-\frac{(p+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2cz)^2}{4c} \right) - \right. \right.$$

$$(-1)^n e^{\frac{p^2}{2c}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p - 2 c z)^{q+1} \left(\frac{(p-2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cz)^2}{4c} \right) \Bigg) -$$

$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{\frac{(p+b i (m-2s))^2}{4c}} \binom{m}{s} \left(-(-1)^n \sum_{q=0}^{n} 2^{q-n} (-p - i b (m-2s))^{n-q} (p + b i (m-2s) - 2 c z)^{q+1} \right.$$

$$\left(\frac{(p+b i (m-2s) - 2 c z)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+b i (m-2s) - 2 c z)^2}{4c} \right) - (-1)^n e^{-\frac{i b p (m-2s)}{c}}$$

$$\sum_{q=0}^{n} 2^{q-n} (i b (m-2s) - p)^{n-q} (p - i b (m-2s) - 2 c z)^{q+1} \left(\frac{(p - i b (m-2s) - 2 c z)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \right.$$

$$\left. \frac{(p - i b (m-2s) - 2 c z)^2}{4c} \right) + e^{-\frac{(p+b i (m-2s))^2}{2c}} \sum_{q=0}^{n} 2^{q-n} (-p - i b (m-2s))^{n-q} (p + b i (m-2s) + 2 c z)^{q+1}$$

$$\left(-\frac{(p+b i (m-2s) + 2 c z)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+b i (m-2s) + 2 c z)^2}{4c} \right) +$$

$$e^{\frac{b^2 (m-2s)^2 - p^2}{2c}} \sum_{q=0}^{n} 2^{q-n} (i b (m-2s) - p)^{n-q} (p - i b (m-2s) + 2 c z)^{q+1} \left(\frac{(b (m-2s) + i (p + 2 c z))^2}{c} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p - i b (m-2s) + 2 c z)^2}{4c} \right) \right) \right) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1441.01

$$\int z^n e^{p z} \cos^m(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2} \left(4^{-n} e^{-\frac{c^2}{4p}} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k c^{-h-k+2n} \left(\frac{\left(i c + 2 i p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-k-1)} \right. \right.$$

$$\left. \left(c + 2 p \sqrt{z} \right)^{h+k} \binom{k}{h} \binom{n}{k} \left(i c \left(i c + 2 i p \sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(i c + 2 i p \sqrt{z}\right)^2}{4p} \right) - \right. \right.$$

$$2\,p\sqrt{\frac{\left(i\,c+2\,i\,p\,\sqrt{z}\right)^2}{p}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(i\,c+2\,i\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(\frac{\left(i\,c-2\,i\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\left(2\,p\,\sqrt{z}-c\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(i\,c\left(i\,c-2\,i\,p\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(i\,c-2\,i\,p\,\sqrt{z}\right)^2}{4\,p}\right)-2\,p\sqrt{\frac{\left(i\,c-2\,i\,p\,\sqrt{z}\right)^2}{p}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(i\,c-2\,i\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)\Bigg)$$

$$p^{-2(n+1)}+4^{-n}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{-\frac{c^2}{4(i\,b\,m+p-2\,i\,b\,s)}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,(i\,b\,m+p-2\,i\,b\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(i\,c+2\,(-b\,m+i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{i\,b\,m+p-2\,i\,b\,s}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(2\,(i\,b\,m+p-2\,i\,b\,s)$$

$$\sqrt{\frac{\left(i\,c+2\,(-b\,m+i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{i\,b\,m+p-2\,i\,b\,s}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(i\,c+2\,(-b\,m+i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}\right)-$$

$$i\,c\left(i\,c+2\,(-b\,m+i\,p+2\,b\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(i\,c+2\,(-b\,m+i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(\frac{\left(i\,c+2\,(b\,m-i\,p-2\,b\,s)\,\sqrt{z}\right)^2}{i\,b\,m+p-2\,i\,b\,s}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(i\,b\,m+p-2\,i\,b\,s)\,\sqrt{z}-c\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(2\,(i\,b\,m+p-2\,i\,b\,s)$$

$$\sqrt{\frac{\left(i\,c+2\,(b\,m-i\,p-2\,b\,s)\,\sqrt{z}\right)^2}{i\,b\,m+p-2\,i\,b\,s}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(i\,c+2\,(b\,m-i\,p-2\,b\,s)\,\sqrt{z}\right)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}\right)-$$

$$c\left(2\,(i\,b\,m+p-2\,i\,b\,s)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(i\,c+2\,(b\,m-i\,p-2\,b\,s)\,\sqrt{z}\right)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}\right)\Bigg)\Bigg)$$

$$(i\,b\,m+p-2\,i\,b\,s)^{-2\,(n+1)}+e^{-\frac{c^2}{4\,(p+b\,i\,(2\,s-m))}}\,(p+b\,i\,(2\,s-m))^{-2\,(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(\frac{\left(i\,c+2\,(-b\,m-i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{p+b\,i\,(2\,s-m)}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\left(2\,(p+b\,i\,(2\,s-m))\,\sqrt{z}\,-c\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(2\,(p+b\,i\,(2\,s-m))$$

$$\sqrt{\frac{\left(i\,c+2\,(-b\,m-i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{p+b\,i\,(2\,s-m)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(i\,c+2\,(-b\,m-i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)-$$

$$c\left(2\,(p+b\,i\,(2\,s-m))\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(i\,c+2\,(-b\,m-i\,p+2\,b\,s)\,\sqrt{z}\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(p+b\,i\,(2\,s-m))}}\,(p+b\,i\,(2\,s-m))^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(i\,c+2\,(i\,p+b\,(m-2\,s))\,\sqrt{z}\right)^2}{p+b\,i\,(2\,s-m)}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\left(c+2\,(p+b\,i\,(2\,s-m))\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(c\left(c+2\,(p+b\,i\,(2\,s-m))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(i\,c+2\,(i\,p+b\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)+2\sqrt{\frac{\left(i\,c+2\,(i\,p+b\,(m-2\,s))\,\sqrt{z}\right)^2}{p+b\,i\,(2\,s-m)}}$$

$$(p+b\,i\,(2\,s-m))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(i\,c+2\,(i\,p+b\,(m-2\,s))\,\sqrt{z}\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\,m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\cos^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1442.01

$$\int z^n e^{p z^2} \cos^m(b z) \cosh\left(c z^2\right) dz ==$$

$$2^{-m-2}\left(z^{n+1}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2}, (c-p) z^2\right)\left((c-p) z^2\right)^{\frac{1}{2}(-n-1)} + \left(-(c+p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -(c+p) z^2\right)\right)(m \bmod 2 - 1) -\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \frac{1}{\sqrt{p-c}\sqrt{c+p}}\left(\binom{m}{s}\left(e^{\frac{b^2(m-2s)^2}{4(p-c)}}\sqrt{c+p}\sum_{q=0}^{n}(p-c)^{-n-\frac{1}{2}}\left(i b\left(s-\frac{m}{2}\right)\right)^{n-q}\left(\frac{\left(b(m-2s)+2 i (c-p) z\right)^2}{p-c}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left(b i (m-2s)+2(p-c) z\right)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{\left(b(m-2s)+2 i (c-p) z\right)^2}{4(p-c)}\right) +$$

$$e^{\frac{b^2(m-2s)^2}{4(p-c)}}\sqrt{c+p}\sum_{q=0}^{n} 2^{q-n}(p-c)^{-n-\frac{1}{2}}(i b(m-2s))^{n-q}\left(\frac{\left(b(m-2s)+2 i (p-c) z\right)^2}{p-c}\right)^{\frac{1}{2}(-q-1)}$$

$$(2(p-c) z - i b(m-2s))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{\left(b(m-2s)+2 i (p-c) z\right)^2}{4(p-c)}\right) +$$

$$e^{\frac{b^2(m-2s)^2}{4(c+p)}}\sqrt{p-c}\left(\sum_{q=0}^{n} 2^{q-n}(c+p)^{-n-\frac{1}{2}}(i b(m-2s))^{n-q}\left(\frac{\left(b(m-2s)+2 i (c+p) z\right)^2}{c+p}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(2(c+p) z - i b(m-2s))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{\left(b(m-2s)+2 i (c+p) z\right)^2}{4(c+p)}\right) +$$

$$\left.\left.\sum_{q=0}^{n}(c+p)^{-n-\frac{1}{2}}\left(i b\left(s-\frac{m}{2}\right)\right)^{n-q}\left(\frac{\left(b(m-2s)-2 i (c+p) z\right)^2}{c+p}\right)^{\frac{1}{2}(-q-1)}\left(b i (m-2s)+2(c+p) z\right)^{q+1}\right.\right.$$

$$\left.\left.\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{\left(b(m-2s)-2 i (c+p) z\right)^2}{4(c+p)}\right)\right)\right)\right)\Big/; m \in \mathbb{Z} \wedge m > 0 \wedge n \in \mathbb{N}$$

01.20.21.1443.01

$$\int z^n e^{p\sqrt{z}} \cos^m(b z) \cosh\left(c\sqrt{z}\right) dz == 2^{-m-2n-2}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(i b(m-2s))^{-2n-2}$$

$$\left(e^{\frac{i(p-c)^2}{4b(m-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(p-c)^{-h-j+2n}\left(-c+p+2 b i (m-2s)\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c+p+2 b i (m-2s)\sqrt{z}\right)^2}{b(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\left.\binom{j}{h}\binom{n}{j}\left((p-c)\left(-c+p+2 b i (m-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(-c+p+2 b i (m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right) + 2 b i\right.\right.$$

$$(m-2s)\sqrt{\frac{i\left(-c+p+2bi(m-2s)\sqrt{z}\right)^2}{b(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{i\left(-c+p+2bi(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right)\Bigg)+$$

$$e^{\frac{i(c+p)^2}{4b(m-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c+p)^{-h-j+2n}\left(c+p+2bi(m-2s)\sqrt{z}\right)^{h+j}\left(\frac{i\left(c+p+2bi(m-2s)\sqrt{z}\right)^2}{b(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((c+p)\left(c+p+2bi(m-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;\frac{i\left(c+p+2bi(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right)+$$

$$2bi(m-2s)\sqrt{\frac{i\left(c+p+2bi(m-2s)\sqrt{z}\right)^2}{b(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{i\left(c+p+2bi(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right)\Bigg)+$$

$$e^{-\frac{i(p-c)^2}{4b(m-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(p-c)^{-h-j+2n}\left(-c+p-2ib(m-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c+p-2ib(m-2s)\sqrt{z}\right)^2}{b(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((p-c)\left(-c+p-2ib(m-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{i\left(-c+p-2ib(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right)-2ib(m-2s)$$

$$\sqrt{-\frac{i\left(-c+p-2ib(m-2s)\sqrt{z}\right)^2}{b(m-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{i\left(-c+p-2ib(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right)\Bigg)+$$

$$e^{-\frac{i(c+p)^2}{4b(m-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c+p)^{-h-j+2n}\left(c+p-2ib(m-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c+p-2ib(m-2s)\sqrt{z}\right)^2}{b(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c+p)\left(c+p-2ib(m-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{i\left(c+p-2ib(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right)-2ib(m-2s)$$

$$\sqrt{-\frac{i\left(c+p-2\,i\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(c+p-2\,i\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)\Bigg)\Bigg)-$$

$$2^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,(c-p)\,\sqrt{z}\right)(c-p)^{-2\,(n+1)}+(c+p)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-c-p)\,\sqrt{z}\right)\right)$$

$$(1-\\ m \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\,e^{p\,z}\cos^m\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1444.01

$$\int z^n e^{p z} \cos^m\left(b z^2\right) \cosh\left(c z^2\right) dz == 2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}$$

$$\left(-\frac{1}{\sqrt{-c+2 i b k-i b m}} \left(e^{\frac{p^2}{4 c-8 i b k+4 i b m}} \sum_{q=0}^{n} 2^{q-n} (-c+2 i b k-i b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 (-c+2 i b k-i b m) z)^{q+1} \right.\right.$$

$$\left. \left(-\frac{(p+2 (-c+2 i b k-i b m) z)^2}{-c+2 i b k-i b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 (-c+2 i b k-i b m) z)^2}{-4 c+8 i b k-4 i b m} \right) \right) -$$

$$\frac{1}{\sqrt{-c-2 i b k+i b m}} \left(e^{\frac{p^2}{4 c+8 i b k-4 i b m}} \sum_{q=0}^{n} 2^{q-n} (-c-2 i b k+i b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 (-c-2 i b k+i b m) z)^{q+1} \right.$$

$$\left. \left(\frac{(p+2 (-c-2 i b k+i b m) z)^2}{c+2 i b k-i b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2 (-c-2 i b k+i b m) z)^2}{4 c+8 i b k-4 i b m} \right) \right) -$$

$$\frac{1}{\sqrt{c-2 i b k+i b m}} \left(e^{\frac{p^2}{-4 c+8 i b k-4 i b m}} \sum_{q=0}^{n} 2^{q-n} (c-2 i b k+i b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 (c-2 i b k+i b m) z)^{q+1} \right.$$

$$\left. \left(-\frac{(p+2 (c-2 i b k+i b m) z)^2}{c-2 i b k+i b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2 (c-2 i b k+i b m) z)^2}{-4 c+8 i b k-4 i b m} \right) \right) -$$

$$\frac{1}{\sqrt{c+2 i b k-i b m}} \left(e^{\frac{p^2}{-4 c-8 i b k+4 i b m}} \sum_{q=0}^{n} 2^{q-n} (c+2 i b k-i b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 (c+2 i b k-i b m) z)^{q+1} \right.$$

$$\left. \left. \left(-\frac{(p+2 (c+2 i b k-i b m) z)^2}{c+2 i b k-i b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 (c+2 i b k-i b m) z)^2}{4 c+8 i b k-4 i b m} \right) \right) \right) - 2^{-m-2} \binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2) \left(\frac{1}{\sqrt{-c}} \left(e^{\frac{p^2}{4 c}} \sum_{q=0}^{n} 2^{q-n} (-c)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2 c z)^{q+1} \left(\frac{(p-2 c z)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2 c z)^2}{4 c} \right) \right) + \right.$$

$$\frac{1}{\sqrt{c}}$$

$$\left. \left(e^{-\frac{p^2}{4 c}} \sum_{q=0}^{n} 2^{q-n} c^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 c z)^{q+1} \left(-\frac{(p+2 c z)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 c z)^2}{4 c} \right) \right) \right) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1445.01

$$\int z^n e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz == 2^{-m-2n-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(e^{-\frac{c^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c)^{-h-i+2n} \left(2 p \sqrt{z} - c\right)^{h+i} \left(-\frac{\left(2 p \sqrt{z} - c\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left(2 p \sqrt{-\frac{\left(2 p \sqrt{z} - c\right)^2}{p}} \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4 p}\right) - c \left(2 p \sqrt{z} - c\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4 p}\right) \right) +$$

$$e^{-\frac{c^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i c^{-h-i+2n} \left(c + 2 p \sqrt{z}\right)^{h+i} \left(-\frac{\left(c + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left(c \left(c + 2 p \sqrt{z}\right) \right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(c + 2 p \sqrt{z}\right)^2}{4 p}\right) + 2 \sqrt{-\frac{\left(c + 2 p \sqrt{z}\right)^2}{p}}\ p \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(c + 2 p \sqrt{z}\right)^2}{4 p}\right) \right) \right)$$

$$p^{-2(n+1)} + 2^{-m-2n-2} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \right) \left(e^{-\frac{(i b (m-2s)-c)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (i b (m-2 s) - c)^{-h-i+2n} \right.$$

$$\left(-c + b i (m-2 s) + 2 p \sqrt{z} \right)^{h+i} \left(-\frac{\left(-c + b i (m-2 s) + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i}$$

$$\left((i b (m-2 s) - c) \left(-c + b i (m-2 s) + 2 p \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-c + b i (m-2 s) + 2 p \sqrt{z}\right)^2}{4 p}\right) + 2 \right.$$

$$\left. \left. \sqrt{-\frac{\left(-c + b i (m-2 s) + 2 p \sqrt{z}\right)^2}{p}}\ p \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(-c + b i (m-2 s) + 2 p \sqrt{z}\right)^2}{4 p}\right) \right) \right) +$$

$$e^{-\frac{(c+b i (m-2 s))^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (c + b i (m-2 s))^{-h-i+2n} \left(c + b i (m-2 s) + 2 p \sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(c+b\,i\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((c+b\,i\,(m-2\,s))\left(c+b\,i\,(m-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(c+b\,i\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(c+b\,i\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(c+b\,i\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(-c-i\,b\,(m-2\,s))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c-i\,b\,(m-2\,s))^{-h-i+2\,n}\left(-c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-c-i\,b\,(m-2\,s))\left(-c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(-c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(-c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(-c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(c-i\,b\,(m-2\,s))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c-i\,b\,(m-2\,s))^{-h-i+2\,n}\left(c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((c-i\,b\,(m-2\,s))\left(c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.\left.p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(c-i\,b\,(m-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right)p^{-2\,(n+1)}\;/;\;m\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\, z^r} \cos^m(b\, z^r) \cosh(c\, z^r)$

01.20.21.1446.01

$$\int z^{\alpha-1}\, e^{p\, z^r} \cos^m(b\, z^r) \cosh(c\, z^r)\, dz ==$$

$$-\frac{2^{-m-1}\, z^{\alpha}}{r}\left(\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{\alpha}{r}, (-c-p)\, z^r\right)((-c-p)\, z^r)^{-\frac{\alpha}{r}} + ((c-p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (c-p)\, z^r\right)\right)(1-m \bmod 2) + \right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r}, (-c-2\, i\, b\, k+i\, b\, m-p)\, z^r\right)((-c-2\, i\, b\, k+i\, b\, m-p)\, z^r)^{-\frac{\alpha}{r}} + ((c-2\, i\, b\, k+i\, b\, m-p)\, z^r)^{-\frac{\alpha}{r}}\right.$$

$$\Gamma\left(\frac{\alpha}{r}, (c-2\, i\, b\, k+i\, b\, m-p)\, z^r\right) + ((-c+2\, i\, b\, k-i\, b\, m-p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-c+2\, i\, b\, k-i\, b\, m-p)\, z^r\right) +$$

$$\left.\left.((c+2\, i\, b\, k-i\, b\, m-p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (c+2\, i\, b\, k-i\, b\, m-p)\, z^r\right)\right)\right) /;\ m \in \mathbb{N}^+$$

01.20.21.1447.01

$$\int z^n\, e^{p\, z^2} \cos^m\left(b\, z^2\right) \cosh\left(c\, z^2\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2}, (-c-p)\, z^2\right)\left((-c-p)\, z^2\right)^{\frac{1}{2}(-n-1)} + \left((c-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c-p)\, z^2\right)\right)(1-m \bmod 2)\, z^{n+1} -$$

$$2^{-m-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\Gamma\left(\frac{n+1}{2}, (-c-p+b\, i\, (m-2\, s))\, z^2\right)\left((-c-p+b\, i\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)} + \left((c-p+b\, i\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)}\right.\right.$$

$$\Gamma\left(\frac{n+1}{2}, (c-p+b\, i\, (m-2\, s))\, z^2\right) + \left((-c-p-i\, b\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-c-p-i\, b\, (m-2\, s))\, z^2\right) +$$

$$\left.\left.\left((c-p-i\, b\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c-p-i\, b\, (m-2\, s))\, z^2\right)\right)\right) z^{n+1}\ /;\ m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1448.01

$$\int z^n\, e^{p\, \sqrt{z}} \cos^m\left(b\, \sqrt{z}\right) \cosh\left(c\, \sqrt{z}\right) dz ==$$

$$-2^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1), (-c-p)\, \sqrt{z}\right)(-c-p)^{-2\,(n+1)} + (c-p)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (c-p)\, \sqrt{z}\right)\right)(1-m \bmod 2) -$$

$$2^{-m}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\Gamma\left(2\,(n+1), (-c-p+b\, i\, (m-2\, s))\, \sqrt{z}\right)(-c-p+b\, i\, (m-2\, s))^{-2\,(n+1)} + \right.$$

$$(c-p+b\, i\, (m-2\, s))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (c-p+b\, i\, (m-2\, s))\, \sqrt{z}\right) +$$

$$(-c-p-i\, b\, (m-2\, s))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (-c-p-i\, b\, (m-2\, s))\, \sqrt{z}\right) +$$

$$\left.(c-p-i\, b\, (m-2\, s))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (c-p-i\, b\, (m-2\, s))\, \sqrt{z}\right)\right) /;\ m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{b\, z^r+e} \cos^m(a\, z^r+q) \cosh(c\, z^r+g)$

01.20.21.1449.01

$$\int z^{\alpha-1}\, e^{b\, z^r+e} \cos^m(a\, z^r+q) \cosh(c\, z^r+g)\, dz ==$$

$$-\frac{2^{-m-1}\, z^{\alpha}}{r}\left(\binom{m}{\frac{m}{2}}\left(e^{e+g}\, \Gamma\left(\frac{\alpha}{r}, (-b-c)\, z^r\right)((-b-c)\, z^r)^{-\frac{\alpha}{r}} + e^{e-g}\, ((c-b)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (c-b)\, z^r\right)\right)(1-m \bmod 2) + \right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e+g+2\, i\, k\, q-i\, m\, q}\, \Gamma\left(\frac{\alpha}{r}, (-b-c-2\, i\, a\, k+i\, a\, m)\, z^r\right)((-b-c-2\, i\, a\, k+i\, a\, m)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$e^{e-g+2\, i\, k\, q-i\, m\, q}\, ((-b+c-2\, i\, a\, k+i\, a\, m)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+c-2\, i\, a\, k+i\, a\, m)\, z^r\right) +$$

$$e^{e+g-2\, i\, k\, q+i\, m\, q}\, ((-b-c+2\, i\, a\, k-i\, a\, m)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-c+2\, i\, a\, k-i\, a\, m)\, z^r\right) +$$

$$\left.\left.e^{e-g-2\, i\, k\, q+i\, m\, q}\, ((-b+c+2\, i\, a\, k-i\, a\, m)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+c+2\, i\, a\, k-i\, a\, m)\, z^r\right)\right)\right) /;\ m \in \mathbb{N}^+$$

01.20.21.4942.01

$$\int z^n\, e^{b\, z^2+e} \cos^m\left(a\, z^2+q\right) \cosh\left(c\, z^2+g\right) dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}\left(e^{e+g}\, \Gamma\left(\frac{n+1}{2}, (-b-c)\, z^2\right)\left((-b-c)\, z^2\right)^{\frac{1}{2}(-n-1)} + e^{e-g}\left((c-b)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c-b)\, z^2\right)\right)(1-m \bmod 2)$$

$$z^{n+1} - 2^{-m-2}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{e+g-i\, q\, (m-2\, s)}\, \Gamma\left(\frac{n+1}{2}, (-b-c+a\, i\, (m-2\, s))\, z^2\right)\left((-b-c+a\, i\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)} + \right.\right.$$

$$e^{e-g-i\, q\, (m-2\, s)}\left((-b+c+a\, i\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-b+c+a\, i\, (m-2\, s))\, z^2\right) +$$

$$e^{e+g+i\, q\, (m-2\, s)}\left((-b-c-i\, a\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-b-c-i\, a\, (m-2\, s))\, z^2\right) +$$

$$\left.\left.e^{e-g+i\, q\, (m-2\, s)}\left((-b+c-i\, a\, (m-2\, s))\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-b+c-i\, a\, (m-2\, s))\, z^2\right)\right)\right) z^{n+1} /;\ m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1450.01

$$\int z^n e^{\sqrt{z}\ b+e} \cos^m\left(\sqrt{z}\ a+q\right) \cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$-2^{-m}\binom{m}{\frac{m}{2}}\left(e^{e+g}\,\Gamma\left(2\,(n+1),\,(-b-c)\,\sqrt{z}\right)(-b-c)^{-2\,(n+1)}+(c-b)^{-2\,(n+1)}\,e^{e-g}\,\Gamma\left(2\,(n+1),\,(c-b)\,\sqrt{z}\right)\right)(1-m \bmod 2)-$$

$$2^{-m}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{e+g-i\,q\,(m-2\,s)}\,\Gamma\left(2\,(n+1),\,(-b-c+a\,i\,(m-2\,s))\,\sqrt{z}\right)(-b-c+a\,i\,(m-2\,s))^{-2\,(n+1)}+\right.$$

$$e^{e-g-i\,q\,(m-2\,s)}\,(-b+c+a\,i\,(m-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b+c+a\,i\,(m-2\,s))\,\sqrt{z}\right)+$$

$$e^{e+g+i\,q\,(m-2\,s)}\,(-b-c-i\,a\,(m-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b-c-i\,a\,(m-2\,s))\,\sqrt{z}\right)+$$

$$\left.e^{e-g+i\,q\,(m-2\,s)}\,(-b+c-i\,a\,(m-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b+c-i\,a\,(m-2\,s))\,\sqrt{z}\right)\right)/;\ m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cos^m\left(a\,z^r+p\,z+q\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1451.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cos^m\left(a\,z^2+p\,z+q\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left((b-c)^{-n-1}\,e^{-\frac{(d-f)^2}{4\,(b-c)}+e-g}\sum_{j=0}^{n}2^{j-n}\,(f-d)^{n-j}\,(d-f+2\,(b-c)\,z)^{j+1}\right.$$

$$\left(-\frac{(d-f+2\,(b-c)\,z)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d-f+2\,(b-c)\,z)^2}{4\,(b-c)}\right)+(b+c)^{-n-1}\,e^{-\frac{(d+f)^2}{4\,(b+c)}+e+g}$$

$$\left.\sum_{j=0}^{n}2^{j-n}\,(-d-f)^{n-j}\,(d+f+2\,(b+c)\,z)^{j+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f+2\,(b+c)\,z)^2}{4\,(b+c)}\right)\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(d-f+i\,(2\,k-m)\,p)^2}{4\,(b-c+a\,i\,(2\,k-m))}+e-g+i\,(2\,k-m)\,q}\,(b-c+a\,i\,(2\,k-m))^{-n-1}\right.$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d+f-i\,(2\,k-m)\,p)^{n-j}\,(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)^{j+1}$$

$$\left(-\frac{(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)^2}{b-c+a\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)^2}{4\,(b-c+a\,i\,(2\,k-m))}\right)+\right.$$

$$\left.e^{-\frac{(d+f+i\,(2\,k-m)\,p)^2}{4\,(b+c+a\,i\,(2\,k-m))}+e+g+i\,(2\,k-m)\,q}\,(b+c+a\,i\,(2\,k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f-i\,(2\,k-m)\,p)^{n-j}\,(d+f+i\,(2\,k-m)\right.$$

$$p+2\,(b+c+a\,i\,(2\,k-m))\,z)^{j+1}\left(-\frac{(d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z)^2}{b+c+a\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z)^2}{4\,(b+c+a\,i\,(2\,k-m))}\right)+e^{-\frac{(d-f+i\,(m-2\,k)\,p)^2}{4\,(b-c+a\,i\,(m-2\,k))}+e-g+i\,(m-2\,k)\,q}$$

$$(b-c+a\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d+f-i\,(m-2\,k)\,p)^{n-j}\,(d-f+i\,(m-2\,k)\,p+2$$

$$(b-c+a\,i\,(m-2\,k))\,z)^{j+1}\left(-\frac{(d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z)^2}{b-c+a\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z)^2}{4\,(b-c+a\,i\,(m-2\,k))}\right)+$$

$$e^{-\frac{(d+f+i\,(m-2\,k)\,p)^2}{4\,(b+c+a\,i\,(m-2\,k))}+e+g+i\,(m-2\,k)\,q}\,(b+c+a\,i\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f-i\,(m-2\,k)\,p)^{n-j}$$

$$(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)^2}{b+c+a\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)^2}{4\,(b+c+a\,i\,(m-2\,k))}\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1452.01

$$\int z^n\,e^{\sqrt{z}\,b+d\,z+e}\cos^m\left(\sqrt{z}\,a+p\,z+q\right)\cosh\left(\sqrt{z}\,c+f\,z+g\right)dz==2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\left(e^{-\frac{(b-c)^2}{4\,(d-f)}+e-g}\,(d-f)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c)^{-h-i+2\,n}\left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left((b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}\,(h+i+2),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)+e^{-\frac{(b+c)^2}{4\,(d+f)}+e+g}$$

$$\left.(d+f)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c)^{-h-i+2\,n}\left(b+c+2\,(d+f)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-i-1)}\right)$$

$$\binom{i}{h}\binom{n}{i}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)+$$

$$2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(b-c+a\,i\,(2k-m))^2}{4(d-f+i\,(2k-m)\,p)}+e-g+i\,(2k-m)\,q}\,(d-f+i\,(2k-m)\,p)^{-2n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c+a\,i\,(2k-m))^{-h-i+2n}\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b-c+a\,i\,(2k-m))\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+i+1),-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}\right)+$$

$$2(d-f+i\,(2k-m)\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}}\right)+\right.$$

$$e^{-\frac{(b+c+a\,i\,(2k-m))^2}{4(d+f+i\,(2k-m)\,p)}+e+g+i\,(2k-m)\,q}\,(d+f+i\,(2k-m)\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c+a\,i\,(2k-m))^{-h-i+2n}$$

$$\left(b+c+a\,i\,(2k-m)+2(d+f+i\,(2k-m)\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+a\,i\,(2k-m)+2(d+f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d+f+i\,(2k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+c+a\,i\,(2\,k-m))\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}\right)+2\,(d+f+i\,(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}\right)\sqrt{-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}}\right)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k))^2}{4\,(d-f+i\,(m-2\,k)\,p)}+e-g+i\,(m-2\,k)\,q}\,(d-f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c+a\,i\,(m-2\,k))^{-h-i+2\,n}$$

$$\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}\,(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b-c+a\,i\,(m-2\,k))\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)+2\,(d-f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\right)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k))^2}{4\,(d+f+i\,(m-2\,k)\,p)}+e+g+i\,(m-2\,k)\,q}\,(d+f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c+a\,i\,(m-2\,k))^{-h-i+2\,n}$$

$$\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+c+a\,i\,(m-2\,k))\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)+2\,(d+f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\right)\Big/;\ n\in\mathbb{N}\wedge m\in\mathbb{N}^+$$

Involving hyperbolic functions

Involving sinh

Involving $\sinh(c\,z)\cosh(a\,z)$

01.20.21.1453.01

$$\int \sinh(c\,z)\cosh(a\,z)\,dz == \frac{c\cosh(a\,z)\cosh(c\,z)-a\sinh(a\,z)\sinh(c\,z)}{c^2-a^2}$$

01.20.21.1454.01

$$\int \sinh(a\,z)\cosh(a\,z)\,dz == \frac{\cosh^2(a\,z)}{2\,a}$$

Involving $\sinh(c\,z+d)\cosh(a\,z)$

01.20.21.1455.01

$$\int \sinh(d+c\,z)\cosh(a\,z)\,dz == \frac{a\sinh(a\,z)\sinh(d+c\,z)-c\cosh(a\,z)\cosh(d+c\,z)}{a^2-c^2}$$

01.20.21.1456.01

$$\int \sinh(d+a\,z)\cosh(a\,z)\,dz == \frac{\cosh(d+2\,a\,z)+2\,a\,z\sinh(d)}{4\,a}$$

Involving $\sinh(c\,z)\cosh(a\,z+b)$

01.20.21.1457.01

$$\int \sinh(c\,z)\cosh(b+a\,z)\,dz == \frac{a\sinh(b+a\,z)\sinh(c\,z)-c\cosh(b+a\,z)\cosh(c\,z)}{a^2-c^2}$$

01.20.21.1458.01

$$\int \sinh(a\,z)\cosh(b+a\,z)\,dz == \frac{\cosh(b+2\,a\,z)-2\,a\,z\sinh(b)}{4\,a}$$

Involving $\sinh(c\,z+d)\cosh(a\,z+b)$

01.20.21.1459.01

$$\int \sinh(d+c\,z)\cosh(b+a\,z)\,dz == \frac{a\sinh(b+a\,z)\sinh(d+c\,z)-c\cosh(b+a\,z)\cosh(d+c\,z)}{a^2-c^2}$$

01.20.21.1460.01

$$\int \sinh(d+a\,z)\cosh(b+a\,z)\,dz == \frac{\cosh(b+d+2\,a\,z)-2\,a\,z\sinh(b-d)}{4\,a}$$

Involving $\sinh\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1461.01

$$\int \sinh\left(b\,z^2\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b}\;e^{\frac{c^2}{4b}}\operatorname{erfi}\left(\frac{-c-2\,b\,z}{2\sqrt{-b}}\right)}{b}+\frac{e^{\frac{c^2}{4b}}\left(\sqrt{-b}\;\operatorname{erfi}\left(\frac{c-2\,b\,z}{2\sqrt{-b}}\right)+\sqrt{b}\;e^{-\frac{c^2}{2b}}\operatorname{erfi}\left(\frac{2\,b\,z-c}{2\sqrt{b}}\right)\right)}{b}+\frac{e^{-\frac{c^2}{4b}}\operatorname{erfi}\left(\frac{c+2\,b\,z}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1462.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8\sqrt{-c}\;c^{3/2}}\left(e^{-\frac{b^2}{4c}}\left(-b\sqrt{c}\;e^{\frac{b^2}{2c}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2\,c\sqrt{z}-b}{2\sqrt{-c}}\right)-b\sqrt{c}\;e^{\frac{b^2}{2c}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{b+2\,c\sqrt{z}}{2\sqrt{-c}}\right)-b\sqrt{-c}\;\sqrt{\pi}\;\operatorname{erfi}\left(\frac{b+2\,c\sqrt{z}}{2\sqrt{c}}\right)+\right.\right.$$
$$\left.\left.b\sqrt{-c}\;\sqrt{\pi}\;\operatorname{erfi}\left(\frac{b-2\,c\sqrt{z}}{2\sqrt{c}}\right)+8\sqrt{-c^2}\;e^{\frac{b^2}{4c}}\sinh\left(b\sqrt{z}\right)\sinh(c\,z)\right)\right)$$

Involving $\sinh\left(b\,z^r+e\right)\cosh(c\,z)$

01.20.21.1463.01

$$\int \sinh\left(b\,z^2+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b}\;e^{\frac{c^2}{4b}-e}\operatorname{erfi}\left(\frac{-c-2\,b\,z}{2\sqrt{-b}}\right)}{b}+\frac{e^{\frac{c^2}{4b}-e}\left(\sqrt{-b}\;\operatorname{erfi}\left(\frac{c-2\,b\,z}{2\sqrt{-b}}\right)+\sqrt{b}\;e^{2\left(e-\frac{c^2}{4b}\right)}\operatorname{erfi}\left(\frac{2\,b\,z-c}{2\sqrt{b}}\right)\right)}{b}+\frac{e^{e-\frac{c^2}{4b}}\operatorname{erfi}\left(\frac{c+2\,b\,z}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1464.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\left(e^{e}\left(-\frac{4\,e^{-e}\cosh\left(\sqrt{z}\ b+e-c\,z\right)}{c}+\frac{b\,e^{\frac{b^2}{4c}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2c\sqrt{z}-b}{2\sqrt{-c}}\right)}{(-c)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4c}-2e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2c\sqrt{z}-b}{2\sqrt{c}}\right)}{c^{3/2}}\right)-\right.$$

$$\left.e^{-e}\left(-\frac{4\,e^{e}\cosh\left(\sqrt{z}\ b+e+c\,z\right)}{c}+\frac{b\,e^{2e-\frac{b^2}{4c}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2c\sqrt{z}}{2\sqrt{c}}\right)}{c^{3/2}}-\frac{b\,e^{\frac{b^2}{4c}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2c\sqrt{z}}{2\sqrt{-c}}\right)}{(-c)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh(c\,z)$

01.20.21.1465.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b}\ e^{\frac{(c+d)^2}{4b}}\operatorname{erfi}\left(\frac{-c-d-2b\,z}{2\sqrt{-b}}\right)}{b}+\frac{e^{\frac{(c-d)^2}{4b}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{c-d-2b\,z}{2\sqrt{-b}}\right)+\sqrt{b}\ e^{-\frac{(c-d)^2}{2b}}\operatorname{erfi}\left(\frac{-c+d+2b\,z}{2\sqrt{b}}\right)\right)}{b}+\frac{e^{-\frac{(c+d)^2}{4b}}\operatorname{erfi}\left(\frac{c+d+2b\,z}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1466.01

$$\int \sinh\left(\sqrt{z}\ b+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\left(\frac{4\cosh\left(\sqrt{z}\ b-c\,z+d\,z\right)}{d-c}+\frac{4\cosh\left(\sqrt{z}\ b+(c+d)\,z\right)}{c+d}+\frac{b\,e^{\frac{b^2}{4(c+d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(c+d)\sqrt{z}}{2\sqrt{-c-d}}\right)}{(-c-d)^{3/2}}+\frac{b\,e^{\frac{b^2}{4c-4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c-d)\sqrt{z}-b}{2\sqrt{d-c}}\right)}{(d-c)^{3/2}}-\right.$$

$$\left.\frac{b\,e^{\frac{b^2}{4d-4c}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c-d)\sqrt{z}-b}{2\sqrt{c-d}}\right)}{(c-d)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4(c+d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(c+d)\sqrt{z}}{2\sqrt{c+d}}\right)}{(c+d)^{3/2}}\right)$$

Involving $\sinh\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.1467.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh(c\,z)\,dz == \frac{1}{8}\sqrt{\pi}$$

$$\left(\frac{\sqrt{-b}\ e^{\frac{(c+d)^2}{4b}-e}\operatorname{erfi}\left(\frac{-c-d-2b\,z}{2\sqrt{-b}}\right)}{b}+\frac{e^{\frac{(c-d)^2}{4b}-e}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{c-d-2b\,z}{2\sqrt{-b}}\right)+\sqrt{b}\ e^{2\left(e-\frac{(c-d)^2}{4b}\right)}\operatorname{erfi}\left(\frac{-c+d+2b\,z}{2\sqrt{b}}\right)\right)}{b}+\frac{e^{e-\frac{(c+d)^2}{4b}}\operatorname{erfi}\left(\frac{c+d+2b\,z}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1468.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\left(e^{e}\left(\frac{4\,e^{-e}\cosh\left(\sqrt{z}\ b+e+(d-c)\,z\right)}{d-c}+\frac{b\,e^{-\frac{b^2}{4(d-c)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c-d)\sqrt{z}-b}{2\sqrt{d-c}}\right)}{(d-c)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4(c-d)}-2e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c-d)\sqrt{z}-b}{2\sqrt{c-d}}\right)}{(c-d)^{3/2}}\right)-\right.$$

$$\left.e^{-e}\left(-\frac{4\,e^{e}\cosh\left(\sqrt{z}\ b+e+(c+d)\,z\right)}{c+d}+\frac{b\,e^{2e-\frac{b^2}{4(c+d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(c+d)\sqrt{z}}{2\sqrt{c+d}}\right)}{(c+d)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4(-c-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(c+d)\sqrt{z}}{2\sqrt{-c-d}}\right)}{(-c-d)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^{r}\right)\cosh(f\,z+g)$

01.20.21.1469.01

$$\int \sinh\left(b\,z^{2}\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b}\ e^{\frac{f^2}{4b}-g}\operatorname{erfi}\left(\frac{-f-2bz}{2\sqrt{-b}}\right)}{b}+\frac{e^{\frac{f^2}{4b}+g}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{f-2bz}{2\sqrt{-b}}\right)+\sqrt{b}\ e^{2\left(-\frac{f^2}{4b}-g\right)}\operatorname{erfi}\left(\frac{2bz-f}{2\sqrt{b}}\right)\right)}{b}+\frac{e^{g-\frac{f^2}{4b}}\operatorname{erfi}\left(\frac{f+2bz}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1470.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{8}\left(e^{-g}\left(-\frac{4\,e^{g}\cosh\left(-\sqrt{z}\ b+g+f\,z\right)}{f}+\frac{b\,e^{\frac{b^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2f\sqrt{z}-b}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\frac{b\,e^{2g-\frac{b^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2f\sqrt{z}-b}{2\sqrt{f}}\right)}{f^{3/2}}\right)-\right.$$

$$\left.e^{-g}\left(-\frac{4\,e^{g}\cosh\left(\sqrt{z}\ b+g+f\,z\right)}{f}+\frac{b\,e^{2g-\frac{b^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{b\,e^{\frac{b^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^{r}+e\right)\cosh(f\,z+g)$

01.20.21.1471.01

$$\int \sinh\left(b\,z^2+e\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b}\;e^{\frac{f^2}{4b}-e-g}\,\text{erfi}\left(\frac{-f-2\,b\,z}{2\sqrt{-b}}\right)}{b}+\frac{e^{\frac{f^2}{4b}-e+g}\left(\sqrt{-b}\;\text{erfi}\left(\frac{f-2\,b\,z}{2\sqrt{-b}}\right)+\sqrt{b}\;e^{2\left(-\frac{f^2}{4b}+e-g\right)}\,\text{erfi}\left(\frac{2\,b\,z-f}{2\sqrt{b}}\right)\right)}{b}+\frac{e^{-\frac{f^2}{4b}+e+g}\,\text{erfi}\left(\frac{f+2\,b\,z}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1472.01

$$\int \sinh\left(\sqrt{z}\;b+e\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{1}{8}\left(e^{e-g}\left(-\frac{4\,e^{g-e}\cosh\left(\sqrt{z}\;b+e-g-f\,z\right)}{f}+\frac{b\,e^{\frac{b^2}{4f}}\sqrt{\pi}\;\text{erfi}\left(\frac{2\,f\sqrt{z}-b}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\frac{b\,e^{2(g-e)-\frac{b^2}{4f}}\sqrt{\pi}\;\text{erfi}\left(\frac{2\,f\sqrt{z}-b}{2\sqrt{f}}\right)}{f^{3/2}}\right)-\right.$$

$$\left.e^{-e-g}\left(-\frac{4\,e^{e+g}\cosh\left(\sqrt{z}\;b+e+g+f\,z\right)}{f}+\frac{b\,e^{2(e+g)-\frac{b^2}{4f}}\sqrt{\pi}\;\text{erfi}\left(\frac{b+2\,f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{b\,e^{\frac{b^2}{4f}}\sqrt{\pi}\;\text{erfi}\left(\frac{b+2\,f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh(f\,z+g)$

01.20.21.1473.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b}\;e^{\frac{(d+f)^2}{4b}-g}\,\text{erfi}\left(\frac{-d-f-2\,b\,z}{2\sqrt{-b}}\right)}{b}+\right.$$

$$\left.\frac{e^{\frac{(f-d)^2}{4b}+g}\left(\sqrt{-b}\;\text{erfi}\left(\frac{-d+f-2\,b\,z}{2\sqrt{-b}}\right)+\sqrt{b}\;e^{2\left(-\frac{(f-d)^2}{4b}-g\right)}\,\text{erfi}\left(\frac{d-f+2\,b\,z}{2\sqrt{b}}\right)\right)}{b}+\frac{e^{g-\frac{(d+f)^2}{4b}}\,\text{erfi}\left(\frac{d+f+2\,b\,z}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1474.01

$$\int \sinh\left(\sqrt{z}\ b + d\,z\right)\cosh(g + f\,z)\,dz ==$$

$$\frac{1}{8}\left(e^{-g}\left(\frac{4\,e^{g}\cosh\left(-\sqrt{z}\ b + g - d\,z + f\,z\right)}{d-f} + \frac{b\,e^{-\frac{b^2}{4(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(f-d)\sqrt{z}-b}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}} - \frac{b\,e^{2g-\frac{b^2}{4(f-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(f-d)\sqrt{z}-b}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}\right) - e^{-g}\left(-\frac{4\,e^{g}\cosh\left(\sqrt{z}\ b + g + d\,z + f\,z\right)}{d+f} + \frac{b\,e^{2g-\frac{b^2}{4(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}} - \frac{b\,e^{-\frac{b^2}{4(-d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^r + d\,z + e\right)\cosh(f\,z + g)$

01.20.21.1475.01

$$\int \sinh\left(b\,z^2 + d\,z + e\right)\cosh(g + f\,z)\,dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b}\ e^{\frac{(d+f)^2}{4b}-e-g}\operatorname{erfi}\left(\frac{-d-f-2bz}{2\sqrt{-b}}\right)}{b} + \frac{e^{\frac{(f-d)^2}{4b}-e+g}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{-d+f-2bz}{2\sqrt{-b}}\right) + \sqrt{b}\ e^{2\left(-\frac{(f-d)^2}{4b}+e-g\right)}\operatorname{erfi}\left(\frac{d-f+2bz}{2\sqrt{b}}\right)\right)}{b} + \frac{e^{-\frac{(d+f)^2}{4b}+e+g}\operatorname{erfi}\left(\frac{d+f+2bz}{2\sqrt{b}}\right)}{\sqrt{b}}\right)$$

01.20.21.1476.01

$$\int \sinh\left(\sqrt{z}\ b + e + d\,z\right)\cosh(g + f\,z)\,dz ==$$

$$\frac{1}{8}\left(e^{e-g}\left(\frac{4\,e^{g-e}\cosh\left(\sqrt{z}\ b + e - g + d\,z - f\,z\right)}{d-f} + \frac{b\,e^{-\frac{b^2}{4(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(f-d)\sqrt{z}-b}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}} - \frac{b\,e^{2(g-e)-\frac{b^2}{4(f-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(f-d)\sqrt{z}-b}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}\right) - e^{-e-g}\left(-\frac{4\,e^{e+g}\cosh\left(\sqrt{z}\ b + e + g + d\,z + f\,z\right)}{d+f} + \frac{b\,e^{2(e+g)-\frac{b^2}{4(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}} - \frac{b\,e^{-\frac{b^2}{4(-d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}\right)\right)$$

Involving $\sinh^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1477.01

$$\int \sinh(b\,z)\cosh\left(c\,z^2\right)dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-c}\;e^{\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{-b-2cz}{2\sqrt{-c}}\right)}{c}+\frac{e^{-\frac{b^2}{4c}}\operatorname{erfi}\left(\frac{b+2cz}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{e^{-\frac{b^2}{4c}}\left(\sqrt{-c}\;e^{\frac{b^2}{2c}}\operatorname{erfi}\left(\frac{b-2cz}{2\sqrt{-c}}\right)+\sqrt{c}\;\operatorname{erfi}\left(\frac{2cz-b}{2\sqrt{c}}\right)\right)}{c}\right)$$

01.20.21.1478.01

$$\int \sinh(b\,z)\cosh\left(c\sqrt{z}\right)dz == \frac{1}{8}\left(\frac{8\cosh\left(c\sqrt{z}\right)\cosh(b\,z)}{b}+\frac{c\,e^{\frac{c^2}{4b}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2\sqrt{z}\;b+c}{2\sqrt{-b}}\right)}{(-b)^{3/2}}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2}{4b}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c-2b\sqrt{z}}{2\sqrt{-b}}\right)}{(-b)^{3/2}}-\frac{c\,e^{-\frac{c^2}{4b}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2\sqrt{z}\;b+c}{2\sqrt{b}}\right)}{b^{3/2}}-\frac{c\,e^{-\frac{c^2}{4b}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c-2b\sqrt{z}}{2\sqrt{b}}\right)}{b^{3/2}}\right)$$

Involving $\sinh(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.1479.01

$$\int \sinh(e+d\,z)\cosh\left(c\,z^2\right)dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-c}\;e^{\frac{d^2}{4c}-e}\operatorname{erfi}\left(\frac{-d-2cz}{2\sqrt{-c}}\right)}{c}+\frac{e^{e-\frac{d^2}{4c}}\operatorname{erfi}\left(\frac{d+2cz}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{e^{-\frac{d^2}{4c}-e}\left(\sqrt{-c}\;e^{2\left(\frac{d^2}{4c}+e\right)}\operatorname{erfi}\left(\frac{d-2cz}{2\sqrt{-c}}\right)+\sqrt{c}\;\operatorname{erfi}\left(\frac{2cz-d}{2\sqrt{c}}\right)\right)}{c}\right)$$

01.20.21.1480.01

$$\int \sinh(e+d\,z)\cosh\left(c\sqrt{z}\right)dz ==$$

$$\frac{1}{8}\left(e^{e}\left(\frac{4e^{-e}\cosh\left(-\sqrt{z}\;c+e+d\,z\right)}{d}+\frac{c\,e^{\frac{c^2}{4d}-2e}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{c\,e^{-\frac{c^2}{4d}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)-\right.$$

$$\left.e^{-e}\left(-\frac{4e^{e}\cosh\left(\sqrt{z}\;c+e+d\,z\right)}{d}+\frac{c\,e^{2e-\frac{c^2}{4d}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}-\frac{c\,e^{\frac{c^2}{4d}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1481.01

$$\int \sinh(b\,z^r)\cosh(c\,z^r)\,dz == -\frac{1}{4\,r}\left(z\left(\Gamma\left(\frac{1}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}-((b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-c)\,z^r\right)+((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)\,z^r\right)-((b+c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.1482.01

$$\int \sinh\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\ \operatorname{erfi}\left(\frac{-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\frac{\sqrt{b-c}\ \operatorname{erfi}\left(\frac{2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\ \operatorname{erfi}\left(\frac{2\,c\,z-2\,b\,z}{2\sqrt{c-b}}\right)}{b-c}+\frac{\operatorname{erfi}\left(\frac{2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1483.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right)dz == -\frac{(-b-c)\sqrt{z}\ \cosh\left((-b-c)\sqrt{z}\right)-\sinh\left((-b-c)\sqrt{z}\right)}{(-b-c)^2}-\frac{(c-b)\sqrt{z}\ \cosh\left((c-b)\sqrt{z}\right)-\sinh\left((c-b)\sqrt{z}\right)}{(c-b)^2}$$

Involving $\sinh\left(b\,z^r+e\right)\cosh\left(c\,z^r\right)$

01.20.21.1484.01

$$\int \sinh(b\,z^r+e)\cosh(c\,z^r)\,dz == -\frac{1}{4\,r}\left(e^{-e}\,z\left(e^{2\,e}\,\Gamma\left(\frac{1}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}-((b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-c)\,z^r\right)+e^{2\,e}\,((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)\,z^r\right)-((b+c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.1485.01

$$\int \sinh\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\ e^{-e}\operatorname{erfi}\left(\frac{-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\frac{e^{-e}\left(\sqrt{b-c}\ e^{2\,e}\operatorname{erfi}\left(\frac{2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\ \operatorname{erfi}\left(\frac{2\,c\,z-2\,b\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{e}\operatorname{erfi}\left(\frac{2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1486.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh\left(c\sqrt{z}\right)dz == -\frac{(-b-c)\sqrt{z}\ \cosh\left(e-(-b-c)\sqrt{z}\right)+\sinh\left(e-(-b-c)\sqrt{z}\right)}{(-b-c)^2}-\frac{(c-b)\sqrt{z}\ \cosh\left(e-(c-b)\sqrt{z}\right)+\sinh\left(e-(c-b)\sqrt{z}\right)}{(c-b)^2}$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r\right)$

01.20.21.1487.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{d^2}{-4\,b-4\,c}}\;\text{erfi}\left(\frac{-d-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\left.\frac{e^{-\frac{d^2}{4\,c-4\,b}}\left(\sqrt{b-c}\;e^{\frac{d^2}{2\,c-2\,b}}\;\text{erfi}\left(\frac{d+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{-d-2\,b\,z+2\,c\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{d^2}{-4\,b-4\,c}}\;\text{erfi}\left(\frac{d+2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1488.01

$$\int \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh\left(c\,\sqrt{z}\right)dz ==$$

$$\frac{1}{8}\left(\frac{8\cosh\left(c\,\sqrt{z}\right)\cosh\left(\sqrt{z}\;b+d\,z\right)}{d}+\frac{(b+c)\,e^{\frac{(-b-c)^2}{4\,d}}\;\sqrt{\pi}\;\text{erfi}\left(\frac{b+c+2\,d\,\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}+\frac{(c-b)\,e^{\frac{(c-b)^2}{4\,d}}\;\sqrt{\pi}\;\text{erfi}\left(\frac{-b+c-2\,d\,\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\right.$$

$$\left.\frac{(b+c)\,e^{-\frac{(b+c)^2}{4\,d}}\;\sqrt{\pi}\;\text{erfi}\left(\frac{b+c+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}-\frac{(c-b)\,e^{-\frac{(b-c)^2}{4\,d}}\;\sqrt{\pi}\;\text{erfi}\left(\frac{-b+c-2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)$$

Involving $\sinh\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

01.20.21.1489.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{d^2}{-4\,b-4\,c}-e}\;\text{erfi}\left(\frac{-d-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\left.\frac{e^{-\frac{d^2}{4\,c-4\,b}-e}\left(\sqrt{b-c}\;e^{2\left(\frac{d^2}{4\,c-4\,b}+e\right)}\;\text{erfi}\left(\frac{d+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{-d-2\,b\,z+2\,c\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{d^2}{-4\,b-4\,c}+e}\;\text{erfi}\left(\frac{d+2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1490.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(c\sqrt{z}\right)dz ==$$

$$\frac{1}{8}\left(e^{e}\left(\frac{4\,e^{-e}\cosh\left(\sqrt{z}\ (b-c)+e+d\,z\right)}{d}+\frac{(c-b)\,e^{\frac{(c-b)^2}{4d}-2e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{(c-b)\,e^{-\frac{(b-c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)-\right.$$

$$\left.e^{-e}\left(-\frac{4\,e^{e}\cosh\left(\sqrt{z}\ (b+c)+e+d\,z\right)}{d}+\frac{(b+c)\,e^{2e-\frac{(b+c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}-\frac{(b+c)\,e^{\frac{(-b-c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)$$

Involving $\sinh(d\,z)\cosh\left(c\,z^{r}+g\right)$

01.20.21.1491.01

$$\int \sinh(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-c}\ e^{\frac{d^2}{4c}-g}\operatorname{erfi}\left(\frac{-d-2c\,z}{2\sqrt{-c}}\right)}{c}+\frac{e^{g-\frac{d^2}{4c}}\operatorname{erfi}\left(\frac{d+2c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{e^{g-\frac{d^2}{4c}}\left(\sqrt{-c}\ e^{2\left(\frac{d^2}{4c}-g\right)}\operatorname{erfi}\left(\frac{d-2c\,z}{2\sqrt{-c}}\right)+\sqrt{c}\ \operatorname{erfi}\left(\frac{2c\,z-d}{2\sqrt{c}}\right)\right)}{c}\right)$$

01.20.21.1492.01

$$\int \sinh(d\,z)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$

$$\frac{1}{8}\left(e^{-g}\left(\frac{2\,e^{-d\,z-c\sqrt{z}}\left(e^{2\left(\sqrt{z}\ c+g\right)}+e^{2d\,z}\right)}{d}+\frac{c\,e^{\frac{c^2}{4d}+2g}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{c\,e^{-\frac{c^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)-\right.$$

$$\left.e^{-g}\left(-\frac{4\,e^{g}\cosh\left(\sqrt{z}\ c+g+d\,z\right)}{d}+\frac{c\,e^{2g-\frac{c^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}-\frac{c\,e^{\frac{c^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)$$

Involving $\sinh(d\,z+e)\cosh\left(c\,z^{r}+g\right)$

01.20.21.1493.01

$$\int \sinh(e+d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-c}\;e^{\frac{d^2}{4c}-e-g}\,\text{erfi}\left(\frac{-d-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\frac{e^{-\frac{d^2}{4c}+e+g}\,\text{erfi}\left(\frac{d+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{e^{-\frac{d^2}{4c}-e+g}\left(\sqrt{-c}\;e^{2\left(\frac{d^2}{4c}+e-g\right)}\,\text{erfi}\left(\frac{d-2\,c\,z}{2\sqrt{-c}}\right)+\sqrt{c}\;\text{erfi}\left(\frac{2\,c\,z-d}{2\sqrt{c}}\right)\right)}{c}\right)$$

01.20.21.1494.01

$$\int \sinh(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$\frac{1}{8}\left(e^{e-g}\left(\frac{4\,e^{g-e}\cosh\left(-\sqrt{z}\;c+e-g+d\,z\right)}{d}+\frac{c\,e^{\frac{c^2}{4d}+2\,(g-e)}\sqrt{\pi}\;\text{erfi}\left(\frac{c-2\,d\,\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{c\,e^{-\frac{c^2}{4d}}\sqrt{\pi}\;\text{erfi}\left(\frac{c-2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)-\right.$$

$$\left.e^{-e-g}\left(-\frac{4\,e^{e+g}\cosh\left(\sqrt{z}\;c+e+g+d\,z\right)}{d}+\frac{c\,e^{2\,(e+g)-\frac{c^2}{4d}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}-\frac{c\,e^{\frac{c^2}{4d}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,d\,\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^r\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1495.01

$$\int \sinh(b\,z^r)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{1}{4\,r}\left(e^{-g}\,z\left(e^{2\,g}\,\Gamma\left(\frac{1}{r},(-b-c)\,z^r\right)\left((-b-c)\,z^r\right)^{-1/r}-e^{2\,g}\left((b-c)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(b-c)\,z^r\right)+\left((c-b)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(c-b)\,z^r\right)-\right.\right.$$

$$\left.\left.\left((b+c)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.1496.01

$$\int \sinh\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-g}\,\text{erfi}\left(\frac{-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\frac{e^{g}\left(\sqrt{b-c}\;e^{-2\,g}\,\text{erfi}\left(\frac{2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{2\,c\,z-2\,b\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{g}\,\text{erfi}\left(\frac{2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1497.01

$$\int \sinh\left(b\,\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$-\frac{(c-b)\,\sqrt{z}\;\cosh\left(\sqrt{z}\;(c-b)+g\right)-\sinh\left(\sqrt{z}\;(c-b)+g\right)}{(c-b)^2}-\frac{(-b-c)\,\sqrt{z}\;\cosh\left(g-(-b-c)\,\sqrt{z}\right)+\sinh\left(g-(-b-c)\,\sqrt{z}\right)}{(-b-c)^2}$$

Involving $\sinh\left(b\,z^r+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1498.01

$$\int \sinh(b\,z^r+e)\cosh(c\,z^r+g)\,dz == -\frac{1}{4\,r}\left(e^{-e-g}\,z\left(e^{2\,e+2\,g}\,\Gamma\left(\frac{1}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}-e^{2\,g}\,((b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-c)\,z^r\right)+e^{2\,e}\,((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)\,z^r\right)-((b+c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.1499.01

$$\int \sinh\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-e-g}\,\text{erfi}\left(\frac{-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\frac{e^{g-e}\left(\sqrt{b-c}\;e^{2\,(e-g)}\,\text{erfi}\left(\frac{2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{2\,c\,z-2\,b\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{e+g}\,\text{erfi}\left(\frac{2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1500.01

$$\int \sinh\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz == -\frac{(-b-c)\,\sqrt{z}\;\cosh\left(-\sqrt{z}\;(-b-c)+e+g\right)+\sinh\left(-\sqrt{z}\;(-b-c)+e+g\right)}{(-b-c)^2}-\frac{(c-b)\,\sqrt{z}\;\cosh\left(-\sqrt{z}\;(c-b)+e-g\right)+\sinh\left(-\sqrt{z}\;(c-b)+e-g\right)}{(c-b)^2}$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1501.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{d^2}{-4\,b-4\,c}-g}\,\text{erfi}\left(\frac{-d-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\frac{e^{g-\frac{d^2}{4\,c-4\,b}}\left(\sqrt{b-c}\;e^{2\left(\frac{d^2}{4\,c-4\,b}-g\right)}\,\text{erfi}\left(\frac{d+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{-d-2\,b\,z+2\,c\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{d^2}{-4\,b-4\,c}+g}\,\text{erfi}\left(\frac{d+2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1502.01

$$\int \sinh\left(\sqrt{z}\ b + d\,z\right)\cosh\left(\sqrt{z}\ c + g\right)dz ==$$

$$\frac{1}{8}\left(e^{-g}\left(\frac{4\,e^{g}\cosh\left(-\sqrt{z}\ (b-c)+g-d\,z\right)}{d} + \frac{(c-b)\,e^{\frac{(c-b)^2}{4d}+2g}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} - \frac{(c-b)\,e^{-\frac{(b-c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right) - \right.$$

$$\left. e^{-g}\left(-\frac{4\,e^{g}\cosh\left(\sqrt{z}\ (b+c)+g+d\,z\right)}{d} + \frac{(b+c)\,e^{2g-\frac{(b+c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}} - \frac{(b+c)\,e^{\frac{(-b-c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^r + d\,z + e\right)\cosh\left(c\,z^r + g\right)$

01.20.21.1503.01

$$\int \sinh\left(b\,z^2 + d\,z + e\right)\cosh\left(c\,z^2 + g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\ e^{-\frac{d^2}{-4b-4c}-e-g}\operatorname{erfi}\left(\frac{-d-2bz-2cz}{2\sqrt{-b-c}}\right)}{b+c} + \right.$$

$$\left. \frac{e^{-\frac{d^2}{4c-4b}-e+g}\left(\sqrt{b-c}\ e^{2\left(\frac{d^2}{4c-4b}+e-g\right)}\operatorname{erfi}\left(\frac{d+2bz-2cz}{2\sqrt{b-c}}\right) + \sqrt{c-b}\ \operatorname{erfi}\left(\frac{-d-2bz+2cz}{2\sqrt{c-b}}\right)\right)}{b-c} + \frac{e^{\frac{d^2}{-4b-4c}+e+g}\operatorname{erfi}\left(\frac{d+2bz+2cz}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1504.01

$$\int \sinh\left(\sqrt{z}\ b + e + d\,z\right)\cosh\left(\sqrt{z}\ c + g\right)dz ==$$

$$\frac{1}{8}\left(e^{e-g}\left(\frac{4\,e^{g-e}\cosh\left(\sqrt{z}\ (b-c)+e-g+d\,z\right)}{d} + \frac{(c-b)\,e^{\frac{(c-b)^2}{4d}+2(g-e)}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} - \right.\right.$$

$$\left. \frac{(c-b)\,e^{-\frac{(b-c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right) - e^{-e-g}\left(-\frac{4\,e^{e+g}\cosh\left(\sqrt{z}\ (b+c)+e+g+d\,z\right)}{d} + \right.$$

$$\left.\left. \frac{(b+c)\,e^{2(e+g)-\frac{(b+c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}} - \frac{(b+c)\,e^{\frac{(-b-c)^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)$$

Involving $\sinh(d\,z)\cosh\left(c\,z^r + f\,z\right)$

01.20.21.1505.01

$$\int \sinh(d\,z)\cosh\left(c\,z^2 + f\,z\right)dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-c}\;e^{\frac{(d+f)^2}{4c}}\;\text{erfi}\left(\frac{-d-f-2cz}{2\sqrt{-c}}\right)}{c} - \frac{e^{-\frac{(f-d)^2}{4c}}\left(\sqrt{-c}\;e^{\frac{(f-d)^2}{2c}}\;\text{erfi}\left(\frac{d-f-2cz}{2\sqrt{-c}}\right) + \sqrt{c}\;\text{erfi}\left(\frac{-d+f+2cz}{2\sqrt{c}}\right)\right)}{c} + \frac{e^{-\frac{(d+f)^2}{4c}}\;\text{erfi}\left(\frac{d+f+2cz}{2\sqrt{c}}\right)}{\sqrt{c}}\right)$$

01.20.21.1506.01

$$\int \sinh(d\,z)\cosh\left(\sqrt{z}\;c + f\,z\right)dz ==$$

$$\frac{1}{8}\left(\frac{c\,e^{-\frac{c^2}{4(-d-f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}} + \frac{c\,e^{-\frac{c^2}{4(f-d)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}} - \frac{2\,e^{(-d-f)z-c\sqrt{z}}}{-d-f} + \frac{2\,e^{(d-f)z-c\sqrt{z}}}{d-f} - \right.$$

$$\left.\frac{c\,e^{-\frac{c^2}{4(d-f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}} - \frac{2\,e^{\sqrt{z}\;c+(f-d)z}}{f-d} + \frac{2\,e^{\sqrt{z}\;c+(d+f)z}}{d+f} - \frac{c\,e^{-\frac{c^2}{4(d+f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)$$

Involving $\sinh(d\,z + e)\cosh\left(c\,z^r + f\,z\right)$

01.20.21.1507.01

$$\int \sinh(e + d\,z)\cosh\left(c\,z^2 + f\,z\right)dz == \frac{1}{8}\sqrt{\pi}$$

$$\left(\frac{\sqrt{-c}\;e^{\frac{(d+f)^2}{4c}-e}\;\text{erfi}\left(\frac{-d-f-2cz}{2\sqrt{-c}}\right)}{c} - \frac{e^{-\frac{(f-d)^2}{4c}-e}\left(\sqrt{-c}\;e^{2\left(\frac{(f-d)^2}{4c}+e\right)}\;\text{erfi}\left(\frac{d-f-2cz}{2\sqrt{-c}}\right) + \sqrt{c}\;\text{erfi}\left(\frac{-d+f+2cz}{2\sqrt{c}}\right)\right)}{c} + \frac{e^{e-\frac{(d+f)^2}{4c}}\;\text{erfi}\left(\frac{d+f+2cz}{2\sqrt{c}}\right)}{\sqrt{c}}\right)$$

01.20.21.1508.01

$$\int \sinh(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{8}\left(e^{e}\left(\frac{4\,e^{-e}\cosh\left(-\sqrt{z}\;c+e+(d-f)\,z\right)}{d-f}+\frac{c\,e^{-\frac{c^2}{4(f-d)}-2e}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}-\frac{c\,e^{-\frac{c^2}{4(d-f)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}\right)-\right.$$

$$\left.e^{-e}\left(-\frac{4\,e^{e}\cosh\left(\sqrt{z}\;c+e+(d+f)\,z\right)}{d+f}+\frac{c\,e^{2e-\frac{c^2}{4(d+f)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}-\frac{c\,e^{-\frac{c^2}{4(-d-f)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}\right)\right)$$

Involving $\sinh\left(b\,z^{r}\right)\cosh\left(c\,z^{r}+f\,z\right)$

01.20.21.1509.01

$$\int \sinh\left(b\,z^{2}\right)\cosh\left(c\,z^{2}+f\,z\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{f^2}{-4b-4c}}\operatorname{erfi}\left(\frac{-f-2bz-2cz}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\left.\frac{e^{-\frac{f^2}{4c-4b}}\left(\sqrt{b-c}\;e^{\frac{f^2}{2c-2b}}\operatorname{erfi}\left(\frac{-f+2bz-2cz}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\operatorname{erfi}\left(\frac{f-2bz+2cz}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{f^2}{-4b-4c}}\operatorname{erfi}\left(\frac{f+2bz+2cz}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1510.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{8}\left(-\frac{(c-b)\,e^{\frac{(b-c)^2}{4f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-b+c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{(b+c)\,e^{\frac{(-b-c)^2}{4f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{(c-b)\,e^{-\frac{(c-b)^2}{4f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\,(c-b)+fz}}{f}+\frac{2\,e^{\sqrt{z}\,(b+c)+fz}}{f}+\frac{2\,e^{(-b-c)\sqrt{z}-fz}}{f}-\frac{2\,e^{(b-c)\sqrt{z}-fz}}{f}-\frac{(b+c)\,e^{-\frac{(b+c)^2}{4f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}\right)$$

Involving $\sinh\left(b\,z^{r}+e\right)\cosh\left(c\,z^{r}+f\,z\right)$

01.20.21.1511.01

$$\int \sinh\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{f^2}{-4\,b-4\,c}-e}\;\text{erfi}\left(\frac{-f-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\left.\frac{e^{-\frac{f^2}{4\,c-4\,b}-e}\left(\sqrt{b-c}\;e^{2\left(\frac{f^2}{4\,c-4\,b}+e\right)}\,\text{erfi}\left(\frac{-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{f-2\,b\,z+2\,c\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{f^2}{-4\,b-4\,c}+e}\,\text{erfi}\left(\frac{f+2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1512.01

$$\int \sinh\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{8}\left(e^{e}\left(-\frac{(c-b)\,e^{\frac{(b-c)^2}{4\,f}}\sqrt{\pi}\;\text{erfi}\left(\frac{-b+c+2\,f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{(c-b)\,e^{-\frac{(c-b)^2}{4\,f}-2\,e}\sqrt{\pi}\;\text{erfi}\left(\frac{-b+c+2\,f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\right.\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\,(c-b)-2\,e+f\,z}}{f}-\frac{2\,e^{(b-c)\sqrt{z}-f\,z}}{f}\right)-e^{-e}$$

$$\left.\left(-\frac{(b+c)\,e^{\frac{(-b-c)^2}{4\,f}}\sqrt{\pi}\;\text{erfi}\left(\frac{b+c+2\,f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{(b+c)\,e^{2\,e-\frac{(b+c)^2}{4\,f}}\sqrt{\pi}\;\text{erfi}\left(\frac{b+c+2\,f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{2\,e^{\sqrt{z}\,(b+c)+2\,e+f\,z}}{f}-\frac{2\,e^{(-b-c)\sqrt{z}-f\,z}}{f}\right)\right)$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1513.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{(d+f)^2}{-4\,b-4\,c}}\,\text{erfi}\left(\frac{-d-f-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\left.\frac{e^{-\frac{(f-d)^2}{4\,c-4\,b}}\left(\sqrt{b-c}\;e^{\frac{(f-d)^2}{2\,c-2\,b}}\,\text{erfi}\left(\frac{d-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{-d+f-2\,b\,z+2\,c\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{(d+f)^2}{-4\,b-4\,c}}\,\text{erfi}\left(\frac{d+f+2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1514.01

$$\int \sinh\left(\sqrt{z}\ b + d\,z\right)\cosh\left(\sqrt{z}\ c + f\,z\right) dz ==$$

$$\frac{1}{8}\left(\frac{(b+c)\,e^{-\frac{(-b-c)^2}{4(-d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}} + \frac{(c-b)\,e^{-\frac{(c-b)^2}{4(f-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}} - \right.$$

$$\frac{2\,e^{\sqrt{z}\,(-b-c)+(-d-f)z}}{-d-f} + \frac{2\,e^{\sqrt{z}\,(b-c)+(d-f)z}}{d-f} - \frac{(c-b)\,e^{-\frac{(b-c)^2}{4(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}} -$$

$$\left.\frac{2\,e^{\sqrt{z}\,(c-b)+(f-d)z}}{f-d} + \frac{2\,e^{\sqrt{z}\,(b+c)+(d+f)z}}{d+f} - \frac{(b+c)\,e^{-\frac{(b+c)^2}{4(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)$$

Involving $\sinh\left(b\,z^r + d\,z + e\right)\cosh\left(c\,z^r + f\,z\right)$

01.20.21.1515.01

$$\int \sinh\left(b\,z^2 + d\,z + e\right)\cosh\left(c\,z^2 + f\,z\right) dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\ e^{-\frac{(d+f)^2}{-4b-4c}-e}\ \operatorname{erfi}\left(\frac{-d-f-2bz-2cz}{2\sqrt{-b-c}}\right)}{b+c} + \right.$$

$$\left.\frac{e^{-\frac{(f-d)^2}{4c-4b}-e}\left(\sqrt{b-c}\ e^{2\left(\frac{(f-d)^2}{4c-4b}+e\right)}\operatorname{erfi}\left(\frac{d-f+2bz-2cz}{2\sqrt{b-c}}\right) + \sqrt{c-b}\ \operatorname{erfi}\left(\frac{-d+f-2bz+2cz}{2\sqrt{c-b}}\right)\right)}{b-c} + \frac{e^{\frac{(d+f)^2}{-4b-4c}+e}\ \operatorname{erfi}\left(\frac{d+f+2bz+2cz}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1516.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{1}{8}\left(e^{e}\left(-\frac{(c-b)\,e^{-\frac{(b-c)^2}{4(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}+\frac{(c-b)\,e^{-\frac{(c-b)^2}{4(f-d)}-2e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}+\right.\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b-c)+(d-f)\,z}}{d-f}-\frac{2\,e^{\sqrt{z}\ (c-b)-2e+(f-d)\,z}}{f-d}\right)-e^{-e}\left(-\frac{(b+c)\,e^{-\frac{(-b-c)^2}{4(-d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}+\right.$$

$$\left.\left.\frac{(b+c)\,e^{2e-\frac{(b+c)^2}{4(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}+\frac{2\,e^{\sqrt{z}\ (-b-c)+(-d-f)\,z}}{-d-f}-\frac{2\,e^{\sqrt{z}\ (b+c)+2e+(d+f)\,z}}{d+f}\right)\right)$$

Involving $\sinh(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1517.01

$$\int \sinh(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\sqrt{\pi}$$

$$\left(\frac{\sqrt{-c}\ e^{\frac{(d+f)^2}{4c}-g}\operatorname{erfi}\left(\frac{-d-f-2\,c\,z}{2\sqrt{-c}}\right)}{c}-\frac{e^{g-\frac{(f-d)^2}{4c}}\left(\sqrt{-c}\ e^{2\left(\frac{(f-d)^2}{4c}-g\right)}\operatorname{erfi}\left(\frac{d-f-2\,c\,z}{2\sqrt{-c}}\right)+\sqrt{c}\ \operatorname{erfi}\left(\frac{-d+f+2\,c\,z}{2\sqrt{c}}\right)\right)}{c}+\frac{e^{g-\frac{(d+f)^2}{4c}}\operatorname{erfi}\left(\frac{d+f+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}\right)$$

01.20.21.1518.01

$$\int \sinh(d\,z)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{8}\left(e^{-g}\left(-\frac{c\,e^{-\frac{c^2}{4(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}+\frac{c\,e^{2g-\frac{c^2}{4(f-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}+\frac{2\,e^{(d-f)\,z-c\sqrt{z}}}{d-f}-\frac{2\,e^{\sqrt{z}\ c+2g+(f-d)\,z}}{f-d}\right)-\right.$$

$$\left.e^{-g}\left(-\frac{c\,e^{-\frac{c^2}{4(-d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}+\frac{c\,e^{2g-\frac{c^2}{4(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}+\frac{2\,e^{(-d-f)\,z-c\sqrt{z}}}{-d-f}-\frac{2\,e^{\sqrt{z}\ c+2g+(d+f)\,z}}{d+f}\right)\right)$$

Involving $\sinh(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1519.01

$$\int \sinh(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-c}\;e^{\frac{(d+f)^2}{4c}-e-g}\;\text{erfi}\left(\frac{-d-f-2\,c\,z}{2\sqrt{-c}}\right)}{c}-\right.$$

$$\left.\frac{e^{-\frac{(f-d)^2}{4c}-e+g}\left(\sqrt{-c}\;e^{2\left(\frac{(f-d)^2}{4c}+e-g\right)}\;\text{erfi}\left(\frac{d-f-2\,c\,z}{2\sqrt{-c}}\right)+\sqrt{c}\;\text{erfi}\left(\frac{-d+f+2\,c\,z}{2\sqrt{c}}\right)\right)}{c}+\frac{e^{-\frac{(d+f)^2}{4c}+e+g}\;\text{erfi}\left(\frac{d+f+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}\right)$$

01.20.21.1520.01

$$\int \sinh(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$\frac{1}{8}\left(e^{e-g}\left(-\frac{c\,e^{-\frac{c^2}{4(d-f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}+\frac{c\,e^{2(g-e)-\frac{c^2}{4(f-d)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}+\frac{2\,e^{(d-f)z-c\sqrt{z}}}{d-f}-\frac{2\,e^{\sqrt{z}\;c+2(g-e)+(f-d)z}}{f-d}\right)-\right.$$

$$\left.e^{-e-g}\left(-\frac{c\,e^{-\frac{c^2}{4(-d-f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}+\frac{c\,e^{2(e+g)-\frac{c^2}{4(d+f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}+\frac{2\,e^{(-d-f)z-c\sqrt{z}}}{-d-f}-\frac{2\,e^{\sqrt{z}\;c+2(e+g)+(d+f)z}}{d+f}\right)\right)$$

Involving $\sinh\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1521.01

$$\int \sinh\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{f^2}{-4b-4c}-g}\;\text{erfi}\left(\frac{-f-2\,b\,z-2\,c\,z}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\left.\frac{e^{g-\frac{f^2}{4c-4b}}\left(\sqrt{b-c}\;e^{2\left(\frac{f^2}{4c-4b}-g\right)}\;\text{erfi}\left(\frac{-f+2\,b\,z-2\,c\,z}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\text{erfi}\left(\frac{f-2\,b\,z+2\,c\,z}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{f^2}{-4b-4c}+g}\;\text{erfi}\left(\frac{f+2\,b\,z+2\,c\,z}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1522.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$
$$\frac{1}{8}\left(e^{-g}\left(-\frac{(c-b)\,e^{\frac{(b-c)^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-b+c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{(c-b)\,e^{2g-\frac{(c-b)^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\right.\right.$$
$$\left.\frac{2\,e^{\sqrt{z}\,(c-b)+2g+fz}}{f}-\frac{2\,e^{(b-c)\sqrt{z}-fz}}{f}\right)-e^{-g}\left(-\frac{(b+c)\,e^{\frac{(-b-c)^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\right.$$
$$\left.\left.\frac{(b+c)\,e^{2g-\frac{(b+c)^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{2\,e^{\sqrt{z}\,(b+c)+2g+fz}}{f}-\frac{2\,e^{(-b-c)\sqrt{z}-fz}}{f}\right)\right)$$

Involving $\sinh\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1523.01

$$\int \sinh\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\;e^{-\frac{f^2}{-4b-4c}-e-g}\operatorname{erfi}\left(\frac{-f-2bz-2cz}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$
$$\left.\frac{e^{-\frac{f^2}{4c-4b}-e+g}\left(\sqrt{b-c}\;e^{2\left(\frac{f^2}{4c-4b}+e-g\right)}\operatorname{erfi}\left(\frac{-f+2bz-2cz}{2\sqrt{b-c}}\right)+\sqrt{c-b}\;\operatorname{erfi}\left(\frac{f-2bz+2cz}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{f^2}{-4b-4c}+e+g}\operatorname{erfi}\left(\frac{f+2bz+2cz}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1524.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{8}\left(e^{e-g}\left(-\frac{(c-b)\,e^{\frac{(b-c)^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{(c-b)\,e^{2(g-e)-\frac{(c-b)^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\right.\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (c-b)+2(g-e)+f\,z}}{f}-\frac{2\,e^{(b-c)\sqrt{z}-f\,z}}{f}\right)-e^{-e-g}\left(-\frac{(b+c)\,e^{\frac{(-b-c)^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\right.$$

$$\left.\left.\frac{(b+c)\,e^{2(e+g)-\frac{(b+c)^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{2\,e^{\sqrt{z}\ (b+c)+2(e+g)+f\,z}}{f}-\frac{2\,e^{(-b-c)\sqrt{z}-f\,z}}{f}\right)\right)$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1525.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\ e^{-\frac{(d+f)^2}{-4b-4c}-g}\operatorname{erfi}\left(\frac{-d-f-2bz-2cz}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\left.\frac{e^{g-\frac{(f-d)^2}{4c-4b}}\left(\sqrt{b-c}\ e^{2\left(\frac{(f-d)^2}{4c-4b}-g\right)}\operatorname{erfi}\left(\frac{d-f+2bz-2cz}{2\sqrt{b-c}}\right)+\sqrt{c-b}\ \operatorname{erfi}\left(\frac{-d+f-2bz+2cz}{2\sqrt{c-b}}\right)\right)}{b-c}+\frac{e^{\frac{(d+f)^2}{-4b-4c}+g}\operatorname{erfi}\left(\frac{d+f+2bz+2cz}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1526.01

$$\int \sinh\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{8}\left(e^{-g}\left(-\frac{(c-b)\,e^{-\frac{(b-c)^2}{4(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}+\frac{(c-b)\,e^{2g-\frac{(c-b)^2}{4(f-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}+\right.\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b-c)+(d-f)\,z}}{d-f}-\frac{2\,e^{\sqrt{z}\ (c-b)+2g+(f-d)\,z}}{f-d}\right)-e^{-g}\left(-\frac{(b+c)\,e^{-\frac{(-b-c)^2}{4(-d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}+\right.$$

$$\left.\left.\frac{(b+c)\,e^{2g-\frac{(b+c)^2}{4(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}+\frac{2\,e^{\sqrt{z}\ (-b-c)+(-d-f)\,z}}{-d-f}-\frac{2\,e^{\sqrt{z}\ (b+c)+2g+(d+f)\,z}}{d+f}\right)\right)$$

Involving $\sinh\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1527.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{2}\,i\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(f-d)^2}{4c-4b}+e-g\right)S\left(\frac{-d+f+2(c-b)\,z}{\sqrt{i\,(c-b)}\ \sqrt{2\pi}}\right)-C\left(\frac{-d+f+2(c-b)\,z}{\sqrt{i\,(c-b)}\ \sqrt{2\pi}}\right)\sinh\left(\frac{(f-d)^2}{4c-4b}+e-g\right)}{\sqrt{i\,(c-b)}}+\right.$$

$$\left.\frac{i\cosh\left(\frac{(d+f)^2}{-4b-4c}+e+g\right)S\left(\frac{-d-f-2bz-2cz}{\sqrt{i\,(-b-c)}\ \sqrt{2\pi}}\right)-C\left(\frac{-d-f-2bz-2cz}{\sqrt{i\,(-b-c)}\ \sqrt{2\pi}}\right)\sinh\left(\frac{(d+f)^2}{-4b-4c}+e+g\right)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.1528.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{\sqrt{-b-c}\ e^{-\frac{(d+f)^2}{-4b-4c}-e-g}\ \operatorname{erfi}\left(\frac{-d-f-2bz-2cz}{2\sqrt{-b-c}}\right)}{b+c}+\right.$$

$$\frac{1}{b-c}\left(e^{-\frac{(f-d)^2}{4c-4b}-e+g}\left(\sqrt{b-c}\ e^{2\left(\frac{(f-d)^2}{4c-4b}+e-g\right)}\operatorname{erfi}\left(\frac{d-f+2bz-2cz}{2\sqrt{b-c}}\right)+\sqrt{c-b}\ \operatorname{erfi}\left(\frac{-d+f-2bz+2cz}{2\sqrt{c-b}}\right)\right)\right)+$$

$$\left.\frac{e^{\frac{(d+f)^2}{-4b-4c}+e+g}\operatorname{erfi}\left(\frac{d+f+2bz+2cz}{2\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.1529.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(i\,(f-d))^{3/2}}\left(-2\sqrt{i\,(f-d)}\ i\cosh\left(-\sqrt{z}\ (c-b)+e-g-(f-d)\,z\right)-(c-b)\sqrt{2\,\pi}\right.\right.$$
$$\left.\left(i\cosh\left(\frac{(c-b)^2}{4\,f-4\,d}+e-g\right)S\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\ \sqrt{2\,\pi}}\right)-C\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(c-b)^2}{4\,f-4\,d}+e-g\right)\right)\right)+$$
$$\frac{1}{(i\,(-d-f))^{3/2}}\left(-2\sqrt{i\,(-d-f)}\ i\cosh\left(-\sqrt{z}\ (-b-c)+e+g-(-d-f)\,z\right)-(-b-c)\sqrt{2\,\pi}\left(i\cosh\left(\frac{(b+c)^2}{-4\,d-4\,f}+\right.\right.\right.$$
$$\left.\left.\left.e+g\right)S\left(\frac{-b-c+2\,(-d-f)\sqrt{z}}{\sqrt{i\,(-d-f)}\ \sqrt{2\,\pi}}\right)-C\left(\frac{-b-c+2\,(-d-f)\sqrt{z}}{\sqrt{i\,(-d-f)}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+c)^2}{-4\,d-4\,f}+e+g\right)\right)\right)\right)$$

01.20.21.1530.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$
$$\frac{1}{8}\left(e^{e-g}\left(-\frac{(c-b)\,e^{-\frac{(b-c)^2}{4\,(d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}+\frac{(c-b)\,e^{2\,(g-e)-\frac{(c-b)^2}{4\,(f-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}+\right.\right.$$
$$\left.\frac{2\,e^{\sqrt{z}\ (b-c)+(d-f)\,z}}{d-f}-\frac{2\,e^{\sqrt{z}\ (c-b)+2\,(g-e)+(f-d)\,z}}{f-d}\right)-e^{-e-g}\left(-\frac{(b+c)\,e^{-\frac{(-b-c)^2}{4\,(-d-f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2\,(d+f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}+\right.$$
$$\left.\left.\frac{(b+c)\,e^{2\,(e+g)-\frac{(b+c)^2}{4\,(d+f)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2\,(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}+\frac{2\,e^{\sqrt{z}\ (-b-c)+(-d-f)\,z}}{-d-f}-\frac{2\,e^{\sqrt{z}\ (b+c)+2\,(e+g)+(d+f)\,z}}{d+f}\right)\right)$$

Involving powers of sinh

Involving $\sinh^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.1531.01

$$\int \sinh^{\mu}(c\,z)\cosh(a\,z)\,dz == \frac{1}{((a-c\,\mu)\,(a+c\,\mu))\,2}\left(e^{-a\,z}\sinh^{\mu}(c\,z)\left(1-e^{2\,c\,z}\right)^{-\mu}\right.$$
$$\left.\left(e^{2\,a\,z}\,(a+c\,\mu)\,{}_2F_1\left(\frac{a-c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a}{c}-\mu+2\right);\,e^{2\,c\,z}\right)+(c\,\mu-a)\,{}_2F_1\left(-\frac{a+c\,\mu}{2\,c},\,-\mu;\,-\frac{a+c\,(\mu-2)}{2\,c};\,e^{2\,c\,z}\right)\right)\right)$$

01.20.21.1532.01

$$\int \sinh^m(c\,z)\cosh(a\,z)\,dz == \binom{m}{\frac{m}{2}} \frac{i^m\,2^{-m}\,(1-m \bmod 2)\sinh(a\,z)}{a} +$$
$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\left((-a-2\,c\,k+c\,m)\left(-e^{i\,m\,\pi-(a-c\,(m-2\,k))\,z}\,(a-2\,c\,k+c\,m)+e^{c\,z\,m+i\,\pi\,m+a\,z-2\,c\,k\,z}\,(a-c\,(m-2\,k))-\right.\right.$$
$$\left.\left.e^{-a\,z+2\,c\,k\,z-c\,m\,z}\,(a-c\,(m-2\,k))\right)-e^{(a+2\,c\,k-c\,m)\,z}\,(a-2\,c\,k+c\,m)\,(a-c\,(m-2\,k))\right)$$
$$\binom{m}{k}\Big/\left((-a-2\,c\,k+c\,m)\,(a-2\,c\,k+c\,m)\,(a-c\,(m-2\,k))\right)\,/;\,m\in\mathbb{N}^+$$

01.20.21.1533.01

$$\int \sinh^{\mu}(z)\cosh((\mu+2)\,z)\,dz == \frac{\cosh((\mu+1)\,z)\sinh^{\mu+1}(z)}{\mu+1}$$

01.20.21.1534.01

$$\int \sinh^{\mu}(a\,z)\cosh(a\,z)\,dz == \frac{\sinh^{\mu+1}(a\,z)}{\mu\,a+a}$$

01.20.21.1535.01

$$\int \sinh^2(a\,z)\cosh(a\,z)\,dz == \frac{\sinh^3(a\,z)}{3\,a}$$

01.20.21.1536.01

$$\int \sinh^3(a\,z)\cosh(a\,z)\,dz == \frac{\cosh(4\,a\,z)-4\cosh(2\,a\,z)}{32\,a}$$

01.20.21.1537.01

$$\int \sinh^4(a\,z)\cosh(a\,z)\,dz == \frac{\sinh^5(a\,z)}{5\,a}$$

01.20.21.1538.01

$$\int \sinh^2(a\,z)\cosh(2\,a\,z)\,dz == \frac{4\,a\,z-4\sinh(2\,a\,z)+\sinh(4\,a\,z)}{16\,a}$$

01.20.21.1539.01

$$\int \sinh^{\mu}(a\,z)\cosh(3\,a\,z)\,dz == \frac{(-\mu+2\,(\mu+1)\cosh(2\,a\,z)+1)\sinh^{\mu+1}(a\,z)}{a\,(\mu+1)\,(\mu+3)}$$

01.20.21.1540.01

$$\int \sinh^{\frac{1}{2}}(a\,z)\cosh(a\,z)\,dz == \frac{2\sinh^{\frac{3}{2}}(a\,z)}{3\,a}$$

01.20.21.1541.01

$$\int \frac{\cosh(a\,z)}{\sinh^{\frac{1}{2}}(a\,z)}\,dz == \frac{2\sinh^{\frac{1}{2}}(a\,z)}{a}$$

01.20.21.1542.01

$$\int \sinh^{\frac{1}{2}}(2\,a\,z)\cosh(a\,z)\,dz == \frac{\operatorname{sech}(a\,z)\sinh^{\frac{1}{2}}(2\,a\,z)\left(\coth^{-1}\left(\tanh^{\frac{1}{2}}(a\,z)\right)-\tan^{-1}\left(\tanh^{\frac{1}{2}}(a\,z)\right)+\sinh(2\,a\,z)\tanh^{\frac{1}{2}}(a\,z)\right)}{4\,a\tanh^{\frac{1}{2}}(a\,z)}$$

01.20.21.1543.01

$$\int \frac{\cosh(a\,z)}{\sinh^{\frac{1}{2}}(2\,a\,z)}\,dz == \frac{\operatorname{csch}(a\,z)\sinh^{\frac{1}{2}}(2\,a\,z)}{2\,a\coth^{\frac{1}{2}}(a\,z)}\left(\tanh^{-1}\left(\coth^{\frac{1}{2}}(a\,z)\right)-\tan^{-1}\left(\coth^{\frac{1}{2}}(a\,z)\right)\right)$$

01.20.21.1544.01

$$\int \frac{\cosh(a\,z)}{\sqrt{\sinh^3(2\,a\,z)}}\,dz == -\frac{\cosh(a\,z)\sinh(2\,a\,z)}{a\sqrt{\sinh^3(2\,a\,z)}}$$

01.20.21.1545.01

$$\int \sinh^{\frac{1}{r}}(a\,z)^{\,b}\cosh(a\,z)\,dz == \frac{r\sinh(a\,z)\sinh^{\frac{1}{r}}(a\,z)^{\,b}}{(b+r)\,a}$$

Involving $\sinh^{\mu}(c\,z+d)\cosh(a\,z)$

01.20.21.1546.01

$$\int \sinh^{\mu}(d+c\,z)\cosh(a\,z)\,dz == \frac{1}{2}\left(1-e^{2(d+c\,z)}\right)^{-\mu}$$
$$\left(\frac{e^{-a\,z}}{-a-c\,\mu}\,{}_2F_1\left(-\frac{a+c\,\mu}{2\,c},\,-\mu;\,-\frac{a+c\,(\mu-2)}{2\,c};\,e^{2(d+c\,z)}\right)-\frac{e^{a\,z}}{c\,\mu-a}\,{}_2F_1\left(-\frac{c\,\mu-a}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a}{c}-\mu+2\right);\,e^{2(d+c\,z)}\right)\right)\sinh^{\mu}(d+c\,z)$$

01.20.21.1547.01

$$\int \sinh^{m}(d+c\,z)\cosh(a\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(a\,z)\left(\frac{i}{2}\right)^m}{a}+$$
$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\binom{m}{k}\left((c\,(m-2\,k)-a)\sinh\left(d\,(m-2\,k)+(a+c\,(m-2\,k))\,z-\frac{i\,m\,\pi}{2}\right)-(a+c\,(m-2\,k))\right.\right.\right.$$
$$\left.\left.\left.\sinh\left(-d\,(m-2\,k)+a\,z-c\,(m-2\,k)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)\Big/\left((c\,(m-2\,k)-a)\,(a+c\,(m-2\,k))\right)\right)\left(\frac{i}{2}\right)^m /;\, m\in\mathbb{N}^+$$

Involving $\sinh^{\mu}(c\,z)\cosh(a\,z+b)$

01.20.21.1548.01

$$\int \sinh^{\mu}(c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2}e^{-b}\left(1-e^{2\,c\,z}\right)^{-\mu}$$
$$\left(\frac{e^{-a\,z}}{-a-c\,\mu}\,{}_2F_1\left(-\frac{a+c\,\mu}{2\,c},\,-\mu;\,-\frac{a+c\,(\mu-2)}{2\,c};\,e^{2\,c\,z}\right)-\frac{e^{2\,b+a\,z}}{c\,\mu-a}\,{}_2F_1\left(-\frac{c\,\mu-a}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a}{c}-\mu+2\right);\,e^{2\,c\,z}\right)\right)\sinh^{\mu}(c\,z)$$

01.20.21.1549.01

$$\int \sinh^m(c\,z)\cosh(b+a\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(b+a\,z)\left(\frac{i}{2}\right)^m}{a} + \left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\binom{m}{k}\left((c\,(m-2\,k)-a)\sinh\left(b+(a+c\,(m-2\,k))\,z-\frac{i\,m\,\pi}{2}\right)-\right.\right.\right.$$

$$\left.\left.\left.(a+c\,(m-2\,k))\sinh\left(b+a\,z-c\,(m-2\,k)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)\Big/((c\,(m-2\,k)-a)\,(a+c\,(m-2\,k)))\right)\left(\frac{i}{2}\right)^m /;\ m\in\mathbb{N}^+$$

Involving $\sinh^{\mu}(c\,z+d)\cosh(a\,z+b)$

01.20.21.1550.01

$$\int \sinh^{\mu}(d+c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2}e^{-b}\left(1-e^{2(d+c\,z)}\right)^{-\mu}$$

$$\left(\frac{e^{-a\,z}}{-a-c\,\mu}\,{}_2F_1\left(-\frac{a+c\,\mu}{2\,c},\,-\mu;\,-\frac{a+c\,(\mu-2)}{2\,c};\,e^{2(d+c\,z)}\right)-\frac{e^{2\,b+a\,z}}{c\,\mu-a}\,{}_2F_1\left(-\frac{c\,\mu-a}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a}{c}-\mu+2\right);\,e^{2(d+c\,z)}\right)\right)\sinh^{\mu}(d+c\,z)$$

01.20.21.1551.01

$$\int \sinh^m(d+c\,z)\cosh(b+a\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(b+a\,z)\left(\frac{i}{2}\right)^m}{a} +$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\binom{m}{k}\left((c\,(m-2\,k)-a)\sinh\left(b+d\,(m-2\,k)+(a+c\,(m-2\,k))\,z-\frac{i\,m\,\pi}{2}\right)-(a+c\,(m-2\,k))\right.\right.\right.$$

$$\left.\left.\left.\sinh\left(b-d\,(m-2\,k)+a\,z-c\,(m-2\,k)\,z+\frac{i\,m\,\pi}{2}\right)\right)\right)\Big/((c\,(m-2\,k)-a)\,(a+c\,(m-2\,k)))\right)\left(\frac{i}{2}\right)^m /;\ m\in\mathbb{N}^+$$

Involving $\sinh^{m}(b\,z^{r})\cosh(c\,z)$

01.20.21.1552.01

$$\int \sinh^m\left(b\,z^2\right)\cosh(c\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{c^2}{8bk-4bm}}\operatorname{erfi}\left(\frac{c-4bkz+2bmz}{2\sqrt{b(m-2k)}}\right)}{\sqrt{b(m-2k)}}+\frac{1}{bm-2bk}\left(e^{-\frac{c^2}{8bk-4bm}}\left(e^{\frac{c^2}{4bk-2bm}}\sqrt{bm-2bk}\,\operatorname{erfi}\left(\frac{-c-4bkz+2bmz}{2\sqrt{bm-2bk}}\right)-(-1)^m\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{c+4bkz-2bmz}{2\sqrt{2bk-bm}}\right)\right)-\frac{(-1)^m e^{-\frac{c^2}{8bk-4bm}}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{-c+4bkz-2bmz}{2\sqrt{2bk-bm}}\right)}{b(m-2k)}\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1553.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(-\frac{b\,e^{\frac{b^2(2k-m)^2}{4c}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+b(2k-m)}{2\sqrt{-c}}\right)}{(-c)^{3/2}}-\frac{(-1)^m b\,e^{-\frac{b^2(2k-m)^2}{4c}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+b(2k-m)}{2\sqrt{c}}\right)}{c^{3/2}}+(-1)^m\left(-\frac{b\,e^{\frac{b^2(m-2k)^2}{4c}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+b(m-2k)}{2\sqrt{-c}}\right)}{(-c)^{3/2}}-\frac{(-1)^m b\,e^{-\frac{b^2(m-2k)^2}{4c}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+b(m-2k)}{2\sqrt{c}}\right)}{c^{3/2}}+\frac{2(-1)^m e^{b\sqrt{z}\,(m-2k)+cz}}{c}-\frac{2e^{-b\sqrt{z}\,(m-2k)-cz}}{c}\right)+\frac{2(-1)^m e^{b\sqrt{z}\,(2k-m)+cz}}{c}-\frac{2e^{-b\sqrt{z}\,(2k-m)-cz}}{c}\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+e\right)\cosh(c\,z)$

01.20.21.1554.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{c^2}{8\,b\,k-4\,b\,m}+e\,(m-2\,k)}\,\text{erfi}\left(\frac{c-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\frac{1}{b\,m-2\,b\,k}\right.$$

$$\left(e^{-\frac{c^2}{8\,b\,k-4\,b\,m}-e\,(2\,k+m)}\left(e^{2\left(\frac{c^2}{8\,b\,k-4\,b\,m}+e\,m\right)}\sqrt{b\,m-2\,b\,k}\;\text{erfi}\left(\frac{-c-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,m-2\,b\,k}}\right)-(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m}\right.\right.$$

$$\left.\left.\text{erfi}\left(\frac{c+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-\left.\frac{(-1)^m\,e^{e\,(2\,k-m)-\frac{c^2}{8\,b\,k-4\,b\,m}}\sqrt{2\,b\,k-b\,m}\;\text{erfi}\left(\frac{-c+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)}{b\,(m-2\,k)}\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1555.01

$$\int \sinh^m\left(\sqrt{z}\;b+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-e\,(2\,k-m)}\left(-\frac{b\,e^{\frac{b^2\,(2\,k-m)^2}{4\,c}}\,(2\,k-m)\,\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\;c+b\,(2\,k-m)}{2\sqrt{-c}}\right)}{(-c)^{3/2}}-\right.\right.$$

$$\frac{(-1)^m\,b\,e^{2\,e\,(2\,k-m)-\frac{b^2\,(2\,k-m)^2}{4\,c}}\,(2\,k-m)\,\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\;c+b\,(2\,k-m)}{2\sqrt{c}}\right)}{c^{3/2}}+\frac{2\,(-1)^m\,e^{2\,e\,(2\,k-m)+b\sqrt{z}\;(2\,k-m)+c\,z}}{c}-$$

$$\left.\frac{2\,e^{-b\sqrt{z}\;(2\,k-m)-c\,z}}{c}\right)+(-1)^m\,e^{-e\,(m-2\,k)}\left(-\frac{b\,e^{\frac{b^2\,(m-2\,k)^2}{4\,c}}\,(m-2\,k)\,\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\;c+b\,(m-2\,k)}{2\sqrt{-c}}\right)}{(-c)^{3/2}}-\right.$$

$$\frac{(-1)^m\,b\,e^{2\,e\,(m-2\,k)-\frac{b^2\,(m-2\,k)^2}{4\,c}}\,(m-2\,k)\,\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\;c+b\,(m-2\,k)}{2\sqrt{c}}\right)}{c^{3/2}}+$$

$$\left.\left.\frac{2\,(-1)^m\,e^{2\,e\,(m-2\,k)+b\sqrt{z}\;(m-2\,k)+c\,z}}{c}-\frac{2\,e^{-b\sqrt{z}\;(m-2\,k)-c\,z}}{c}\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh(c\,z)$

01.20.21.1556.01

$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{(c-2dk+dm)^2}{8bk-4bm}}\operatorname{erfi}\left(\frac{c-2k(d+2bz)+m(d+2bz)}{2\sqrt{b(m-2k)}}\right)}{\sqrt{b(m-2k)}}+\right.$$

$$\frac{1}{bm-2bk}\left(e^{-\frac{(c+2dk-dm)^2}{8bk-4bm}}\left(e^{\frac{(c+2dk-dm)^2}{4bk-2bm}}\sqrt{bm-2bk}\,\operatorname{erfi}\left(\frac{-c-2k(d+2bz)+m(d+2bz)}{2\sqrt{bm-2bk}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{c+2k(d+2bz)-m(d+2bz)}{2\sqrt{2bk-bm}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m e^{-\frac{(c-2dk+dm)^2}{8bk-4bm}}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{-c+2k(d+2bz)-m(d+2bz)}{2\sqrt{2bk-bm}}\right)}{b(m-2k)}\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1557.01

$$\int \sinh^m\left(\sqrt{z}\;b+d\,z\right)\cosh(c\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\left(\frac{2e^{(d(2k-m)-c)z-b(m-2k)\sqrt{z}}}{d(2k-m)-c}-\frac{b\,e^{-\frac{b^2(m-2k)^2}{4(d(2k-m)-c)}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2(c+d(m-2k))\sqrt{z}}{2\sqrt{d(2k-m)-c}}\right)}{(d(2k-m)-c)^{3/2}}+\right.\right.$$

$$\frac{2(-1)^m e^{b\sqrt{z}\,(m-2k)+(c+d(m-2k))z}}{c+d(m-2k)}-\frac{(-1)^m b\,e^{-\frac{b^2(m-2k)^2}{4(c+d(m-2k))}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2(c+d(m-2k))\sqrt{z}}{2\sqrt{c+d(m-2k)}}\right)}{(c+d(m-2k))^{3/2}}\Bigg)+$$

$$\frac{2(-1)^m e^{b\sqrt{z}\,(2k-m)+(c+d(2k-m))z}}{c+d(2k-m)}-\frac{(-1)^m b\,e^{-\frac{b^2(2k-m)^2}{4(c+d(2k-m))}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\;(c+d(2k-m))+b(2k-m)}{2\sqrt{c+d(2k-m)}}\right)}{(c+d(2k-m))^{3/2}}+$$

$$\left.\frac{2e^{(d(m-2k)-c)z-b(2k-m)\sqrt{z}}}{d(m-2k)-c}-\frac{b\,e^{-\frac{b^2(2k-m)^2}{4(d(m-2k)-c)}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\;(c+d(2k-m))+b(2k-m)}{2\sqrt{d(m-2k)-c}}\right)}{(d(m-2k)-c)^{3/2}}\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.1558.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{(c-2dk+dm)^2}{8bk-4bm}+e(m-2k)}\operatorname{erfi}\left(\frac{c-2k(d+2bz)+m(d+2bz)}{2\sqrt{b(m-2k)}}\right)}{\sqrt{b(m-2k)}}+\frac{1}{bm-2bk}\right.$$

$$\left(e^{-\frac{(c+2dk-dm)^2}{8bk-4bm}-e(2k+m)}\left(e^{2\left(\frac{(c+2dk-dm)^2}{8bk-4bm}+em\right)}\sqrt{bm-2bk}\,\operatorname{erfi}\left(\frac{-c-2k(d+2bz)+m(d+2bz)}{2\sqrt{bm-2bk}}\right)-\right.\right.$$

$$\left.\left.(-1)^m e^{4ek}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{c+2k(d+2bz)-m(d+2bz)}{2\sqrt{2bk-bm}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m e^{e(2k-m)-\frac{(c-2dk+dm)^2}{8bk-4bm}}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{-c+2k(d+2bz)-m(d+2bz)}{2\sqrt{2bk-bm}}\right)}{b(m-2k)}\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1559.01

$$\int \sinh^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(c\,z)\left(\frac{i}{2}\right)^m}{c}+2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-e(2k-m)}\left(\frac{2(-1)^m e^{2e(2k-m)+b\sqrt{z}\,(2k-m)+(c+d(2k-m))z}}{c+d(2k-m)}-\left((-1)^m b\right.\right.\right.$$

$$\left.\left.e^{2e(2k-m)-\frac{b^2(2k-m)^2}{4(c+d(2k-m))}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+d(2k-m))+b(2k-m)}{2\sqrt{c+d(2k-m)}}\right)\right)\Big/(c+d(2k-m))^{3/2}+\right.$$

$$\left.\frac{2e^{(d(m-2k)-c)z-b(2k-m)\sqrt{z}}}{d(m-2k)-c}-\frac{b\,e^{-\frac{b^2(2k-m)^2}{4(d(m-2k)-c)}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+d(2k-m))+b(2k-m)}{2\sqrt{d(m-2k)-c}}\right)}{(d(m-2k)-c)^{3/2}}\right)+$$

$$(-1)^m e^{-e(m-2k)}\left(\frac{2e^{(d(2k-m)-c)z-b(m-2k)\sqrt{z}}}{d(2k-m)-c}-\frac{b\,e^{-\frac{b^2(m-2k)^2}{4(d(2k-m)-c)}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2(c+d(m-2k))\sqrt{z}}{2\sqrt{d(2k-m)-c}}\right)}{(d(2k-m)-c)^{3/2}}+\right.$$

$$\frac{2(-1)^m e^{2e(m-2k)+b\sqrt{z}\,(m-2k)+(c+d(m-2k))z}}{c+d(m-2k)}-\left((-1)^m b\,e^{2e(m-2k)-\frac{b^2(m-2k)^2}{4(c+d(m-2k))}}(m-2k)\right.$$

$$\left.\left.\left.\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2(c+d(m-2k))\sqrt{z}}{2\sqrt{c+d(m-2k)}}\right)\right)\Big/(c+d(m-2k))^{3/2}\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh(f\,z+g)$

01.20.21.1560.01

$$\int \sinh^m\left(b\,z^2\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(\frac{i}{2}\right)^m}{f} +$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{f^2}{8bk-4bm}+g}\,\text{erfi}\left(\frac{f-4bkz+2bmz}{2\sqrt{b(m-2k)}}\right)}{\sqrt{b(m-2k)}} + \frac{1}{bm-2bk}\left(e^{-\frac{f^2}{8bk-4bm}+g}\right.\right.$$

$$\left.\left(e^{2\left(\frac{f^2}{8bk-4bm}-g\right)}\sqrt{bm-2bk}\;\text{erfi}\left(\frac{-f-4bkz+2bmz}{2\sqrt{bm-2bk}}\right)-(-1)^m\sqrt{2bk-bm}\;\text{erfi}\left(\frac{f+4bkz-2bmz}{2\sqrt{2bk-bm}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m e^{-\frac{f^2}{8bk-4bm}-g}\sqrt{2bk-bm}\;\text{erfi}\left(\frac{-f+4bkz-2bmz}{2\sqrt{2bk-bm}}\right)}{b(m-2k)}\right) /;\; m\in\mathbb{N}^+$$

01.20.21.1561.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(\frac{i}{2}\right)^m}{f} + 2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(e^{-g}\left(-\frac{b\,e^{\frac{b^2(2k-m)^2}{4f}}(2k-m)\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\,f+b(2k-m)}{2\sqrt{-f}}\right)}{(-f)^{3/2}} - \frac{(-1)^m b\,e^{2g-\frac{b^2(2k-m)^2}{4f}}(2k-m)\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\,f+b(2k-m)}{2\sqrt{f}}\right)}{f^{3/2}} +\right.\right.$$

$$\left.\left.\frac{2(-1)^m e^{2g+fz+b(2k-m)\sqrt{z}}}{f} - \frac{2e^{-b\sqrt{z}(2k-m)-fz}}{f}\right) + (-1)^m e^{-g}\right.$$

$$\left(-\frac{b\,e^{\frac{b^2(m-2k)^2}{4f}}(m-2k)\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\,f+b(m-2k)}{2\sqrt{-f}}\right)}{(-f)^{3/2}} - \frac{(-1)^m b\,e^{2g-\frac{b^2(m-2k)^2}{4f}}(m-2k)\sqrt{\pi}\;\text{erfi}\left(\frac{2\sqrt{z}\,f+b(m-2k)}{2\sqrt{f}}\right)}{f^{3/2}} +\right.$$

$$\left.\left.\frac{2(-1)^m e^{2g+fz+b(m-2k)\sqrt{z}}}{f} - \frac{2e^{-b\sqrt{z}(m-2k)-fz}}{f}\right)\right) /;\; m\in\mathbb{N}^+$$

Involving $\sinh^m(b z^r + e)\cosh(f z + g)$

01.20.21.1562.01

$$\int \sinh^m\left(b z^2 + e\right)\cosh(g + f z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sinh(g + f z)\left(\frac{i}{2}\right)^m}{f} +$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{f^2}{8bk-4bm}+g+e(m-2k)}\operatorname{erfi}\left(\frac{f-4bkz+2bmz}{2\sqrt{b(m-2k)}}\right)}{\sqrt{b(m-2k)}} + \frac{1}{bm-2bk}\left(e^{-\frac{f^2}{8bk-4bm}+g-e(2k+m)}\left(e^{2\left(\frac{f^2}{8bk-4bm}-g+em\right)}\right.\right.\right.$$

$$\left.\left.\left.\sqrt{bm-2bk}\,\operatorname{erfi}\left(\frac{-f-4bkz+2bmz}{2\sqrt{bm-2bk}}\right) - (-1)^m e^{4ek}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{f+4bkz-2bmz}{2\sqrt{2bk-bm}}\right)\right)\right) -$$

$$\left.\frac{(-1)^m e^{-\frac{f^2}{8bk-4bm}-g+e(2k-m)}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{-f+4bkz-2bmz}{2\sqrt{2bk-bm}}\right)}{b(m-2k)}\right) /;\ m \in \mathbb{N}^+$$

01.20.21.1563.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(\frac{i}{2}\right)^m}{f} +$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g-e(2k-m)}\left(-\frac{b\,e^{\frac{b^2(2k-m)^2}{4f}}(2k-m)\sqrt{\pi}\ \text{erfi}\left(\frac{2\sqrt{z}\ f+b(2k-m)}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.\right.$$

$$\frac{(-1)^m b\,e^{2(g+e(2k-m))-\frac{b^2(2k-m)^2}{4f}}(2k-m)\sqrt{\pi}\ \text{erfi}\left(\frac{2\sqrt{z}\ f+b(2k-m)}{2\sqrt{f}}\right)}{f^{3/2}}+\frac{2(-1)^m e^{2(g+e(2k-m))+f z+b(2k-m)\sqrt{z}}}{f}-$$

$$\left.\frac{2e^{-b\sqrt{z}\ (2k-m)-f z}}{f}\right)+(-1)^m e^{-g-e(m-2k)}\left(-\frac{b\,e^{\frac{b^2(m-2k)^2}{4f}}(m-2k)\sqrt{\pi}\ \text{erfi}\left(\frac{2\sqrt{z}\ f+b(m-2k)}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.$$

$$\frac{(-1)^m b\,e^{2(g+e(m-2k))-\frac{b^2(m-2k)^2}{4f}}(m-2k)\sqrt{\pi}\ \text{erfi}\left(\frac{2\sqrt{z}\ f+b(m-2k)}{2\sqrt{f}}\right)}{f^{3/2}}+$$

$$\left.\left.\frac{2(-1)^m e^{b\sqrt{z}\ (m-2k)+2(g+e(m-2k))+f z}}{f}-\frac{2e^{-b\sqrt{z}\ (m-2k)-f z}}{f}\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh(f\,z+g)$

01.20.21.1564.01

$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(\frac{i}{2}\right)^m}{f}+2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{(f-2\,d\,k+d\,m)^2}{8\,b\,k-4\,b\,m}+g}\ \text{erfi}\left(\frac{f-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\right.$$

$$\frac{1}{b\,m-2\,b\,k}\left(e^{g-\frac{(f+2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m}}\left(e^{2\left(\frac{(f+2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m}-g\right)}\sqrt{b\,m-2\,b\,k}\ \text{erfi}\left(\frac{-f-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,m-2\,b\,k}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\sqrt{2\,b\,k-b\,m}\ \text{erfi}\left(\frac{f+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(f-2\,d\,k+d\,m)^2}{8\,b\,k-4\,b\,m}-g}\sqrt{2\,b\,k-b\,m}\ \text{erfi}\left(\frac{-f+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)}{b\,(m-2\,k)}\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1565.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(\frac{i}{2}\right)^m}{f}+2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g}\left(\frac{2\,(-1)^m\,e^{2\,g+(f+d\,(2\,k-m))\,z+b\,(2\,k-m)\,\sqrt{z}}}{f+d\,(2\,k-m)}-\right.\right.$$

$$\frac{(-1)^m\,b\,e^{2\,g-\frac{b^2\,(2\,k-m)^2}{4\,(f+d\,(2\,k-m))}}\,(2\,k-m)\,\sqrt{\pi}\ \text{erfi}\left(\frac{2\sqrt{z}\ (f+d\,(2\,k-m))+b\,(2\,k-m)}{2\sqrt{f+d\,(2\,k-m)}}\right)}{(f+d\,(2\,k-m))^{3/2}}+\frac{2\,e^{(d\,(m-2\,k)-f)\,z-b\,(2\,k-m)\,\sqrt{z}}}{d\,(m-2\,k)-f}-$$

$$\left.\frac{b\,e^{-\frac{b^2\,(2\,k-m)^2}{4\,(d\,(m-2\,k)-f)}}\,(2\,k-m)\,\sqrt{\pi}\ \text{erfi}\left(\frac{2\sqrt{z}\ (f+d\,(2\,k-m))+b\,(2\,k-m)}{2\sqrt{d\,(m-2\,k)-f}}\right)}{(d\,(m-2\,k)-f)^{3/2}}\right)+(-1)^m\,e^{-g}\left(\frac{2\,e^{(d\,(2\,k-m)-f)\,z-b\,(m-2\,k)\,\sqrt{z}}}{d\,(2\,k-m)-f}-\right.$$

$$\frac{b\,e^{-\frac{b^2\,(m-2\,k)^2}{4\,(d\,(2\,k-m)-f)}}\,(m-2\,k)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,(f+d\,(m-2\,k))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)-f}}\right)}{(d\,(2\,k-m)-f)^{3/2}}+\frac{2\,(-1)^m\,e^{2\,g+(f+d\,(m-2\,k))\,z+b\,(m-2\,k)\,\sqrt{z}}}{f+d\,(m-2\,k)}-$$

$$\left.\left.\frac{(-1)^m\,b\,e^{2\,g-\frac{b^2\,(m-2\,k)^2}{4\,(f+d\,(m-2\,k))}}\,(m-2\,k)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,(f+d\,(m-2\,k))\,\sqrt{z}}{2\sqrt{f+d\,(m-2\,k)}}\right)}{(f+d\,(m-2\,k))^{3/2}}\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(b z^r + d z + e)\cosh(f z + g)$

01.20.21.1566.01

$$\int \sinh^m\left(b z^2 + d z + e\right)\cosh(g + f z)\, dz ==$$

$$\frac{\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sinh(g + f z)\left(\frac{i}{2}\right)^m}{f} + 2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{\frac{(f-2dk+dm)^2}{8bk-4bm}+g+e(m-2k)}\operatorname{erfi}\left(\frac{f-2k(d+2bz)+m(d+2bz)}{2\sqrt{b(m-2k)}}\right)}{\sqrt{b(m-2k)}} + \right.$$

$$\frac{1}{bm-2bk}\left(e^{-\frac{(f+2dk-dm)^2}{8bk-4bm}+g-e(2k+m)}\left(e^{2\left(\frac{(f+2dk-dm)^2}{8bk-4bm}-g+em\right)}\sqrt{bm-2bk}\,\operatorname{erfi}\left(\frac{-f-2k(d+2bz)+m(d+2bz)}{2\sqrt{bm-2bk}}\right)-\right.\right.$$

$$\left.\left.(-1)^m e^{4ek}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{f+2k(d+2bz)-m(d+2bz)}{2\sqrt{2bk-bm}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m e^{-\frac{(f-2dk+dm)^2}{8bk-4bm}-g+e(2k-m)}\sqrt{2bk-bm}\,\operatorname{erfi}\left(\frac{-f+2k(d+2bz)-m(d+2bz)}{2\sqrt{2bk-bm}}\right)}{b(m-2k)}\right) /;\ m\in\mathbb{N}^+$$

01.20.21.1567.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh(g+f\,z)\,dz == \frac{\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sinh(g+f\,z)\left(\frac{i}{2}\right)^m}{f}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g-e\,(2\,k-m)}\left(\frac{2\,(-1)^m\,e^{2\,(g+e\,(2\,k-m))+(f+d\,(2\,k-m))\,z+b\,(2\,k-m)\,\sqrt{z}}}{f+d\,(2\,k-m)}-\left((-1)^m\,b\,e^{2\,(g+e\,(2\,k-m))-\frac{b^2\,(2\,k-m)^2}{4\,(f+d\,(2\,k-m))}}\right.\right.\right.$$

$$\left.\left.\left.(2\,k-m)\,\sqrt{\pi}\ \text{erfi}\left(\frac{2\,\sqrt{z}\ (f+d\,(2\,k-m))+b\,(2\,k-m)}{2\,\sqrt{f+d\,(2\,k-m)}}\right)\right)\Big/(f+d\,(2\,k-m))^{3/2}+\right.\right.$$

$$\left.\left.\frac{2\,e^{(d\,(m-2\,k)-f)\,z-b\,(2\,k-m)\,\sqrt{z}}}{d\,(m-2\,k)-f}-\frac{b\,e^{-\frac{b^2\,(2\,k-m)^2}{4\,(d\,(m-2\,k)-f)}}\,(2\,k-m)\,\sqrt{\pi}\ \text{erfi}\left(\frac{2\,\sqrt{z}\ (f+d\,(2\,k-m))+b\,(2\,k-m)}{2\,\sqrt{d\,(m-2\,k)-f}}\right)}{(d\,(m-2\,k)-f)^{3/2}}\right)+\right.$$

$$(-1)^m\,e^{-g-e\,(m-2\,k)}\left(\frac{2\,e^{(d\,(2\,k-m)-f)\,z-b\,(m-2\,k)\,\sqrt{z}}}{d\,(2\,k-m)-f}-\frac{b\,e^{-\frac{b^2\,(m-2\,k)^2}{4\,(d\,(2\,k-m)-f)}}\,(m-2\,k)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,(f+d\,(m-2\,k))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)-f}}\right)}{(d\,(2\,k-m)-f)^{3/2}}+\right.$$

$$\left.\frac{2\,(-1)^m\,e^{b\,\sqrt{z}\ (m-2\,k)+2\,(g+e\,(m-2\,k))+(f+d\,(m-2\,k))\,z}}{f+d\,(m-2\,k)}-\left((-1)^m\,b\,e^{2\,(g+e\,(m-2\,k))-\frac{b^2\,(m-2\,k)^2}{4\,(f+d\,(m-2\,k))}}\,(m-2\,k)\right.\right.$$

$$\left.\left.\left.\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,(f+d\,(m-2\,k))\,\sqrt{z}}{2\,\sqrt{f+d\,(m-2\,k)}}\right)\right)\Big/(f+d\,(m-2\,k))^{3/2}\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1568.01

$$\int \sinh^m(b\,z)\cosh\left(c\,z^2\right)dz == -\frac{i^m\,2^{-m-2}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{(-1)^m\sqrt{-c}\;e^{\frac{(b\,m-2\,b\,k)^2}{4\,c}}\operatorname{erfi}\left(\frac{2\,b\,k-b\,m-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\frac{e^{-\frac{(b\,m-2\,b\,k)^2}{4\,c}}\operatorname{erfi}\left(\frac{-2\,b\,k+b\,m+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\right.$$

$$\left.\frac{1}{c}\left(e^{-\frac{(2\,b\,k-b\,m)^2}{4\,c}}\left(\sqrt{-c}\;e^{\frac{(2\,b\,k-b\,m)^2}{2\,c}}\operatorname{erfi}\left(\frac{-2\,b\,k+b\,m-2\,c\,z}{2\sqrt{-c}}\right)-(-1)^m\sqrt{c}\;\operatorname{erfi}\left(\frac{2\,b\,k-b\,m+2\,c\,z}{2\sqrt{c}}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1569.01

$$\int \sinh^m(b\,z)\cosh\left(c\,\sqrt{z}\right)dz == \frac{\left(\frac{i}{2}\right)^m e^{-c\sqrt{z}}\left(-\sqrt{z}\;c+e^{2\,c\sqrt{z}}\left(c\,\sqrt{z}\;-1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\left(-\frac{c\,e^{-\frac{c^2}{4\,b\,(2\,k-m)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,b\,(m-2\,k)\,\sqrt{z}}{2\sqrt{b\,(2\,k-m)}}\right)}{(b\,(2\,k-m))^{3/2}}+\frac{2\,e^{b\,(2\,k-m)\,z-c\,\sqrt{z}}}{b\,(2\,k-m)}+\right.\right.$$

$$\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+b\,(m-2\,k)\,z}}{b\,(m-2\,k)}-\frac{(-1)^m\,c\,e^{-\frac{c^2}{4\,b\,(m-2\,k)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,b\,(m-2\,k)\,\sqrt{z}}{2\sqrt{b\,(m-2\,k)}}\right)}{(b\,(m-2\,k))^{3/2}}\Bigg)+\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+b\,(2\,k-m)\,z}}{b\,(2\,k-m)}-$$

$$\left.\left.\frac{(-1)^m\,c\,e^{-\frac{c^2}{4\,b\,(2\,k-m)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,b\,(2\,k-m)\,\sqrt{z}}{2\sqrt{b\,(2\,k-m)}}\right)}{(b\,(2\,k-m))^{3/2}}+\frac{2\,e^{b\,(m-2\,k)\,z-c\,\sqrt{z}}}{b\,(m-2\,k)}-\frac{c\,e^{-\frac{c^2}{4\,b\,(m-2\,k)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,b\,(2\,k-m)\,\sqrt{z}}{2\sqrt{b\,(m-2\,k)}}\right)}{(b\,(m-2\,k))^{3/2}}\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.1570.01

$$\int \sinh^m(e+d\,z)\cosh\left(c\,z^2\right)dz ==$$

$$-\frac{i^m\,2^{-m-2}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(-\frac{(-1)^m\,\sqrt{-c}\;e^{\frac{(d\,m-2\,d\,k)^2}{4\,c}+e\,(2\,k-m)}\operatorname{erfi}\left(\frac{2\,d\,k-d\,m-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\frac{e^{-\frac{(d\,m-2\,d\,k)^2}{4\,c}+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{1}{c}\left(e^{-\frac{(2\,d\,k-d\,m)^2}{4\,c}-e\,(2\,k+m)}\right.\right.$$

$$\left.\left.\left(\sqrt{-c}\;e^{2\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}+e\,m\right)}\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m-2\,c\,z}{2\sqrt{-c}}\right)-(-1)^m\,\sqrt{c}\;e^{4\,e\,k}\operatorname{erfi}\left(\frac{2\,d\,k-d\,m+2\,c\,z}{2\sqrt{c}}\right)\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1571.01

$$\int \sinh^m(e+d\,z)\cosh\left(c\sqrt{z}\right)dz == \frac{\left(\frac{i}{2}\right)^m e^{-c\sqrt{z}}\left(-\sqrt{z}\;c+e^{2\,c\sqrt{z}}\left(c\sqrt{z}-1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-e\,(2\,k-m)}\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+2\,e\,(2\,k-m)+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\frac{(-1)^m\,c\,e^{2\,e\,(2\,k-m)-\frac{c^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,d\,(2\,k-m)\sqrt{z}}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\right.\right.$$

$$\left.\left.\frac{2\,e^{d\,(m-2\,k)\,z-c\sqrt{z}}}{d\,(m-2\,k)}-\frac{c\,e^{-\frac{c^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,d\,(m-2\,k)\sqrt{z}}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+\right.$$

$$(-1)^m\,e^{-e\,(m-2\,k)}\left(-\frac{c\,e^{-\frac{c^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,d\,(m-2\,k)\sqrt{z}}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\frac{2\,e^{d\,(2\,k-m)\,z-c\sqrt{z}}}{d\,(2\,k-m)}+\right.$$

$$\left.\left.\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+2\,e\,(m-2\,k)+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{(-1)^m\,c\,e^{2\,e\,(m-2\,k)-\frac{c^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2\,d\,(m-2\,k)\sqrt{z}}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh(c\,z^r)$

01.20.21.1572.01

$$\int \sinh^m(b\,z^r)\cosh(c\,z^r)\,dz == -\frac{i^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r},\,-c\,z^r\right)(-c\,z^r)^{-1/r}+(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$

$$\frac{1}{r}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(-c-2\,b\,k+b\,m)\,z^r\right)((-c-2\,b\,k+b\,m)\,z^r)^{-1/r}+\right.$$

$$(-1)^m\,((c-2\,b\,k+b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-2\,b\,k+b\,m)\,z^r\right)+((-c+2\,b\,k-b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-c+2\,b\,k-b\,m)\,z^r\right)+$$

$$\left.((c+2\,b\,k-b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c+2\,b\,k-b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1573.01

$$\int \sinh^m\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz ==$$

$$-\frac{i^m\,2^{-m-2}\,\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\right.$$

$$\left(\sqrt{-c-2\,b\,k+b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\sqrt{c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)+$$

$$\left.\frac{\operatorname{erfi}\left(\frac{2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{(-1)^m\sqrt{-c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1574.01

$$\int \sinh^m\left(b\,\sqrt{z}\right)\cosh\left(c\,\sqrt{z}\right)dz == -\frac{i^{-m}\,2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\,\sinh\left(c\,\sqrt{z}\right)\right)}{c^2}-i^{-m}\,2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{1}{(c+2\,b\,k-b\,m)^2}\left(\cosh\left((c+2\,b\,k-b\,m)\,\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-(c+2\,b\,k-b\,m)\,\sqrt{z}\,\sinh\left((c+2\,b\,k-b\,m)\,\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+\right.$$

$$\frac{1}{(-c+2\,b\,k-b\,m)^2}\left(\cosh\left(\frac{i\,m\,\pi}{2}-(-c+2\,b\,k-b\,m)\,\sqrt{z}\right)+\right.$$

$$\left.\left.(-c+2\,b\,k-b\,m)\,\sqrt{z}\,\sinh\left(\frac{i\,m\,\pi}{2}-(-c+2\,b\,k-b\,m)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+e)\cosh(c\,z^r)$

01.20.21.1575.01

$$\int \sinh^m(b\,z^r+e)\cosh(c\,z^r)\,dz == -\frac{i^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$
$$\frac{1}{r}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,e\,k-e\,m}\,\Gamma\left(\frac{1}{r},(-c-2\,b\,k+b\,m)\,z^r\right)((-c-2\,b\,k+b\,m)\,z^r)^{-1/r}+\right.$$
$$(-1)^m\,e^{2\,e\,k-e\,m}\,((c-2\,b\,k+b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,b\,k+b\,m)\,z^r\right)+e^{e\,m-2\,e\,k}\,((-c+2\,b\,k-b\,m)\,z^r)^{-1/r}$$
$$\left.\Gamma\left(\frac{1}{r},(-c+2\,b\,k-b\,m)\,z^r\right)+e^{e\,m-2\,e\,k}\,((c+2\,b\,k-b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,b\,k-b\,m)\,z^r\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1576.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz == -\frac{i^m\,2^{-m-2}\,\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\ \operatorname{erfi}\left(\sqrt{-c}\ z\right)-\sqrt{c}\ \operatorname{erfi}\left(\sqrt{c}\ z\right)\right)(1-m \bmod 2)}{c}+$$
$$2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{-e\,(2\,k+m)}\left(e^{2\,e\,m}\,\sqrt{-c-2\,b\,k+b\,m}\ \operatorname{erfi}\left(\frac{-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\,\sqrt{-c-2\,b\,k+b\,m}}\right)-\right.\right.\right.$$
$$\left.\left.(-1)^m\,e^{4\,e\,k}\,\sqrt{c+2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\,\sqrt{c+2\,b\,k-b\,m}}\right)\right)+$$
$$\left.\left.\frac{e^{e\,(m-2\,k)}\,\operatorname{erfi}\left(\frac{2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\,\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{(-1)^m\,e^{e\,(2\,k-m)}\,\sqrt{-c+2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\,\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1577.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh\left(c\,\sqrt{z}\right)dz == -\frac{i^{-m}\,2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(c\,\sqrt{z}\right)-c\,\sqrt{z}\ \sinh\left(c\,\sqrt{z}\right)\right)}{c^2}-$$
$$i^{-m}\,2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(c+2\,b\,k-b\,m)^2}\left(\cosh\left(2\,e\,k-e\,m+(c+2\,b\,k-b\,m)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)-\right.\right.$$
$$\left.(c+2\,b\,k-b\,m)\,\sqrt{z}\ \sinh\left(2\,e\,k-e\,m+(c+2\,b\,k-b\,m)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)+$$
$$\frac{1}{(-c+2\,b\,k-b\,m)^2}\left(\cosh\left(-2\,e\,k+e\,m-(-c+2\,b\,k-b\,m)\,\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)+\right.$$
$$\left.\left.(-c+2\,b\,k-b\,m)\,\sqrt{z}\ \sinh\left(-2\,e\,k+e\,m-(-c+2\,b\,k-b\,m)\,\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+d\,z)\cosh(c\,z^r)$

01.20.21.1578.01

$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)dz == -\frac{i^m\,2^{-m-2}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+$$

$$2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{-\frac{(2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}\right.\right.$$

$$\left(e^{\frac{(2\,d\,k-d\,m)^2}{2\,c+4\,b\,k-2\,b\,m}}\sqrt{-c-2\,b\,k+b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\sqrt{c+2\,b\,k-b\,m}\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+\frac{e^{\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}}\operatorname{erfi}\left(\frac{2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}}\sqrt{-c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1579.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(c\,\sqrt{z}\right)dz == \frac{\left(\frac{i}{2}\right)^m e^{-c\sqrt{z}}\left(-\sqrt{z}\ c+e^{2c\sqrt{z}}\left(c\sqrt{z}\ -1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,(2\,k-m))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\right.$$

$$\frac{(-1)^m\,e^{-\frac{(c+b\,(2\,k-m))^2}{4\,d\,(2\,k-m)}}\,(c+b\,(2\,k-m))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2\,k-m)+2\,d\,(2\,k-m)\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\frac{2\,e^{\sqrt{z}\ (-c-b\,(2\,k-m))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-$$

$$\frac{e^{-\frac{(c+b\,(2\,k-m))^2}{4\,d\,(m-2\,k)}}\,(c+b\,(2\,k-m))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2\,k-m)+2\,d\,(2\,k-m)\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}+(-1)^m\left(\frac{2\,e^{\sqrt{z}\ (-c-b\,(m-2\,k))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\right.$$

$$\frac{e^{-\frac{(c+b\,(m-2\,k))^2}{4\,d\,(2\,k-m)}}\,(c+b\,(m-2\,k))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2\,k)+2\,d\,(m-2\,k)\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,(m-2\,k))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-$$

$$\left.\left.\frac{(-1)^m\,e^{-\frac{(c+b\,(m-2\,k))^2}{4\,d\,(m-2\,k)}}\,(c+b\,(m-2\,k))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2\,k)+2\,d\,(m-2\,k)\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

01.20.21.1580.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2\right)dz ==$$

$$-\frac{i^m\,2^{-m-2}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\right.$$

$$\left(e^{-\frac{(2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}-e\,(2\,k+m)}\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}+e\,m\right)}\sqrt{-c-2\,b\,k+b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+$$

$$\frac{e^{\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{1}{c+b\,(m-2\,k)}$$

$$\left.\left((-1)^m\,e^{e\,(2\,k-m)-\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}}\sqrt{-c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{-c+2\,b\,k-b\,m}}\right)\right)\right/;\ m\in\mathbb{N}^+$$

01.20.21.1581.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(c\,\sqrt{z}\right)dz == \frac{\left(\frac{i}{2}\right)^m e^{-c\sqrt{z}}\left(-\sqrt{z}\ c+e^{2c\sqrt{z}}\left(c\sqrt{z}\ -1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-e(2k-m)}\left(\frac{2(-1)^m e^{\sqrt{z}\ (c+b(2k-m))+2e(2k-m)+d(2k-m)z}}{d(2k-m)}-\right.\right.$$

$$\frac{1}{(d(2k-m))^{3/2}}\left((-1)^m e^{2e(2k-m)-\frac{(c+b(2k-m))^2}{4d(2k-m)}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2d(2k-m)\sqrt{z}}{2\sqrt{d(2k-m)}}\right)\right)+$$

$$\left.\frac{2e^{\sqrt{z}\ (-c-b(2k-m))+d(m-2k)z}}{d(m-2k)}-\frac{e^{-\frac{(-c-b(2k-m))^2}{4d(m-2k)}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2d(2k-m)\sqrt{z}}{2\sqrt{d(m-2k)}}\right)}{(d(m-2k))^{3/2}}\right)+$$

$$(-1)^m e^{-e(m-2k)}\left(\frac{2e^{\sqrt{z}\ (-c-b(m-2k))+d(2k-m)z}}{d(2k-m)}-\frac{e^{-\frac{(-c-b(m-2k))^2}{4d(2k-m)}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2d(m-2k)\sqrt{z}}{2\sqrt{d(2k-m)}}\right)}{(d(2k-m))^{3/2}}+\right.$$

$$\frac{2(-1)^m e^{2e(m-2k)+dz(m-2k)+(c+b(m-2k))\sqrt{z}}}{d(m-2k)}-\frac{1}{(d(m-2k))^{3/2}}$$

$$\left.\left.\left((-1)^m e^{2e(m-2k)-\frac{(c+b(m-2k))^2}{4d(m-2k)}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2d(m-2k)\sqrt{z}}{2\sqrt{d(m-2k)}}\right)\right)\right)\right/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.1582.01

$$\int \sinh^m(d\,z)\cosh\left(c\,z^2+g\right)dz == -\frac{i^m 2^{-m-2}e^{-g}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\ \operatorname{erfi}\left(\sqrt{-c}\ z\right)-\sqrt{c}\ e^{2g}\operatorname{erfi}\left(\sqrt{c}\ z\right)\right)(1-m \bmod 2)}{c}+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{(-1)^m\sqrt{-c}\ e^{\frac{(d(m-2k))^2}{4c}-g}\operatorname{erfi}\left(\frac{2dk-dm-2cz}{2\sqrt{-c}}\right)}{c}+\frac{e^{g-\frac{(d(m-2k))^2}{4c}}\operatorname{erfi}\left(\frac{-2dk+dm+2cz}{2\sqrt{c}}\right)}{\sqrt{c}}-\right.$$

$$\left.\frac{1}{c}\left(e^{g-\frac{(2dk-dm)^2}{4c}}\left(\sqrt{-c}\ e^{2\left(\frac{(2dk-dm)^2}{4c}-g\right)}\operatorname{erfi}\left(\frac{-2dk+dm-2cz}{2\sqrt{-c}}\right)-(-1)^m\sqrt{c}\ \operatorname{erfi}\left(\frac{2dk-dm+2cz}{2\sqrt{c}}\right)\right)\right)\right/;\ m\in\mathbb{N}^+$$

01.20.21.1583.01

$$\int \sinh^m(d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz == \frac{\left(\frac{i}{2}\right)^m e^{-\sqrt{z}\;c-g}\left(-\sqrt{z}\;c+e^{2\left(\sqrt{z}\;c+g\right)}\left(c\sqrt{z}\;-1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+2^{-m-2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g}\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+2\,g+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\frac{(-1)^m\,c\,e^{2\,g-\frac{c^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,d\,(2\,k-m)\sqrt{z}}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\frac{2\,e^{d\,(m-2\,k)\,z-c\sqrt{z}}}{d\,(m-2\,k)}-\right.\right.$$

$$\left.\frac{c\,e^{-\frac{c^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,d\,(2\,k-m)\sqrt{z}}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+(-1)^m\,e^{-g}\left(-\frac{c\,e^{-\frac{c^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,d\,(m-2\,k)\sqrt{z}}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\right.$$

$$\left.\left.\frac{2\,e^{d\,(2\,k-m)\,z-c\sqrt{z}}}{d\,(2\,k-m)}+\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+2\,g+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{(-1)^m\,c\,e^{2\,g-\frac{c^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2\,d\,(m-2\,k)\sqrt{z}}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.1584.01

$$\int \sinh^m(e+d\,z)\cosh\left(c\,z^2+g\right)dz == -\frac{i^m\,2^{-m-2}\,e^{-g}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;\operatorname{erfi}\left(\sqrt{-c}\;z\right)-\sqrt{c}\;e^{2\,g}\operatorname{erfi}\left(\sqrt{c}\;z\right)\right)(1-m \bmod 2)}{c}+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{(-1)^m\sqrt{-c}\;e^{\frac{(d\,m-2\,d\,k)^2}{4\,c}-g+e\,(2\,k-m)}\operatorname{erfi}\left(\frac{2\,d\,k-d\,m-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\right.$$

$$\frac{e^{-\frac{(d\,m-2\,d\,k)^2}{4\,c}+g+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{1}{c}\left(e^{-\frac{(2\,d\,k-d\,m)^2}{4\,c}+g-e\,(2\,k+m)}\right.$$

$$\left.\left.\left(\sqrt{-c}\;e^{2\left(\frac{(2\,d\,k-d\,m)^2}{4\,c}-g+e\,m\right)}\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m-2\,c\,z}{2\sqrt{-c}}\right)-(-1)^m\sqrt{c}\;e^{4\,e\,k}\operatorname{erfi}\left(\frac{2\,d\,k-d\,m+2\,c\,z}{2\sqrt{c}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1585.01

$$\int \sinh^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$\frac{\left(\frac{i}{2}\right)^m e^{-\sqrt{z}\;c-g}\left(-\sqrt{z}\;c+e^{2\left(\sqrt{z}\;c+g\right)}\left(c\sqrt{z}\;-1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(e^{-g-e(2k-m)}\left(\frac{2(-1)^m e^{\sqrt{z}\;c+2(g+e(2k-m))+d(2k-m)z}}{d(2k-m)}-\frac{(-1)^m c\,e^{2(g+e(2k-m))-\frac{c^2}{4d(2k-m)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2d(2k-m)\sqrt{z}}{2\sqrt{d(2k-m)}}\right)}{(d(2k-m))^{3/2}}+\right.\right.$$

$$\left.\frac{2e^{d(m-2k)z-c\sqrt{z}}}{d(m-2k)}-\frac{c\,e^{-\frac{c^2}{4d(m-2k)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2d(m-2k)\sqrt{z}}{2\sqrt{d(m-2k)}}\right)}{(d(m-2k))^{3/2}}\right)+$$

$$(-1)^m e^{-g-e(m-2k)}\left(-\frac{c\,e^{-\frac{c^2}{4d(2k-m)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2d(m-2k)\sqrt{z}}{2\sqrt{d(2k-m)}}\right)}{(d(2k-m))^{3/2}}+\frac{2e^{d(2k-m)z-c\sqrt{z}}}{d(2k-m)}+\right.$$

$$\left.\left.\frac{2(-1)^m e^{\sqrt{z}\;c+2(g+e(m-2k))+d(m-2k)z}}{d(m-2k)}-\frac{(-1)^m c\,e^{2(g+e(m-2k))-\frac{c^2}{4d(m-2k)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2d(m-2k)\sqrt{z}}{2\sqrt{d(m-2k)}}\right)}{(d(m-2k))^{3/2}}\right)\right)/;\; m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh(c\,z^r+g)$

01.20.21.1586.01

$$\int \sinh^m(b\,z^r)\cosh(c\,z^r+g)\,dz == -\frac{i^m 2^{-m-1} z\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+e^{-g}(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$

$$\frac{1}{r}2^{-m-1} z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m e^g\,\Gamma\left(\frac{1}{r},(-c-2bk+bm)z^r\right)((-c-2bk+bm)z^r)^{-1/r}+\right.$$

$$(-1)^m e^{-g}((c-2bk+bm)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2bk+bm)z^r\right)+e^g((-c+2bk-bm)z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-c+2bk-bm)z^r\right)+e^{-g}((c+2bk-bm)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2bk-bm)z^r\right)\right)/;\; m\in\mathbb{N}^+$$

01.20.21.1587.01

$$\int \sinh^m\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz == -\frac{i^m\,2^{-m-2}\,e^{-g}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,e^{2g}\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^g\left(e^{-2g}\sqrt{-c-2\,b\,k+b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-\right.\right.\right.$$

$$\left.\left.\left.(-1)^m\sqrt{c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+$$

$$\left.\frac{e^g\operatorname{erfi}\left(\frac{2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{(-1)^m\,e^{-g}\sqrt{-c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1588.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$-\frac{i^{-m}\,2^{1-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\,c+g\right)-c\sqrt{z}\,\sinh\left(\sqrt{z}\,c+g\right)\right)}{c^2}-i^{-m}\,2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(c+2\,b\,k-b\,m)^2}\right.$$

$$\left(\cosh\left(g+(c+2\,b\,k-b\,m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-(c+2\,b\,k-b\,m)\sqrt{z}\,\sinh\left(g+(c+2\,b\,k-b\,m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(-c+2\,b\,k-b\,m)^2}\left(\cosh\left(g-(-c+2\,b\,k-b\,m)\sqrt{z}+\frac{i\,m\,\pi}{2}\right)+\right.$$

$$\left.\left.(-c+2\,b\,k-b\,m)\sqrt{z}\,\sinh\left(g-(-c+2\,b\,k-b\,m)\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1589.01

$$\int \sinh^m(b\,z^r+e)\cosh(c\,z^r+g)\,dz == -\frac{i^m\,2^{-m-1}\,z\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+e^{-g}\,(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)(1-m \bmod 2)}{r}-$$

$$\frac{1}{r}\,2^{-m-1}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{g+2\,e\,k-e\,m}\,\Gamma\left(\frac{1}{r},(-c-2\,b\,k+b\,m)\,z^r\right)((-c-2\,b\,k+b\,m)\,z^r)^{-1/r}+\right.$$

$$(-1)^m\,e^{-g+2\,e\,k-e\,m}\,((c-2\,b\,k+b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,b\,k+b\,m)\,z^r\right)+e^{g-2\,e\,k+e\,m}\,((-c+2\,b\,k-b\,m)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-c+2\,b\,k-b\,m)\,z^r\right)+e^{-g-2\,e\,k+e\,m}\,((c+2\,b\,k-b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,b\,k-b\,m)\,z^r\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1590.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$-\frac{i^m\,2^{-m-2}\,e^{-g}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,e^{2g}\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+2^{-m-2}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{g-e\,(2\,k+m)}\left(e^{2\,(e\,m-g)}\sqrt{-c-2\,b\,k+b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\right.\right.\right.$$

$$\left.\left.\left.e^{4\,e\,k}\sqrt{c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+\right.$$

$$\left.\frac{e^{g+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{(-1)^m\,e^{e\,(2\,k-m)-g}\sqrt{-c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1591.01

$$\int \sinh^m\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz == -\frac{i^{-m}\,2^{1-m}\,\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\cosh\left(\sqrt{z}\;c+g\right)-c\sqrt{z}\;\sinh\left(\sqrt{z}\;c+g\right)\right)}{c^2}-$$

$$i^{-m}\,2^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(c+2\,b\,k-b\,m)^2}\left(\cosh\left(g+2\,e\,k-e\,m+(c+2\,b\,k-b\,m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-\right.\right.$$

$$\left.(c+2\,b\,k-b\,m)\sqrt{z}\;\sinh\left(g+2\,e\,k-e\,m+(c+2\,b\,k-b\,m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(-c+2\,b\,k-b\,m)^2}\left(\cosh\left(g-2\,e\,k+e\,m-(-c+2\,b\,k-b\,m)\sqrt{z}+\frac{i\,m\,\pi}{2}\right)+\right.$$

$$\left.\left.(-c+2\,b\,k-b\,m)\sqrt{z}\;\sinh\left(g-2\,e\,k+e\,m-(-c+2\,b\,k-b\,m)\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1592.01

$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+g\right)dz == -\frac{i^m\,2^{-m-2}\,e^{-g}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,e^{2g}\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{g-\frac{(2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}\right.\right.$$

$$\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}-g\right)}\sqrt{-c-2\,b\,k+b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\sqrt{c+2\,b\,k-b\,m}\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+\frac{e^{\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}+g}\operatorname{erfi}\left(\frac{2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}-g}\sqrt{-c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1593.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g\right)dz == \frac{\left(\frac{i}{2}\right)^m e^{-\sqrt{z}\ c-g}\left(-\sqrt{z}\ c+e^{2\left(\sqrt{z}\ c+g\right)}\left(c\sqrt{z}\ -1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g}\left(\frac{2\,(-1)^m\,e^{2g+d\,(2k-m)\,z+(c+b\,(2k-m))\sqrt{z}}}{d\,(2k-m)}-\right.\right.$$

$$\frac{1}{(d\,(2k-m))^{3/2}}\left((-1)^m\,e^{2g-\frac{(c+b\,(2k-m))^2}{4\,d\,(2k-m)}}\,(c+b\,(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2k-m)+2\,d\,(2k-m)\sqrt{z}}{2\sqrt{d\,(2k-m)}}\right)\right)+$$

$$\frac{2\,e^{\sqrt{z}\ (-c-b\,(2k-m))+d\,(m-2k)\,z}}{d\,(m-2k)}-\frac{e^{-\frac{(-c-b\,(2k-m))^2}{4\,d\,(m-2k)}}\,(c+b\,(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2k-m)+2\,d\,(2k-m)\sqrt{z}}{2\sqrt{d\,(m-2k)}}\right)}{(d\,(m-2k))^{3/2}}\Bigg)+$$

$$(-1)^m\,e^{-g}\left(\frac{2\,e^{\sqrt{z}\ (-c-b\,(m-2k))+d\,(2k-m)\,z}}{d\,(2k-m)}-\frac{e^{-\frac{(-c-b\,(m-2k))^2}{4\,d\,(2k-m)}}\,(c+b\,(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2k)+2\,d\,(m-2k)\sqrt{z}}{2\sqrt{d\,(2k-m)}}\right)}{(d\,(2k-m))^{3/2}}+\right.$$

$$\frac{2\,(-1)^m\,e^{2g+d\,(m-2k)\,z+(c+b\,(m-2k))\sqrt{z}}}{d\,(m-2k)}-\frac{1}{(d\,(m-2k))^{3/2}}$$

$$\left.\left.\left.\left((-1)^m\,e^{2g-\frac{(c+b\,(m-2k))^2}{4\,d\,(m-2k)}}\,(c+b\,(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2k)+2\,d\,(m-2k)\sqrt{z}}{2\sqrt{d\,(m-2k)}}\right)\right)\right)\right)\Bigg/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1594.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+g\right)dz == -\frac{i^m\,2^{-m-2}\,e^{-g}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\,\operatorname{erfi}\left(\sqrt{-c}\,z\right)-\sqrt{c}\,e^{2g}\operatorname{erfi}\left(\sqrt{c}\,z\right)\right)(1-m \bmod 2)}{c}+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\right.$$

$$\left(e^{-\frac{(2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}+g-e\,(2\,k+m)}\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}-g+e\,m\right)}\sqrt{-c-2\,b\,k+b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+$$

$$\frac{e^{\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}+g+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{1}{c+b\,(m-2\,k)}$$

$$\left.\left.\left((-1)^m\,e^{-\frac{(d\,m-2\,d\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}-g+e\,(2\,k-m)}\sqrt{-c+2\,b\,k-b\,m}\,\operatorname{erfi}\left(\frac{-2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{-c+2\,b\,k-b\,m}}\right)\right)\right/;\ m\in\mathbb{N}^+$$

01.20.21.1595.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g\right)dz == \frac{\left(\frac{i}{2}\right)^m e^{-\sqrt{z}\ c-g}\left(-\sqrt{z}\ c+e^{2\left(\sqrt{z}\ c+g\right)}\left(c\sqrt{z}\ -1\right)-1\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g-e\,(2\,k-m)}\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,(2\,k-m))+2\,(g+e\,(2\,k-m))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\frac{1}{(d\,(2\,k-m))^{3/2}}\right.\right.$$

$$\left.\left(\left(-1\right)^m e^{2\,(g+e\,(2\,k-m))-\frac{(c+b\,(2\,k-m))^2}{4\,d\,(2\,k-m)}}\,(c+b\,(2\,k-m))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2\,k-m)+2\,d\,(2\,k-m)\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)}}\right)\right)+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (-c-b\,(2\,k-m))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{e^{-\frac{(-c-b\,(2\,k-m))^2}{4\,d\,(m-2\,k)}}\,(c+b\,(2\,k-m))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2\,k-m)+2\,d\,(2\,k-m)\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+$$

$$(-1)^m\,e^{-g-e\,(m-2\,k)}\left(\frac{2\,e^{\sqrt{z}\ (-c-b\,(m-2\,k))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\frac{e^{-\frac{(-c-b\,(m-2\,k))^2}{4\,d\,(2\,k-m)}}\,(c+b\,(m-2\,k))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2\,k)+2\,d\,(m-2\,k)\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\right.$$

$$\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,(m-2\,k))+2\,(g+e\,(m-2\,k))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{1}{(d\,(m-2\,k))^{3/2}}$$

$$\left.\left.\left(\left(-1\right)^m e^{2\,(g+e\,(m-2\,k))-\frac{(c+b\,(m-2\,k))^2}{4\,d\,(m-2\,k)}}\,(c+b\,(m-2\,k))\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2\,k)+2\,d\,(m-2\,k)\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)}}\right)\right)\right)\right/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1596.01

$$\int \sinh^m(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2}{4c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;\text{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+2^{-m-2}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{(-1)^m\sqrt{-c}\;e^{\frac{(-f-2\,d\,k+d\,m)^2}{4c}}\,\text{erfi}\left(\frac{-f+2\,d\,k-d\,m-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\frac{e^{-\frac{(f-2\,d\,k+d\,m)^2}{4c}}\,\text{erfi}\left(\frac{f-2\,d\,k+d\,m+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{1}{c}\left(e^{-\frac{(f+2\,d\,k-d\,m)^2}{4c}}\right.\right.$$

$$\left.\left.\left(\sqrt{-c}\;e^{\frac{(f+2\,d\,k-d\,m)^2}{2c}}\,\text{erfi}\left(\frac{-f-2\,d\,k+d\,m-2\,c\,z}{2\sqrt{-c}}\right)-(-1)^m\sqrt{c}\;\text{erfi}\left(\frac{f+2\,d\,k-d\,m+2\,c\,z}{2\sqrt{c}}\right)\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1597.01

$$\int \sinh^m(d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{-\frac{c^2}{4f}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\sinh\left(\sqrt{z}\;c+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\left(-\frac{c\,e^{-\frac{c^2}{4(d(2k-m)-f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f+d(m-2k))\sqrt{z}}{2\sqrt{d(2k-m)-f}}\right)}{(d(2k-m)-f)^{3/2}}+\frac{2\,e^{(d(2k-m)-f)z-c\sqrt{z}}}{d(2k-m)-f}+\right.\right.$$

$$\frac{2(-1)^m e^{\sqrt{z}\;c+(f+d(m-2k))z}}{f+d(m-2k)}-\frac{(-1)^m c\,e^{-\frac{c^2}{4(f+d(m-2k))}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f+d(m-2k))\sqrt{z}}{2\sqrt{f+d(m-2k)}}\right)}{(f+d(m-2k))^{3/2}}+$$

$$\frac{2(-1)^m e^{\sqrt{z}\;c+(f+d(2k-m))z}}{f+d(2k-m)}-\frac{(-1)^m c\,e^{-\frac{c^2}{4(f+d(2k-m))}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f+d(2k-m))\sqrt{z}}{2\sqrt{f+d(2k-m)}}\right)}{(f+d(2k-m))^{3/2}}+$$

$$\left.\left.\frac{2\,e^{(d(m-2k)-f)z-c\sqrt{z}}}{d(m-2k)-f}-\frac{c\,e^{-\frac{c^2}{4(d(m-2k)-f)}}\sqrt{\pi}\;\text{erfi}\left(\frac{c+2(f+d(2k-m))\sqrt{z}}{2\sqrt{d(m-2k)-f}}\right)}{(d(m-2k)-f)^{3/2}}\right)\right)/;\,m\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1598.01

$$\int \sinh^m(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2}{4c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;\text{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{(-1)^m\sqrt{-c}\;e^{\frac{(f-2\,d\,k+d\,m)^2}{4c}+e\,(2\,k-m)}\,\text{erfi}\left(\frac{-f+2\,d\,k-d\,m-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\right.$$

$$\frac{e^{e\,(m-2\,k)-\frac{(f-2\,d\,k+d\,m)^2}{4c}}\,\text{erfi}\left(\frac{f-2\,d\,k+d\,m+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{1}{c}\left(e^{-\frac{(f+2\,d\,k-d\,m)^2}{4c}-e\,(2\,k+m)}\left(\sqrt{-c}\;e^{2\left(\frac{(f+2\,d\,k-d\,m)^2}{4c}+e\,m\right)}\right.\right.$$

$$\left.\left.\left.\text{erfi}\left(\frac{-f-2\,d\,k+d\,m-2\,c\,z}{2\sqrt{-c}}\right)-(-1)^m\sqrt{c}\;e^{4\,e\,k}\,\text{erfi}\left(\frac{f+2\,d\,k-d\,m+2\,c\,z}{2\sqrt{c}}\right)\right)\right)\right)\Big/;\; m\in\mathbb{N}^+$$

01.20.21.1599.01

$$\int \sinh^m(e+d\,z)\cosh\left(\sqrt{z}\,c+f\,z\right)dz == -i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}$$

$$\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{-\frac{c^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\sinh\left(\sqrt{z}\,c+f\,z\right)}{f}\right)(1-m \bmod 2)+2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(e^{-e(2k-m)}\left(\frac{2(-1)^m\,e^{\sqrt{z}\,c+2e(2k-m)+(f+d(2k-m))z}}{f+d(2k-m)}-\frac{(-1)^m\,c\,e^{2e(2k-m)-\frac{c^2}{4(f+d(2k-m))}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2(f+d(2k-m))\sqrt{z}}{2\sqrt{f+d(2k-m)}}\right)}{(f+d(2k-m))^{3/2}}+\right.\right.$$

$$\left.\frac{2\,e^{(d(m-2k)-f)z-c\sqrt{z}}}{d(m-2k)-f}-\frac{c\,e^{-\frac{c^2}{4(d(m-2k)-f)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2(f+d(2k-m))\sqrt{z}}{2\sqrt{d(m-2k)-f}}\right)}{(d(m-2k)-f)^{3/2}}\right)+$$

$$(-1)^m\,e^{-e(m-2k)}\left(-\frac{c\,e^{-\frac{c^2}{4(d(2k-m)-f)}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2(f+d(m-2k))\sqrt{z}}{2\sqrt{d(2k-m)-f}}\right)}{(d(2k-m)-f)^{3/2}}+\frac{2\,e^{(d(2k-m)-f)z-c\sqrt{z}}}{d(2k-m)-f}+\right.$$

$$\left.\left.\frac{2(-1)^m\,e^{\sqrt{z}\,c+2e(m-2k)+(f+d(m-2k))z}}{f+d(m-2k)}-\frac{(-1)^m\,c\,e^{2e(m-2k)-\frac{c^2}{4(f+d(m-2k))}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2(f+d(m-2k))\sqrt{z}}{2\sqrt{f+d(m-2k)}}\right)}{(f+d(m-2k))^{3/2}}\right)\right);\ m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh(c\,z^r+f\,z)$

01.20.21.1600.01

$$\int \sinh^m(b\,z^2)\cosh(c\,z^2+f\,z)\,dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2}{4c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;\text{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{-\frac{f^2}{4\,c+8\,b\,k-4\,b\,m}}\left(e^{\frac{f^2}{2\,c+4\,b\,k-2\,b\,m}}\sqrt{-c-2\,b\,k+b\,m}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\text{erfi}\left(\frac{-f-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\sqrt{c+2\,b\,k-b\,m}\;\text{erfi}\left(\frac{f+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+\right.$$

$$\left.\frac{e^{\frac{f^2}{-4\,c+8\,b\,k-4\,b\,m}}\,\text{erfi}\left(\frac{f+2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{(-1)^m\,e^{-\frac{f^2}{-4\,c+8\,b\,k-4\,b\,m}}\sqrt{-c+2\,b\,k-b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\;m\in\mathbb{N}^+$$

01.20.21.1601.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{-\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\sinh\left(\sqrt{z}\ c+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{e^{\frac{(-c-b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.$$

$$\frac{(-1)^m\,e^{-\frac{(c+b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}+$$

$$(-1)^m\left(-\frac{e^{\frac{(-c-b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.$$

$$\frac{(-1)^m\,e^{-\frac{(c+b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}+\frac{2(-1)^m\,e^{\sqrt{z}\ (c+b(m-2k))+fz}}{f}-$$

$$\left.\left.\frac{2\,e^{(-c-b(m-2k))\sqrt{z}-fz}}{f}\right)+\frac{2(-1)^m\,e^{\sqrt{z}\ (c+b(2k-m))+fz}}{f}-\frac{2\,e^{(-c-b(2k-m))\sqrt{z}-fz}}{f}\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1602.01

$$\int \sinh^m(b z^2+e)\cosh(c z^2+f z)\,dz ==$$

$$-\frac{1}{c}\left(i^m 2^{-m-2} e^{-\frac{f^2}{4c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\ e^{\frac{f^2}{2c}}\operatorname{erfi}\left(\frac{\sqrt{-c}\ (f+2cz)}{2c}\right)-\sqrt{c}\ \operatorname{erfi}\left(\frac{f+2cz}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2bk+bm}\right.$$

$$\left(e^{-\frac{f^2}{4c+8bk-4bm}-e(2k+m)}\left(e^{2\left(\frac{f^2}{4c+8bk-4bm}+em\right)}\sqrt{-c-2bk+bm}\ \operatorname{erfi}\left(\frac{-f-2cz-4bkz+2bmz}{2\sqrt{-c-2bk+bm}}\right)-(-1)^m e^{4ek}\right.\right.$$

$$\left.\left.\sqrt{c+2bk-bm}\ \operatorname{erfi}\left(\frac{f+2cz+4bkz-2bmz}{2\sqrt{c+2bk-bm}}\right)\right)\right)+\frac{e^{\frac{f^2}{-4c+8bk-4bm}+e(m-2k)}\operatorname{erfi}\left(\frac{f+2cz-4bkz+2bmz}{2\sqrt{c+b(m-2k)}}\right)}{\sqrt{c+b(m-2k)}}-$$

$$\left.\frac{1}{c+b(m-2k)}\left((-1)^m e^{e(2k-m)-\frac{f^2}{-4c+8bk-4bm}}\sqrt{-c+2bk-bm}\ \operatorname{erfi}\left(\frac{-f-2cz+4bkz-2bmz}{2\sqrt{-c+2bk-bm}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1603.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{-\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\sinh\left(\sqrt{z}\ c+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-e(2k-m)}\left(-\frac{e^{\frac{(-c-b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.\right.$$

$$\left.\frac{1}{f^{3/2}}\left((-1)^m e^{2e(2k-m)-\frac{(c+b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{f}}\right)\right)+\right.$$

$$\left.\frac{2(-1)^m e^{\sqrt{z}\ (c+b(2k-m))+2e(2k-m)+fz}}{f}-\frac{2e^{(-c-b(2k-m))\sqrt{z}-fz}}{f}\right)+$$

$$(-1)^m e^{-e(m-2k)}\left(-\frac{e^{\frac{(-c-b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.$$

$$\left.\frac{1}{f^{3/2}}\left((-1)^m e^{2e(m-2k)-\frac{(c+b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{f}}\right)\right)+\right.$$

$$\left.\left.\frac{2(-1)^m e^{2e(m-2k)+fz+(c+b(m-2k))\sqrt{z}}}{f}-\frac{2e^{(-c-b(m-2k))\sqrt{z}-fz}}{f}\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1604.01

$$\int \sinh^m(b\,z^2+d\,z)\cosh(c\,z^2+f\,z)\,dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2}{4c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;\text{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}\right.\right.$$

$$\left(e^{\frac{(f+2\,d\,k-d\,m)^2}{2\,c+4\,b\,k-2\,b\,m}}\sqrt{-c-2\,b\,k+b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\sqrt{c+2\,b\,k-b\,m}\right.$$

$$\left.\left.\left.\text{erfi}\left(\frac{f+2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+\frac{e^{\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}}\,\text{erfi}\left(\frac{f+2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}}\sqrt{-c+2\,b\,k-b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\;m\in\mathbb{N}^+$$

01.20.21.1605.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{-\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\sinh\left(\sqrt{z}\ c+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\left(\frac{2\,e^{\sqrt{z}\ (-c-b\,(m-2k))+(d\,(2k-m)-f)\,z}}{d\,(2k-m)-f}-\right.\right.$$

$$\frac{e^{-\frac{(-c-b\,(m-2k))^2}{4\,(d\,(2k-m)-f)}}\,(c+b\,(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2k)+2\,(f+d\,(m-2k))\sqrt{z}}{2\sqrt{d\,(2k-m)-f}}\right)}{(d\,(2k-m)-f)^{3/2}}+\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,(m-2k))+(f+d\,(m-2k))\,z}}{f+d\,(m-2k)}-$$

$$\left.\left.\left((-1)^m\,e^{-\frac{(c+b\,(m-2k))^2}{4\,(f+d\,(m-2k))}}\,(c+b\,(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2k)+2\,(f+d\,(m-2k))\sqrt{z}}{2\sqrt{f+d\,(m-2k)}}\right)\right)\Big/\right.\right.$$

$$\left.\left.(f+d\,(m-2k))^{3/2}+\frac{2\,(-1)^m\,e^{\sqrt{z}\ (c+b\,(2k-m))+(f+d\,(2k-m))\,z}}{f+d\,(2k-m)}-\right.\right.$$

$$\frac{(-1)^m\,e^{-\frac{(c+b\,(2k-m))^2}{4\,(f+d\,(2k-m))}}\,(c+b\,(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2k-m)+2\,(f+d\,(2k-m))\sqrt{z}}{2\sqrt{f+d\,(2k-m)}}\right)}{(f+d\,(2k-m))^{3/2}}+\frac{2\,e^{\sqrt{z}\ (-c-b\,(2k-m))+(d\,(m-2k)-f)\,z}}{d\,(m-2k)-f}-$$

$$\left.\left.\frac{e^{-\frac{(-c-b\,(2k-m))^2}{4\,(d\,(m-2k)-f)}}\,(c+b\,(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2k-m)+2\,(f+d\,(2k-m))\sqrt{z}}{2\sqrt{d\,(m-2k)-f}}\right)}{(d\,(m-2k)-f)^{3/2}}\right)\right);\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1606.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2}{4c}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;\text{erfi}\left(\frac{f+2\,c\,z}{2\,\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\right.$$

$$\left(e^{-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}-e\,(2\,k+m)}\left(e^{2\left(\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}+e\,m\right)}\sqrt{-c-2\,b\,k+b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{-c-2\,b\,k+b\,m}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,e^{4\,e\,k}\,\sqrt{c+2\,b\,k-b\,m}\;\text{erfi}\left(\frac{f+2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+$$

$$\frac{e^{\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}+e\,(m-2\,k)}\,\text{erfi}\left(\frac{f+2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-\frac{1}{c+b\,(m-2\,k)}$$

$$\left.\left.\left((-1)^m\,e^{e\,(2\,k-m)-\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}}\,\sqrt{-c+2\,b\,k-b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{-c+2\,b\,k-b\,m}}\right)\right)\right)\right/;\; m\in\mathbb{N}^+$$

01.20.21.1607.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}\left(-\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\ \text{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{4\sinh\left(\sqrt{z}\ c+f\,z\right)}{f}-\frac{c\,e^{-\frac{c^2}{4f}}\sqrt{\pi}\ \text{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-e(2k-m)}\left(\frac{2(-1)^m e^{\sqrt{z}\ (c+b(2k-m))+2e(2k-m)+(f+d(2k-m))z}}{f+d(2k-m)}-\right.\right.$$

$$\frac{1}{(f+d(2k-m))^{3/2}}\left((-1)^m e^{2e(2k-m)-\frac{(c+b(2k-m))^2}{4(f+d(2k-m))}}(c+b(2k-m))\sqrt{\pi}\right.$$

$$\left.\text{erfi}\left(\frac{c+b(2k-m)+2(f+d(2k-m))\sqrt{z}}{2\sqrt{f+d(2k-m)}}\right)\right)+\frac{2e^{\sqrt{z}\ (-c-b(2k-m))+(d(m-2k)-f)z}}{d(m-2k)-f}-$$

$$\left.\left.\frac{e^{-\frac{(-c-b(2k-m))^2}{4(d(m-2k)-f)}}(c+b(2k-m))\sqrt{\pi}\ \text{erfi}\left(\frac{c+b(2k-m)+2(f+d(2k-m))\sqrt{z}}{2\sqrt{d(m-2k)-f}}\right)}{(d(m-2k)-f)^{3/2}}\right)+(-1)^m e^{-e(m-2k)}\right.$$

$$\left(\frac{2e^{\sqrt{z}\ (-c-b(m-2k))+(d(2k-m)-f)z}}{d(2k-m)-f}-\frac{e^{-\frac{(-c-b(m-2k))^2}{4(d(2k-m)-f)}}(c+b(m-2k))\sqrt{\pi}\ \text{erfi}\left(\frac{c+b(m-2k)+2(f+d(m-2k))\sqrt{z}}{2\sqrt{d(2k-m)-f}}\right)}{(d(2k-m)-f)^{3/2}}+\right.$$

$$\frac{2(-1)^m e^{2e(m-2k)+(f+d(m-2k))z+(c+b(m-2k))\sqrt{z}}}{f+d(m-2k)}-\frac{1}{(f+d(m-2k))^{3/2}}\left((-1)^m e^{2e(m-2k)-\frac{(c+b(m-2k))^2}{4(f+d(m-2k))}}\right.$$

$$\left.\left.\left.(c+b(m-2k))\sqrt{\pi}\ \text{erfi}\left(\frac{c+b(m-2k)+2(f+d(m-2k))\sqrt{z}}{2\sqrt{f+d(m-2k)}}\right)\right)\right)\right/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1608.01

$$\int \sinh^m(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2+4\,c\,g}{4\,c}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2\,c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;e^{2\,g}\,\text{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m\bmod 2)\right)+2^{-m-2}\,\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{(-1)^m\,\sqrt{-c}\;e^{\frac{(f-2\,d\,k+d\,m)^2}{4\,c}-g}\,\text{erfi}\left(\frac{-f+2\,d\,k-d\,m-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\frac{e^{g-\frac{(f-2\,d\,k+d\,m)^2}{4\,c}}\,\text{erfi}\left(\frac{f-2\,d\,k+d\,m+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{1}{c}\left(e^{g-\frac{(f+2\,d\,k-d\,m)^2}{4\,c}}\right.\right.$$

$$\left.\left.\left(\sqrt{-c}\;e^{2\left(\frac{(f+2\,d\,k-d\,m)^2}{4\,c}-g\right)}\,\text{erfi}\left(\frac{-f-2\,d\,k+d\,m-2\,c\,z}{2\sqrt{-c}}\right)-(-1)^m\,\sqrt{c}\;\text{erfi}\left(\frac{f+2\,d\,k-d\,m+2\,c\,z}{2\sqrt{c}}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1609.01

$$\int \sinh^m(d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\,e^{-g}\,\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4\,f}}\,\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,f\,\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{2\,g-\frac{c^2}{4\,f}}\,\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,f\,\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\,e^g\,\sinh\left(\sqrt{z}\;c+g+f\,z\right)}{f}\right)(1-m\bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g}\left(-\frac{(-1)^m\,c\,e^{2\,g-\frac{c^2}{4\,(f+d\,(2\,k-m))}}\,\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,(f+d\,(2\,k-m))\,\sqrt{z}}{2\sqrt{f+d\,(2\,k-m)}}\right)}{(f+d\,(2\,k-m))^{3/2}}+\right.\right.$$

$$\left.\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+2\,g+(f+d\,(2\,k-m))\,z}}{f+d\,(2\,k-m)}+\frac{2\,e^{(d\,(m-2\,k)-f)\,z-c\,\sqrt{z}}}{d\,(m-2\,k)-f}-\frac{c\,e^{-\frac{c^2}{4\,(d\,(m-2\,k)-f)}}\,\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,(f+d\,(2\,k-m))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)-f}}\right)}{(d\,(m-2\,k)-f)^{3/2}}\right)+$$

$$(-1)^m\,e^{-g}\left(-\frac{c\,e^{-\frac{c^2}{4\,(d\,(2\,k-m)-f)}}\,\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,(f+d\,(m-2\,k))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)-f}}\right)}{(d\,(2\,k-m)-f)^{3/2}}+\frac{2\,e^{(d\,(2\,k-m)-f)\,z-c\,\sqrt{z}}}{d\,(2\,k-m)-f}+\right.$$

$$\left.\left.\frac{2\,(-1)^m\,e^{\sqrt{z}\;c+2\,g+(f+d\,(m-2\,k))\,z}}{f+d\,(m-2\,k)}-\frac{(-1)^m\,c\,e^{2\,g-\frac{c^2}{4\,(f+d\,(m-2\,k))}}\,\sqrt{\pi}\;\text{erfi}\left(\frac{c+2\,(f+d\,(m-2\,k))\,\sqrt{z}}{2\sqrt{f+d\,(m-2\,k)}}\right)}{(f+d\,(m-2\,k))^{3/2}}\right)\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1610.01

$$\int \sinh^m(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2+4\,c\,g}{4\,c}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2\,c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;e^{2\,g}\,\text{erfi}\left(\frac{f+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-\frac{(-1)^m\,\sqrt{-c}\;e^{\frac{(f-2\,d\,k+d\,m)^2}{4\,c}-g+e\,(2\,k-m)}\,\text{erfi}\left(\frac{-f+2\,d\,k-d\,m-2\,c\,z}{2\sqrt{-c}}\right)}{c}+\right.$$

$$\frac{e^{-\frac{(f-2\,d\,k+d\,m)^2}{4\,c}+g+e\,(m-2\,k)}\,\text{erfi}\left(\frac{f-2\,d\,k+d\,m+2\,c\,z}{2\sqrt{c}}\right)}{\sqrt{c}}-\frac{1}{c}\left(e^{-\frac{(f+2\,d\,k-d\,m)^2}{4\,c}+g-e\,(2\,k+m)}\left(\sqrt{-c}\;e^{2\left(\frac{(f+2\,d\,k-d\,m)^2}{4\,c}-g+e\,m\right)}\right.\right.$$

$$\left.\left.\left.\text{erfi}\left(\frac{-f-2\,d\,k+d\,m-2\,c\,z}{2\sqrt{-c}}\right)-(-1)^m\,\sqrt{c}\;e^{4\,e\,k}\,\text{erfi}\left(\frac{f+2\,d\,k-d\,m+2\,c\,z}{2\sqrt{c}}\right)\right)\right)\right)\Big/;\; m\in\mathbb{N}^+$$

01.20.21.1611.01

$$\int \sinh^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{2g-\frac{c^2}{4f}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\,e^g\sinh\left(\sqrt{z}\;c+g+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(e^{-g-e(2k-m)}\left(\frac{2(-1)^m\,e^{\sqrt{z}\;c+2(g+e(2k-m))+(f+d(2k-m))z}}{f+d(2k-m)}-\frac{(-1)^m\,c\,e^{2(g+e(2k-m))-\frac{c^2}{4(f+d(2k-m))}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(f+d(2k-m))\sqrt{z}}{2\sqrt{f+d(2k-m)}}\right)}{(f+d(2k-m))^{3/2}}+\right.\right.$$

$$\left.\frac{2\,e^{(d(m-2k)-f)z-c\sqrt{z}}}{d(m-2k)-f}-\frac{c\,e^{-\frac{c^2}{4(d(m-2k)-f)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(f+d(2k-m))\sqrt{z}}{2\sqrt{d(m-2k)-f}}\right)}{(d(m-2k)-f)^{3/2}}\right)+$$

$$(-1)^m\,e^{-g-e(m-2k)}\left(-\frac{c\,e^{-\frac{c^2}{4(d(2k-m)-f)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(f+d(m-2k))\sqrt{z}}{2\sqrt{d(2k-m)-f}}\right)}{(d(2k-m)-f)^{3/2}}+\frac{2\,e^{(d(2k-m)-f)z-c\sqrt{z}}}{d(2k-m)-f}+\right.$$

$$\frac{2(-1)^m\,e^{\sqrt{z}\;c+2(g+e(m-2k))+(f+d(m-2k))z}}{f+d(m-2k)}-$$

$$\left.\left.\frac{(-1)^m\,c\,e^{2(g+e(m-2k))-\frac{c^2}{4(f+d(m-2k))}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+2(f+d(m-2k))\sqrt{z}}{2\sqrt{f+d(m-2k)}}\right)}{(f+d(m-2k))^{3/2}}\right)\right);\ m\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh(c\,z^r+f\,z+g)$

01.20.21.1612.01

$$\int \sinh^m(b\,z^2)\cosh(c\,z^2+f\,z+g)\,dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2+4cg}{4c}}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2cz)}{2c}\right)-\sqrt{c}\;e^{2g}\,\text{erfi}\left(\frac{f+2cz}{2\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{1}{-c-2bk+bm}\left(e^{g-\frac{f^2}{4c+8bk-4bm}}\left(e^{2\left(\frac{f^2}{4c+8bk-4bm}-g\right)}\sqrt{-c-2bk+bm}\;\text{erfi}\left(\frac{-f-2cz-4bkz+2bmz}{2\sqrt{-c-2bk+bm}}\right)-\right.\right.\right.$$

$$\left.\left.\left.(-1)^m\sqrt{c+2bk-bm}\;\text{erfi}\left(\frac{f+2cz+4bkz-2bmz}{2\sqrt{c+2bk-bm}}\right)\right)\right)+\frac{e^{\frac{f^2}{-4c+8bk-4bm}+g}\,\text{erfi}\left(\frac{f+2cz-4bkz+2bmz}{2\sqrt{c+b(m-2k)}}\right)}{\sqrt{c+b(m-2k)}}-\right.$$

$$\left.\frac{(-1)^m\,e^{-\frac{f^2}{-4c+8bk-4bm}-g}\sqrt{-c+2bk-bm}\;\text{erfi}\left(\frac{-f-2cz+4bkz-2bmz}{2\sqrt{-c+2bk-bm}}\right)}{c+b(m-2k)}\right)/;\; m\in\mathbb{N}^+$$

01.20.21.1613.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{2g-\frac{c^2}{4f}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\,e^g\sinh\left(\sqrt{z}\,c+g+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g}\left(-\frac{e^{\frac{(-c-b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.\right.$$

$$\frac{(-1)^m\,e^{2g-\frac{(c+b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}+\frac{2(-1)^m\,e^{2g+fz+(c+b(2k-m))\sqrt{z}}}{f}-$$

$$\left.\frac{2\,e^{(-c-b(2k-m))\sqrt{z}-fz}}{f}\right)+(-1)^m\,e^{-g}\left(-\frac{e^{\frac{(-c-b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.$$

$$\left.\left.\frac{(-1)^m\,e^{2g-\frac{(c+b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}+\frac{2(-1)^m\,e^{2g+fz+(c+b(m-2k))\sqrt{z}}}{f}-\frac{2\,e^{(-c-b(m-2k))\sqrt{z}-fz}}{f}\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1614.01

$$\int \sinh^m(b\,z^2+e)\cosh(c\,z^2+f\,z+g)\,dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2+4\,c\,g}{4\,c}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2\,c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;e^{2\,g}\,\text{erfi}\left(\frac{f+2\,c\,z}{2\,\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{-\frac{f^2}{4\,c+8\,b\,k-4\,b\,m}+g-e\,(2\,k+m)}\right.\right.$$

$$\left(e^{2\left(\frac{f^2}{4\,c+8\,b\,k-4\,b\,m}-g+e\,m\right)}\sqrt{-c-2\,b\,k+b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\,\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\,e^{4\,e\,k}\,\sqrt{c+2\,b\,k-b\,m}\right.$$

$$\left.\left.\text{erfi}\left(\frac{f+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\,\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+\frac{e^{\frac{f^2}{-4\,c+8\,b\,k-4\,b\,m}+g+e\,(m-2\,k)}\,\text{erfi}\left(\frac{f+2\,c\,z-4\,b\,k\,z+2\,b\,m\,z}{2\,\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-$$

$$\left.\frac{(-1)^m\,e^{-\frac{f^2}{-4\,c+8\,b\,k-4\,b\,m}-g+e\,(2\,k-m)}\,\sqrt{-c+2\,b\,k-b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z}{2\,\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\;m\in\mathbb{N}^+$$

01.20.21.1615.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{2g-\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\,e^g\sinh\left(\sqrt{z}\ c+g+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g-e(2k-m)}\left(-\frac{e^{\frac{(-c-b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.\right.$$

$$\left.\frac{1}{f^{3/2}}\left((-1)^m\,e^{2(g+e(2k-m))-\frac{(c+b(2k-m))^2}{4f}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2f\sqrt{z}}{2\sqrt{f}}\right)\right)+\right.$$

$$\left.\frac{2(-1)^m\,e^{\sqrt{z}\,(c+b(2k-m))+2(g+e(2k-m))+fz}}{f}-\frac{2\,e^{(-c-b(2k-m))\sqrt{z}-fz}}{f}\right)+$$

$$(-1)^m\,e^{-g-e(m-2k)}\left(-\frac{e^{\frac{(-c-b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}-\right.$$

$$\left.\frac{1}{f^{3/2}}\left((-1)^m\,e^{2(g+e(m-2k))-\frac{(c+b(m-2k))^2}{4f}}(c+b(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2f\sqrt{z}}{2\sqrt{f}}\right)\right)+\right.$$

$$\left.\left.\frac{2(-1)^m\,e^{\sqrt{z}\,(c+b(m-2k))+2(g+e(m-2k))+fz}}{f}-\frac{2\,e^{(-c-b(m-2k))\sqrt{z}-fz}}{f}\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1616.01

$$\int \sinh^m(b\,z^2+d\,z)\cosh(c\,z^2+f\,z+g)\,dz ==$$

$$-\frac{1}{c}\left(i^m\,2^{-m-2}\,e^{-\frac{f^2+4\,c\,g}{4\,c}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2\,c}}\,\text{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;e^{2\,g}\,\text{erfi}\left(\frac{f+2\,c\,z}{2\,\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{-c-2\,b\,k+b\,m}\left(e^{g-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}\left(e^{2\left(\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}-g\right)}\sqrt{-c-2\,b\,k+b\,m}\right.\right.\right.$$

$$\left.\text{erfi}\left(\frac{-f-2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{-c-2\,b\,k+b\,m}}\right)-(-1)^m\sqrt{c+2\,b\,k-b\,m}\right.$$

$$\left.\left.\left.\text{erfi}\left(\frac{f+2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{c+2\,b\,k-b\,m}}\right)\right)\right)+\frac{e^{\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}+g}\,\text{erfi}\left(\frac{f+2\,c\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{c+b\,(m-2\,k)}}\right)}{\sqrt{c+b\,(m-2\,k)}}-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}-g}\,\sqrt{-c+2\,b\,k-b\,m}\;\text{erfi}\left(\frac{-f-2\,c\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{-c+2\,b\,k-b\,m}}\right)}{c+b\,(m-2\,k)}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1617.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$-i^m\,2^{-m-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{c\,e^{2g-\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}-\frac{4\,e^g\sinh\left(\sqrt{z}\ c+g+f\,z\right)}{f}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g}\left(\frac{2\,(-1)^m\,e^{2g+(f+d\,(2k-m))\,z+(c+b\,(2k-m))\sqrt{z}}}{f+d\,(2k-m)}-\left((-1)^m\,e^{2g-\frac{(c+b\,(2k-m))^2}{4\,(f+d\,(2k-m))}}\,(c+b\,(2k-m))\right.\right.\right.$$

$$\left.\left.\left.\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2k-m)+2\,(f+d\,(2k-m))\sqrt{z}}{2\sqrt{f+d\,(2k-m)}}\right)\right)\Big/(f+d\,(2k-m))^{3/2}+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (-c-b\,(2k-m))+(d\,(m-2k)-f)\,z}}{d\,(m-2k)-f}-\frac{e^{-\frac{(-c-b\,(2k-m))^2}{4\,(d\,(m-2k)-f)}}\,(c+b\,(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(2k-m)+2\,(f+d\,(2k-m))\sqrt{z}}{2\sqrt{d\,(m-2k)-f}}\right)}{(d\,(m-2k)-f)^{3/2}}\right)+$$

$$(-1)^m\,e^{-g}\left(\frac{2\,e^{\sqrt{z}\ (-c-b\,(m-2k))+(d\,(2k-m)-f)\,z}}{d\,(2k-m)-f}-\frac{e^{-\frac{(-c-b\,(m-2k))^2}{4\,(d\,(2k-m)-f)}}\,(c+b\,(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b\,(m-2k)+2\,(f+d\,(m-2k))\sqrt{z}}{2\sqrt{d\,(2k-m)-f}}\right)}{(d\,(2k-m)-f)^{3/2}}+\right.$$

$$\left.\frac{2\,(-1)^m\,e^{2g+(f+d\,(m-2k))\,z+(c+b\,(m-2k))\sqrt{z}}}{f+d\,(m-2k)}-\left((-1)^m\,e^{2g-\frac{(c+b\,(m-2k))^2}{4\,(f+d\,(m-2k))}}\,(c+b\,(m-2k))\sqrt{\pi}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{c+b\,(m-2k)+2\,(f+d\,(m-2k))\sqrt{z}}{2\sqrt{f+d\,(m-2k)}}\right)\right)\Big/(f+d\,(m-2k))^{3/2}\right)\Bigg);\ m\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1618.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,c}}\left(i^{-m}\,2^{-m-\frac{1}{2}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(i\cosh\left(\frac{f^2}{4\,c}-g\right)C\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,c}-g\right)\right)\right)+$$

$$i^{-m}\,2^{-m-\frac{1}{2}}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{\sqrt{-i\,c+2\,i\,b\,k-i\,b\,m}}\left(i\cosh\left(\frac{(f+d\,(m-2\,k))^2}{-4\,c+8\,b\,k-4\,b\,m}+g-2\,e\,k+e\,m+\frac{i\,m\,\pi}{2}\right)\right.\right.$$

$$\left.C\left(\frac{-f+d\,(2\,k-m)-2\,c\,z+2\,b\,(2\,k-m)\,z}{\sqrt{i\,(-c+2\,b\,k-b\,m)}\,\sqrt{2\,\pi}}\right)+S\left(\frac{-f+d\,(2\,k-m)-2\,c\,z+2\,b\,(2\,k-m)\,z}{\sqrt{i\,(-c+2\,b\,k-b\,m)}\,\sqrt{2\,\pi}}\right)\right.$$

$$\left.\left.\sinh\left(\frac{(f+d\,(m-2\,k))^2}{-4\,c+8\,b\,k-4\,b\,m}+g-2\,e\,k+e\,m+\frac{i\,m\,\pi}{2}\right)\right)+\frac{1}{\sqrt{i\,(c+2\,b\,k-b\,m)}}\right.$$

$$\left(i\cosh\left(-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}+g+2\,e\,k-e\,m-\frac{i\,m\,\pi}{2}\right)C\left(\frac{f+2\,d\,k-d\,m+2\,(c+2\,b\,k-b\,m)\,z}{\sqrt{i\,(c+2\,b\,k-b\,m)}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.S\left(\frac{f+2\,d\,k-d\,m+2\,(c+2\,b\,k-b\,m)\,z}{\sqrt{i\,(c+2\,b\,k-b\,m)}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}+g+2\,e\,k-e\,m-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1619.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{c}\left(i^{-m}\,2^{-m-2}\,e^{-\frac{f^2+4\,c\,g}{4\,c}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{f^2}{2\,c}}\,\operatorname{erfi}\left(\frac{\sqrt{-c}\;(f+2\,c\,z)}{2\,c}\right)-\sqrt{c}\;e^{2\,g}\,\operatorname{erfi}\left(\frac{f+2\,c\,z}{2\,\sqrt{c}}\right)\right)(1-m \bmod 2)\right)+$$

$$2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(-\frac{1}{c-b\,(m-2\,k)}\left(e^{-\frac{(f+2\,d\,k-d\,m)^2}{-4\,c-8\,b\,k+4\,b\,m}-g-e\,(2\,k-m)}\,\sqrt{-c-2\,b\,k+b\,m}\;\operatorname{erfi}\left(\frac{-f-2\,c\,z+2\,k\,(-d-2\,b\,z)-m\,(-d-2\,b\,z)}{2\,\sqrt{-c-2\,b\,k+b\,m}}\right)\right)+\right.$$

$$\frac{1}{-c+2\,b\,k-b\,m}\left(e^{-\frac{(f-2\,d\,k+d\,m)^2}{4\,c-8\,b\,k+4\,b\,m}+g+2\,e\,m-e\,(m-2\,k)}\right.$$

$$\left(\left((-1)^m\,e^{2\left(\frac{(f-2\,d\,k+d\,m)^2}{4\,c-8\,b\,k+4\,b\,m}-g-e\,m\right)}\right)\sqrt{-c+2\,b\,k-b\,m}\;\operatorname{erfi}\left(\frac{-f-2\,c\,z-2\,k\,(-d-2\,b\,z)+m\,(-d-2\,b\,z)}{2\,\sqrt{-c+2\,b\,k-b\,m}}\right)-\right.$$

$$\left.\left.e^{-4\,e\,k}\,\sqrt{c-2\,b\,k+b\,m}\;\operatorname{erfi}\left(\frac{f+2\,c\,z+2\,k\,(-d-2\,b\,z)-m\,(-d-2\,b\,z)}{2\,\sqrt{c-2\,b\,k+b\,m}}\right)\right)\right)+$$

$$\left.\left.\frac{(-1)^m\,e^{\frac{(f+2\,d\,k-d\,m)^2}{-4\,c-8\,b\,k+4\,b\,m}+g-e\,(m-2\,k)}\,\operatorname{erfi}\left(\frac{f+2\,c\,z-2\,k\,(-d-2\,b\,z)+m\,(-d-2\,b\,z)}{2\,\sqrt{c-b\,(m-2\,k)}}\right)}{\sqrt{c-b\,(m-2\,k)}}\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1620.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{(i\,f)^{3/2}}\left(i^{1-m}\,2^{-m-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left.\left(2\sqrt{i\,f}\ \sinh\left(\sqrt{z}\ c+g+f\,z\right)-c\sqrt{2\,\pi}\left(i\cosh\left(\frac{c^2}{4\,f}-g\right)C\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)+S\left(\frac{c+2\,f\sqrt{z}}{\sqrt{i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,f}-g\right)\right)\right)+$$

$$i^{1-m}\,2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{(i\,(f+2\,d\,k-d\,m))^{3/2}}\left(2\sqrt{i\,(f+2\,d\,k-d\,m)}\right.\right.$$

$$\sinh\left(g+2\,e\,k-e\,m+(f+2\,d\,k-d\,m)\,z+(c+2\,b\,k-b\,m)\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)-(c+2\,b\,k-b\,m)\sqrt{2\,\pi}$$

$$\left(i\cosh\left(-\frac{(c+2\,b\,k-b\,m)^2}{4\,f+8\,d\,k-4\,d\,m}+g+2\,e\,k-e\,m-\frac{i\,m\,\pi}{2}\right)C\left(\frac{c+2\,b\,k-b\,m+2\,(f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,(f+2\,d\,k-d\,m)}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.S\left(\frac{c+2\,b\,k-b\,m+2\,(f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,(f+2\,d\,k-d\,m)}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{(c+2\,b\,k-b\,m)^2}{4\,f+8\,d\,k-4\,d\,m}+g+2\,e\,k-e\,m-\frac{i\,m\,\pi}{2}\right)\right)\right)+$$

$$\frac{1}{(i\,(-f+2\,d\,k-d\,m))^{3/2}}\left(-(-c+2\,b\,k-b\,m)\sqrt{2\,\pi}\left(i\cosh\left(\frac{(c+b\,(m-2\,k))^2}{-4\,f+8\,d\,k-4\,d\,m}+g-2\,e\,k+e\,m+\frac{i\,m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-c+2\,b\,k-b\,m+2\,(-f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,(-f+2\,d\,k-d\,m)}\ \sqrt{2\,\pi}}\right)+S\left(\frac{-c+2\,b\,k-b\,m+2\,(-f+2\,d\,k-d\,m)\sqrt{z}}{\sqrt{i\,(-f+2\,d\,k-d\,m)}\ \sqrt{2\,\pi}}\right)$$

$$\left.\sinh\left(\frac{(c+b\,(m-2\,k))^2}{-4\,f+8\,d\,k-4\,d\,m}+g-2\,e\,k+e\,m+\frac{i\,m\,\pi}{2}\right)\right)-2\sqrt{i\,(-f+2\,d\,k-d\,m)}$$

$$\left.\left.\sinh\left(g-2\,e\,k+e\,m-(-f+2\,d\,k-d\,m)\,z-(-c+2\,b\,k-b\,m)\sqrt{z}\ +\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1621.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$i^m\,2^{-m-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(-\frac{c\,e^{\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{-f}}\right)}{(-f)^{3/2}}+\frac{4\,e^g\sinh\left(\sqrt{z}\ c+g+f\,z\right)}{f}-\frac{c\,e^{2g-\frac{c^2}{4f}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+2f\sqrt{z}}{2\sqrt{f}}\right)}{f^{3/2}}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-g-e(2k-m)}\left(\frac{2(-1)^m e^{\sqrt{z}\ (c+b(2k-m))+2(g+e(2k-m))+(f+d(2k-m))z}}{f+d(2k-m)}-\left((-1)^m e^{2(g+e(2k-m))-\frac{(c+b(2k-m))^2}{4(f+d(2k-m))}}\right.\right.\right.$$

$$\left.\left.\left.(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2(f+d(2k-m))\sqrt{z}}{2\sqrt{f+d(2k-m)}}\right)\right)\Big/(f+d(2k-m))^{3/2}+\right.\right.$$

$$\left.\left.\frac{2e^{\sqrt{z}\ (-c-b(2k-m))+(d(m-2k)-f)z}}{d(m-2k)-f}-\frac{e^{-\frac{(-c-b(2k-m))^2}{4(d(m-2k)-f)}}(c+b(2k-m))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(2k-m)+2(f+d(2k-m))\sqrt{z}}{2\sqrt{d(m-2k)-f}}\right)}{(d(m-2k)-f)^{3/2}}\right)+\right.$$

$$e^{-g-e(m-2k)}\left(\frac{2(-1)^m e^{\sqrt{z}\ (-c-b(m-2k))+(d(2k-m)-f)z}}{d(2k-m)-f}-\left((-1)^m e^{-\frac{(-c-b(m-2k))^2}{4(d(2k-m)-f)}}(c+b(m-2k))\right.\right.$$

$$\left.\left.\sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+b(m-2k)+2(f+d(m-2k))\sqrt{z}}{2\sqrt{d(2k-m)-f}}\right)\right)\Big/(d(2k-m)-f)^{3/2}+\right.$$

$$\left.\frac{2e^{\sqrt{z}\ (c+b(m-2k))+2(g+e(m-2k))+(f+d(m-2k))z}}{f+d(m-2k)}-\left(e^{2(g+e(m-2k))-\frac{(c+b(m-2k))^2}{4(f+d(m-2k))}}(c+b(m-2k))\sqrt{\pi}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{c+b(m-2k)+2(f+d(m-2k))\sqrt{z}}{2\sqrt{f+d(m-2k)}}\right)\right)\Big/(f+d(m-2k))^{3/2}\right)\Big/;\ m\in\mathbb{Z}\wedge m>0$$

Involving products of sinh

Involving $\sinh(a\,z)\sinh(b\,z)\cosh(c\,z)$

01.20.21.1622.01

$$\int \sinh(a\,z)\sinh(b\,z)\cosh(c\,z)\,dz == \frac{1}{4}\left(-\frac{\sinh((a-b-c)\,z)}{a-b-c}+\frac{\sinh((a+b-c)\,z)}{a+b-c}+\frac{\sinh((a+b+c)\,z)}{a+b+c}-\frac{\sinh((a-b+c)\,z)}{a-b+c}\right)$$

01.20.21.1623.01

$$\int \sinh(a\,z)\sinh(b\,z)\cosh(a\,z)\,dz == \frac{2\,a\cosh(2\,a\,z)\sinh(b\,z) - b\cosh(b\,z)\sinh(2\,a\,z)}{8\,a^2 - 2\,b^2}$$

Involving rational functions of sinh

Involving $\frac{\cosh(c\,z)}{a+b\sinh(d\,z)}$

01.20.21.1624.01

$$\int \frac{\cosh(c\,z)}{a+b\sinh(d\,z)}\,dz == \frac{1}{2\,b\sqrt{a^2+b^2}}\,e^{(d-c)\,z}$$

$$\left(\frac{1}{c-d}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(1-\frac{c}{d},\,1;\,2-\frac{c}{d};\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(1-\frac{c}{d},\,1;\,2-\frac{c}{d};-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)-\right.$$

$$\left.\frac{1}{c+d}\,e^{2\,c\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d}{d},\,1;\,\frac{c}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d}{d},\,1;\,\frac{c}{d}+2;-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)$$

01.20.21.1625.01

$$\int \frac{\cosh(c\,z)}{a+b\sinh(c\,z)}\,dz == \frac{\log(a+b\sinh(c\,z))}{b\,c}$$

01.20.21.1626.01

$$\int \frac{A+B\cosh(c\,z)}{a+b\sinh(c\,z)}\,dz == \frac{2\,A}{\sqrt{-a^2-b^2}\;c}\tan^{-1}\left(\frac{\operatorname{sech}\left(\frac{c\,z}{2}\right)\left(b\cosh\left(\frac{c\,z}{2}\right)-a\sinh\left(\frac{c\,z}{2}\right)\right)}{\sqrt{-a^2-b^2}}\right)+\frac{B\log(a+b\sinh(c\,z))}{b\,c}$$

01.20.21.1627.01

$$\int \frac{\cosh(2\,c\,z)}{a+b\sinh(c\,z)}\,dz == -\frac{2\,a\,z}{b^2}+\frac{2\left(2\,a^2+b^2\right)}{b^2\sqrt{-a^2-b^2}\;c}\tan^{-1}\left(\frac{\operatorname{sech}\left(\frac{c\,z}{2}\right)\left(b\cosh\left(\frac{c\,z}{2}\right)-a\sinh\left(\frac{c\,z}{2}\right)\right)}{\sqrt{-a^2-b^2}}\right)+\frac{2\cosh(c\,z)}{b\,c}$$

01.20.21.1628.01

$$\int \frac{\cosh(c\,z)}{a+b\sinh(2\,c\,z)}\,dz ==$$

$$\left(\sqrt{\sqrt{a^2+b^2}-a}\left(a-b+\sqrt{a^2+b^2}\right)\tan^{-1}\left(\frac{\sqrt{b}\;e^{c\,z}}{\sqrt{a+\sqrt{a^2+b^2}}}\right)-\sqrt{a+\sqrt{a^2+b^2}}\left(-a+b+\sqrt{a^2+b^2}\right)\right.$$

$$\left.\tanh^{-1}\left(\frac{\sqrt{b}\;e^{c\,z}}{\sqrt{\sqrt{a^2+b^2}-a}}\right)\right)\Big/\left(2\sqrt{b}\;\sqrt{a^2+b^2}\;\sqrt{\sqrt{a^2+b^2}-a}\;\sqrt{a+\sqrt{a^2+b^2}}\;c\right)$$

01.20.21.1629.01

$$\int \frac{(A + B \sinh(z)) \cosh(z)}{a + b \sinh(z)} \, dz == \frac{(A\,b - a\,B) \log(a + b \sinh(z)) + b\,B \sinh(z)}{b^2}$$

Involving $\cosh(c\,z)\,(a + b \sinh(d\,z))^{-n}$

01.20.21.1630.01

$$\int \frac{\cosh(c\,z)}{(a + b \sinh(d\,z))^2} \, dz == -\frac{1}{2\,b\left(a^2 + b^2\right)^{3/2}}$$

$$\left(\frac{1}{c+d}\left(e^{-c\,z-d\,z}\left(-{}_2F_1\left(\frac{c}{d}+1,\,2;\,\frac{c}{d}+2;\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)a^2+{}_2F_1\left(\frac{c}{d}+1,\,2;\,\frac{c}{d}+2;\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)a^2+\left(a+\sqrt{a^2+b^2}\right)\right.\right.\right.$$
$${}_2F_1\left(\frac{c}{d}+1,\,1;\,\frac{c}{d}+2;\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)a+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c}{d}+1,\,1;\,\frac{c}{d}+2;\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)a-$$
$$\sqrt{a^2+b^2}\;{}_2F_1\left(\frac{c}{d}+1,\,2;\,\frac{c}{d}+2;\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)a-\sqrt{a^2+b^2}\;{}_2F_1\left(\frac{c}{d}+1,\,2;\,\frac{c}{d}+2;\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)a-$$
$$\left.\left.b^2\,{}_2F_1\left(\frac{c}{d}+1,\,2;\,\frac{c}{d}+2;\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)+b^2\,{}_2F_1\left(\frac{c}{d}+1,\,2;\,\frac{c}{d}+2;\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)+$$
$$\frac{1}{c-d}\left(e^{(c-d)\,z}\left({}_2F_1\left(1-\frac{c}{d},\,2;\,2-\frac{c}{d};\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)a^2-{}_2F_1\left(1-\frac{c}{d},\,2;\,2-\frac{c}{d};\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)a^2+\left(a-\sqrt{a^2+b^2}\right)\right.\right.$$
$${}_2F_1\left(1-\frac{c}{d},\,1;\,2-\frac{c}{d};\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)a+\sqrt{a^2+b^2}\;{}_2F_1\left(1-\frac{c}{d},\,2;\,2-\frac{c}{d};\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)a+\sqrt{a^2+b^2}$$
$${}_2F_1\left(1-\frac{c}{d},\,2;\,2-\frac{c}{d};\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)a-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(1-\frac{c}{d},\,1;\,2-\frac{c}{d};\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)+$$
$$\left.\left.\left.b^2\,{}_2F_1\left(1-\frac{c}{d},\,2;\,2-\frac{c}{d};\,-\frac{b\,e^{-d\,z}}{\sqrt{a^2+b^2}-a}\right)-b^2\,{}_2F_1\left(1-\frac{c}{d},\,2;\,2-\frac{c}{d};\,\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

01.20.21.1631.01

$$\int \frac{A + B \cosh(c\,z)}{(a + b \sinh(c\,z))^2} \, dz == \frac{1}{\left(a^2+b^2\right)c}\left(\frac{2\,a\,A}{\sqrt{-a^2-b^2}}\tan^{-1}\left(\frac{b-a\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{-a^2-b^2}}\right)-\frac{A\cosh(c\,z)\,b^2+\left(a^2+b^2\right)B}{b\,(a+b\sinh(c\,z))}\right)$$

01.20.21.1632.01

$$\int \frac{A+B\cosh(c\,z)}{(a+b\sinh(c\,z))^3}\,dz ==$$
$$-\frac{1}{2\left(a^2+b^2\right)^2 c}\left(\frac{B\left(a^2+b^2\right)^2}{b\,(a+b\sinh(c\,z))^2}+\frac{A\,b\cosh(c\,z)\left(4\,a^2+3\,b\sinh(c\,z)\,a+b^2\right)}{(a+b\sinh(c\,z))^2}-\frac{2\,A\left(2\,a^2-b^2\right)}{\sqrt{-a^2-b^2}}\tan^{-1}\left(\frac{b-a\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{-a^2-b^2}}\right)\right)$$

01.20.21.1633.01

$$\int \frac{A+B\cosh(c\,z)+C\cosh^2(c\,z)}{(a+b\sinh(c\,z))^3}\,dz ==$$
$$\frac{1}{2\left(a^2+b^2\right)^2 c}\left(\frac{2\left((2\,A+C)\,a^2+b^2\,(C-A)\right)}{\sqrt{-a^2-b^2}}\tan^{-1}\left(\frac{b-a\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{-a^2-b^2}}\right)+\frac{a\left(\left(a^2+b^2\right)C-3\,A\,b^2\right)\cosh(c\,z)}{b\,(a+b\sinh(c\,z))}-\frac{\left(a^2+b^2\right)\left(\left(a^2+b^2\right)B+\left(A\,b^2+\left(a^2+b^2\right)C\right)\cosh(c\,z)\right)}{b\,(a+b\sinh(c\,z))^2}\right)$$

Involving $\frac{\cosh(c\,z)}{a+b\sinh^2(d\,z)}$

01.20.21.1634.01

$$\int \frac{\cosh(c\,z)}{a+b\sinh^2(d\,z)}\,dz ==$$
$$-\frac{1}{2\sqrt{a}\,\sqrt{a-b}\,b}\left(\frac{1}{c-2\,d}\left(e^{(2\,d-c)\,z}\left(\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{c}{2\,d},\,1;\,2-\frac{c}{2\,d};\,-\frac{b\,e^{2\,d\,z}}{2\,a+2\sqrt{a-b}\,\sqrt{a}-b}\right)+\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{c}{2\,d},\,1;\,2-\frac{c}{2\,d};\,-\frac{b\,e^{2\,d\,z}}{2\,a-2\sqrt{a-b}\,\sqrt{a}-b}\right)\right)\right)-\frac{1}{c+2\,d}\left(e^{(c+2\,d)\,z}\left(\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c}{2\,d}+1,\,1;\,\frac{c}{2\,d}+2;\,-\frac{b\,e^{2\,d\,z}}{2\,a+2\sqrt{a-b}\,\sqrt{a}-b}\right)+\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{c}{2\,d}+1,\,1;\,\frac{c}{2\,d}+2;\,-\frac{b\,e^{2\,d\,z}}{2\,a-2\sqrt{a-b}\,\sqrt{a}-b}\right)\right)\right)\right)$$

01.20.21.1635.01

$$\int \frac{\cosh(c\,z)}{a+b\sinh^2(c\,z)}\,dz == \frac{1}{\sqrt{a}\,\sqrt{b}\,c}\tan^{-1}\left(\frac{\sqrt{b}\,\sinh(c\,z)}{\sqrt{a}}\right)$$

Involving $\cosh(c\,z)\left(a+b\sinh^2(d\,z)\right)^{-n}$

01.20.21.1636.01

$$\int \frac{\cosh(c\,z)}{\left(a+b\sinh^2(d\,z)\right)^2}\,dz == -\frac{1}{4\,a^{3/2}\,(a-b)^{3/2}\,b}$$

$$\left(-\frac{1}{-c-2\,d}\left(e^{-c\,z-2\,d\,z}\left((2\,a-b)\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c}{2\,d}+1,\,1;\,\frac{c}{2\,d}+2;\,-\frac{b\,e^{-2\,d\,z}}{2\,a+2\sqrt{a-b}\,\sqrt{a}-b}\right)+\right.\right.\right.$$
$$(2\,a-b)\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{c}{2\,d}+1,\,1;\,\frac{c}{2\,d}+2;\,-\frac{b\,e^{-2\,d\,z}}{2\,a-2\sqrt{a-b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(2\,a^{3/2}-2\sqrt{a-b}\,a-2\,b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{c}{2\,d}+1,\,2;\,\frac{c}{2\,d}+2;\,-\frac{b\,e^{-2\,d\,z}}{2\,a+2\sqrt{a-b}\,\sqrt{a}-b}\right)+\right.$$
$$\left.\left(-2\,a^{3/2}-2\sqrt{a-b}\,a+2\,b\sqrt{a}+\sqrt{a-b}\,b\right)\right.$$
$${}_2F_1\left(\frac{c}{2\,d}+1,\,2;\,\frac{c}{2\,d}+2;\,-\frac{b\,e^{-2\,d\,z}}{2\,a-2\sqrt{a-b}\,\sqrt{a}-b}\right)\Big)\Big)\Big)\Big)-$$
$$\frac{1}{c-2\,d}\left(e^{(c-2\,d)\,z}\left((2\,a-b)\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{c}{2\,d},\,1;\,2-\frac{c}{2\,d};\,-\frac{b\,e^{-2\,d\,z}}{2\,a+2\sqrt{a-b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$(2\,a-b)\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{c}{2\,d},\,1;\,2-\frac{c}{2\,d};\,-\frac{b\,e^{-2\,d\,z}}{2\,a-2\sqrt{a-b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(2\,a^{3/2}-2\sqrt{a-b}\,a-2\,b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(1-\frac{c}{2\,d},\,2;\,2-\frac{c}{2\,d};\,-\frac{b\,e^{-2\,d\,z}}{2\,a+2\sqrt{a-b}\,\sqrt{a}-b}\right)+\right.$$
$$\left.\left.\left(-2\,a^{3/2}-2\sqrt{a-b}\,a+2\,b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(1-\frac{c}{2\,d},\,2;\,2-\frac{c}{2\,d};\,-\frac{b\,e^{-2\,d\,z}}{2\,a-2\sqrt{a-b}\,\sqrt{a}-b}\right)\right)\right)\right)$$

Involving $\frac{\sinh(e\,z)\cosh(c\,z)}{a+b\sinh(d\,z)}$

01.20.21.1637.01

$$\int \frac{\sinh(e\,z)\cosh(c\,z)}{a+b\sinh(d\,z)}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2+b^2}\,(-c+d-e)}\left(e^{(-c+d-e)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d-e}{d},1;\frac{-c-e}{d}+2;\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{-c+d-e}{d},1;\frac{-c-e}{d}+2;-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d-e)}\left(e^{(c+d-e)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e}{d},1;\frac{c-e}{d}+2;\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d-e}{d},1;\frac{c-e}{d}+2;-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(-c+d+e)}\left(e^{(-c+d+e)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d+e}{d},1;\frac{e-c}{d}+2;\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{-c+d+e}{d},1;\frac{e-c}{d}+2;-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d+e)}\left(e^{(c+d+e)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e}{d},1;\frac{c+e}{d}+2;\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d+e}{d},1;\frac{c+e}{d}+2;-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $\sinh(e\,z)\cosh(c\,z)\,(a+b\sinh(d\,z))^{-n}$

01.20.21.1638.01

$$\int \frac{\sinh(e\,z)\cosh(c\,z)}{(a+b\sinh(d\,z))^2}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\left(a^2+b^2\right)^{3/2}(-c+d+e)}\left(e^{(-c+d+e)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d+e}{d},1;\frac{e-c}{d}+2;\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d+e}{d},1;\frac{e-c}{d}+2;-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)+$$
$$\left.\left.\left.\left(a^2+\sqrt{a^2+b^2}\,a+b^2\right){}_2F_1\left(\frac{-c+d+e}{d},2;\frac{e-c}{d}+2;\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{-c+d+e}{d},\,2;\,\frac{e-c}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+e)}\left(e^{(c+d+e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e}{d},\,1;\,\frac{c+e}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e}{d},\,1;\,\frac{c+e}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d+e}{d},\,2;\,\frac{c+e}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d+e}{d},\,2;\,\frac{c+e}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\Bigg)-$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(-c+d-e)}\left(e^{(-c+d-e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d-e}{d},\,1;\,\frac{-c-e}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d-e}{d},\,1;\,\frac{-c-e}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{-c+d-e}{d},\,2;\,\frac{-c-e}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{-c+d-e}{d},\,2;\,\frac{-c-e}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\Bigg)-$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-e)}\left(e^{(c+d-e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e}{d},\,1;\,\frac{c-e}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e}{d},\,1;\,\frac{c-e}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d-e}{d},\,2;\,\frac{c-e}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d-e}{d},\,2;\,\frac{c-e}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $\frac{\sinh(e\,z)\cosh(c\,z)}{a+b\sinh^2(d\,z)}$

01.20.21.1639.01

$$\int \frac{\sinh(e\,z)\cosh(c\,z)}{a+b\sinh^2(d\,z)}\,dz == \frac{1}{4}\left(\frac{1}{\sqrt{a}\,\sqrt{a-b}\,b\,(-c-2\,d+e)}\left(e^{(-c-2\,d+e)\,z}\right.\right.$$
$$\left(\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{e-c}{2\,d},\,1;\,2-\frac{e-c}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right)\right.$$
$$\left.{}_2F_1\left(1-\frac{e-c}{2\,d},\,1;\,2-\frac{e-c}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)+\frac{1}{\sqrt{a}\,\sqrt{a-b}\,b\,(c-2\,d+e)}$$
$$\left(e^{(c-2\,d+e)\,z}\left(\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{c+e}{2\,d},\,1;\,2-\frac{c+e}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{c+e}{2\,d},\,1;\,2-\frac{c+e}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{\sqrt{a}\,\sqrt{a-b}\,b\,(-c-2\,d-e)}\left(e^{(-c-2\,d-e)\,z}\left(\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right)\right.\right.$$
$$\left.{}_2F_1\left(1-\frac{-c-e}{2\,d},\,1;\,2-\frac{-c-e}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right)\right.$$
$$\left.\left.{}_2F_1\left(1-\frac{-c-e}{2\,d},\,1;\,2-\frac{-c-e}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)-\frac{1}{\sqrt{a}\,\sqrt{a-b}\,b\,(c-2\,d-e)}$$
$$\left(e^{(c-2\,d-e)\,z}\left(\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{c-e}{2\,d},\,1;\,2-\frac{c-e}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{c-e}{2\,d},\,1;\,2-\frac{c-e}{2\,d};\,\frac{b\,e^{-2\,d\,z}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\sinh(e\,z)\cosh(c\,z)\left(a+b\sinh^2(d\,z)\right)^{-n}$

01.20.21.1640.01

$$\int \frac{\sinh(e\,z)\cosh(c\,z)}{\left(a+b\sinh^2(d\,z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-c+2\,d+e)\,z}\left((2\,a-b)\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-c}{2\,d}+1,\,1;\,\frac{e-c}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.(2\,a-b)\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-c}{2\,d}+1,\,1;\,\frac{e-c}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}\right.$$
$$\left(\left(-2\,a^{3/2}-2\sqrt{a-b}\,a+2\,b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{e-c}{2\,d}+1,\,2;\,\frac{e-c}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left(2\,a^{3/2}-2\sqrt{a-b}\,a-2\,b\sqrt{a}+\sqrt{a-b}\,b\right)\right.\right.$$

$$
{}_2F_1\left(\frac{e-c}{2\,d}+1,\,2;\,\frac{e-c}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\,\sqrt{a-b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,(a-b)^{3/2}\,b\,(-c+2\,d+e)\right)+\frac{1}{2\,a^{3/2}\,(a-b)^{3/2}\,b\,(c+2\,d+e)}\left(e^{(c+2\,d+e)\,z}\right.
$$

$$
\left((2\,a-b)\left(2\,a+2\,\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{c+e}{2\,d}+1,\,1;\,\frac{c+e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.
$$

$$
(2\,a-b)\left(-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c+e}{2\,d}+1,\,1;\,\frac{c+e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+2\,\sqrt{a}
$$

$$
\left(\left(-2\,a^{3/2}-2\,\sqrt{a-b}\,a+2\,b\,\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{c+e}{2\,d}+1,\,2;\,\frac{c+e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.
$$

$$
\left(2\,a^{3/2}-2\,\sqrt{a-b}\,a-2\,b\,\sqrt{a}+\sqrt{a-b}\,b\right)
$$

$$
\left.{}_2F_1\left(\frac{c+e}{2\,d}+1,\,2;\,\frac{c+e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\,\sqrt{a-b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)-
$$

$$
\left(e^{(-c+2\,d-e)\,z}\left((2\,a-b)\left(2\,a+2\,\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-c-e}{2\,d}+1,\,1;\,\frac{-c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.
$$

$$
(2\,a-b)\left(-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-c-e}{2\,d}+1,\,1;\,\frac{-c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\left(\left(-2\,a^{3/2}-2\,\sqrt{a-b}\,a+2\,b\,\sqrt{a}+\sqrt{a-b}\,b\right)\right.
$$

$$
{}_2F_1\left(\frac{-c-e}{2\,d}+1,\,2;\,\frac{-c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}-2\,\sqrt{a-b}\,a-2\,b\right.
$$

$$
\left.\left.\left.\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{-c-e}{2\,d}+1,\,2;\,\frac{-c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\,\sqrt{a-b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,(a-b)^{3/2}\,b\,(-c+2\,d-e)\right)-\frac{1}{2\,a^{3/2}\,(a-b)^{3/2}\,b\,(c+2\,d-e)}\left(e^{(c+2\,d-e)\,z}\right.
$$

$$
\left((2\,a-b)\left(2\,a+2\,\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{c-e}{2\,d}+1,\,1;\,\frac{c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.
$$

$$
(2\,a-b)\left(-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c-e}{2\,d}+1,\,1;\,\frac{c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+2\,\sqrt{a}
$$

$$
\left(\left(-2\,a^{3/2}-2\,\sqrt{a-b}\,a+2\,b\,\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{c-e}{2\,d}+1,\,2;\,\frac{c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a+2\,\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.
$$

$$
\left(2\,a^{3/2}-2\,\sqrt{a-b}\,a-2\,b\,\sqrt{a}+\sqrt{a-b}\,b\right)
$$

$$
\left.\left.{}_2F_1\left(\frac{c-e}{2\,d}+1,\,2;\,\frac{c-e}{2\,d}+2;\,\frac{b\,e^{2\,d\,z}}{-2\,a-2\,\sqrt{a-b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\right)
$$

Involving algebraic functions of sinh

Involving $(a + b \sinh(d z))^{\beta} \cosh(c z)$

01.20.21.1641.01

$$\int (a + b \sinh(d z))^{\beta} \cosh(c z)\, dz == \frac{1}{2\left(c^2 - d^2 \beta^2\right)} e^{-c z} \left(\frac{e^{d z} b}{a - \sqrt{a^2 + b^2}} + 1\right)^{-\beta} \left(\frac{e^{d z} b}{a + \sqrt{a^2 + b^2}} + 1\right)^{-\beta}$$
$$\left(a + \frac{1}{2} b e^{-d z}\left(-1 + e^{2 d z}\right)\right)^{\beta} \left(e^{2 c z} (c + d \beta) F_1\left(\frac{c}{d} - \beta; -\beta, -\beta; \frac{c}{d} - \beta + 1; -\frac{b e^{d z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{d z}}{\sqrt{a^2 + b^2} - a}\right) - \right.$$
$$\left. (c - d \beta) F_1\left(-\frac{c}{d} - \beta; -\beta, -\beta; -\frac{c}{d} - \beta + 1; -\frac{b e^{d z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{d z}}{\sqrt{a^2 + b^2} - a}\right)\right)$$

01.20.21.1642.01

$$\int (a + b \sinh(c z))^{\beta} \cosh(c z)\, dz == \frac{(a + b \sinh(c z))^{\beta + 1}}{b c (\beta + 1)}$$

01.20.21.1643.01

$$\int \sqrt{a + b \sinh(c z)}\, \cosh(c z)\, dz == \frac{2 (a + b \sinh(c z))^{3/2}}{3 b c}$$

01.20.21.1644.01

$$\int \frac{\cosh(c z)}{\sqrt{a + b \sinh(c z)}}\, dz == \frac{2 \sqrt{a + b \sinh(c z)}}{b c}$$

01.20.21.1645.01

$$\int \frac{\cosh(c z)}{\sqrt{a + b \sinh(2 c z)}}\, dz == \frac{b \left(\tan^{-1}\left(\frac{\sqrt{2}\ \sqrt{-i b}\ \sin\left(\frac{1}{4}(\pi - 4 i c z)\right)}{\sqrt{a + b \sinh(2 c z)}}\right) - \tanh^{-1}\left(\frac{\sqrt{2}\ \sqrt{-i b}\ \cos\left(\frac{1}{4}(\pi - 4 i c z)\right)}{\sqrt{a + b \sinh(2 c z)}}\right)\right)}{2 (-i b)^{3/2} c}$$

01.20.21.1646.01

$$\int \frac{\sqrt{a + b \sinh(z)}}{p + q \sinh(z)} \cosh(z)\, dz == \frac{2 \sqrt{a + b \sinh(z)}}{q} - \frac{2 \sqrt{a q - b p}}{q^{3/2}} \tanh^{-1}\left(\frac{\sqrt{q}\ \sqrt{a + b \sinh(z)}}{\sqrt{a q - b p}}\right)$$

01.20.21.1647.01

$$\int \frac{\cosh(2\,z)}{\sqrt{a+b\sinh(z)}\,(c+b\sinh(z))}\,dz ==$$

$$\frac{1}{\sqrt{\frac{1}{i\,b-a}}\,b^3\,(a-c)}\left(i\,(\cosh(z)+\cosh(3\,z))\left(2\,(a+i\,b)\,(a-c)\,E\left(i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\middle|\frac{a-i\,b}{a+i\,b}\right)+\right.\right.$$

$$2\,(a-c)\,(c-i\,b)\,F\left(i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\middle|\frac{a-i\,b}{a+i\,b}\right)+\left(b^2+2\,c^2\right)$$

$$\left.\left.\Pi\left(\frac{a-i\,b}{a-c};\,i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\middle|\frac{a-i\,b}{a+i\,b}\right)\right)\operatorname{sech}^2(z)\operatorname{sech}(2\,z)\sqrt{\frac{b-i\,b\sinh(z)}{b+i\,a}}\,\sqrt{\frac{i\sinh(z)\,b+b}{b-i\,a}}\right)$$

01.20.21.1648.01

$$\int \frac{\cosh(2\,a\,z)}{\sinh^{\frac{1}{2}}(a\,z)\,(\sinh(a\,z)+1)}\,dz ==$$

$$\frac{1}{a}\left(2\sqrt[4]{-1}\,\sqrt{\cosh^2(a\,z)}\,\left(-2\,i\,E\left(i\sinh^{-1}\left(\sqrt[4]{-1}\,\sinh^{\frac{1}{2}}(a\,z)\right)\middle|-1\right)+(2+2\,i)\,F\left(i\sinh^{-1}\left(\sqrt[4]{-1}\,\sinh^{\frac{1}{2}}(a\,z)\right)\middle|-1\right)-\right.\right.$$

$$\left.\left.3\,\Pi\left(-i;\,i\sinh^{-1}\left(\sqrt[4]{-1}\,\sinh^{\frac{1}{2}}(a\,z)\right)\middle|-1\right)\right)\operatorname{sech}(a\,z)\right)$$

Involving $\left(a+b\sinh^2(d\,z)\right)^{\beta}\cosh(c\,z)$

01.20.21.1649.01

$$\int \left(b\sinh^2(d\,z)+a\right)^{\beta}\cosh(c\,z)\,dz ==$$

$$\frac{1}{2\left(c^2-4\,d^2\,\beta^2\right)}e^{-c\,z}\left(\frac{e^{2\,d\,z}\,b}{2\,a-b+2\sqrt{a\,(a-b)}}+1\right)^{-\beta}\left(1-\frac{b\,e^{2\,d\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,d\,z}\left(-1+e^{2\,d\,z}\right)^2+a\right)^{\beta}$$

$$\left(e^{2\,c\,z}\,(c+2\,d\,\beta)\,F_1\left(\frac{c}{2\,d}-\beta;\,-\beta,\,-\beta;\,\frac{c}{2\,d}-\beta+1;\,\frac{b\,e^{2\,d\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\,\frac{b\,e^{2\,d\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)-\right.$$

$$\left.(c-2\,d\,\beta)\,F_1\left(-\frac{c+2\,d\,\beta}{2\,d};\,-\beta,\,-\beta;\,-\frac{c}{2\,d}-\beta+1;\,\frac{b\,e^{2\,d\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\,\frac{b\,e^{2\,d\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)\right)$$

01.20.21.1650.01

$$\int \frac{\cosh(z)}{\sqrt{b\sinh^2(z)+a}}\,dz == \frac{\log\left(2\left(\sqrt{b}\,\sinh(z)+\sqrt{b\sinh^2(z)+a}\right)\right)}{\sqrt{b}}$$

01.20.21.1651.01

$$\int \frac{\cosh(z)}{\sqrt{a-\sinh^2(z)}}\,dz == \tan^{-1}\left(\frac{\sinh(z)}{\sqrt{a-\sinh^2(z)}}\right)$$

01.20.21.1652.01

$$\int \frac{\cosh(c\,z)}{\left(b\sinh^2(c\,z)+a\right)\sqrt{1-k^2\sinh^2(c\,z)}}\,dz ==$$

$$\frac{1}{2\sqrt{a}\;c\sqrt{a\,k^2+b}}\left(i\left(\log\left(\frac{2\sqrt{a}\left(\sqrt{a}\;\sinh(c\,z)\,k^2+i\left(\sqrt{b}\;+\sqrt{a\,k^2+b}\;\sqrt{1-k^2\sinh^2(c\,z)}\right)\right)}{\sqrt{a\,k^2+b}\left(\sqrt{b}\;\sinh(c\,z)-i\sqrt{a}\right)}\right)-\right.\right.$$

$$\left.\left.\log\left(\frac{2\sqrt{a}\left(\sqrt{a}\;k^2\sinh(c\,z)-i\left(\sqrt{b}\;+\sqrt{a\,k^2+b}\;\sqrt{1-k^2\sinh^2(c\,z)}\right)\right)}{\sqrt{a\,k^2+b}\left(\sqrt{b}\;\sinh(c\,z)+i\sqrt{a}\right)}\right)\right)\right)$$

01.20.21.1653.01

$$\int \frac{\sinh^4(z)\cosh(z)}{\sqrt{\left(b\sinh^2(z)+a\right)^3}}\,dz == \frac{2\,a-b+b\cosh(2\,z)}{8\,b^{5/2}\sqrt{\left(b\sinh^2(z)+a\right)^3}}$$

$$\left(\sqrt{b}\;(6\,a-b+b\cosh(2\,z))\sinh(z)-3\,a\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(z)}{\sqrt{2\,a-b+b\cosh(2\,z)}}\right)\sqrt{4\,a-2\,b+2\,b\cosh(2\,z)}\right)$$

Involving $\sinh(e\,z)\cosh(c\,z)\,(a+b\sinh(d\,z))^{\beta}$

01.20.21.1654.01

$$\int \sinh(e\,z)\cosh(c\,z)\,(a+b\sinh(d\,z))^{\beta}\,dz ==$$

$$\frac{1}{4}\left(\frac{e^{-d\,z}\,b}{\sqrt{a^2+b^2}\;-a}+1\right)^{-\beta}\left(1-\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}}\right)^{-\beta}\left(\frac{e^{(-c-e)\,z}\,F_1\left(\frac{c+e-d\,\beta}{d};-\beta,-\beta;-\frac{i\,(i\,d+i\,(c+e)-i\,d\,\beta)}{d};\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{-d\,z}}{a-\sqrt{a^2+b^2}}\right)}{c+e-d\,\beta}-\right.$$

$$\frac{e^{(c-e)\,z}\,F_1\left(-\frac{c-e}{d}-\beta;-\beta,-\beta;-\frac{c-e}{d}-\beta+1;\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{-d\,z}}{a-\sqrt{a^2+b^2}}\right)}{c-e+d\,\beta}+$$

$$\frac{e^{(e-c)\,z}\,F_1\left(-\frac{e-c}{d}-\beta;-\beta,-\beta;-\frac{e-c}{d}-\beta+1;\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{-d\,z}}{a-\sqrt{a^2+b^2}}\right)}{-c+e+d\,\beta}+$$

$$\left.\frac{e^{(c+e)\,z}\,F_1\left(-\frac{c+e}{d}-\beta;-\beta,-\beta;-\frac{c+e}{d}-\beta+1;\frac{b\,e^{-d\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{-d\,z}}{a-\sqrt{a^2+b^2}}\right)}{c+e+d\,\beta}\right)(a+b\sinh(d\,z))^{\beta}$$

Involving $\sinh(e\,z)\cosh(c\,z)\left(a+b\sinh^2(d\,z)\right)^{\beta}$

01.20.21.1655.01

$$\int e^{p z} \sinh(e z) \cosh(c z) \left(a + b \sinh^2(d z)\right)^{\beta} dz ==$$

$$\frac{1}{4}\left(\frac{e^{-2 d z} b}{2 a - b - 2\sqrt{a (a-b)}} + 1\right)^{-\beta} \left(\frac{e^{-2 d z} b}{2 a - b + 2\sqrt{a (a-b)}} + 1\right)^{-\beta} \left(\frac{1}{4} b e^{2 d z} \left(-1 + e^{-2 d z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(-c-e+p) z}}{c + e - p - 2 d \beta} F_1\left(\frac{c + e - p - 2 d \beta}{2 d}; -\beta, -\beta; \frac{c + e - p}{2 d} - \beta + 1; -\frac{b e^{-2 d z}}{2 a - b + 2\sqrt{a (a-b)}}, -\frac{b e^{-2 d z}}{2 a - b - 2\sqrt{a (a-b)}}\right) -\right.$$
$$\frac{e^{(c-e+p) z}}{c - e + p + 2 d \beta} F_1\left(-\frac{c - e + p}{2 d} - \beta; -\beta, -\beta; -\frac{c - e + p}{2 d} - \beta + 1;\right.$$
$$\left. -\frac{b e^{-2 d z}}{2 a - b + 2\sqrt{a (a-b)}}, -\frac{b e^{-2 d z}}{2 a - b - 2\sqrt{a (a-b)}}\right) - \frac{e^{(-c+e+p) z}}{c - e - p - 2 d \beta}$$
$$F_1\left(-\frac{-c + e + p}{2 d} - \beta; -\beta, -\beta; -\frac{-c + e + p}{2 d} - \beta + 1; -\frac{b e^{-2 d z}}{2 a - b + 2\sqrt{a (a-b)}}, -\frac{b e^{-2 d z}}{2 a - b - 2\sqrt{a (a-b)}}\right) +$$
$$\left.\frac{e^{(c+e+p) z}}{c + e + p + 2 d \beta} F_1\left(-\frac{c + e + p}{2 d} - \beta; -\beta, -\beta; -\frac{c + e + p}{2 d} - \beta + 1; -\frac{b e^{-2 d z}}{2 a - b + 2\sqrt{a (a-b)}}, -\frac{b e^{-2 d z}}{2 a - b - 2\sqrt{a (a-b)}}\right)\right)$$

Involving other constructions

01.20.21.1656.01

$$\int \sinh^{n-1}(z) \left(\left(b \sinh^n(z) + a\right)^{\frac{1}{c}}\right)^r \cosh(z) dz == \frac{c \left(b \sinh^n(z) + a\right) \left(\left(b \sinh^n(z) + a\right)^{\frac{1}{c}}\right)^r}{b n (c + r)}$$

Involving hyperbolic and a power functions

Involving sinh and power

Involving $z^{\alpha-1} \sinh(c z) \cosh(a z)$

01.20.21.1657.01

$$\int z^{\alpha-1} \sinh(c z) \cosh(a z) dz ==$$
$$\frac{1}{4} z^{\alpha} \left(-((a-c) z)^{-\alpha} \Gamma(\alpha, (a-c) z) + ((c-a) z)^{-\alpha} \Gamma(\alpha, (c-a) z) - (-(a+c) z)^{-\alpha} \Gamma(\alpha, -(a+c) z) + ((a+c) z)^{-\alpha} \Gamma(\alpha, (a+c) z)\right)$$

01.20.21.1658.01

$$\int z^n \sinh(c z) \cosh(a z) dz == \frac{1}{4} n! \left((c-a)^{-n-1} e^{(a-c) z} \sum_{k=0}^{n} \frac{(-(a-c) z)^k}{k!} - (a-c)^{-n-1} e^{-(a-c) z} \sum_{k=0}^{n} \frac{((a-c) z)^k}{k!} -\right.$$
$$\left.(-a-c)^{-n-1} e^{(a+c) z} \sum_{k=0}^{n} \frac{(-(a+c) z)^k}{k!} + (a+c)^{-n-1} e^{-a z - c z} \sum_{k=0}^{n} \frac{((a+c) z)^k}{k!}\right) /; n \in \mathbb{N}$$

01.20.21.1659.01

$$\int z^{-n} \sinh(c\,z) \cosh(a\,z)\, dz == \frac{1}{4\left(a^2-c^2\right)(n-1)!}\left(e^{(c-a)\,z}\left(-(a-c)\,e^{2\,a\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(-a-c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(-a-c)^n+(-1)^n\,e^{(a-c)\,z}\right.\right.$$
$$\left((-a-c)^n\,(a-c)\,\mathrm{Ei}((a+c)\,z)-(a-c)^n\,(a+c)\,\mathrm{Ei}((c-a)\,z)\right)+(a-c)^n\,(a+c)\,(n-1)!\sum_{k=1}^{n-1}\frac{(a-c)^{k-n}\,z^{k-n}}{(1-n)_k}\Bigg)+$$
$$e^{-(2\,a+c)\,z}\left((a+c)\,e^{3\,a\,z}\,(n-1)!\left(\sum_{k=1}^{n-1}\frac{(c-a)^{k-n}\,z^{k-n}}{(1-n)_k}\right)(c-a)^n+(-1)^n\,e^{(2\,a+c)\,z}\left((a-c)\,(a+c)^n\,\mathrm{Ei}(-(a+c)\,z)-\right.\right.$$
$$\left.\left.\left.(c-a)^n\,(a+c)\,\mathrm{Ei}((a-c)\,z)\right)-(a-c)\,(a+c)^n\,e^{a\,z}\,(n-1)!\sum_{k=1}^{n-1}\frac{(a+c)^{k-n}\,z^{k-n}}{(1-n)_k}\right)\right);\ n\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh(c\,z+d)\cosh(a\,z)$

01.20.21.1660.01

$$\int z^{\alpha-1}\sinh(d+c\,z)\cosh(a\,z)\,dz == \frac{1}{4}z^{\alpha}\left((a-c)\,z\right)^{-\alpha}\left((c-a)\,z\right)^{-\alpha}\left(-(a+c)^2\,z^2\right)^{-\alpha}$$
$$\left(\left((a-c)\,z\right)^{\alpha}\left(\left((-(a+c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a+c)\,z)\,(\cosh(d)-\sinh(d))-((a+c)\,z)^{\alpha}\,\Gamma(\alpha,\,-(a+c)\,z)\,(\cosh(d)+\sinh(d))\right)\left((c-a)\,z\right)^{\alpha}+\right.$$
$$\left.\left(-(a+c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,(c-a)\,z)\,(\cosh(d)-\sinh(d))\right)-\left((c-a)\,z\right)^{\alpha}\left(-(a+c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,(a-c)\,z)\,(\cosh(d)+\sinh(d))\Big)$$

Involving $z^{\alpha-1}\sinh(c\,z)\cosh(a\,z+b)$

01.20.21.1661.01

$$\int z^{\alpha-1}\sinh(c\,z)\cosh(b+a\,z)\,dz == \frac{1}{4}z^{\alpha}\left((a-c)\,z\right)^{-\alpha}\left((c-a)\,z\right)^{-\alpha}\left(-(a+c)^2\,z^2\right)^{-\alpha}$$
$$\left(\left((a-c)\,z\right)^{\alpha}\left(\left((-(a+c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a+c)\,z)\,(\cosh(b)-\sinh(b))-((a+c)\,z)^{\alpha}\,\Gamma(\alpha,\,-(a+c)\,z)\,(\cosh(b)+\sinh(b))\right)\left((c-a)\,z\right)^{\alpha}+\right.$$
$$\left.\left(-(a+c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,(c-a)\,z)\,(\cosh(b)+\sinh(b))\right)-\left((c-a)\,z\right)^{\alpha}\left(-(a+c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,(a-c)\,z)\,(\cosh(b)-\sinh(b))\Big)$$

Involving $z^{\alpha-1}\sinh(c\,z+d)\cosh(a\,z+b)$

01.20.21.1662.01

$$\int z^{\alpha-1}\sinh(d+c\,z)\cosh(b+a\,z)\,dz == \frac{1}{4}z^{\alpha}\left((a-c)\,z\right)^{-\alpha}\left((c-a)\,z\right)^{-\alpha}\left(-(a+c)^2\,z^2\right)^{-\alpha}$$
$$\left(\left((a-c)\,z\right)^{\alpha}\left(\left((-(a+c)\,z)^{\alpha}\,\Gamma(\alpha,\,(a+c)\,z)\,(\cosh(b+d)-\sinh(b+d))-((a+c)\,z)^{\alpha}\,\Gamma(\alpha,\,-(a+c)\,z)\,(\cosh(b+d)+\sinh(b+d))\right)\right.$$
$$\left.\left((c-a)\,z\right)^{\alpha}+\left(-(a+c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,(c-a)\,z)\,(\cosh(b)+\sinh(b))\,(\cosh(d)-\sinh(d))\right)-$$
$$\left((c-a)\,z\right)^{\alpha}\left(-(a+c)^2\,z^2\right)^{\alpha}\Gamma(\alpha,\,(a-c)\,z)\,(\cosh(b)-\sinh(b))\,(\cosh(d)+\sinh(d))\Big)$$

Involving $z^n\sinh\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1663.01

$$\int z^n \sinh\left(b\,z^2\right) \cosh(c\,z)\,dz ==$$

$$\frac{1}{8} e^{-\frac{c^2}{4\,b}} \left(\frac{1}{\sqrt{-b}} \left(e^{\frac{c^2}{2\,b}} \left(\sum_{k=0}^{n} 2^{k-n}\, c^{n-k}\, (-b)^{-n-\frac{1}{2}} \left(\frac{(c+2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-k-1)} (-c-2\,b\,z)^{k+1} \binom{n}{k} \Gamma\left(\frac{k+1}{2}, \frac{(c+2\,b\,z)^2}{4\,b} \right) + \right. \right. \right.$$

$$\left. \left. \left. \sum_{k=0}^{n} 2^{k-n}\, (-c)^{n-k}\, (-b)^{-n-\frac{1}{2}}\, (c-2\,b\,z)^{k+1} \left(\frac{(c-2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-k-1)} \binom{n}{k} \Gamma\left(\frac{k+1}{2}, \frac{(c-2\,b\,z)^2}{4\,b} \right) \right) \right) -$$

$$\frac{1}{\sqrt{b}} \left(\sum_{k=0}^{n} 2^{k-n}\, (-c)^{n-k}\, b^{-n-\frac{1}{2}}\, (c+2\,b\,z)^{k+1} \left(-\frac{(c+2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-k-1)} \binom{n}{k} \Gamma\left(\frac{k+1}{2}, -\frac{(c+2\,b\,z)^2}{4\,b} \right) + \right.$$

$$\left. \left. \sum_{k=0}^{n} 2^{k-n}\, c^{n-k}\, b^{-n-\frac{1}{2}} \left(-\frac{(c-2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-k-1)} (2\,b\,z-c)^{k+1} \binom{n}{k} \Gamma\left(\frac{k+1}{2}, -\frac{(c-2\,b\,z)^2}{4\,b} \right) \right) \right) /;\ n \in \mathbb{N}$$

01.20.21.1664.01

$$\int z^n \sinh\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$2^{-2n-3}\,c^{-2(n+1)}\,e^{\frac{b^2}{4c}}\left(-\sum_{k=0}^{n}\sum_{m=0}^{k}(-1)^{k-m}\,4^k\,(-b)^{-k-m+2n}\left(-2\sqrt{z}\,c-b\right)^{k+m}\left(\frac{\left(2\sqrt{z}\,c+b\right)^2}{c}\right)^{\frac{1}{2}(-k-m-1)}\binom{k}{m}\binom{n}{k}\right.$$

$$\left(b\left(2\sqrt{z}\,c+b\right)\Gamma\left(\frac{1}{2}(k+m+1),\,\frac{\left(2\sqrt{z}\,c+b\right)^2}{4c}\right)-2c\sqrt{\frac{\left(2\sqrt{z}\,c+b\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(k+m+2),\,\frac{\left(2\sqrt{z}\,c+b\right)^2}{4c}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{m=0}^{k}(-1)^{k-m}\,4^k\,b^{-k-m+2n}\left(b-2c\sqrt{z}\right)^{k+m}\left(\frac{\left(b-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-k-m-1)}\binom{k}{m}\binom{n}{k}$$

$$\left(b\left(b-2c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(k+m+1),\,\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)-2c\sqrt{\frac{\left(b-2c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(k+m+2),\,\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)\right)+$$

$$e^{-\frac{b^2}{2c}}\left(\sum_{k=0}^{n}\sum_{m=0}^{k}(-1)^{k-m}\,4^k\,b^{-k-m+2n}\left(2\sqrt{z}\,c+b\right)^{k+m}\left(-\frac{\left(2\sqrt{z}\,c+b\right)^2}{c}\right)^{\frac{1}{2}(-k-m-1)}\binom{k}{m}\binom{n}{k}\right.\left(b\left(2\sqrt{z}\,c+b\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(k+m+1),\,-\frac{\left(2\sqrt{z}\,c+b\right)^2}{4c}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\,c+b\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(k+m+2),\,-\frac{\left(2\sqrt{z}\,c+b\right)^2}{4c}\right)\right)-$$

$$\sum_{k=0}^{n}\sum_{m=0}^{k}(-1)^{k-m}\,4^k\,(-b)^{-k-m+2n}\left(-\frac{\left(b-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-k-m-1)}\left(2c\sqrt{z}-b\right)^{k+m}\binom{k}{m}\binom{n}{k}$$

$$\left(b\left(b-2c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(k+m+1),\,-\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b-2c\sqrt{z}\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(k+m+2),\,-\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+e\right)\cosh(c\,z)$

01.20.21.1665.01

$$\int z^n \sinh\left(b\,z^2+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}\,b^{-n-1}\,e^{\frac{c^2-4\,b\,e}{4\,b}}\left((-1)^{n+1}\sum_{q=0}^{n}2^{q-n}\,c^{n-q}\,(-c-2\,b\,z)^{q+1}\left(\frac{(c+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(c+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$(-1)^{n+1}\sum_{q=0}^{n}2^{q-n}\,(-c)^{n-q}\,(c-2\,b\,z)^{q+1}\left(\frac{(c-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(c-2\,b\,z)^2}{4\,b}\right)+$$

$$e^{2\,e-\frac{c^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,(-c)^{n-q}\,(-c-2\,b\,z)\,(c+2\,b\,z)^q\left(-\frac{(c+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(c+2\,b\,z)^2}{4\,b}\right)-$$

$$\left.e^{2\,e-\frac{c^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,c^{n-q}\left(-\frac{(c-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}(2\,b\,z-c)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(c-2\,b\,z)^2}{4\,b}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1666.01

$$\int z^n \sinh\left(\sqrt{z}\ b+e\right)\cosh(c\,z)\,dz ==$$

$$2^{-2n-3}\,c^{-2n-2}\,e^{\frac{b^2-4ce}{4c}}\left(-\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-b-2c\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.$$

$$\left(b\left(b+2c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2c\sqrt{z}\right)^2}{4c}\right)-2c\sqrt{\frac{\left(b+2c\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2c\sqrt{z}\right)^2}{4c}\right)\right)+$$

$$e^{2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b-2c\sqrt{z}\right)^{h+k}\left(\frac{\left(b-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b-2c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)-2c\sqrt{\frac{\left(b-2c\sqrt{z}\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)\right)+$$

$$e^{2e-\frac{b^2}{2c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2c\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2c\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2c\sqrt{z}\right)^2}{4c}\right)+2\sqrt{-\frac{\left(b+2c\sqrt{z}\right)^2}{c}}\ c\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2c\sqrt{z}\right)^2}{4c}\right)\right)-$$

$$e^{-\frac{b^2}{2c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-\frac{\left(b-2c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\left(2c\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b-2c\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)+2\sqrt{-\frac{\left(b-2c\sqrt{z}\right)^2}{c}}\ c\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b-2c\sqrt{z}\right)^2}{4c}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+d\,z\right)\cosh(c\,z)$

01.20.21.1667.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh(c\,z)\,dz ==$$

$$\frac{1}{8}(-b)^{-n-1}\left(e^{\frac{(c+d)^2}{4b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}(c+d)^{n-q}(-c-d-2\,b\,z)^{q+1}\left(\frac{(-c-d-2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},\frac{(-c-d-2\,b\,z)^2}{4\,b}\right)+\right.$$

$$\left.e^{\frac{(c-d)^2}{4b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}(d-c)^{n-q}(c-d-2\,b\,z)^{q+1}\left(\frac{(c-d-2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},\frac{(c-d-2\,b\,z)^2}{4\,b}\right)\right)-$$

$$\frac{1}{8}b^{-n-1}\left(e^{-\frac{(c-d)^2}{4b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}(c-d)^{n-q}(-c+d+2\,b\,z)^{q+1}\left(-\frac{(-c+d+2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},-\frac{(-c+d+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$\left.e^{-\frac{(c+d)^2}{4b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}(-(c+d))^{n-q}((c+d)+2\,b\,z)^{q+1}\left(-\frac{(c+d+2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},-\frac{(c+d+2\,b\,z)^2}{4\,b}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1668.01

$$\int z^n \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh(c\,z)\,dz ==$$

$$2^{-2n-3}\left(e^{\frac{b^2}{4c-4d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d-c)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{c-d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d-c)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(c-d)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{c-d}}\;(d-c)\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(c-d)}\right)\right)\right)(d-c)^{-2(n+1)}+$$

$$(c+d)^{-2(n+1)}\,e^{-\frac{b^2}{4(c+d)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(c+d)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(c+d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}}\,(c+d)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)\Bigg)\Bigg)-$$

$$2^{-2n-3}\left(e^{\frac{b^2}{4(c+d)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-b-2(c+d)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(c+d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)-\right.$$

$$\left.\left.2(c+d)\sqrt{\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}}\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)\right)\right)(-c-d)^{-2(n+1)}+$$

$$(c-d)^{-2(n+1)}\,e^{\frac{b^2}{4d-4c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(2(c-d)\sqrt{z}-b\right)^{h+k}\left(-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{c-d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d-c)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(c-d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{c-d}}\,(c-d)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(c-d)}\right)\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+d\,z+e\right)\cosh(c\,z)$

01.20.21.1669.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh(c\,z)\,dz ==$$

$$\frac{(-b)^{-n-1}\,e^{-e}}{8}\left(e^{\frac{(c+d)^2}{4\,b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}\,(c+d)^{n-q}\,(-c-d-2\,b\,z)^{q+1}\left(\frac{(-c-d-2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},\,\frac{(-c-d-2\,b\,z)^2}{4\,b}\right)+\right.$$

$$\left.e^{\frac{(c-d)^2}{4\,b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}\,(d-c)^{n-q}\,(c-d-2\,b\,z)^{q+1}\left(\frac{(c-d-2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},\,\frac{(c-d-2\,b\,z)^2}{4\,b}\right)\right)-$$

$$\frac{b^{-n-1}\,e^{e}}{8}\left(e^{-\frac{(c-d)^2}{4\,b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}\,(c-d)^{n-q}\,(-c+d+2\,b\,z)^{q+1}\left(-\frac{(-c+d+2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},\,-\frac{(-c+d+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$\left.e^{-\frac{(c+d)^2}{4\,b}}\sum_{q=0}^{n}\binom{n}{q}2^{q-n}\,(-(c+d))^{n-q}\,((c+d)+2\,b\,z)^{q+1}\left(-\frac{(c+d+2\,b\,z)^2}{b}\right)^{-\frac{q+1}{2}}\Gamma\left(\frac{q+1}{2},\,-\frac{(c+d+2\,b\,z)^2}{4\,b}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1670.01

$$\int z^n \sinh\left(\sqrt{z}\;b+e+d\,z\right)\cosh(c\,z)\,dz ==$$

$$2^{-2\,n-3}\,e^{e}\left(e^{\frac{b^2}{4\,c-4\,d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d-c)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,(d-c)\,\sqrt{z}\right)^2}{c-d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d-c)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b+2\,(d-c)\,\sqrt{z}\right)^2}{4\,(c-d)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{\frac{\left(b+2\,(d-c)\,\sqrt{z}\right)^2}{c-d}}\;(d-c)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b+2\,(d-c)\,\sqrt{z}\right)^2}{4\,(c-d)}\right)\right)\right)(d-c)^{-2\,(n+1)}+$$

$$(c+d)^{-2\,(n+1)}\,e^{-\frac{b^2}{4\,(c+d)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(c+d)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,(c+d)\,\sqrt{z}\right)^2}{c+d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(c+d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+2\,(c+d)\,\sqrt{z}\right)^2}{4\,(c+d)}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}}\ (c+d)\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)\Bigg)\Bigg)-$$

$$2^{-2n-3}\,e^{-e}\left(e^{\frac{b^2}{4(c+d)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-b-2(c+d)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(c+d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)-\right.$$

$$\left.\left.2(c+d)\sqrt{\frac{\left(b+2(c+d)\sqrt{z}\right)^2}{c+d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2(c+d)\sqrt{z}\right)^2}{4(c+d)}\right)\right)(-c-d)^{-2(n+1)}+\right.$$

$$(c-d)^{-2(n+1)}\,e^{\frac{b^2}{4d-4c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(2(c-d)\sqrt{z}\ -b\right)^{h+k}\left(-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{c-d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(d-c)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(c-d)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{c-d}}\ (c-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2(d-c)\sqrt{z}\right)^2}{4(c-d)}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r\right)\cosh(f\,z+g)$

01.20.21.1671.01

$$\int z^n \sinh\left(b\,z^2\right) \cosh(g + f\,z)\,dz ==$$

$$-\frac{1}{8}\,b^{-n-1}\,e^{\frac{f^2}{4b}-g}\left((-1)^n \sum_{q=0}^{n} 2^{q-n}\,f^{n-q}\,(-f-2\,b\,z)^{q+1}\left(\frac{(f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$(-1)^n\,e^{2\,g} \sum_{q=0}^{n} 2^{q-n}\,(-f)^{n-q}\,(f-2\,b\,z)^{q+1}\left(\frac{(f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f-2\,b\,z)^2}{4\,b}\right)-$$

$$e^{2\,g-\frac{f^2}{2\,b}} \sum_{q=0}^{n} 2^{q-n}\,(-f)^{n-q}\,(-f-2\,b\,z)\,(f+2\,b\,z)^q\left(-\frac{(f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,b\,z)^2}{4\,b}\right)+$$

$$\left.e^{-\frac{f^2}{2\,b}} \sum_{q=0}^{n} 2^{q-n}\,f^{n-q}\left(-\frac{(f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}(2\,b\,z-f)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f-2\,b\,z)^2}{4\,b}\right)\right) /;\, n \in \mathbb{N}$$

01.20.21.1672.01

$$\int z^n \sinh\left(\sqrt{z}\, b\right) \cosh(g + f\, z)\, dz ==$$

$$2^{-2n-3}\, e^{\frac{b^2}{4f}-g}\, f^{-2n-2} \left(-\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2n} \left(-b-2f\sqrt{z}\right)^{h+k} \left(\frac{\left(b+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \right.$$

$$\left(b\left(b+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right) - 2f\sqrt{\frac{\left(b+2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right)\right) +$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2n} \left(b-2f\sqrt{z}\right)^{h+k} \left(\frac{\left(b-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right) - 2f\sqrt{\frac{\left(b-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right)\right) +$$

$$e^{-\frac{b^2}{2f}+2g} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2n} \left(b+2f\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(b\left(b+2f\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right) + 2\sqrt{-\frac{\left(b+2f\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right)\right) -$$

$$e^{2g-\frac{b^2}{2f}} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2n} \left(-\frac{\left(b-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \left(2f\sqrt{z}-b\right)^{h+k} \binom{k}{h}\binom{n}{k} \left(b\left(b-2f\sqrt{z}\right)\Gamma\right.$$

$$\left. \left(\frac{1}{2}(h+k+1),\ -\frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right) + 2\sqrt{-\frac{\left(b-2f\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right)\right) \Bigg) \Bigg/; n \in \mathbb{N}$$

Involving $z^n \sinh\left(b\, z^r + e\right) \cosh(f\, z + g)$

01.20.21.1673.01

$$\int z^n \sinh\left(b\,z^2+e\right)\cosh(g+f\,z)\,dz ==$$

$$-\frac{1}{8}\,b^{-n-1}\,e^{\frac{f^2-4\,b\,(e+g)}{4\,b}}\left((-1)^n\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f-2\,b\,z)^{q+1}\left(\frac{(f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$(-1)^n\,e^{2\,g}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f-2\,b\,z)^{q+1}\left(\frac{(f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f-2\,b\,z)^2}{4\,b}\right)-$$

$$e^{-\frac{f^2}{2\,b}+2\,e+2\,g}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(-f-2\,b\,z)\,(f+2\,b\,z)^q\left(-\frac{(f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,b\,z)^2}{4\,b}\right)+$$

$$\left.e^{2\,e-\frac{f^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\left(-\frac{(f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}(2\,b\,z-f)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f-2\,b\,z)^2}{4\,b}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1674.01

$$\int z^n \sinh\left(\sqrt{z}\, b + e\right) \cosh(g + f\, z)\, dz ==$$

$$2^{-2n-3}\, e^{\frac{b^2-4f(e+g)}{4f}}\, f^{-2n-2} \left(-\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2n} \left(-b-2f\sqrt{z}\right)^{h+k} \left(\frac{\left(b+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \right.$$

$$\left(b\left(b+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right) - 2f\sqrt{\frac{\left(b+2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right)\right) +$$

$$e^{2e} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2n} \left(b-2f\sqrt{z}\right)^{h+k} \left(\frac{\left(b-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right) - 2f\sqrt{\frac{\left(b-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right)\right) +$$

$$e^{-\frac{b^2}{2f}+2e+2g} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2n} \left(b+2f\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(b\left(b+2f\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right) + 2\sqrt{-\frac{\left(b+2f\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2f\sqrt{z}\right)^2}{4f}\right)\right) -$$

$$e^{2g-\frac{b^2}{2f}} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2n} \left(-\frac{\left(b-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \left(2f\sqrt{z}-b\right)^{h+k} \binom{k}{h}\binom{n}{k} \left(b\left(b-2f\sqrt{z}\right)\Gamma\right.$$

$$\left. \left(\frac{1}{2}(h+k+1),\ -\frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right) + 2\sqrt{-\frac{\left(b-2f\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b-2f\sqrt{z}\right)^2}{4f}\right)\right) \Big) \Big/; n \in \mathbb{N}$$

Involving $z^n \sinh\left(b\, z^r + d\, z\right) \cosh(f\, z + g)$

01.20.21.1675.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh(g+f\,z)\,dz == \frac{1}{8}\,b^{-n-1}\,e^{\frac{d^2-2\,f\,d+f^2}{4\,b}-g}$$

$$\left((-1)^{n+1}\,e^{2\,g}\sum_{q=0}^{n}2^{q-n}\,(d-f)^{n-q}\,(-d+f-2\,b\,z)^{q+1}\left(\frac{(-d+f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d+f-2\,b\,z)^2}{4\,b}\right)-e^{\frac{d\,f}{b}}\right.$$

$$\left(-(-1)^{n+1}\sum_{q=0}^{n}2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,b\,z)^{q+1}\left(\frac{(d+f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d+f+2\,b\,z)^2}{4\,b}\right)+e^{2\,g-\frac{(d+f)^2}{2\,b}}\right.$$

$$\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}(d+f+2\,b\,z)^{q+1}\left(-\frac{(d+f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+f+2\,b\,z)^2}{4\,b}\right)+e^{-\frac{d^2+f^2}{2\,b}}$$

$$\left.\left.\sum_{q=0}^{n}2^{q-n}\,(f-d)^{n-q}\left(-\frac{(-d+f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}(d-f+2\,b\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d+f-2\,b\,z)^2}{4\,b}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

01.20.21.1676.01

$$\int z^n \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$-2^{-2\,n-3}\,e^{-g}\left(-e^{-\frac{b^2}{4\,d-4\,f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{4\,d-4\,f}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\;(d-f)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{4\,d-4\,f}\right)\right)\right)(d-f)^{-2\,(n+1)}-$$

$$e^{-\frac{b^2}{4\,(d+f)}}\,(d+f)^{-2\,n-2}\left(e^{2\,g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)+\right.\right.$$

$$2\sqrt{-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}}\ (d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\Bigg)-$$

$$e^{\frac{b^2}{2(d+f)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-b-2(d+f)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)-$$

$$2(d+f)\sqrt{\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\Bigg)\Bigg)+$$

$$e^{\frac{b^2}{4d-4f}+2g}\,(f-d)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\left(2(f-d)\sqrt{z}-b\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4d-4f}\right)-$$

$$2(d-f)\sqrt{\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4d-4f}\right)\Bigg)\Bigg)\ /;\ n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+d\,z+e\right)\cosh(f\,z+g)$

01.20.21.1677.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh(g+f\,z)\,dz == \frac{1}{8}\,b^{-n-1}\,e^{\frac{d^2-2\,f\,d+f^2-4\,b\,(e+g)}{4\,b}}$$

$$\left((-1)^{n+1}\,e^{2\,g}\sum_{q=0}^{n}2^{q-n}\,(d-f)^{n-q}\,(-d+f-2\,b\,z)^{q+1}\left(\frac{(-d+f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d+f-2\,b\,z)^2}{4\,b}\right)-\right.$$

$$e^{\frac{d\,f}{b}}\left(-(-1)^{n+1}\sum_{q=0}^{n}2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,b\,z)^{q+1}\left(\frac{(d+f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d+f+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$e^{-\frac{(d+f)^2}{2\,b}+2\,e+2\,g}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}(d+f+2\,b\,z)^{q+1}\left(-\frac{(d+f+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+f+2\,b\,z)^2}{4\,b}\right)+$$

$$e^{-\frac{d^2}{2\,b}+2\,e-\frac{f^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,(f-d)^{n-q}\left(-\frac{(-d+f-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(d-f+2\,b\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d+f-2\,b\,z)^2}{4\,b}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

01.20.21.1678.01

$$\int z^n \sinh\left(\sqrt{z}\;b+e+d\,z\right)\cosh(g+f\,z)\,dz ==$$

$$-2^{-2\,n-3}\,e^{e-g}\left(e^{-2\,e}\left(e^{\frac{b^2}{4\,d-4\,f}+2\,g}\,(f-d)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left(2\,(f-d)\,\sqrt{z}\;-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{4\,d-4\,f}\right)-\right.$$

$$\left.\left.2\,(d-f)\sqrt{\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b+2\,(d-f)\,\sqrt{z}\right)^2}{4\,d-4\,f}\right)\right)-\right.$$

$$e^{-\frac{b^2}{4\,(d+f)}}\,(d+f)^{-2\,n-2}\left(e^{2\,e+2\,g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)+\right.\right.$$

$$2\sqrt{-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\Bigg)-$$

$$e^{\frac{b^2}{2(d+f)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-b-2(d+f)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)-$$

$$2(d+f)\sqrt{\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{d+f}}\,\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\Bigg)\Bigg)\Bigg)-$$

$$e^{-\frac{b^2}{4d-4f}}(d-f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4d-4f}\right)+$$

$$2\sqrt{-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2(d-f)\sqrt{z}\right)^2}{4d-4f}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \sinh(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1679.01

$$\int z^n \sinh(b\,z)\cosh\left(c\,z^2\right)dz == -\frac{1}{8}\,c^{-n-1}\,e^{\frac{b^2}{4c}}\left((-1)^n\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\,(-b-2\,c\,z)^{q+1}\left(\frac{(b+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(b+2\,c\,z)^2}{4\,c}\right)-\right.$$

$$(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b-2\,c\,z)^{q+1}\left(\frac{(b-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(b-2\,c\,z)^2}{4\,c}\right)-$$

$$e^{-\frac{b^2}{2c}}\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(-b-2\,c\,z)\,(b+2\,c\,z)^q\left(-\frac{(b+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.e^{-\frac{b^2}{2c}}\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\left(-\frac{(b-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(2\,c\,z-b)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b-2\,c\,z)^2}{4\,c}\right)\right)\Big/;\,n\in\mathbb{N}$$

01.20.21.1680.01

$$\int z^n \sinh(d\,z)\cosh\left(\sqrt{z}\,c\right)dz ==$$

$$2^{-2n-3}\,d^{-2n-2}\,e^{-\frac{c^2}{4d}}\left(-e^{\frac{c^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.$$

$$\left(-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-2d\sqrt{\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)-$$

$$e^{\frac{c^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(-c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(2d\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-c\left(-c-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sinh(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.1681.01

$$\int z^n \sinh(e + d\,z)\cosh\left(c\,z^2\right) dz ==$$

$$-\frac{1}{8}\,c^{-n-1}\,e^{\frac{d^2}{4c}+e}\left((-1)^n\,e^{-2\,e}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,c\,z)^{q+1}\left(\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d+2\,c\,z)^2}{4\,c}\right)-\right.$$

$$(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d-2\,c\,z)^{q+1}\left(\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d-2\,c\,z)^2}{4\,c}\right)-$$

$$e^{-\frac{d^2}{2c}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(-d-2\,c\,z)\,(d+2\,c\,z)^q\left(-\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.e^{-\frac{d^2}{2c}-2\,e}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\left(-\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(2\,c\,z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d-2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1682.01

$$\int z^n \sinh(e+d\,z)\cosh\left(\sqrt{z}\ c\right) dz ==$$

$$2^{-2n-3}\,d^{-2n-2}\,e^{-\frac{c^2}{4d}-e}\left(-e^{\frac{c^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.$$

$$\left(-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-2d\sqrt{\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)-$$

$$e^{\frac{c^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(-c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(2d\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\Bigg)+$$

$$e^{2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-c\left(-c-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh(b\,z^r)\cosh(c\,z^r)$

01.20.21.1683.01

$$\int z^{\alpha-1} \sinh(b\, z^r) \cosh(c\, z^r)\, dz == -\frac{1}{4\, r}\left(z^{\alpha}\left(\Gamma\left(\frac{\alpha}{r}, (-b-c)\, z^r\right)((-b-c)\, z^r)^{-\frac{\alpha}{r}} - ((b-c)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (b-c)\, z^r\right) + ((c-b)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (c-b)\, z^r\right) - ((b+c)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (b+c)\, z^r\right)\right)\right)$$

01.20.21.1684.01

$$\int z^n \sinh\left(b\, z^2\right) \cosh\left(c\, z^2\right) dz == -\frac{1}{8}\, z^{n+1}\left(\Gamma\left(\frac{n+1}{2}, (-b-c)\, z^2\right)\left((-b-c)\, z^2\right)^{\frac{1}{2}(-n-1)} - \left((b-c)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (b-c)\, z^2\right) + \left((c-b)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c-b)\, z^2\right) - \left((b+c)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (b+c)\, z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1685.01

$$\int z^n \sinh\left(b\, \sqrt{z}\right) \cosh\left(\sqrt{z}\, c\right) dz == \frac{1}{2}\left(-(b+c)^{-2(n+1)}\, \Gamma\left(2\,(n+1), (-b-c)\, \sqrt{z}\right) + (b-c)^{-2(n+1)}\, \Gamma\left(2\,(n+1), (b-c)\, \sqrt{z}\right) - (c-b)^{-2(n+1)}\, \Gamma\left(2\,(n+1), (c-b)\, \sqrt{z}\right) + (b+c)^{-2(n+1)}\, \Gamma\left(2\,(n+1), (b+c)\, \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} \sinh\left(b\, z^r + e\right) \cosh\left(c\, z^r\right)$

01.20.21.1686.01

$$\int z^{\alpha-1} \sinh(b\, z^r + e) \cosh(c\, z^r)\, dz == -\frac{1}{4\, r}\left(e^{-e}\, z^{\alpha}\left(e^{2\, e}\, \Gamma\left(\frac{\alpha}{r}, (-b-c)\, z^r\right)((-b-c)\, z^r)^{-\frac{\alpha}{r}} - ((b-c)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (b-c)\, z^r\right) + e^{2\, e}\, ((c-b)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (c-b)\, z^r\right) - ((b+c)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (b+c)\, z^r\right)\right)\right)$$

01.20.21.1687.01

$$\int z^n \sinh\left(b\, z^2 + e\right) \cosh\left(c\, z^2\right) dz == -\frac{1}{8}\, e^{-e}\, z^{n+1}\left(e^{2\, e}\, \Gamma\left(\frac{n+1}{2}, (-b-c)\, z^2\right)\left((-b-c)\, z^2\right)^{\frac{1}{2}(-n-1)} - \left((b-c)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (b-c)\, z^2\right) + e^{2\, e}\left((c-b)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c-b)\, z^2\right) - \left((b+c)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (b+c)\, z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1688.01

$$\int z^n \sinh\left(\sqrt{z}\ b + e\right) \cosh\left(\sqrt{z}\ c\right) dz == \frac{1}{2}\left(e^{-e}\, \Gamma\left(2\,(n+1), (b-c)\, \sqrt{z}\right)(b-c)^{-2(n+1)} - (b+c)^{-2(n+1)}\, e^{e}\, \Gamma\left(2\,(n+1), (-b-c)\, \sqrt{z}\right) - (c-b)^{-2(n+1)}\, e^{e}\, \Gamma\left(2\,(n+1), (c-b)\, \sqrt{z}\right) + (b+c)^{-2(n+1)}\, e^{-e}\, \Gamma\left(2\,(n+1), (b+c)\, \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n \sinh\left(b\, z^r + d\, z\right) \cosh\left(c\, z^r\right)$

01.20.21.1689.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)\,dz ==$$

$$\frac{1}{8}\left(e^{\frac{d^2}{4\,b+4\,c}}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(d+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)(-b-c)^{-n-1}-\right.$$

$$(b-c)^{-n-1}\,e^{\frac{d^2}{4\,c-4\,b}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,(b-c)\,z)^{q+1}\left(\frac{(d+2\,(b-c)\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,(b-c)\,z)^2}{4\,c-4\,b}\right)+$$

$$(c-b)^{-n-1}\,e^{-\frac{d^2}{4\,c-4\,b}}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\left(-\frac{(d+2\,(b-c)\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}(2\,(c-b)\,z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b-c)\,z)^2}{4\,c-4\,b}\right)-$$

$$(b+c)^{-n-1}\,e^{\frac{d^2}{-4\,b-4\,c}}$$

$$\left.\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,(b+c)\,z)^{q+1}\left(\frac{(d+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.1690.01

$$\int z^n \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c\right)\,dz ==$$

$$2^{-2\,n-3}\,d^{-2\,n-2}\,e^{-\frac{b^2+2\,c\,b+c^2}{4\,d}}\left(-e^{\frac{b^2+c^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2\,n}\left(-b+c-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,d\sqrt{\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$e^{\frac{b^2+2\,c\,b+c^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c)^{-h-k+2\,n}\left(-b-c-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$2\,d\sqrt{\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{b\,c}{d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b-c)\left(b-c+2\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\;-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\;-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2\,n}\left(b+c+2\,d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+c)\left(b+c+2\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\;-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\;-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Bigg/;\;n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r\right)$

01.20.21.1691.01

$$\int z^n \sinh\left(b z^2 + d z + e\right) \cosh\left(c z^2\right) dz == \frac{1}{8} e^{-e}$$

$$\left(e^{\frac{d^2}{4b+4c}} \left(\sum_{q=0}^{n} 2^{q-n} d^{n-q} (-d - 2bz - 2cz)^{q+1} \left(-\frac{(d+2(b+c)z)^2}{-b-c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2(b+c)z)^2}{-4b-4c} \right) \right) (-b-c)^{-n-1} - \right.$$

$$(b-c)^{-n-1} e^{\frac{d^2}{4c-4b}+2e} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2(b-c)z)^{q+1} \left(\frac{(d+2(b-c)z)^2}{c-b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d+2(b-c)z)^2}{4c-4b} \right) +$$

$$(c-b)^{-n-1} e^{-\frac{d^2}{4c-4b}} \sum_{q=0}^{n} 2^{q-n} d^{n-q} \left(-\frac{(d+2(b-c)z)^2}{c-b} \right)^{\frac{1}{2}(-q-1)} (2(c-b)z-d)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2(b-c)z)^2}{4c-4b} \right) -$$

$$(b+c)^{-n-1} e^{\frac{d^2}{-4b-4c}+2e}$$

$$\left. \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2(b+c)z)^{q+1} \left(\frac{(d+2(b+c)z)^2}{-b-c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d+2(b+c)z)^2}{-4b-4c} \right) \right) /; n \in \mathbb{N}$$

01.20.21.1692.01

$$\int z^n \sinh\left(\sqrt{z}\ b + e + d z\right) \cosh\left(\sqrt{z}\ c\right) dz ==$$

$$2^{-2n-3} d^{-2n-2} e^{-\frac{b^2+2cb+c^2}{4d}-e} \left(-e^{\frac{b^2+c^2}{2d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c-b)^{-h-k+2n} \left(-b+c-2d\sqrt{z}\right)^{h+k} \right.$$

$$\left(\frac{\left(b-c+2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b-c)\left(b-c+2d\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b-c+2d\sqrt{z}\right)^2}{4d} \right) - \right.$$

$$\left. \left. 2d\sqrt{\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b-c+2d\sqrt{z}\right)^2}{4d} \right) \right) -$$

$$e^{\frac{b^2+2cb+c^2}{2d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b-c)^{-h-k+2n} \left(-b-c-2d\sqrt{z}\right)^{h+k} \left(\frac{\left(b+c+2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((b+c)\left(b+c+2d\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+c+2d\sqrt{z}\right)^2}{4d} \right) - \right.$$

$$2\,d\,\sqrt{\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{b\,c}{d}+2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg((b-c)\left(b-c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2\,n}\left(b+c+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+c)\left(b+c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}$$

Involving $z^n \sinh(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.1693.01

$$\int z^n \sinh(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$-\frac{1}{8}c^{-n-1}e^{\frac{d^2}{4c}-g}\left((-1)^n\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,c\,z)^{q+1}\left(\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,c\,z)^2}{4\,c}\right)-\right.$$

$$(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d-2\,c\,z)^{q+1}\left(\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-2\,c\,z)^2}{4\,c}\right)-$$

$$e^{2\,g-\frac{d^2}{2\,c}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(-d-2\,c\,z)\,(d+2\,c\,z)^q\left(-\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.e^{2\,g-\frac{d^2}{2\,c}}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\left(-\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(2\,c\,z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-2\,c\,z)^2}{4\,c}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1694.01

$$\int z^n \sinh(d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-2n-3}\,d^{-2n-2}\,e^{-\frac{c^2}{4d}-g}\left(-e^{\frac{c^2}{2d}+2g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.$$

$$\left(-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-2d\sqrt{\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)-$$

$$e^{\frac{c^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(-c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(2d\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)+$$

$$e^{2g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-c\left(-c-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sinh(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.1695.01

$$\int z^n \sinh(e+d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$-\frac{1}{8}c^{-n-1}e^{\frac{d^2+4c(e-g)}{4c}}\left((-1)^n e^{-2e}\sum_{q=0}^{n}2^{q-n}d^{n-q}(-d-2cz)^{q+1}\left(\frac{(d+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2cz)^2}{4c}\right)-\right.$$

$$(-1)^n\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d-2cz)^{q+1}\left(\frac{(d-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-2cz)^2}{4c}\right)-$$

$$e^{2g-\frac{d^2}{2c}}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(-d-2cz)(d+2cz)^q\left(-\frac{(d+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2cz)^2}{4c}\right)-$$

$$\left.e^{-\frac{d^2}{2c}-2e+2g}\sum_{q=0}^{n}2^{q-n}d^{n-q}\left(-\frac{(d-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}(2cz-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-2cz)^2}{4c}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1696.01

$$\int z^n \sinh(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-2n-3}\,d^{-2n-2}\,e^{-\frac{c^2}{4d}-e-g}\left(-e^{\frac{c^2}{2d}+2g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.$$

$$\left(-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-2d\sqrt{\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)-$$

$$e^{\frac{c^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(-c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(2d\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\Bigg)+$$

$$e^{2e+2g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2d\sqrt{-\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)-c\left(-c-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)/;\;n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh\left(b\,z^r\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1697.01

$$\int z^{\alpha-1}\sinh(b\,z^r)\cosh(c\,z^r+g)\,dz ==$$
$$-\frac{1}{4r}\left(e^{-g}\,z^{\alpha}\left(e^{2g}\,\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}-e^{2g}\,((b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-c)\,z^r\right)+((c-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)-\right.\right.$$
$$\left.\left.((b+c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.1698.01

$$\int z^n\sinh\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz ==$$
$$-\frac{1}{8}\,e^{-g}\,z^{n+1}\left(e^{2g}\,\Gamma\left(\frac{n+1}{2},(-b-c)\,z^2\right)\left((-b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}-e^{2g}\left((b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b-c)\,z^2\right)+\right.$$
$$\left.\left((c-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-b)\,z^2\right)-\left((b+c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+c)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1699.01

$$\int z^n\sinh\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$
$$\frac{1}{2}\left(-(-b-c)^{-2(n+1)}\,e^{g}\,\Gamma\left(2(n+1),(-b-c)\sqrt{z}\right)+(b-c)^{-2(n+1)}\,e^{g}\,\Gamma\left(2(n+1),(b-c)\sqrt{z}\right)-\right.$$
$$\left.(c-b)^{-2(n+1)}\,e^{-g}\,\Gamma\left(2(n+1),(c-b)\sqrt{z}\right)+(b+c)^{-2(n+1)}\,e^{-g}\,\Gamma\left(2(n+1),(b+c)\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh(b\,z^r+e)\cosh(c\,z^r+g)$

01.20.21.1700.01

$$\int z^{\alpha-1}\sinh(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$
$$-\frac{1}{4r}\left(e^{-e-g}\,z^{\alpha}\left(e^{2e+2g}\,\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}-e^{2g}\,((b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-c)\,z^r\right)+\right.\right.$$
$$\left.\left.e^{2e}\,((c-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)-((b+c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.1701.01

$$\int z^n\sinh\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz ==$$
$$-\frac{1}{8}\,e^{-e-g}\,z^{n+1}\left(e^{2e+2g}\,\Gamma\left(\frac{n+1}{2},(-b-c)\,z^2\right)\left((-b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}-e^{2g}\left((b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b-c)\,z^2\right)+\right.$$
$$\left.e^{2e}\left((c-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-b)\,z^2\right)-\left((b+c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+c)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1702.01

$$\int z^n\sinh\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$
$$\frac{1}{2}\left(e^{g-e}\,\Gamma\left(2(n+1),(b-c)\sqrt{z}\right)(b-c)^{-2(n+1)}-(b+c)^{-2(n+1)}\,e^{e+g}\,\Gamma\left(2(n+1),(-b-c)\sqrt{z}\right)-\right.$$
$$\left.(c-b)^{-2(n+1)}\,e^{e-g}\,\Gamma\left(2(n+1),(c-b)\sqrt{z}\right)+(b+c)^{-2(n+1)}\,e^{-e-g}\,\Gamma\left(2(n+1),(b+c)\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\sinh\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1703.01

$$\int z^n \sinh\left(b z^2+d z\right)\cosh\left(c z^2+g\right) dz == \frac{1}{8} e^{-g}$$

$$\left(e^{\frac{d^2}{4b+4c}}\left(\sum_{q=0}^{n} 2^{q-n} d^{n-q} (-d-2bz-2cz)^{q+1}\left(-\frac{(d+2(b+c)z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2(b+c)z)^2}{-4b-4c}\right)\right)(-b-c)^{-n-1}-\right.$$

$$(b-c)^{-n-1} e^{\frac{d^2}{4c-4b}} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2(b-c)z)^{q+1}\left(\frac{(d+2(b-c)z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2(b-c)z)^2}{4c-4b}\right)+$$

$$(c-b)^{-n-1} e^{2g-\frac{d^2}{4c-4b}} \sum_{q=0}^{n} 2^{q-n} d^{n-q}\left(-\frac{(d+2(b-c)z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}(2(c-b)z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2(b-c)z)^2}{4c-4b}\right)-$$

$$(b+c)^{-n-1} e^{\frac{d^2}{-4b-4c}+2g}$$

$$\left.\sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2(b+c)z)^{q+1}\left(\frac{(d+2(b+c)z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2(b+c)z)^2}{-4b-4c}\right)\right) /; n\in\mathbb{N}$$

01.20.21.1704.01

$$\int z^n \sinh\left(\sqrt{z}\ b+d z\right)\cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-2n-3} d^{-2n-2} e^{-\frac{b^2+2cb+c^2}{4d}-g}\left(-e^{\frac{b^2+c^2}{2d}+2g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c-b)^{-h-k+2n}\left(-b+c-2d\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right)-\right.$$

$$\left.2d\sqrt{\frac{\left(b-c+2d\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c+2d\sqrt{z}\right)^2}{4d}\right)\right)-$$

$$e^{\frac{b^2+2cb+c^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b-c)^{-h-k+2n}\left(-b-c-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+c+2d\sqrt{z}\right)^2}{4d}\right)-\right.$$

$$2\,d\sqrt{\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{b\,c}{d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(\left(b-c\right)\left(b-c+2\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\;-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\;-\frac{\left(b-c+2\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2\,n}\left(b+c+2\,d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(\left(b+c\right)\left(b+c+2\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\;-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\;-\frac{\left(b+c+2\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1705.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{8}\,e^{-e-g}$$

$$\left(e^{\frac{d^2}{4\,b+4\,c}}\left(\sum_{q=0}^{n} 2^{q-n}\,d^{n-q}\,(-d-2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(d+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)(-b-c)^{-n-1}-\right.$$

$$(b-c)^{-n-1}\,e^{\frac{d^2}{4\,c-4\,b}+2\,e}\sum_{q=0}^{n} 2^{q-n}\,(-d)^{n-q}\,(d+2\,(b-c)\,z)^{q+1}\left(\frac{(d+2\,(b-c)\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d+2\,(b-c)\,z)^2}{4\,c-4\,b}\right)+$$

$$(c-b)^{-n-1}\,e^{2\,g-\frac{d^2}{4\,c-4\,b}}\sum_{q=0}^{n} 2^{q-n}\,d^{n-q}\left(-\frac{(d+2\,(b-c)\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}(2\,(c-b)\,z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+2\,(b-c)\,z)^2}{4\,c-4\,b}\right)-$$

$$(b+c)^{-n-1}\,e^{\frac{d^2}{-4\,b-4\,c}+2\,e+2\,g}$$

$$\left.\sum_{q=0}^{n} 2^{q-n}\,(-d)^{n-q}\,(d+2\,(b+c)\,z)^{q+1}\left(\frac{(d+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1706.01

$$\int z^n \sinh\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-2\,n-3}\,d^{-2\,n-2}\,e^{-\frac{b^2+2\,c\,b+c^2}{4\,d}-e-g}\left(-e^{\frac{b^2+c^2}{2\,d}+2\,g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2\,n}\left(-b+c-2\,d\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(\left(b-c\right)\left(b-c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,d\sqrt{\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$e^{\frac{b^2+2\,c\,b+c^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c)^{-h-k+2\,n}\left(-b-c-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(\left(b+c\right)\left(b+c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$2\,d\,\sqrt{\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{b\,c}{d}+2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg((b-c)\left(b-c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b-c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e+2\,g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2\,n}\left(b+c+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg((b+c)\left(b+c+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}$$

Involving $z^n \sinh(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1707.01

$$\int z^n \sinh(d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{8}\,c^{-n-1}\left(-(-1)^n\,e^{\frac{(f-d)^2}{4c}}\right.$$

$$\sum_{q=0}^{n} 2^{q-n}\,(f-d)^{n-q}\,(d-f-2\,c\,z)^q\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$(-1)^n\,e^{\frac{(d+f)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,c\,z)^{q+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)+$$

$$e^{-\frac{(f-d)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d-f)^{n-q}\left(-\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.e^{-\frac{(d+f)^2}{4c}}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}(d+f+2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1708.01

$$\int z^n \sinh(d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-2n-3}\left(e^{-\frac{c^2}{4d-4f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(2\,(d-f)\,\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(d-f)\sqrt{-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{4\,d-4\,f}\right)-$$

$$\left.\left.c\left(2\,(d-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{4\,d-4\,f}\right)\right)\right)(d-f)^{-2(n+1)}-$$

$$e^{\frac{c^2}{4d+4f}}(d+f)^{-2n-2}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(-c-2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-\right.$$

$$2\,(d+f)\sqrt{\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)-$$

$$e^{-\frac{c^2}{2\,d+2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-$$

$$2\,(-d-f)\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)\Bigg)-$$

$$e^{\frac{c^2}{4\,d-4\,f}}\,(f-d)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(-c\left(2\,(d-f)\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)-$$

$$2\,(d-f)\sqrt{\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}$$

Involving $z^n \sinh(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1709.01

$$\int z^n \sinh(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{8}\,c^{-n-1}\,e^{-e}\left(-(-1)^n\,e^{\frac{(f-d)^2}{4c}+2e}\right.$$

$$\sum_{q=0}^{n} 2^{q-n}\,(f-d)^{n-q}\,(d-f-2\,c\,z)^q\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$(-1)^n\,e^{\frac{(d+f)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,c\,z)^{q+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)+$$

$$e^{-\frac{(f-d)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d-f)^{n-q}\left(-\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.e^{2\,e-\frac{(d+f)^2}{4c}}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}(d+f+2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1710.01

$$\int z^n \sinh(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-2\,n-3}\,e^e\left(e^{-\frac{c^2}{4\,d-4\,f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(2\,(d-f)\,\sqrt{z}\;-c\right)^{h+k}\left(-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(d-f)\sqrt{-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)-\right.$$

$$\left.\left.\left.c\left(2\,(d-f)\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)\right)\right)(d-f)^{-2\,(n+1)}+\right.$$

$$e^{-2\,e}\left(-e^{\frac{c^2}{4\,d-4\,f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\right.\right.$$

$$\left.\left.\binom{n}{k}\left(-c\left(2\,(d-f)\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)-2\,(d-f)\right.\right.\right.$$

$$\sqrt{\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{4\,d-4\,f}\right)\Bigg)\Bigg)(f-d)^{-2\,(n+1)}-$$

$$e^{\frac{c^2}{4\,d+4\,f}}\,(d+f)^{-2\,n-2}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-\right.$$

$$\left.2\,(d+f)\,\sqrt{\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\right)-$$

$$e^{2\left(e-\frac{c^2}{4\,d+4\,f}\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-\right.$$

$$\left.\left.2\,(-d-f)\,\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\right)\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1711.01

$$\int z^n \sinh\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}\left(-e^{-\frac{f^2}{-4\,b-4\,c}}\left(\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f-2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(f+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)\right.$$

$$(-b-c)^{-n-1}+(b-c)^{-n-1}\,e^{\frac{f^2}{4\,c-4\,b}}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f+2\,b\,z-2\,c\,z)^{q+1}$$

$$\left(\frac{(f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)-(c-b)^{-n-1}\,e^{-\frac{f^2}{4\,c-4\,b}}$$

$$\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f-2\,b\,z+2\,c\,z)^{q+1}\left(-\frac{(f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)+(b+c)^{-n-1}$$

$$\left.e^{\frac{f^2}{-4\,b-4\,c}}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2\,(b+c)\,z)^{q+1}\left(-\frac{(f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.1712.01

$$\int z^n \sinh\left(\sqrt{z}\ b\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$-2^{-2\,n-3}\,f^{-2\,(n+1)}\left(e^{\frac{(b+c)^2}{4\,f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c)^{-h-k+2\,n}\left(-b-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.\left.2\,f\sqrt{\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)-$$

$$e^{-\frac{(b+c)^2}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2\,n}\left(b+c+2\,f\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left.\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.\right.$$

$$2\sqrt{-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)-$$

$$e^{\frac{(b-c)^2}{4 f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2 n}\left(b-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b-c)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)-$$

$$2 f\sqrt{\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)+$$

$$e^{-\frac{(b-c)^2}{4 f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2 n}\left(-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\left(-b+c+2 f \sqrt{z}\right)^{h+k}\binom{k}{h}$$

$$\binom{n}{k}\Bigg((b-c)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2\sqrt{-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}$$

Involving $z^n \sinh(b\,z^r+e)\cosh(c\,z^r+f\,z)$

01.20.21.1713.01

$$\int z^n \sinh\left(b z^2+e\right)\cosh\left(c z^2+f z\right)\,dz ==$$

$$-\frac{1}{8}e^e\left(-e^{-\frac{f^2}{-4b-4c}-2e}\left(\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f-2bz-2cz)^{q+1}\left(-\frac{(f+2(b+c)z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2(b+c)z)^2}{-4b-4c}\right)\right)\right.$$

$$(-b-c)^{-n-1}+(b-c)^{-n-1}\,e^{\frac{f^2}{4c-4b}}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f+2bz-2cz)^{q+1}$$

$$\left(\frac{(f-2bz+2cz)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f-2bz+2cz)^2}{4c-4b}\right)-(c-b)^{-n-1}\,e^{-\frac{f^2}{4c-4b}-2e}$$

$$\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f-2bz+2cz)^{q+1}\left(-\frac{(f-2bz+2cz)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f-2bz+2cz)^2}{4c-4b}\right)+(b+c)^{-n-1}$$

$$\left.e^{\frac{f^2}{-4b-4c}}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2(b+c)z)^{q+1}\left(-\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2(b+c)z)^2}{-4b-4c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.1714.01

$$\int z^n \sinh\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+f z\right)\,dz ==$$

$$-2^{-2n-3}\,e^e\,f^{-2(n+1)}\left(e^{\frac{(b+c)^2}{4f}}\left(e^{-2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c)^{-h-k+2n}\left(-b-c-2f\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.\left.2f\sqrt{\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)-\right.$$

$$e^{-\frac{(b+c)^2}{2f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2f\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left.\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.\right.$$

$$2\sqrt{-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{f}}\; f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)-$$

$$e^{\frac{(b-c)^2}{4 f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2 n}\left(b-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(\left(b-c\right)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)-$$

$$2 f\sqrt{\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)+$$

$$e^{-\frac{(b-c)^2}{4 f}-2 e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2 n}\left(-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\left(-b+c+2 f \sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(\left(b-c\right)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2\sqrt{-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\; f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)\Big/;\; n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\, z^r + d\, z\right) \cosh\left(c\, z^r + f\, z\right)$

01.20.21.1715.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}\left(-e^{-\frac{(d+f)^2}{-4\,b-4\,c}}\left(\sum_{q=0}^{n}2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)(-b-c)^{-n-1}+(b-c)^{-n-1}\,e^{\frac{(f-d)^2}{4\,c-4\,b}}\sum_{q=0}^{n}2^{q-n}\,(f-d)^{n-q}\right.$$

$$(d-f+2\,b\,z-2\,c\,z)^{q+1}\left(\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)-$$

$$(c-b)^{-n-1}\,e^{-\frac{(f-d)^2}{4\,c-4\,b}}\sum_{q=0}^{n}2^{q-n}\,(d-f)^{n-q}\,(-d+f-2\,b\,z+2\,c\,z)^{q+1}\left(-\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)+(b+c)^{-n-1}\,e^{\frac{(d+f)^2}{-4\,b-4\,c}}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}$$

$$\left.(d+f+2\,(b+c)\,z)^{q+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1716.01

$$\int z^n \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-2\,n-3}\left(e^{-\frac{(b-c)^2}{4\,(d-f)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.\right.$$

$$\left.\left(b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)+2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\right.\right.$$

$$\left.\left.(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)\right)(d-f)^{-2\,n-2}-e^{-\frac{(-b-c)^2}{4\,(-d-f)}}\,(d+f)^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c)^{-h-k+2\,n}\left(-b-c+2\,(-d-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b-c+2\,(-d-f)\,\sqrt{z}\right)^2}{-d-f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((-b-c)\left(-b-c+2(-d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{4(-d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{-d-f}}\,(-d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{4(-d-f)}\right)\right)-$$

$$e^{-\frac{(c-b)^2}{4(f-d)}}(f-d)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2n}\left(-b+c+2(f-d)\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{f-d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((c-b)\left(-b+c+2(f-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{4(f-d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{f-d}}\,(f-d)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{4(f-d)}\right)\right)+$$

$$e^{-\frac{(b+c)^2}{4(d+f)}}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sinh(b\,z^r + d\,z + e)\cosh(c\,z^r + f\,z)$

01.20.21.1717.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}e^e\left(-e^{-\frac{(d+f)^2}{-4\,b-4\,c}-2\,e}\left(\sum_{q=0}^{n}2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)(-b-c)^{-n-1}+(b-c)^{-n-1}\,e^{\frac{(f-d)^2}{4\,c-4\,b}}\sum_{q=0}^{n}2^{q-n}\,(f-d)^{n-q}$$

$$(d-f+2\,b\,z-2\,c\,z)^{q+1}\left(\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)-$$

$$(c-b)^{-n-1}\,e^{-\frac{(f-d)^2}{4\,c-4\,b}-2\,e}\sum_{q=0}^{n}2^{q-n}\,(d-f)^{n-q}\,(-d+f-2\,b\,z+2\,c\,z)^{q+1}\left(-\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)+(b+c)^{-n-1}\,e^{\frac{(d+f)^2}{-4\,b-4\,c}}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}$$

$$\left.(d+f+2\,(b+c)\,z)^{q+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1718.01

$$\int z^n \sinh\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-2\,n-3}\left(e^{e-\frac{(b-c)^2}{4\,(d-f)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.\binom{k}{h}\binom{n}{k}$$

$$\left(\left(b-c\right)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)+2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\right.$$

$$\left.\left.(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)\right)(d-f)^{-2\,n-2}-e^{-\frac{(-b-c)^2}{4\,(-d-f)}-e}\,(d+f)^{-2\,n-2}$$

$$\left.\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c)^{-h-k+2\,n}\left(-b-c+2\,(-d-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b-c+2\,(-d-f)\,\sqrt{z}\right)^2}{-d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((-b-c)\left(-b-c+2(-d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{4(-d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{-d-f}}\,(-d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{4(-d-f)}\right)\right)-e^{-\frac{(c-b)^2}{4(f-d)}-e}$$

$$(f-d)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2n}\left(-b+c+2(f-d)\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{f-d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((c-b)\left(-b+c+2(f-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{4(f-d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{f-d}}\,(f-d)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{4(f-d)}\right)\right)+$$

$$e^{e-\frac{(b+c)^2}{4(d+f)}}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sinh(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1719.01

$$\int z^n \sinh(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\,c^{-n-1}\,e^{-g}\left(-(-1)^n\,e^{\frac{(f-d)^2}{4c}}\right.$$

$$\sum_{q=0}^{n} 2^{q-n}\,(f-d)^{n-q}\,(d-f-2\,c\,z)^q\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$(-1)^n\,e^{\frac{(d+f)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,c\,z)^{q+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)+$$

$$e^{2\,g-\frac{(f-d)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d-f)^{n-q}\left(-\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.e^{-\frac{(d+f)^2}{4c}+2\,g}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}(d+f+2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\; n\in\mathbb{N}$$

01.20.21.1720.01

$$\int z^n \sinh(d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-2\,n-3}\,e^{-g}\left(e^{-\frac{c^2}{4\,d-4\,f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(2\,(d-f)\,\sqrt{z}\;-c\right)^{h+k}\left(-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(d-f)\sqrt{-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)-\right.$$

$$\left.\left.\left.c\left(2\,(d-f)\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)\right)\right)(d-f)^{-2\,(n+1)}-\right.$$

$$e^{\frac{c^2}{4\,d+4\,f}}\,(d+f)^{-2\,n-2}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-\right.$$

$$2\,(d+f)\sqrt{\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)-$$

$$e^{2\left(\frac{c^2}{-4\,d-4\,f}+g\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-$$

$$2\,(-d-f)\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)\Bigg)-$$

$$e^{\frac{c^2}{4\,d-4\,f}+2\,g}\,(f-d)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(-c\left(2\,(d-f)\,\sqrt{z}\;-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)-$$

$$2\,(d-f)\sqrt{\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\,(d-f)\,\sqrt{z}\;-c\right)^2}{4\,d-4\,f}\right)\Bigg)\Bigg)\Big/;\;n\in\mathbb{N}$$

Involving $z^n \sinh(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1721.01

$$\int z^n \sinh(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\,c^{-n-1}\,e^{-e-g}\left(-(-1)^n\,e^{\frac{(f-d)^2}{4c}+2e}\right.$$

$$\sum_{q=0}^{n} 2^{q-n}\,(f-d)^{n-q}\,(d-f-2\,c\,z)^q\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$(-1)^n\,e^{\frac{(d+f)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,c\,z)^{q+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)+$$

$$e^{2g-\frac{(f-d)^2}{4c}}\sum_{q=0}^{n} 2^{q-n}\,(d-f)^{n-q}\left(-\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(-d+f+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)-$$

$$\left.e^{-\frac{(d+f)^2}{4c}+2e+2g}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}(d+f+2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1722.01

$$\int z^n \sinh(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-2n-3}\,e^{e-g}\left(e^{-\frac{c^2}{4d-4f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2n}\left(2\,(d-f)\,\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(d-f)\sqrt{-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{4d-4f}\right)-\right.$$

$$\left.\left.c\left(2\,(d-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{4d-4f}\right)\right)\right)(d-f)^{-2(n+1)}+$$

$$e^{-2e}\left(-e^{\frac{c^2}{4d-4f}+2g}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(-c\left(2\,(d-f)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{4d-4f}\right)-2\,(d-f)\right.$$

$$\sqrt{\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,(d-f)\,\sqrt{z}-c\right)^2}{4\,d-4\,f}\right)\Bigg)\Bigg)(f-d)^{-2\,(n+1)}-$$

$$e^{\frac{c^2}{4\,d+4\,f}}\,(d+f)^{-2\,n-2}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-$$

$$2\,(d+f)\sqrt{\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)-$$

$$e^{2\left(-\frac{c^2}{4\,d+4\,f}+e+g\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)-$$

$$2\,(-d-f)\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1723.01

$$\int z^n \sinh\left(b\,z^2\right) \cosh\left(c\,z^2 + f\,z + g\right) dz ==$$

$$-\frac{1}{8} e^g \left(-e^{-\frac{f^2}{-4\,b-4\,c}-2\,g} \left(\sum_{q=0}^{n} 2^{q-n}\, f^{n-q} \left(-f-2\,b\,z-2\,c\,z\right)^{q+1} \left(-\frac{\left(f+2\,(b+c)\,z\right)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{\left(f+2\,(b+c)\,z\right)^2}{-4\,b-4\,c}\right)\right)\right.$$

$$(-b-c)^{-n-1} + (b-c)^{-n-1}\, e^{\frac{f^2}{4\,c-4\,b}-2\,g} \sum_{q=0}^{n} 2^{q-n}\, f^{n-q} \left(-f+2\,b\,z-2\,c\,z\right)^{q+1}$$

$$\left(\frac{\left(f-2\,b\,z+2\,c\,z\right)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{\left(f-2\,b\,z+2\,c\,z\right)^2}{4\,c-4\,b}\right) - (c-b)^{-n-1}\, e^{-\frac{f^2}{4\,c-4\,b}}$$

$$\sum_{q=0}^{n} 2^{q-n}\, (-f)^{n-q} \left(f-2\,b\,z+2\,c\,z\right)^{q+1} \left(-\frac{\left(f-2\,b\,z+2\,c\,z\right)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{\left(f-2\,b\,z+2\,c\,z\right)^2}{4\,c-4\,b}\right) + (b+c)^{-n-1}$$

$$\left.e^{\frac{f^2}{-4\,b-4\,c}} \sum_{q=0}^{n} 2^{q-n}\, (-f)^{n-q} \left(f+2\,(b+c)\,z\right)^{q+1} \left(-\frac{\left(f+2\,(b+c)\,z\right)^2}{b+c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{\left(f+2\,(b+c)\,z\right)^2}{-4\,b-4\,c}\right)\right) /;\ n \in \mathbb{N}$$

01.20.21.1724.01

$$\int z^n \sinh\left(b\,\sqrt{z}\right) \cosh\left(\sqrt{z}\;c + g + f\,z\right) dz ==$$

$$-2^{-2\,n-3}\, e^{-g}\, f^{-2\,(n+1)} \left(e^{\frac{(b+c)^2}{4\,f}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b-c)^{-h-k+2\,n} \left(-b-c-2\,f\,\sqrt{z}\right)^{h+k} \left(\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\binom{k}{h} \binom{n}{k} \left((b+c)\left(b+c+2\,f\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right) - \right.$$

$$\left.2\,f\,\sqrt{\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right) -$$

$$\left.e^{2\,g-\frac{(b+c)^2}{2\,f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b+c)^{-h-k+2\,n} \left(b+c+2\,f\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\left.\binom{k}{h} \binom{n}{k} \left((b+c)\left(b+c+2\,f\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right) + \right.\right.$$

$$2\sqrt{-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)-$$

$$e^{\frac{(b-c)^2}{4 f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2 n}\left(b-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(\left(b-c\right)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)-$$

$$2 f\sqrt{\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)+$$

$$e^{2 g-\frac{(b-c)^2}{4 f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2 n}\left(-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\left(-b+c+2 f \sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(\left(b-c\right)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2\sqrt{-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1725.01

$$\int z^n \sinh\left(b z^2+e\right)\cosh\left(c z^2+f z+g\right) dz == -\frac{1}{8} e^{e+g}$$

$$\left(-e^{-\frac{f^2}{-4b-4c}-2e-2g}\left(\sum_{q=0}^{n} 2^{q-n} f^{n-q} (-f-2bz-2cz)^{q+1}\left(-\frac{(f+2(b+c)z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f+2(b+c)z)^2}{-4b-4c}\right)\right)\right.$$

$$(-b-c)^{-n-1}+(b-c)^{-n-1} e^{\frac{f^2}{4c-4b}-2g}\sum_{q=0}^{n} 2^{q-n} f^{n-q} (-f+2bz-2cz)^{q+1}$$

$$\left(\frac{(f-2bz+2cz)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(f-2bz+2cz)^2}{4c-4b}\right)-(c-b)^{-n-1} e^{-\frac{f^2}{4c-4b}-2e}$$

$$\sum_{q=0}^{n} 2^{q-n}(-f)^{n-q}(f-2bz+2cz)^{q+1}\left(-\frac{(f-2bz+2cz)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f-2bz+2cz)^2}{4c-4b}\right)+(b+c)^{-n-1}$$

$$\left.e^{\frac{f^2}{-4b-4c}}\sum_{q=0}^{n} 2^{q-n}(-f)^{n-q}(f+2(b+c)z)^{q+1}\left(-\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(f+2(b+c)z)^2}{-4b-4c}\right)\right) /; n\in\mathbb{N}$$

01.20.21.1726.01

$$\int z^n \sinh\left(\sqrt{z}\, b+e\right)\cosh\left(\sqrt{z}\, c+g+f z\right) dz ==$$

$$-2^{-2n-3} e^{e-g} f^{-2(n+1)}\left(e^{\frac{(b+c)^2}{4f}}\left(e^{-2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k (-b-c)^{-h-k+2n}\left(-b-c-2f\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.\left.2f\sqrt{\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\,\Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)-$$

$$e^{2g-\frac{(b+c)^2}{2f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k (b+c)^{-h-k+2n}\left(b+c+2f\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)-$$

$$e^{\frac{(b-c)^2}{4 f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2 n}\left(b-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(\left(b-c\right)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)-$$

$$2 f\sqrt{\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)+$$

$$e^{-\frac{(b-c)^2}{4 f}-2 e+2 g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2 n}\left(-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\left(-b+c+2 f \sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(\left(b-c\right)\left(b-c-2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)+$$

$$2\sqrt{-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c-2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}$$

Involving $z^n \sinh\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1727.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{8}e^g\left(-e^{-\frac{(d+f)^2}{-4\,b-4\,c}-2\,g}\left(\sum_{q=0}^{n}2^{q-n}\,(d+f)^{n-q}\,(-d-f-2\,b\,z-2\,c\,z)^{q+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{-b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)(-b-c)^{-n-1}+(b-c)^{-n-1}\,e^{\frac{(f-d)^2}{4\,c-4\,b}-2\,g}\sum_{q=0}^{n}2^{q-n}\,(f-d)^{n-q}\right.$$

$$(d-f+2\,b\,z-2\,c\,z)^{q+1}\left(\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)-$$

$$(c-b)^{-n-1}\,e^{-\frac{(f-d)^2}{4\,c-4\,b}}\sum_{q=0}^{n}2^{q-n}\,(d-f)^{n-q}\,(-d+f-2\,b\,z+2\,c\,z)^{q+1}\left(-\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-d+f-2\,b\,z+2\,c\,z)^2}{4\,c-4\,b}\right)+(b+c)^{-n-1}\,e^{\frac{(d+f)^2}{-4\,b-4\,c}}\sum_{q=0}^{n}\left(-\frac{d}{2}-\frac{f}{2}\right)^{n-q}$$

$$\left.(d+f+2\,(b+c)\,z)^{q+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f+2\,(b+c)\,z)^2}{-4\,b-4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.1728.01

$$\int z^n \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-2\,n-3}\left(e^{-\frac{(b-c)^2}{4\,(d-f)}-g}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2\,n}\left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.\right.$$

$$\left.\left.\left((b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)+2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\right.\right.\right.$$

$$\left.\left.\left.(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)\right)(d-f)^{-2\,n-2}-e^{-\frac{(-b-c)^2}{4\,(-d-f)}-g}\,(d+f)^{-2\,n-2}\right.$$

$$\left.\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c)^{-h-k+2\,n}\left(-b-c+2\,(-d-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b-c+2\,(-d-f)\,\sqrt{z}\right)^2}{-d-f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((-b-c)\left(-b-c+2(-d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{4(-d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{-d-f}}\,(-d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-b-c+2(-d-f)\sqrt{z}\right)^2}{4(-d-f)}\right)\right)-e^{g-\frac{(c-b)^2}{4(f-d)}}$$

$$(f-d)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b)^{-h-k+2n}\left(-b+c+2(f-d)\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{f-d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((c-b)\left(-b+c+2(f-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{4(f-d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{f-d}}\,(f-d)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-b+c+2(f-d)\sqrt{z}\right)^2}{4(f-d)}\right)\right)+$$

$$e^{g-\frac{(b+c)^2}{4(d+f)}}(d+f)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sinh(b\,z^r + d\,z + e)\cosh(c\,z^r + f\,z + g)$

01.20.21.1729.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{8}e^{-e-g}\left(\frac{1}{\sqrt{c-b}}e^{\frac{(d-f)^2}{4(b-c)}+2g}\sum_{q=0}^{n}2^{q-n}(c-b)^{-n-\frac{1}{2}}(d-f)^{n-q}\left(\frac{(d-f+2bz-2cz)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}(-d+f-2bz+2cz)^{q+1}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-f+2bz-2cz)^2}{4(b-c)}\right)-\frac{1}{\sqrt{b-c}}e^{2e-\frac{(d-f)^2}{4(b-c)}}\sum_{q=0}^{n}2^{q-n}(b-c)^{-n-\frac{1}{2}}(f-d)^{n-q}$$

$$(d-f+2bz-2cz)^{q+1}\left(-\frac{(d-f+2bz-2cz)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-f+2bz-2cz)^2}{4(b-c)}\right)+$$

$$\frac{1}{\sqrt{-b-c}}e^{\frac{(d+f)^2}{4(b+c)}}\sum_{q=0}^{n}2^{q-n}(-b-c)^{-n-\frac{1}{2}}(d+f)^{n-q}(-d-f-2bz-2cz)^{q+1}\left(\frac{(d+f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)-\frac{1}{\sqrt{b+c}}e^{-\frac{(d+f)^2}{4(b+c)}+2e+2g}\sum_{q=0}^{n}2^{q-n}(b+c)^{-n-\frac{1}{2}}(-d-f)^{n-q}$$

$$\left.(d+f+2(b+c)z)^{q+1}\left(-\frac{(d+f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1730.01

$$\int z^n \sinh\left(\sqrt{z}\ b+d\,z+e\right)\cosh\left(\sqrt{z}\ c+f\,z+g\right)dz == 2^{-2n-3}e^{-e-g}$$

$$\left(-(-d-f)^{-2(n+1)}e^{\frac{(b+c)^2}{4(d+f)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b-c)^{-h-k+2n}\left(-b-c-2(d+f)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)-\right.$$

$$\left.2(d+f)\sqrt{\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)-$$

$$\left.e^{\frac{(b-c)^2}{4(d-f)}+2g}(f-d)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c-b)^{-h-k+2n}\left(\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\left(-b+c+2(f-d)\sqrt{z}\right)^{h+k}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((c-b)\left(-b+c+2(f-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(f-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+$$

$$e^{2e-\frac{(b-c)^2}{4(d-f)}}(d-f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+e^{-\frac{(b+c)^2}{4(d+f)}+2e+2g}$$

$$(d+f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving powers of sinh and power

Involving $z^{\alpha-1}\sinh^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.1731.01

$$\int z^{\alpha-1} \sinh^m(c\,z) \cosh(a\,z)\, dz == -i^m\, 2^{-m-1}\, z^\alpha \left(-a^2\, z^2\right)^{-\alpha} \binom{m}{\frac{m}{2}} (\Gamma(\alpha,\, a\,z)\, (-a\,z)^\alpha + (a\,z)^\alpha\, \Gamma(\alpha,\, -a\,z))\, (1 - m \bmod 2) -$$

$$2^{-m-1}\, z^\alpha \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k\, ((-a + 2\,c\,k - c\,m)\,z)^{-\alpha}\, ((a + c\,(m - 2\,k))\,z)^{-\alpha} \left(-(a + 2\,c\,k - c\,m)^2\, z^2\right)^{-\alpha} \binom{m}{k}$$

$$\left(\left((-1)^m\, ((a + 2\,c\,k - c\,m)\,z)^\alpha\, \Gamma(\alpha,\, (-a - 2\,c\,k + c\,m)\,z)\, ((a + c\,(m - 2\,k))\,z)^\alpha + ((-a - 2\,c\,k + c\,m)\,z)^\alpha \right.\right.$$

$$\Gamma(\alpha,\, (a + 2\,c\,k - c\,m)\,z)\, ((a + c\,(m - 2\,k))\,z)^\alpha + (-1)^m \left(-(a + 2\,c\,k - c\,m)^2\, z^2\right)^\alpha \Gamma(\alpha,\, (a + c\,(m - 2\,k))\,z)$$

$$\left.\left.((-a + 2\,c\,k - c\,m)\,z)^\alpha + ((a + c\,(m - 2\,k))\,z)^\alpha \left(-(a + 2\,c\,k - c\,m)^2\, z^2\right)^\alpha \Gamma(\alpha,\, (-a + 2\,c\,k - c\,m)\,z)\right) /;\, m \in \mathbb{N}^+$$

01.20.21.1732.01

$$\int z^n \sinh^\mu(c\,z) \cosh(a\,z)\, dz == \frac{n!}{2}\, \sinh^\mu(c\,z) \left(1 - e^{2\,c\,z}\right)^{-\mu}$$

$$\left(e^{a\,z} \sum_{p=0}^{n} \frac{(-1)^p\, z^{n-p}}{(n-p)!\, (a - c\,\mu)^{p+1}}\, {}_{p+2}F_{p+1}\left(\frac{a - c\,\mu}{2\,c}, \ldots, \frac{a - c\,\mu}{2\,c}, -\mu; 1 + \frac{a - c\,\mu}{2\,c}, \ldots, 1 + \frac{a - c\,\mu}{2\,c}; e^{2\,c\,z}\right) +\right.$$

$$\left. e^{-a\,z} \sum_{p=0}^{n} \frac{(-1)^p\, z^{n-p}}{(n-p)!\, (-a - c\,\mu)^{p+1}}\, {}_{p+2}F_{p+1}\left(-\frac{a + c\,\mu}{2\,c}, \ldots, -\frac{a + c\,\mu}{2\,c}, -\mu; 1 - \frac{a + c\,\mu}{2\,c}, \ldots, 1 - \frac{a + c\,\mu}{2\,c}; e^{2\,c\,z}\right)\right) /;\, n \in \mathbb{N}$$

01.20.21.1733.01

$$\int z^2 \sinh^2(a\,z) \cosh(a\,z)\, dz == \frac{27\,a\,z \cosh(a\,z) - 3\,a\,z \cosh(3\,a\,z) + \left(-9\,a^2\, z^2 + \left(9\,a^2\, z^2 + 2\right) \cosh(2\,a\,z) - 26\right) \sinh(a\,z)}{54\,a^3}$$

Involving $z^{\alpha-1} \sinh^\mu(c\,z + d) \cosh(a\,z)$

01.20.21.1734.01

$$\int z^{\alpha-1} \sinh^m(c\,z + d) \cosh(a\,z)\, dz == -i^m\, 2^{-m-1}\, z^\alpha \left(-a^2\, z^2\right)^{-\alpha} \binom{m}{\frac{m}{2}} (\Gamma(\alpha,\, a\,z)\, (-a\,z)^\alpha + (a\,z)^\alpha\, \Gamma(\alpha,\, -a\,z))\, (1 - m \bmod 2) -$$

$$i^m\, 2^{-m-1}\, z^\alpha \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k\, ((-a + 2\,c\,k - c\,m)\,z)^{-\alpha}\, ((a + c\,(m - 2\,k))\,z)^{-\alpha} \left(-(a + 2\,c\,k - c\,m)^2\, z^2\right)^{-\alpha}$$

$$\binom{m}{k} \left(\left(e^{2\,d\,k - d\,m + \frac{i\,m\,\pi}{2}}\, ((a + 2\,c\,k - c\,m)\,z)^\alpha\, \Gamma(\alpha,\, (-a - 2\,c\,k + c\,m)\,z)\, ((a + c\,(m - 2\,k))\,z)^\alpha + \right.\right.$$

$$e^{-d\,(2\,k - m) - \frac{i\,m\,\pi}{2}}\, ((-a - 2\,c\,k + c\,m)\,z)^\alpha\, \Gamma(\alpha,\, (a + 2\,c\,k - c\,m)\,z)\, ((a + c\,(m - 2\,k))\,z)^\alpha +$$

$$\left. e^{d\,(2\,k - m) + \frac{i\,m\,\pi}{2}} \left(-(a + 2\,c\,k - c\,m)^2\, z^2\right)^\alpha \Gamma(\alpha,\, (a + c\,(m - 2\,k))\,z)\right) ((-a + 2\,c\,k - c\,m)\,z)^\alpha +$$

$$\left. e^{-2\,d\,k + d\,m - \frac{i\,m\,\pi}{2}}\, ((a + c\,(m - 2\,k))\,z)^\alpha \left(-(a + 2\,c\,k - c\,m)^2\, z^2\right)^\alpha \Gamma(\alpha,\, (-a + 2\,c\,k - c\,m)\,z)\right) /;\, m \in \mathbb{N}^+$$

01.20.21.1735.01

$$\int z^n \sinh^{\mu}(d+c\,z)\cosh(a\,z)\,dz == \frac{1}{2}\,e^{-a\,z}\left(1-e^{-2\,(d+c\,z)}\right)^{-\mu} n!\,\sinh^{\mu}(d+c\,z)$$
$$\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a+c\,\mu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-a}{2\,c},\ldots,-\frac{c\,\mu-a}{2\,c},-\mu;1-\frac{c\,\mu-a}{2\,c},\ldots,1-\frac{c\,\mu-a}{2\,c};e^{-2\,(d+c\,z)}\right)+e^{2\,a\,z}\right.$$
$$\left.\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a+c\,\mu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(-\frac{a+c\,\mu}{2\,c},\ldots,-\frac{a+c\,\mu}{2\,c},-\mu;1-\frac{a+c\,\mu}{2\,c},\ldots,1-\frac{a+c\,\mu}{2\,c};e^{-2\,(d+c\,z)}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh^{\mu}(c\,z)\cosh(a\,z+b)$

01.20.21.1736.01

$$\int z^{\alpha-1}\sinh^{m}(c\,z)\cosh(b+a\,z)\,dz ==$$
$$-i^m\,2^{-m-1}\,z^{\alpha}\left(-a^2\,z^2\right)^{-\alpha}\binom{m}{\frac{m}{2}}\left(e^{-b}\,\Gamma(\alpha,a\,z)\,(-a\,z)^{\alpha}+e^{b}\,(a\,z)^{\alpha}\,\Gamma(\alpha,-a\,z)\right)(1-m\bmod 2)-i^m\,2^{-m-1}\,z^{\alpha}$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,((-a+2\,c\,k-c\,m)\,z)^{-\alpha}\,((a+c\,(m-2\,k))\,z)^{-\alpha}\left(-(a+2\,c\,k-c\,m)^2\,z^2\right)^{-\alpha}\binom{m}{k}\left(\left(e^{b+\frac{i\,m\,\pi}{2}}\,((a+2\,c\,k-c\,m)\,z)^{\alpha}\right.\right.$$
$$\Gamma(\alpha,(-a-2\,c\,k+c\,m)\,z)\,((a+c\,(m-2\,k))\,z)^{\alpha}+e^{-b-\frac{i\,m\,\pi}{2}}\,((-a-2\,c\,k+c\,m)\,z)^{\alpha}\,\Gamma(\alpha,(a+2\,c\,k-c\,m)\,z)$$
$$((a+c\,(m-2\,k))\,z)^{\alpha}+e^{\frac{i\,m\,\pi}{2}-b}\left(-(a+2\,c\,k-c\,m)^2\,z^2\right)^{\alpha}\Gamma(\alpha,(a+c\,(m-2\,k))\,z)\Big)((-a+2\,c\,k-c\,m)\,z)^{\alpha}+$$
$$\left.e^{b-\frac{i\,m\,\pi}{2}}\,((a+c\,(m-2\,k))\,z)^{\alpha}\left(-(a+2\,c\,k-c\,m)^2\,z^2\right)^{\alpha}\Gamma(\alpha,(-a+2\,c\,k-c\,m)\,z)\right)/;\ m\in\mathbb{N}^{+}$$

01.20.21.1737.01

$$\int z^n \sinh^{\mu}(c\,z)\cosh(b+a\,z)\,dz == \frac{1}{2}\,e^{-b-a\,z}\left(1-e^{-2\,c\,z}\right)^{-\mu} n!\,\sinh^{\mu}(c\,z)$$
$$\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c\,\mu-a)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-a}{2\,c},\ldots,-\frac{c\,\mu-a}{2\,c},-\mu;1-\frac{c\,\mu-a}{2\,c},\ldots,1-\frac{c\,\mu-a}{2\,c};e^{-2\,c\,z}\right)+\right.$$
$$\left.e^{2\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a+c\,\mu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(-\frac{a+c\,\mu}{2\,c},\ldots,-\frac{a+c\,\mu}{2\,c},-\mu;1-\frac{a+c\,\mu}{2\,c},\ldots,1-\frac{a+c\,\mu}{2\,c};e^{-2\,c\,z}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh^{\mu}(c\,z+d)\cosh(a\,z+b)$

01.20.21.1738.01

$$\int z^{\alpha-1}\sinh^m(c\,z+d)\cosh(a\,z+b)\,dz ==$$

$$-i^m\,2^{-m-1}\,z^\alpha\left(-a^2\,z^2\right)^{-\alpha}\binom{m}{\frac{m}{2}}\left(e^{-b}\,\Gamma(\alpha,\,a\,z)\,(-a\,z)^\alpha+e^{b}\,(a\,z)^\alpha\,\Gamma(\alpha,\,-a\,z)\right)(1-m\bmod 2)-$$

$$i^m\,2^{-m-1}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left((-a+2\,c\,k-c\,m)\,z\right)^{-\alpha}\left((a+c\,(m-2\,k))\,z\right)^{-\alpha}\left(-(a+2\,c\,k-c\,m)^2\,z^2\right)^{-\alpha}$$

$$\binom{m}{k}\left(\left(e^{b+2\,d\,k-d\,m+\frac{i\,m\,\pi}{2}}\left((a+2\,c\,k-c\,m)\,z\right)^\alpha\Gamma(\alpha,\,(-a-2\,c\,k+c\,m)\,z)\left((a+c\,(m-2\,k))\,z\right)^\alpha+\right.\right.$$

$$e^{-b-d\,(2\,k-m)-\frac{i\,m\,\pi}{2}}\left((-a-2\,c\,k+c\,m)\,z\right)^\alpha\Gamma(\alpha,\,(a+2\,c\,k-c\,m)\,z)\left((a+c\,(m-2\,k))\,z\right)^\alpha+$$

$$\left.e^{-b+d\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\left(-(a+2\,c\,k-c\,m)^2\,z^2\right)^\alpha\Gamma(\alpha,\,(a+c\,(m-2\,k))\,z)\right)\left((-a+2\,c\,k-c\,m)\,z\right)^\alpha+$$

$$\left.e^{b-2\,d\,k+d\,m-\frac{i\,m\,\pi}{2}}\left((a+c\,(m-2\,k))\,z\right)^\alpha\left(-(a+2\,c\,k-c\,m)^2\,z^2\right)^\alpha\Gamma(\alpha,\,(-a+2\,c\,k-c\,m)\,z)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1739.01

$$\int z^n\sinh^\mu(d+c\,z)\cosh(b+a\,z)\,dz==\frac{1}{2}\,e^{-b-a\,z}\left(1-e^{-2\,(d+c\,z)}\right)^{-\mu}n!\sinh^\mu(d+c\,z)$$

$$\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-a}{2\,c},\,\ldots,\,-\frac{c\,\mu-a}{2\,c},\,-\mu;\,1-\frac{c\,\mu-a}{2\,c},\,\ldots,\,1-\frac{c\,\mu-a}{2\,c};\,e^{-2\,(d+c\,z)}\right)+e^{2\,(b+a\,z)}\right.$$

$$\left.\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a+c\,\mu}{2\,c},\,\ldots,\,-\frac{a+c\,\mu}{2\,c},\,-\mu;\,1-\frac{a+c\,\mu}{2\,c},\,\ldots,\,1-\frac{a+c\,\mu}{2\,c};\,e^{-2\,(d+c\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\sinh^m\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1740.01

$$\int z^n \sinh^m\left(b\,z^2\right)\cosh(c\,z)\,dz ==$$

$$2^{-m-2}\left(2\,i^{-m}\,c^{-n-1}\binom{m}{\frac{m}{2}}\left((-1)^{-n-1}\,\Gamma(n+1,\,-c\,z)+\,\Gamma(n+1,\,c\,z)\right)(m \bmod 2-1)+b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{c^2}{b\,(8\,k-4\,m)}}\right.$$

$$(m-2\,k)^{-n-1}\binom{m}{k}\left(-e^{\frac{c^2}{b\,(4\,k-2\,m)}}\sum_{q=0}^{n}2^{q-n}\,c^{n-q}\left(\frac{(c+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}(2\,b\,(m-2\,k)\,z-c)^{q+1}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(c+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)+e^{\frac{c^2}{4\,b\,k-2\,b\,m}}\sum_{q=0}^{n}2^{q-n}\,(-c)^{n-q}\,(-c+4\,b\,k\,z-2\,b\,m\,z)$$

$$(c+2\,b\,(m-2\,k)\,z)^q\left(\frac{(c+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(c-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+$$

$$(-1)^{m+n}\sum_{q=0}^{n}2^{q-n}\,c^{n-q}\,(-c+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(c+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\,-\frac{(c-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+(-1)^{m+n}\sum_{q=0}^{n}2^{q-n}\,(-c)^{n-q}\,(c+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(c+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(c+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1741.01

$$\int z^n \sinh^m\left(b\,\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$2^{-m-2}\left(2\,i^{-m}\,c^{-n-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\,c\,z)-(-1)^n\,\Gamma(n+1,\,-c\,z)\right)(m \bmod 2-1)+4^{-n}\,c^{-2\,n-2}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{\frac{b^2\,(m-2\,u)^2}{4\,c}}\binom{m}{u}\right.$$

$$\left((-1)^m\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(-2\,\sqrt{z}\,c-b\,(m-2\,u)\right)^{h+k}\left(\frac{\left(2\,\sqrt{z}\,c+b\,(m-2\,u)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(2\,\sqrt{z}\,c+b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(2\,\sqrt{z}\,c+b\,(m-2\,u)\right)^2}{4\,c}\right)-\right.$$

$$2\,c\,\sqrt{\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{4\,c}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)-2$$

$$c\,\sqrt{\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)\Bigg)+e^{-\frac{b^2\,(m-2\,u)^2}{2\,c}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{4\,c}\right)+$$

$$2\,\sqrt{-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{4\,c}\right)\Bigg)+$$

$$(-1)^m\,e^{-\frac{b^2\,(m-2\,u)^2}{2\,c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,c\,\sqrt{z}-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)+2\,\sqrt{-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}}$$

$$c\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + e) \cosh(c z)$

01.20.21.1742.01

$$\int z^n \sinh^m\left(b z^2+e\right)\cosh(c z)\,dz ==$$

$$2^{-m-2}\left(2 i^{-m} c^{-n-1}\binom{m}{\frac{m}{2}}\left((-1)^{-n-1}\Gamma(n+1,-c z)+\Gamma(n+1,c z)\right)(m \bmod 2-1)+b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-\frac{c^2+4 b (2 k-m) e (2 k+m)}{b (8 k-4 m)}}\right.$$

$$(m-2 k)^{-n-1}\binom{m}{k}\left(-e^{\frac{c^2}{b (4 k-2 m)}+2 e m}\sum_{q=0}^{n}2^{q-n} c^{n-q}\left(\frac{(c+4 b k z-2 b m z)^2}{2 b k-b m}\right)^{\frac{1}{2}(-q-1)}(2 b (m-2 k) z-c)^{q+1}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(c+4 b k z-2 b m z)^2}{b (8 k-4 m)}\right)+e^{\frac{c^2}{4 b k-2 b m}+2 e m}\sum_{q=0}^{n}2^{q-n}(-c)^{n-q}(-c+4 b k z-2 b m z)$$

$$(c+2 b (m-2 k) z)^q\left(\frac{(c+2 b (m-2 k) z)^2}{b (2 k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(c-4 b k z+2 b m z)^2}{8 b k-4 b m}\right)+$$

$$(-1)^{m+n} e^{4 e k}\sum_{q=0}^{n}2^{q-n} c^{n-q}(-c+4 b k z-2 b m z)^{q+1}\left(-\frac{(c+2 b (m-2 k) z)^2}{b (2 k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(c-4 b k z+2 b m z)^2}{8 b k-4 b m}\right)+(-1)^{m+n} e^{4 e k}\sum_{q=0}^{n}2^{q-n}(-c)^{n-q}(c+4 b k z-2 b m z)^{q+1}$$

$$\left.\left.\left(-\frac{(c+4 b k z-2 b m z)^2}{2 b k-b m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+4 b k z-2 b m z)^2}{8 b k-4 b m}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1743.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e\right)\cosh(c z)\,dz == 2^{-m-2}$$

$$\left(2 i^{-m} c^{-n-1}\binom{m}{\frac{m}{2}}(\Gamma(n+1,c z)-(-1)^n\Gamma(n+1,-c z))(m \bmod 2-1)+4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u e^{\frac{b^2 (m-2 u)^2-4 c e (m+2 u)}{4 c}} c^{-2 n-2}\binom{m}{u}\right)\left((-1)^m\right.$$

$$e^{4 e u}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b (m-2 u))^{-h-k+2 n}\left(-2\sqrt{z}\ c-b (m-2 u)\right)^{h+k}\left(\frac{\left(2\sqrt{z}\ c+b (m-2 u)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b (m-2 u)\left(2\sqrt{z}\ c+b (m-2 u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(2\sqrt{z}\ c+b (m-2 u)\right)^2}{4 c}\right)-\right.$$

$$2\,c\,\sqrt{\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{c}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)-$$

$$2\,c\,\sqrt{\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)\Bigg)+e^{-\frac{b^2\,(m-2\,u)^2}{2\,c}+2\,e\,m}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{4\,c}\right)+$$

$$2\,\sqrt{-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\sqrt{z}\;c+b\,(m-2\,u)\right)^2}{4\,c}\right)\Bigg)+$$

$$(-1)^m\,e^{-\frac{b^2\,(m-2\,u)^2}{2\,c}+4\,e\,u}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,c\,\sqrt{z}-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)+2\,\sqrt{-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{c}}$$

$$c\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b\,(m-2\,u)-2\,c\,\sqrt{z}\right)^2}{4\,c}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\, z^r + d\, z\right) \cosh(c\, z)$

01.20.21.1744.01

$$\int z^n \sinh^m\left(b\, z^2 + d\, z\right) \cosh(c\, z)\, dz ==$$

$$2^{-m-2}\left(2\, i^{-m}\, c^{-n-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\, c\, z) - (-1)^n\, \Gamma(n+1,\, -c\, z)\right)(m \bmod 2 - 1) + b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\, e^{-\frac{c^2+2\,d\,(2\,k-m)\,c+d^2\,(m-2\,k)^2}{b\,(8\,k-4\,m)}}\right.$$

$$(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^{m+n}\sum_{q=0}^{n}2^{q-n}\,(-c-2\,d\,k+d\,m)^{n-q}\,(c+2\,d\,k-d\,m+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\right.$$

$$\left(-\frac{(c+2\,d\,k-d\,m+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\, -\frac{(c+2\,d\,k-d\,m+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)-$$

$$e^{\frac{d\,c}{b}}\left(e^{\frac{(c-2\,d\,k+d\,m)^2}{4\,b\,k-2\,b\,m}}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{c}{2}\right)^{n-q}\left(\frac{(c-2\,d\,k+d\,m-4\,b\,k\,z+2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(c+d\,(m-2\,k)+2\,b\,(m-2\,k)\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\, \frac{(c-2\,d\,k+d\,m-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+$$

$$e^{\frac{(2\,k-m)\,d^2}{2\,b}+\frac{c^2}{4\,b\,k-2\,b\,m}}\sum_{q=0}^{n}2^{q-n}\,(c+2\,d\,k-d\,m)^{n-q}\left(\frac{(c+2\,d\,k-d\,m+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$(-c-2\,d\,k+d\,m-4\,b\,k\,z+2\,b\,m\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\, \frac{(c+2\,d\,k-d\,m+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)-$$

$$(-1)^{m+n}\sum_{q=0}^{n}2^{q-n}\,(c-2\,d\,k+d\,m)^{n-q}\,(-c+2\,d\,k-d\,m+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(c+d\,(m-2\,k)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\left.\Gamma\left(\frac{q+1}{2},\, -\frac{(c-2\,d\,k+d\,m-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right)\Big/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1745.01

$$\int z^n \sinh^m\left(\sqrt{z}\;b + d\, z\right) \cosh(c\, z)\, dz ==$$

$$2^{-m-2}\left(2\, i^{-m}\, c^{-n-1}\binom{m}{\frac{m}{2}}\left(\Gamma(n+1,\, c\, z) - (-1)^n\, \Gamma(n+1,\, -c\, z)\right)(m \bmod 2 - 1) - 4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\right.\left(-(-1)^m\, e^{\frac{b^2\,(m-2\,u)^2}{-4\,c+4\,d\,m-8\,d\,u}}\right.$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)+2\,(-c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{-c+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2\,(c-d\,m+2\,d\,u)\,\sqrt{z}\,-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+\right.\right.$$

$$\left.2\,(-c+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,(-c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{-4\,c+4\,d\,m-8\,d\,u}\right)-$$

$$2\,(-c+d\,m-2\,d\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,(-c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{-c+d\,m-2\,d\,u}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b\,(m-2\,u)+2\,(-c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{-4\,c+4\,d\,m-8\,d\,u}\right)\right)\right)(c-d\,m+2\,d\,u)^{-2\,(n+1)}+$$

$$e^{-\frac{b^{2}\,(m-2\,u)^{2}}{4\,(c+d\,m-2\,d\,u)}}\left(-(c+d\,m-2\,d\,u)^{2}\right)^{-2\,n-1}\left(\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(b\,(m-2\,u))^{-h-k+2\,n}\right.\right.$$

$$\left(b\,(m-2\,u)+2\,(c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,(c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{c+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(c+d\,m-2\,d\,u)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+2\,(c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{4\,(c+d\,m-2\,d\,u)}\right)+2$$

$$\sqrt{-\frac{\left(b\,(m-2\,u)+2\,(c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{c+d\,m-2\,d\,u}}\;(c+d\,m-2\,d\,u)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,(c+d\,m-2\,d\,u)\,\sqrt{z}\right)^{2}}{4\,(c+d\,m-2\,d\,u)}\right)\right)\right)(-c-d\,m+2\,d\,u)^{2\,n}+$$

$$(-1)^m e^{\frac{b^2 (m-2u)^2}{2(c+dm-2du)}} (c+dm-2du)^{2n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b(m-2u))^{-h-k+2n}$$

$$\left(-b(m-2u)-2(c+dm-2du)\sqrt{z}\right)^{h+k} \left(\frac{\left(b(m-2u)+2(c+dm-2du)\sqrt{z}\right)^2}{c+dm-2du}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b(m-2u)+2(c+dm-2du)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b(m-2u)+2(c+dm-2du)\sqrt{z}\right)^2}{4(c+dm-2du)}\right)-$$

$$2(c+dm-2du)\sqrt{\frac{\left(b(m-2u)+2(c+dm-2du)\sqrt{z}\right)^2}{c+dm-2du}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b(m-2u)+2(c+dm-2du)\sqrt{z}\right)^2}{4(c+dm-2du)}\right)\right)\right)-$$

$$e^{-\frac{b^2 (m-2u)^2}{4d(m-2u)-4c}} (-c+dm-2du)^{-2(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b(m-2u))^{-h-k+2n}$$

$$\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^{h+k} \left(-\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-c+dm-2du}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{4d(m-2u)-4c}\right)+$$

$$2\sqrt{-\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-c+dm-2du}}\,(-c+dm-2du)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{4d(m-2u)-4c}\right)\right)\right)\Big/; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + d z + e) \cosh(c z)$

01.20.21.1746.01

$$\int z^n \sinh^m\left(b z^2 + d z + e\right) \cosh(c z)\, dz == 2^{-m-2}$$

$$\left(2 i^{-m} c^{-n-1} \binom{m}{\frac{m}{2}} (\Gamma(n+1, c z) - (-1)^n \Gamma(n+1, -c z)) (m \bmod 2 - 1) + b^{-n-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-\frac{c^2 + 2 d (2k-m) c + d^2 (m-2k)^2 + 4 b (2k-m)(2e k + e m)}{b (8k - 4m)}}\right.$$

$$(m-2k)^{-n-1} \binom{m}{k} \left((-1)^{m+n} e^{4 e k} \sum_{q=0}^{n} 2^{q-n} (-c - 2 d k + d m)^{n-q} (c + 2 d k - d m + 4 b k z - 2 b m z)^{q+1} \right.$$

$$\left(-\frac{(c + 2 d k - d m + 4 b k z - 2 b m z)^2}{2 b k - b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c + 2 d k - d m + 4 b k z - 2 b m z)^2}{8 b k - 4 b m}\right) -$$

$$e^{\frac{d c}{b}} \left(e^{\frac{(c - 2 d k + d m)^2}{4 b k - 2 b m} + 2 e m} \sum_{q=0}^{n} \left(d \left(k - \frac{m}{2} \right) - \frac{c}{2} \right)^{n-q} \left(\frac{(c - 2 d k + d m - 4 b k z + 2 b m z)^2}{2 b k - b m} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$(c + d (m-2k) + 2 b (m-2k) z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c - 2 d k + d m - 4 b k z + 2 b m z)^2}{8 b k - 4 b m}\right) +$$

$$e^{\frac{(2k-m) d^2}{2b} + 2 e m + \frac{c^2}{4 b k - 2 b m}} \sum_{q=0}^{n} 2^{q-n} (c + 2 d k - d m)^{n-q} \left(\frac{(c + 2 d k - d m + 4 b k z - 2 b m z)^2}{2 b k - b m} \right)^{\frac{1}{2}(-q-1)}$$

$$(-c - 2 d k + d m - 4 b k z + 2 b m z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c + 2 d k - d m + 4 b k z - 2 b m z)^2}{8 b k - 4 b m}\right) -$$

$$(-1)^{m+n} e^{4 e k} \sum_{q=0}^{n} 2^{q-n} (c - 2 d k + d m)^{n-q} (-c + 2 d k - d m + 4 b k z - 2 b m z)^{q+1}$$

$$\left(-\frac{(c + d (m-2k) + 2 b (m-2k) z)^2}{b (2k - m)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left.\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(c - 2 d k + d m - 4 b k z + 2 b m z)^2}{8 b k - 4 b m}\right)\right)\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1747.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + e + d z\right) \cosh(c z)\, dz ==$$

$$2^{-m-2} \left(2 i^{-m} c^{-n-1} \binom{m}{\frac{m}{2}} (\Gamma(n+1, c z) - (-1)^n \Gamma(n+1, -c z)) (m \bmod 2 - 1) - 4^{-n} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u e^{e m - 2 e u} \binom{m}{u} \right.$$

$$\left. e^{-2 e (m-2u)} \right.$$

$$\left(e^{-\frac{b^2 (m-2u)^2}{4 (c+d m-2 d u)}-4 e u} \left(-(c+d m-2 d u)^2\right)^{-2 n-1} \left(e^{2 e m} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b (m-2 u))^{-h-k+2 n} \left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^{h+k} \left(-\frac{\left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^2}{c+d m-2 d u}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b (m-2 u) \left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^2}{4 (c+d m-2 d u)}\right)+2 \sqrt{-\frac{\left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^2}{c+d m-2 d u}} (c+d m-2 d u) \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^2}{4 (c+d m-2 d u)}\right)\right)\right)\right)$$

$$(-c-d m+2 d u)^{2 n}+(-1)^m e^{\frac{b^2 (m-2 u)^2}{2 (c+d m-2 d u)}+4 e u} (c+d m-2 d u)^{2 n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b (m-2 u))^{-h-k+2 n} \left(-b (m-2 u)-2 (c+d m-2 d u) \sqrt{z}\right)^{h+k} \left(\frac{\left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^2}{c+d m-2 d u}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b (m-2 u) \left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^2}{4 (c+d m-2 d u)}\right)-2 (c+d m-2 d u) \sqrt{\frac{\left(b (m-2 u)+2 (c+d m-2 d u) \sqrt{z}\right)^2}{c+d m-2 d u}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b(m-2u)+2(c+dm-2du)\sqrt{z}\right)^2}{4(c+dm-2du)}\right)\Bigg)\Bigg)-$$

$$(-1)^m e^{\frac{b^2(m-2u)^2}{-4c+4dm-8du}}(c-dm+2du)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b(m-2u))^{-h-k+2n}$$

$$\left(\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-c+dm-2du}\right)^{\frac{1}{2}(-h-k-1)}\left(2(c-dm+2du)\sqrt{z}-b(m-2u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b(m-2u)\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-4c+4dm-8du}\right)-$$

$$2(-c+dm-2du)\sqrt{\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-c+dm-2du}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-4c+4dm-8du}\right)\Bigg)\Bigg)-$$

$$e^{-\frac{b^2(m-2u)^2}{4d(m-2u)-4c}}(-c+dm-2du)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b(m-2u))^{-h-k+2n}$$

$$\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-c+dm-2du}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b(m-2u)\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{4d(m-2u)-4c}\right)+$$

$$2\sqrt{-\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{-c+dm-2du}}\ (-c+dm-2du)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b(m-2u)+2(-c+dm-2du)\sqrt{z}\right)^2}{4d(m-2u)-4c}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r)\cosh(f z+g)$

01.20.21.1748.01

$$\int z^n \sinh^m\left(b z^2\right)\cosh(g+f z)\,dz ==$$

$$2^{-m-2}\left(2\,i^{-m}\,f^{-n-1}\binom{m}{\frac{m}{2}}\left((-1)^{-n-1}\,e^{g}\,\Gamma(n+1,\,-f z)+e^{-g}\,\Gamma(n+1,\,f z)\right)(m \bmod 2-1)+b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{f^2+4bg(2k-m)}{b(8k-4m)}}\right.$$

$$(m-2k)^{-n-1}\binom{m}{k}\left(-e^{\frac{f^2}{b(4k-2m)}}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\left(\frac{(f+4bkz-2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}(2b(m-2k)z-f)^{q+1}\binom{n}{q}\right.$$

$$\Gamma\left(\frac{q+1}{2},\ \frac{(f+4bkz-2bmz)^2}{b(8k-4m)}\right)+e^{\frac{f^2}{4bk-2bm}+2g}\sum_{q=0}^{n}2^{q-n}(-f)^{n-q}(-f+4bkz-2bmz)$$

$$(f+2b(m-2k)z)^q\left(\frac{(f+2b(m-2k)z)^2}{b(2k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{(f-4bkz+2bmz)^2}{8bk-4bm}\right)+$$

$$(-1)^{m+n}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}(-f+4bkz-2bmz)^{q+1}\left(-\frac{(f+2b(m-2k)z)^2}{b(2k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\ -\frac{(f-4bkz+2bmz)^2}{8bk-4bm}\right)+(-1)^{m+n}\,e^{2g}\sum_{q=0}^{n}2^{q-n}(-f)^{n-q}(f+4bkz-2bmz)^{q+1}$$

$$\left.\left.\left.\left(-\frac{(f+4bkz-2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{(f+4bkz-2bmz)^2}{8bk-4bm}\right)\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1749.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh(g+f z)\,dz == 2^{-m-2}$$

$$\left(2\,i^{-m}\,f^{-n-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f z)-(-1)^n\,e^{g}\,\Gamma(n+1,\,-f z)\right)(m \bmod 2-1)+4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{\frac{b^2\,(m-2u)^2-4\,f\,g}{4\,f}}\,f^{-2n-2}\binom{m}{u}\right.$$

$$\left((-1)^m\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2u))^{-h-k+2n}\left(-2\sqrt{z}\;f-b\,(m-2u)\right)^{h+k}\left(\frac{\left(2\sqrt{z}\;f+b\,(m-2u)\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2u)\left(2\sqrt{z}\;f+b\,(m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\sqrt{z}\;f+b\,(m-2u)\right)^2}{4\,f}\right)-\right.$$

$$2\,f\sqrt{\frac{\left(2\sqrt{z}\;f+b\,(m-2u)\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\sqrt{z}\;f+b\,(m-2u)\right)^2}{4\,f}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2u))^{-h-k+2n}\left(b\,(m-2u)-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b\,(m-2u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2u)\left(b\,(m-2u)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b\,(m-2u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\right.$$

$$\left.\sqrt{\frac{\left(b\,(m-2u)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b\,(m-2u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+e^{2g-\frac{b^2\,(m-2u)^2}{2\,f}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2u))^{-h-k+2n}\left(2\sqrt{z}\;f+b\,(m-2u)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;f+b\,(m-2u)\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2u)\left(2\sqrt{z}\;f+b\,(m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\sqrt{z}\;f+b\,(m-2u)\right)^2}{4\,f}\right)+\right.$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\ f+b\,(m-2\,u)\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(2\sqrt{z}\ f+b\,(m-2\,u)\right)^2}{4\,f}\right)\Bigg)+$$

$$(-1)^m\,e^{2\,g-\frac{b^2\,(m-2\,u)^2}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(-\frac{\left(b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\left(2\,f\,\sqrt{z}\ -b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)-2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}$$

$$f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)\Bigg)\Bigg)\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+e\right)\cosh(f\,z+g)$

01.20.21.1750.01

$$\int z^n \sinh^m\left(b\,z^2+e\right)\cosh(g+f\,z)\,dz ==$$

$$2^{-m-2}\left(2\,i^{-m}\,f^{-n-1}\binom{m}{\frac{m}{2}}\left((-1)^{-n-1}\,e^{g}\,\Gamma(n+1,\,-f\,z)+e^{-g}\,\Gamma(n+1,\,f\,z)\right)(m \bmod 2-1)+b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{f^2+4\,b\,(2\,k-m)\,(g+e\,(2\,k+m))}{b\,(8\,k-4\,m)}}\right.$$

$$(m-2\,k)^{-n-1}\binom{m}{k}\left(-e^{\frac{f^2}{b\,(4\,k-2\,m)}+2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\left(\frac{(f+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}(2\,b\,(m-2\,k)\,z-f)^{q+1}\binom{n}{q}\right.$$

$$\Gamma\left(\frac{q+1}{2},\,\frac{(f+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)+e^{\frac{f^2}{4\,b\,k-2\,b\,m}+2\,g+2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(-f+4\,b\,k\,z-2\,b\,m\,z)$$

$$(f+2\,b\,(m-2\,k)\,z)^q\left(\frac{(f+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+$$

$$(-1)^{m+n}\,e^{4\,e\,k}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\,-\frac{(f-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+(-1)^{m+n}\,e^{2\,g+4\,e\,k}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left.\left.\left.\left(-\frac{(f+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1751.01

$$\int z^n \sinh^m\left(\sqrt{z}\;b+e\right)\cosh(g+f\,z)\,dz == 2^{-m-2}\left(2\,i^{-m}\,f^{-n-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\,f\,z)-(-1)^n\,e^{g}\,\Gamma(n+1,\,-f\,z)\right)(m \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{\frac{b^2\,(m-2\,u)^2-4\,f\,(g+e\,(m+2\,u))}{4\,f}}\,f^{-2\,n-2}\binom{m}{u}\left((-1)^m\,e^{4\,e\,u}\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(-2\,\sqrt{z}\;f-b\,(m-2\,u)\right)^{h+k}\left(\frac{\left(2\,\sqrt{z}\;f+b\,(m-2\,u)\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(2\,\sqrt{z}\;f+b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,\sqrt{z}\;f+b\,(m-2\,u)\right)^2}{4\,f}\right)-\right.$$

$$2 f \sqrt{\frac{\left(2\sqrt{z}\ f + b\,(m-2u)\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2\sqrt{z}\ f + b\,(m-2u)\right)^2}{4 f}\right)\Bigg) +$$

$$e^{2em}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2u))^{-h-k+2n}\left(b\,(m-2u)-2 f\sqrt{z}\right)^{h+k}\left(\frac{\left(b\,(m-2u)-2 f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2u)\left(b\,(m-2u)-2 f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b\,(m-2u)-2 f\sqrt{z}\right)^2}{4 f}\right) -$$

$$2 f \sqrt{\frac{\left(b\,(m-2u)-2 f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b\,(m-2u)-2 f\sqrt{z}\right)^2}{4 f}\right)\Bigg) + e^{-\frac{b^2(m-2u)^2}{2f}+2g+2em}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2u))^{-h-k+2n}\left(2\sqrt{z}\ f + b\,(m-2u)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\ f + b\,(m-2u)\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2u)\left(2\sqrt{z}\ f + b\,(m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(2\sqrt{z}\ f + b\,(m-2u)\right)^2}{4 f}\right) +$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\ f + b\,(m-2u)\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(2\sqrt{z}\ f + b\,(m-2u)\right)^2}{4 f}\right)\Bigg) +$$

$$(-1)^m e^{-\frac{b^2(m-2u)^2}{2f}+2g+4eu}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2u))^{-h-k+2n}\left(-\frac{\left(b\,(m-2u)-2 f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2 f\sqrt{z} - b\,(m-2u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2u)\left(b\,(m-2u)-2 f\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b\,(m-2u)-2 f\sqrt{z}\right)^2}{4 f}\right) + 2\sqrt{-\frac{\left(b\,(m-2u)-2 f\sqrt{z}\right)^2}{f}}$$

$$f\,\Gamma\left(\frac{1}{2}(h+k+2),\ \left(b\,(m-2u)-2 f\sqrt{z}\right)^2\right)\Bigg)\Bigg)\Bigg) \quad (k, n \in \mathbb{N} \wedge m \in \mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + d z) \cosh(f z + g)$

01.20.21.1752.01

$$\int z^n \sinh^m\left(b z^2 + d z\right) \cosh(g + f z)\, dz == 2^{-m-2} \left(2 i^{-m} f^{-n-1} \binom{m}{\frac{m}{2}} \left(e^{-g} \Gamma(n+1, f z) - (-1)^n e^{g} \Gamma(n+1, -f z)\right) (m \bmod 2 - 1) + \right.$$

$$b^{-n-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-\frac{f^2 + 2 d (2k-m) f + d^2 (m-2k)^2 + 4 b g (2k-m)}{b (8k-4m)}} (m-2k)^{-n-1} \binom{m}{k}$$

$$\left((-1)^{m+n} e^{2g} \sum_{q=0}^{n} 2^{q-n} (-f - 2 d k + d m)^{n-q} (f + 2 d k - d m + 4 b k z - 2 b m z)^{q+1} \right.$$

$$\left(-\frac{(f + 2 d k - d m + 4 b k z - 2 b m z)^2}{2 b k - b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f + 2 d k - d m + 4 b k z - 2 b m z)^2}{8 b k - 4 b m} \right) -$$

$$e^{\frac{d f}{b}} \left(e^{\frac{(f - 2 d k + d m)^2}{4 b k - 2 b m} + 2 g} \sum_{q=0}^{n} \left(d \left(k - \frac{m}{2} \right) - \frac{f}{2} \right)^{n-q} \left(\frac{(f - 2 d k + d m - 4 b k z + 2 b m z)^2}{2 b k - b m} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$(f + d (m-2k) + 2 b (m-2k) z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f - 2 d k + d m - 4 b k z + 2 b m z)^2}{8 b k - 4 b m} \right) +$$

$$e^{\frac{(2k-m) d^2}{2 b} + \frac{f^2}{4 b k - 2 b m}} \sum_{q=0}^{n} 2^{q-n} (f + 2 d k - d m)^{n-q} \left(\frac{(f + 2 d k - d m + 4 b k z - 2 b m z)^2}{2 b k - b m} \right)^{\frac{1}{2}(-q-1)}$$

$$(-f - 2 d k + d m - 4 b k z + 2 b m z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f + 2 d k - d m + 4 b k z - 2 b m z)^2}{8 b k - 4 b m} \right) -$$

$$(-1)^{m+n} \sum_{q=0}^{n} 2^{q-n} (f - 2 d k + d m)^{n-q} (-f + 2 d k - d m + 4 b k z - 2 b m z)^{q+1}$$

$$\left(-\frac{(f + d (m-2k) + 2 b (m-2k) z)^2}{b (2k-m)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \left. \left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(f - 2 d k + d m - 4 b k z + 2 b m z)^2}{8 b k - 4 b m} \right) \right) \right) \right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1753.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right)\cosh(g + f\,z)\,dz == 2^{-m-2}\left(2\,i^{-m}\,f^{-n-1}\binom{m}{\frac{m}{2}}(e^{-g}\,\Gamma(n+1,\,f\,z) - (-1)^n\,e^{g}\,\Gamma(n+1,\,-f\,z))\,(m \bmod 2 - 1) - \right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{-g}\binom{m}{u}\left(-(-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{-4\,f+4\,d\,m-8\,d\,u}+2\,g}\right.$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2\,(f-d\,m+2\,d\,u)\,\sqrt{z}\ - b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+\right.\right.$$

$$\left.2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)-$$

$$2\,(-f+d\,m-2\,d\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-f+d\,m-2\,d\,u}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)\right)\right)(f-d\,m+2\,d\,u)^{-2\,(n+1)}+$$

$$e^{-\frac{b^2\,(m-2\,u)^2}{4\,(f+d\,m-2\,d\,u)}}\left(-(f+d\,m-2\,d\,u)^2\right)^{-2\,n-1}\left(e^{2\,g}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\right.\right.$$

$$\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left.\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)^2}{4(f+dm-2du)}\right)+$$

$$2\sqrt{-\frac{\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)^2}{f+dm-2du}}\,(f+dm-2du)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)^2}{4(f+dm-2du)}\right)\right)\right](-f-dm+2du)^{2n}+$$

$$(-1)^m e^{\frac{b^2(m-2u)^2}{2(f+dm-2du)}}(f+dm-2du)^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b(m-2u))^{-h-k+2n}$$

$$\left(-b(m-2u)-2(f+dm-2du)\sqrt{z}\right)^{h+k}\left(\frac{\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)^2}{f+dm-2du}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left[b(m-2u)\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)^2}{4(f+dm-2du)}\right)-$$

$$2(f+dm-2du)\sqrt{\frac{\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)^2}{f+dm-2du}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b(m-2u)+2(f+dm-2du)\sqrt{z}\right)^2}{4(f+dm-2du)}\right)\right)\right]-$$

$$e^{-\frac{b^2(m-2u)^2}{4d(m-2u)-4f}}(-f+dm-2du)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b(m-2u))^{-h-k+2n}$$

$$\left(b(m-2u)+2(-f+dm-2du)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b(m-2u)+2(-f+dm-2du)\sqrt{z}\right)^2}{-f+dm-2du}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)+$$

$$2\sqrt{-\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-f+d\,m-2\,d\,u}}\;(-f+d\,m-2\,d\,u)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z+e\right)\cosh(f\,z+g)$

01.20.21.1754.01

$$\int z^n \sinh^m\left(b z^2 + d z + e\right) \cosh(g + f z)\, dz ==$$

$$2^{-m-2}\left(2 i^{-m} f^{-n-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\, f z) - (-1)^n e^{g}\,\Gamma(n+1,\, -f z)\right)(m \bmod 2 - 1) + \right.$$

$$b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-\frac{f^2+2d(2k-m)f+d^2(m-2k)^2+4b(2k-m)(g+2ek+em)}{b(8k-4m)}}(m-2k)^{-n-1}\binom{m}{k}$$

$$\left((-1)^{m+n} e^{2g+4ek}\sum_{q=0}^{n}2^{q-n}(-f-2dk+dm)^{n-q}(f+2dk-dm+4bkz-2bmz)^{q+1}\right.$$

$$\left(-\frac{(f+2dk-dm+4bkz-2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f+2dk-dm+4bkz-2bmz)^2}{8bk-4bm}\right)-$$

$$e^{\frac{df}{b}}\left(e^{\frac{(f-2dk+dm)^2}{4bk-2bm}+2g+2em}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}\left(\frac{(f-2dk+dm-4bkz+2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(f+d(m-2k)+2b(m-2k)z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(f-2dk+dm-4bkz+2bmz)^2}{8bk-4bm}\right)+$$

$$e^{\frac{(2k-m)d^2}{2b}+2em+\frac{f^2}{4bk-2bm}}\sum_{q=0}^{n}2^{q-n}(f+2dk-dm)^{n-q}\left(\frac{(f+2dk-dm+4bkz-2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}$$

$$(-f-2dk+dm-4bkz+2bmz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(f+2dk-dm+4bkz-2bmz)^2}{8bk-4bm}\right)-$$

$$\left.(-1)^{m+n} e^{4ek}\sum_{q=0}^{n}2^{q-n}(f-2dk+dm)^{n-q}(-f+2dk-dm+4bkz-2bmz)^{q+1}\right.$$

$$\left.\left(-\frac{(f+d(m-2k)+2b(m-2k)z)^2}{b(2k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.$$

$$\left.\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(f-2dk+dm-4bkz+2bmz)^2}{8bk-4bm}\right)\right)\right)\right)/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1755.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + e + d z\right)\cosh(g + f z)\, dz ==$$

$$2^{-m-2}\left(2 i^{-m} f^{-n-1}\binom{m}{\frac{m}{2}}\left(e^{-g}\,\Gamma(n+1,\, f z) - (-1)^n e^{g}\,\Gamma(n+1,\, -f z)\right)(m \bmod 2 - 1) - \right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\, e^{-g+e\,m-2\,e\,u}\binom{m}{u}\left(e^{-2\,e\,(m-2\,u)}\left(e^{-\frac{b^2\,(m-2\,u)^2}{4\,(f+d\,m-2\,d\,u)}-4\,e\,u}\left(-(f+d\,m-2\,d\,u)^2\right)^{-2\,n-1}\right.\right.$$

$$\left(e^{2\,g+2\,e\,m}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)+$$

$$2\sqrt{-\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}\;(f+d\,m-2\,d\,u)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\right)\right)(-f-d\,m+2\,d\,u)^{2\,n}+(-1)^m$$

$$e^{\frac{b^2\,(m-2\,u)^2}{2\,(f+d\,m-2\,d\,u)}+4\,e\,u}\,(f+d\,m-2\,d\,u)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(-b\,(m-2\,u)-\right.$$

$$\left.2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-$$

$$2\,(f+d\,m-2\,d\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b\,(m-2\,u)+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\Bigg)\Bigg)-$$

$$(-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{-4\,f+4\,d\,m-8\,d\,u}+2\,g}\,(f-d\,m+2\,d\,u)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}\,(-h-k-1)}\left(2\,(f-d\,m+2\,d\,u)\,\sqrt{z}\ -b\,(m-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)-$$

$$2\,(-f+d\,m-2\,d\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-f+d\,m-2\,d\,u}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)\Bigg)\Bigg)-$$

$$e^{-\frac{b^2\,(m-2\,u)^2}{4\,d\,(m-2\,u)-4\,f}}\,(-f+d\,m-2\,d\,u)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)+$$

$$2\sqrt{-\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{-f+d\,m-2\,d\,u}}\ (-f+d\,m-2\,d\,u)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b\,(m-2\,u)+2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1756.01

$$\int z^n \sinh^m(b\,z)\cosh\left(c\,z^2\right)dz ==$$

$$2^{-m-2}\left(i^{-m}\,z^{n+1}\left(-c^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\left(-c\,z^2\right)^{\frac{n+1}{2}}+\left(c\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\right)(m \bmod 2-1)-\right.$$

$$c^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,e^{-\frac{-b^2\,(m-2\,k)^2}{4\,c}}\binom{m}{k}\left(-(-1)^m\sum_{q=0}^{n}2^{q-n}\,(b\,(m-2\,k))^{n-q}\,(2\,b\,k-b\,m-2\,c\,z)^{q+1}\right.$$

$$\left(\frac{\left(b\,(m-2\,k)+2\,c\,z\right)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,b\,k+b\,m+2\,c\,z)^2}{4\,c}\right)-$$

$$\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)\right)^{n-q}(-2\,b\,k+b\,m-2\,c\,z)^{q+1}\left(\frac{(-2\,b\,k+b\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,b\,k+b\,m-2\,c\,z)^2}{4\,c}\right)-(-1)^n\,e^{-\frac{b^2\,(m-2\,k)^2}{2\,c}}\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)\right)^{n-q}(2\,b\,k-b\,m-2\,c\,z)$$

$$(b\,(m-2\,k)+2\,c\,z)^q\left(-\frac{\left(b\,(m-2\,k)+2\,c\,z\right)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,b\,k+b\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$(-1)^{m+n}\,e^{-\frac{b^2\,(m-2\,k)^2}{2\,c}}\sum_{q=0}^{n}2^{q-n}\,(b\,(m-2\,k))^{n-q}\left(-\frac{(-2\,b\,k+b\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.(b\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,b\,k+b\,m-2\,c\,z)^2}{4\,c}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1757.01

$$\int z^n \sinh^m(b\,z)\cosh\left(\sqrt{z}\;c\right)dz == 2^{-m-2}$$

$$\left(4\,i^{-m}\,c^{-2\,n-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(m \bmod 2-1)+4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{-\frac{c^2}{4\,b\,(m-2\,u)}}\,(b\,(m-2\,u))^{-2\,n-2}\right.$$

$$\binom{m}{u}\left((-1)^m\,e^{\frac{c^2}{2\,b\,(m-2\,u)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c-2\,b\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,b\,(m-2\,u)}\right)-\right.$$

$$\left.2\,b\,(m-2\,u)\sqrt{\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^2}{b\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,b\,(m-2\,u)}\right)\right)+$$

$$(-1)^m\,e^{\frac{c^2}{2\,b\,(m-2\,u)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,b\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2\,b\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)-\right.$$

$$\left.2\,b\,(m-2\,u)\sqrt{\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,b\,(m-2\,u)\sqrt{-\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^2}{b\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,b\,(m-2\,u)}\right)-c\right.$$

$$\left(2\,b\,(m-2\,u)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,b\,(m-2\,u)\,\sqrt{z}\,-c\right)^2}{4\,b\,(m-2\,u)}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(2\,b\,(m-2\,u)\sqrt{-\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)-c$$

$$\left(-c-2\,b\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)\Bigg)\Bigg)\Bigg

01.20.21.1758.01

$$\int z^n \sinh^m(e+d\,z)\cosh\left(c\,z^2\right)dz ==$$

$$2^{-m-2}\left(i^{-m}\,z^{n+1}\left(-c^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\left(-c\,z^2\right)^{\frac{n+1}{2}}+\left(c\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\right)(m \bmod 2-1)-\right.$$

$$c^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,e^{-\frac{-d^2\,(m-2\,k)^2-4\,c\,(-2\,e\,k+e\,m)}{4\,c}}\binom{m}{k}$$

$$\left(-(-1)^m\,e^{4\,e\,k-2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\,(2\,d\,k-d\,m-2\,c\,z)^{q+1}\left(\frac{(d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.\right.$$

$$\left.\frac{(-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)-\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(-2\,d\,k+d\,m-2\,c\,z)^{q+1}\left(\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{4\,c}\right)-(-1)^n\,e^{-\frac{d^2\,(m-2\,k)^2}{2\,c}}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(2\,d\,k-d\,m-2\,c\,z)$$

$$(d\,(m-2\,k)+2\,c\,z)^q\left(-\frac{(d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$(-1)^{m+n}\,e^{-\frac{d^2\,(m-2\,k)^2}{2\,c}+e\,(4\,k-2\,m)}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\left(-\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(d\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1759.01

$$\int z^n \sinh^m(e+d\,z)\cosh\left(\sqrt{z}\;c\right)dz == 2^{-m-2}\left(4\,i^{-m}\,c^{-2\,n-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\,\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\,\right)\right)(m \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{-\frac{c^2}{4\,d\,(m-2\,u)}-e\,m-2\,e\,u}\,(d\,(m-2\,u))^{-2\,n-2}\binom{m}{u}$$

$$\left((-1)^m\,e^{\frac{c^2}{2\,d\,(m-2\,u)}+4\,e\,u}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c-2\,d\,(m-2\,u)\,\sqrt{z}\,\right)^{h+k}\left(\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}\,-c\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)-2\,d\,(m-2\,u)\right.$$

$$\left.\sqrt{\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)\right)+(-1)^m\,e^{\frac{c^2}{2\,d\,(m-2\,u)}+4\,e\,u}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$\left.2\,d\,(m-2\,u)\sqrt{\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,d\,(m-2\,u)\sqrt{-\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$\left.c\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,d\,(m-2\,u)\sqrt{-\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$\left.\left(\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2\right)\right)\right)$$

Involving $z^{\alpha-1}\sinh^m(b\,z^r)\cosh(c\,z^r)$

01.20.21.1760.01

$$\int z^{\alpha-1}\sinh^m(b\,z^r)\cosh(c\,z^r)\,dz == 2^{-m-1}\,z^{\alpha}\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{\alpha}{r},-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},c\,z^r\right)\right)(m \bmod 2-1)}{r}-\right.$$

$$\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{\alpha}{r},(-c-2\,b\,k+b\,m)\,z^r\right)((-c-2\,b\,k+b\,m)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$(-1)^m\,((c-2\,b\,k+b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2\,b\,k+b\,m)\,z^r\right)+((-c+2\,b\,k-b\,m)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},(-c+2\,b\,k-b\,m)\,z^r\right)+((c+2\,b\,k-b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2\,b\,k-b\,m)\,z^r\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1761.01

$$\int z^n\sinh^m(b\,z^2)\cosh(c\,z^2)\,dz ==$$

$$2^{-m-2}\,z^{n+1}\left(i^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(m \bmod 2-1)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{n+1}{2},(-c-2\,b\,k+b\,m)\,z^2\right)\left((-c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$(-1)^m\left((c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(c-2\,b\,k+b\,m)\,z^2\right)+\left((-c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\right.$$

$$\left.\left.\left.(-c+2\,b\,k-b\,m)\,z^2\right)+\left((c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(c+2\,b\,k-b\,m)\,z^2\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1762.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\ c\right)dz ==$$

$$2^{-m-1}\left(2\,i^{-m}\,c^{-2n-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\sqrt{z}\right)\right)(m \bmod 2-1)-2\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\right.$$

$$\left((-1)^m\,\Gamma\left(2\,(n+1),\,(-c-2\,b\,k+b\,m)\sqrt{z}\right)\left((-c-2\,b\,k+b\,m)\sqrt{z}\right)^{-2(n+1)}+\left((-c+2\,b\,k-b\,m)\sqrt{z}\right)^{-2(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\,(-c+2\,b\,k-b\,m)\sqrt{z}\right)+\left((c+2\,b\,k-b\,m)\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2\,(n+1),\,(c+2\,b\,k-b\,m)\sqrt{z}\right)+$$

$$\left.\left.(-1)^m\,\left((c+b\,(m-2\,k))\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2\,(n+1),\,(c+b\,(m-2\,k))\sqrt{z}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^m\left(b\,z^r+e\right)\cosh\left(c\,z^r\right)$

01.20.21.1763.01

$$\int z^{\alpha-1}\sinh^m(b\,z^r+e)\cosh(c\,z^r)\,dz == 2^{-m-1}\,z^\alpha\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{\alpha}{r},\,-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,z^r\right)\right)(m \bmod 2-1)}{r}-\right.$$

$$\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(-c-2\,b\,k+b\,m)\,z^r\right)\left((-c-2\,b\,k+b\,m)\,z^r\right)^{-\frac{\alpha}{r}}+\right.$$

$$(-1)^m\left((c-2\,b\,k+b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(c-2\,b\,k+b\,m)\,z^r\right)+e^{-4\,e\,k+2\,e\,m}\left((-c+2\,b\,k-b\,m)\,z^r\right)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},\,(-c+2\,b\,k-b\,m)\,z^r\right)+e^{2\,e\,m-4\,e\,k}\left((c+2\,b\,k-b\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(c+2\,b\,k-b\,m)\,z^r\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1764.01

$$\int z^n\sinh^m\left(b\,z^2+e\right)\cosh\left(c\,z^2\right)dz ==$$

$$2^{-m-2}\,z^{n+1}\left(i^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(m \bmod 2-1)-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\right.$$

$$\left((-1)^m\,\Gamma\left(\frac{n+1}{2},\,(-c-2\,b\,k+b\,m)\,z^2\right)\left((-c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+(-1)^m\left((c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},\,(c-2\,b\,k+b\,m)\,z^2\right)+e^{-4\,e\,k+2\,e\,m}\left((-c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-c+2\,b\,k-b\,m)\,z^2\right)+$$

$$\left.\left.e^{2\,e\,m-4\,e\,k}\left((c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c+2\,b\,k-b\,m)\,z^2\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1765.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c\right)dz == 2^{-m-1}\left(2\,i^{-m}\,c^{-2\,n-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(m \bmod 2-1)-\right.$$

$$2\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,e\,k-e\,m}\,\Gamma\left(2\,(n+1),\,(-c-2\,b\,k+b\,m)\,\sqrt{z}\right)\left((-c-2\,b\,k+b\,m)\,\sqrt{z}\right)^{-2\,(n+1)}+\right.$$

$$e^{e\,(m-2\,k)}\left((-c+2\,b\,k-b\,m)\,\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(-c+2\,b\,k-b\,m)\,\sqrt{z}\right)+$$

$$e^{-2\,e\,k+e\,m}\left((c+2\,b\,k-b\,m)\,\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(c+2\,b\,k-b\,m)\,\sqrt{z}\right)+$$

$$\left.\left.(-1)^m\,e^{2\,e\,k-e\,m}\left((c+b\,(m-2\,k))\,\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(c+b\,(m-2\,k))\,\sqrt{z}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b\,z^r+d\,z)\cosh(c\,z^r)$

01.20.21.1766.01

$$\int z^n \sinh^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2\right)dz ==$$

$$2^{-m-2}\left(-i^{-m}\,z^{n+1}\left(-c^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\left(-c\,z^2\right)^{\frac{n+1}{2}}+\left(c\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\right)(1-m \bmod 2)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(e^{\frac{d^2\,(m-2\,k)^2}{4\,c+8\,b\,k-4\,b\,m}+i\,m\,\pi}\right.$$

$$\left(\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d\,(m-2\,k)+2\,(-c-2\,b\,k+b\,m)\,z)^{q+1}\left(\frac{(d\,(m-2\,k)+2\,(-c-2\,b\,k+b\,m)\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d\,(m-2\,k)+2\,(-c-2\,b\,k+b\,m)\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)(-c-2\,b\,k+b\,m)^{-n-1}+$$

$$e^{\frac{d^2\,(m-2\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}+i\,m\,\pi}\,(c+b\,(m-2\,k))^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d\,(m-2\,k)+2\,(c+b\,(m-2\,k))\,z)^{q+1}$$

$$\left(\frac{(d\,(m-2\,k)+2\,(c+b\,(m-2\,k))\,z)^2}{-c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d\,(m-2\,k)+2\,(c+b\,(m-2\,k))\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{d^2\,(m-2\,k)^2}{-4\,c+8\,b\,k-4\,b\,m}}\,(-c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\,(2\,d\,k+4\,b\,z\,k-d\,m-2\,c\,z-2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(d\,(m-2\,k)+2\,(c+b\,(m-2\,k))\,z)^2}{-c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(m-2\,k)+2\,(c+b\,(m-2\,k))\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{d^2\,(m-2\,k)^2}{4\,c+8\,b\,k-4\,b\,m}}\,(c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\,(d\,(2\,k-m)+2\,(c+2\,b\,k-b\,m)\,z)^{q+1}$$

$$\left(-\frac{(d\,(m-2\,k)+2\,(-c-2\,b\,k+b\,m)\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(m-2\,k)+2\,(-c-2\,b\,k+b\,m)\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1767.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right)\cosh\left(\sqrt{z}\ c\right)dz == 2^{-m-2}\left(4\,i^{-m}\,c^{-2\,n-2}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(m \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{-\frac{\frac{c^2}{d\,(m-2\,u)}+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}}{4}}\binom{m}{u}(d\,(m-2\,u))^{-2\,n-2}$$

$$\left((-1)^m\,e^{\frac{1}{2}\left(\frac{(m-2\,u)\,b^2}{d}+\frac{c^2}{d\,(m-2\,u)}\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)+\right.\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+(-1)^m\,e^{\frac{1}{2}\left(\frac{c^2}{d\,(m-2\,u)}+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}\right)}\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,m-2\,b\,u)\right.$$

$$\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$\left.2\,d\,(m-2\,u)\sqrt{\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)+$$

$$e^{\frac{bc}{d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-c+bm-2bu)^{-h-k+2n}\left(-c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-c+bm-2bu)\left(-c+b(m-2u)+\right.\right.$$

$$\left.2d(m-2u)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(-c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)+$$

$$2d(m-2u)\sqrt{-\frac{\left(-c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.-\frac{\left(-c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c+bm-2bu)^{-h-k+2n}\left(c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+bm-2bu)\right.$$

$$\left(c+b(m-2u)+2d(m-2u)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)+2$$

$$d(m-2u)\sqrt{-\frac{\left(c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c+b(m-2u)+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b z^r + d z + e\right) \cosh\left(c z^r\right)$

01.20.21.1768.01

$$\int z^n \sinh^m\left(b z^2 + d z + e\right) \cosh\left(c z^2\right) dz ==$$

$$2^{-m-2}\left(-i^{-m} z^{n+1} \left(-c^2 z^4\right)^{\frac{1}{2}(-n-1)} \binom{m}{\frac{m}{2}} \left(\Gamma\left(\frac{n+1}{2}, c z^2\right)\left(-c z^2\right)^{\frac{n+1}{2}} + \left(c z^2\right)^{\frac{n+1}{2}} \Gamma\left(\frac{n+1}{2}, -c z^2\right)\right)(1 - m \bmod 2) -\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^{k+m} e^{2 e k - e m} \binom{m}{k} \left(e^{\frac{d^2 (m-2k)^2}{4c+8bk-4bm} + 2e(m-2k) + i m \pi}\right.$$

$$\left(\sum_{q=0}^{n} \left(d\left(k - \frac{m}{2}\right)\right)^{n-q} (d(m-2k) + 2(-c-2bk+bm) z)^{q+1} \left(\frac{(d(m-2k) + 2(-c-2bk+bm) z)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d(m-2k) + 2(-c-2bk+bm) z)^2}{4c+8bk-4bm}\right)\right)(-c-2bk+bm)^{-n-1} +$$

$$e^{\frac{d^2 (m-2k)^2}{-4c+8bk-4bm} + 2e(m-2k) + i m \pi} (c + b(m-2k))^{-n-1} \sum_{q=0}^{n} \left(d\left(k - \frac{m}{2}\right)\right)^{n-q} (d(m-2k) + 2(c+b(m-2k)) z)^{q+1}$$

$$\left(\frac{(d(m-2k) + 2(c+b(m-2k)) z)^2}{-c+2bk-bm}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d(m-2k) + 2(c+b(m-2k)) z)^2}{-4c+8bk-4bm}\right) +$$

$$e^{-\frac{d^2 (m-2k)^2}{-4c+8bk-4bm}} (-c+2bk-bm)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (d(m-2k))^{n-q} (2dk + 4bzk - dm - 2cz - 2bmz)^{q+1}$$

$$\left(-\frac{(d(m-2k) + 2(c+b(m-2k)) z)^2}{-c+2bk-bm}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d(m-2k) + 2(c+b(m-2k)) z)^2}{-4c+8bk-4bm}\right) +$$

$$e^{-\frac{d^2 (m-2k)^2}{4c+8bk-4bm}} (c+2bk-bm)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (d(m-2k))^{n-q} (d(2k-m) + 2(c+2bk-bm) z)^{q+1}$$

$$\left(-\frac{(d(m-2k) + 2(-c-2bk+bm) z)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(d(m-2k) + 2(-c-2bk+bm) z)^2}{4c+8bk-4bm}\right)\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1769.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + e + d z\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-2}\left(4 i^{-m} c^{-2n-2} \binom{m}{\frac{m}{2}} \left(\Gamma\left(2(n+1), -c\sqrt{z}\right) + \Gamma\left(2(n+1), c\sqrt{z}\right)\right)(m \bmod 2 - 1) +\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\, e^{-e\,(m+2\,u)-\frac{1}{4}\left(\frac{c^2}{d\,(m-2\,u)}+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}\right)}\binom{m}{u}(d\,(m-2\,u))^{-2\,n-2}$$

$$\left((-1)^m\, e^{\frac{1}{2}\left(\frac{(m-2\,u)\,b^2}{d}+8\,e\,u+\frac{c^2}{d\,(m-2\,u)}\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)+\right.\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+(-1)^m\, e^{\frac{1}{2}\left(\frac{c^2}{d\,(m-2\,u)}+8\,e\,u+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}\right)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,m-2\,b\,u)\right.$$

$$\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{\frac{b c}{d}+2 e m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(-c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)+\right.\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\sqrt{-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{d\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,m-2\,b\,u)\right.$$

$$\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{d\,(m-2\,u)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{2}}{4\,d\,(m-2\,u)}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}$$

Involving $z^n \sinh^m(d\,z)\cosh(c\,z^r+g)$

01.20.21.1770.01

$$\int z^n \sinh^m(d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$2^{-m-2}\left(i^{-m}\,e^{-g}\,z^{n+1}\left(-c^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\left(-c\,z^2\right)^{\frac{n+1}{2}}+e^{2g}\left(c\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\right)(m \bmod 2-1)-\right.$$

$$c^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,e^{-\frac{4\,c\,g-d^2\,(m-2\,k)^2}{4\,c}}\binom{m}{k}\left(-(-1)^m\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\,(2\,d\,k-d\,m-2\,c\,z)^{q+1}\right.$$

$$\left(\frac{(d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)-$$

$$\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(-2\,d\,k+d\,m-2\,c\,z)^{q+1}\left(\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{4\,c}\right)-(-1)^n\,e^{2\,g-\frac{d^2\,(m-2\,k)^2}{2\,c}}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(2\,d\,k-d\,m-2\,c\,z)$$

$$(d\,(m-2\,k)+2\,c\,z)^q\left(-\frac{(d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$(-1)^{m+n}\,e^{2\,g-\frac{d^2\,(m-2\,k)^2}{2\,c}}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\left(-\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(d\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1771.01

$$\int z^n \sinh^m(d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-2}\left(4\,i^{-m}\,c^{-2\,n-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(e^{2\,g}\,\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(m \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{-\frac{c^2}{4\,d\,(m-2\,u)}-g}\,(d\,(m-2\,u))^{-2\,n-2}\binom{m}{u}$$

$$\left((-1)^m\,e^{\frac{c^2}{2\,d\,(m-2\,u)}+2\,g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}\;-c\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$(-1)^m\,e^{\frac{c^2}{2\,d\,(m-2\,u)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,d\,(m-2\,u)\,\sqrt{-\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)-c\right.$$

$$\left.\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(2\,d\,(m-2\,u)\,\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{2\,g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,d\,(m-2\,u)\,\sqrt{-\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(c+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$\left.\left(\right.\right.$$

Involving $z^n \sinh^m(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.1772.01

$$\int z^n \sinh^m(e+d\,z)\cosh\left(c\,z^2+g\right)dz ==$$

$$2^{-m-2}\left(i^{-m}\,e^{-g}\,z^{n+1}\left(-c^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\left(-c\,z^2\right)^{\frac{n+1}{2}}+e^{2g}\left(c\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\right)(m \bmod 2-1)-\right.$$

$$c^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,e^{-\frac{-d^2\,(m-2\,k)^2-4\,c\,(-g-2\,e\,k+e\,m)}{4\,c}}\binom{m}{k}$$

$$\left(-(-1)^m\,e^{4\,e\,k-2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\,(2\,d\,k-d\,m-2\,c\,z)^{q+1}\left(\frac{(d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.\right.$$

$$\left.\frac{(-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)-\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(-2\,d\,k+d\,m-2\,c\,z)^{q+1}\left(\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{4\,c}\right)-(-1)^n\,e^{2\,g-\frac{d^2\,(m-2\,k)^2}{2\,c}}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(2\,d\,k-d\,m-2\,c\,z)$$

$$(d\,(m-2\,k)+2\,c\,z)^q\left(-\frac{(d\,(m-2\,k)+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$(-1)^{m+n}\,e^{-\frac{d^2\,(m-2\,k)^2}{2\,c}+2\,g+e\,(4\,k-2\,m)}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\left(-\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(d\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,d\,k+d\,m-2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1773.01

$$\int z^n \sinh^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-2}\left(4\,i^{-m}\,c^{-2\,n-2}\,e^{-g}\binom{m}{\frac{m}{2}}\left(e^{2\,g}\,\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(m \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{-\frac{c^2}{4\,d\,(m-2\,u)}-g-e\,m-2\,e\,u}\,(d\,(m-2\,u))^{-2\,n-2}\binom{m}{u}$$

$$\left((-1)^m e^{\frac{c^2}{2d(m-2u)}+2g+4eu}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k c^{-h-k+2n}\left(c-2d(m-2u)\sqrt{z}\right)^{h+k}\left(\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(2d(m-2u)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{4d(m-2u)}\right)-2d(m-2u)\right.$$

$$\left.\left.\sqrt{\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{4d(m-2u)}\right)\right)+(-1)^m e^{\frac{c^2}{2d(m-2u)}+4eu}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-c)^{-h-k+2n}\left(-c-2d(m-2u)\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2d(m-2u)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)-\right.$$

$$\left.2d(m-2u)\sqrt{\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)\right)+$$

$$e^{2em}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-c)^{-h-k+2n}\left(2d(m-2u)\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2d(m-2u)\sqrt{-\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{4d(m-2u)}\right)-\right.$$

$$\left.c\left(2d(m-2u)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(2d(m-2u)\sqrt{z}-c\right)^2}{4d(m-2u)}\right)\right)+$$

$$e^{2g+2em}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2n}\left(c+2d(m-2u)\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2d(m-2u)\sqrt{-\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{d(m-2u)}}\;\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)-\right.$$

$$\left.c\left(-c-2d(m-2u)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2d(m-2u)\sqrt{z}\right)^2}{4d(m-2u)}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^m(b\,z^r)\cosh(c\,z^r+g)$

01.20.21.1774.01

$$\int z^{\alpha-1}\sinh^m(b\,z^r)\cosh(c\,z^r+g)\,dz==$$

$$2^{-m-1}\,z^{\alpha}\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\left(e^g\,\Gamma\left(\frac{\alpha}{r},-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+e^{-g}\,(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},c\,z^r\right)\right)(m\bmod 2-1)}{r}-\frac{1}{r}e^{-g}\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2g}\,\Gamma\left(\frac{\alpha}{r},(-c-2bk+bm)z^r\right)((-c-2bk+bm)z^r)^{-\frac{\alpha}{r}}+(-1)^m((c-2bk+bm)z^r)^{-\frac{\alpha}{r}}\,\Gamma\right.$$

$$\left.\left(\frac{\alpha}{r},(c-2bk+bm)z^r\right)+e^{2g}((-c+2bk-bm)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-c+2bk-bm)z^r\right)+\right.$$

$$\left.\left.((c+2bk-bm)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2bk-bm)z^r\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1775.01

$$\int z^n \sinh^m\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz ==$$

$$2^{-m-2}\,z^{n+1}\left(i^{-m}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},\,-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,z^2\right)\right)(m \bmod 2-1)-\right.$$

$$e^{-g}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2g}\,\Gamma\left(\frac{n+1}{2},\,(-c-2\,b\,k+b\,m)\,z^2\right)\left((-c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$(-1)^m\left((c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-2\,b\,k+b\,m)\,z^2\right)+e^{2g}\left((-c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\right.$$

$$\left.\left.\left.(-c+2\,b\,k-b\,m)\,z^2\right)+\left((c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c+2\,b\,k-b\,m)\,z^2\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1776.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-m-1}\left(2\,i^{-m}\,c^{-2\,n-2}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),\,-c\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),\,c\sqrt{z}\right)\right)(m \bmod 2-1)-2\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\right.$$

$$\left(\left((-1)^m\,e^{g}\,\Gamma\left(2\,(n+1),\,(-c-2\,b\,k+b\,m)\sqrt{z}\right)\left((-c-2\,b\,k+b\,m)\sqrt{z}\right)^{-2\,(n+1)}+e^{g}\left((-c+2\,b\,k-b\,m)\sqrt{z}\right)^{-2\,(n+1)}\right.\right.$$

$$\Gamma\left(2\,(n+1),\,(-c+2\,b\,k-b\,m)\sqrt{z}\right)+e^{-g}\left((c+2\,b\,k-b\,m)\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(c+2\,b\,k-b\,m)\sqrt{z}\right)+$$

$$\left.\left.(-1)^m\,e^{-g}\left((c+b\,(m-2\,k))\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(c+b\,(m-2\,k))\sqrt{z}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1777.01

$$\int z^{\alpha-1} \sinh^m(b\,z^r+e)\cosh(c\,z^r+g)\,dz ==$$

$$2^{-m-1}\,z^{\alpha}\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{\alpha}{r},-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+e^{-g}\,(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},c\,z^r\right)\right)(m \bmod 2-1)}{r}-\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-g+2\,e\,k-e\,m}\right.$$

$$\binom{m}{k}\left((-1)^m\,e^{2\,g}\,\Gamma\left(\frac{\alpha}{r},(-c-2\,b\,k+b\,m)\,z^r\right)((-c-2\,b\,k+b\,m)\,z^r)^{-\frac{\alpha}{r}}+(-1)^m\,((c-2\,b\,k+b\,m)\,z^r)^{-\frac{\alpha}{r}}\right.$$

$$\Gamma\left(\frac{\alpha}{r},(c-2\,b\,k+b\,m)\,z^r\right)+e^{2\,g-4\,e\,k+2\,e\,m}\,((-c+2\,b\,k-b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-c+2\,b\,k-b\,m)\,z^r\right)+$$

$$\left.\left.e^{2\,e\,m-4\,e\,k}\,((c+2\,b\,k-b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2\,b\,k-b\,m)\,z^r\right)\right)\right)/;\,m\in\mathbb{N}^+$$

01.20.21.1778.01

$$\int z^n \sinh^m\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz == 2^{-m-2}\,z^{n+1}$$

$$\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},-c\,z^2\right)\left(-c\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g}\left(c\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},c\,z^2\right)\right)(m \bmod 2-1)}{2}-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-g+2\,e\,k-e\,m}\binom{m}{k}\right.$$

$$\left((-1)^m\,e^{2\,g}\,\Gamma\left(\frac{n+1}{2},(-c-2\,b\,k+b\,m)\,z^2\right)\left((-c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}+(-1)^m\left((c-2\,b\,k+b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},(c-2\,b\,k+b\,m)\,z^2\right)+e^{2\,g-4\,e\,k+2\,e\,m}\left((-c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(-c+2\,b\,k-b\,m)\,z^2\right)+$$

$$\left.\left.e^{2\,e\,m-4\,e\,k}\left((c+2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c+2\,b\,k-b\,m)\,z^2\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1779.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-m-1}\left(2\,i^{-m}\,c^{-2\,n-2}\binom{m}{\frac{m}{2}}\left(e^{g}\,\Gamma\left(2\,(n+1),\,-c\,\sqrt{z}\right)+e^{-g}\,\Gamma\left(2\,(n+1),\,c\,\sqrt{z}\right)\right)(m \bmod 2-1)-\right.$$

$$2\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{g+2\,e\,k-e\,m}\,\Gamma\left(2\,(n+1),\,(-c-2\,b\,k+b\,m)\,\sqrt{z}\right)\left((-c-2\,b\,k+b\,m)\,\sqrt{z}\right)^{-2\,(n+1)}+\right.$$

$$e^{g+e\,(m-2\,k)}\left((-c+2\,b\,k-b\,m)\,\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(-c+2\,b\,k-b\,m)\,\sqrt{z}\right)+$$

$$e^{-g-2\,e\,k+e\,m}\left((c+2\,b\,k-b\,m)\,\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(c+2\,b\,k-b\,m)\,\sqrt{z}\right)+$$

$$\left.\left.(-1)^m\,e^{-g+2\,e\,k-e\,m}\left((c+b\,(m-2\,k))\,\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(c+b\,(m-2\,k))\,\sqrt{z}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1780.01

$$\int z^n \sinh^m\left(b z^2 + d z\right) \cosh\left(c z^2 + g\right) dz ==$$

$$2^{-m-2}\left(-i^{-m} e^{-g} z^{n+1} \left(-c^2 z^4\right)^{\frac{1}{2}(-n-1)} \binom{m}{\frac{m}{2}} \left(\Gamma\left(\frac{n+1}{2}, c z^2\right)\left(-c z^2\right)^{\frac{n+1}{2}} + e^{2g}\left(c z^2\right)^{\frac{n+1}{2}} \Gamma\left(\frac{n+1}{2}, -c z^2\right)\right)(1 - m \bmod 2) -\right.$$

$$e^{-g} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{k+m} \binom{m}{k} \left(e^{\frac{d^2 (m-2k)^2}{4c+8bk-4bm} + i m \pi} \right.$$

$$\left(\sum_{q=0}^{n} \left(d\left(k - \frac{m}{2}\right)\right)^{n-q} (d(m-2k) + 2(-c-2bk+bm)z)^{q+1} \left(\frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{c+2bk-bm} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{4c+8bk-4bm} \right) \right) (-c-2bk+bm)^{-n-1} +$$

$$e^{\frac{d^2 (m-2k)^2}{-4c+8bk-4bm} + 2g + i m \pi} (c + b(m-2k))^{-n-1} \sum_{q=0}^{n} \left(d\left(k - \frac{m}{2}\right)\right)^{n-q} (d(m-2k) + 2(c+b(m-2k))z)^{q+1}$$

$$\left(\frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-c+2bk-bm} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-4c+8bk-4bm} \right) +$$

$$e^{-\frac{d^2 (m-2k)^2}{-4c+8bk-4bm}} (-c+2bk-bm)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (d(m-2k))^{n-q} (2dk + 4bzk - dm - 2cz - 2bmz)^{q+1}$$

$$\left(-\frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-c+2bk-bm} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-4c+8bk-4bm} \right) +$$

$$e^{2g - \frac{d^2 (m-2k)^2}{4c+8bk-4bm}} (c+2bk-bm)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (d(m-2k))^{n-q} (d(2k-m) + 2(c+2bk-bm)z)^{q+1}$$

$$\left(-\frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{c+2bk-bm} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{4c+8bk-4bm} \right) \right) \right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1781.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + d z\right) \cosh\left(\sqrt{z}\ c + g\right) dz ==$$

$$2^{-m-2}\left(4 i^{-m} c^{-2n-2} e^{-g} \binom{m}{\frac{m}{2}} \left(e^{2g}\,\Gamma\left(2(n+1), -c\sqrt{z}\right) + \Gamma\left(2(n+1), c\sqrt{z}\right)\right)(m \bmod 2 - 1) +\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\, e^{-g-\frac{1}{4}\left(\frac{c^2}{d\,(m-2\,u)}+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}\right)}\binom{m}{u}(d\,(m-2\,u))^{-2\,n-2}$$

$$\left((-1)^m\, e^{\frac{1}{2}\left(\frac{(m-2\,u)\,b^2}{d}+4\,g+\frac{c^2}{d\,(m-2\,u)}\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)+\right.\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+(-1)^m\, e^{\frac{1}{2}\left(\frac{c^2}{d\,(m-2\,u)}+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}\right)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,m-2\,b\,u)\right.$$

$$\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{\frac{b c}{d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c + b m - 2 b u)^{-h-k+2 n} \left(-c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{d (m-2u)}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((-c + b m - 2 b u) \left(-c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(-c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{4 d (m-2u)}\right) + 2 d (m-2u) \sqrt{-\frac{\left(-c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{d (m-2u)}} \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(-c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{4 d (m-2u)}\right)\right) +$$

$$e^{2 g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c + b m - 2 b u)^{-h-k+2 n} \left(c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{d (m-2u)}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((c + b m - 2 b u) \left(c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{4 d (m-2u)}\right) + 2 d (m-2u) \sqrt{-\frac{\left(c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{d (m-2u)}} \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c + b (m-2u) + 2 d (m-2u) \sqrt{z}\right)^2}{4 d (m-2u)}\right)\right)\Bigg) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + d z + e) \cosh(c z^r + g)$

01.20.21.1782.01

$$\int z^n \sinh^m\left(b z^2+d z+e\right)\cosh\left(c z^2+g\right) dz ==$$

$$2^{-m-2}\left(-i^{-m} e^{-g} z^{n+1}\left(-c^2 z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2}, c z^2\right)\left(-c z^2\right)^{\frac{n+1}{2}}+e^{2g}\left(c z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2}, -c z^2\right)\right)(1-m \bmod 2)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m} e^{-g+2ek-em}\binom{m}{k}\left(e^{\frac{d^2(m-2k)^2}{4c+8bk-4bm}+2e(m-2k)+im\pi}\right.$$

$$\left(\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d(m-2k)+2(-c-2bk+bm)z)^{q+1}\left(\frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{4c+8bk-4bm}\right)\right)(-c-2bk+bm)^{-n-1}+$$

$$e^{\frac{d^2(m-2k)^2}{-4c+8bk-4bm}+2e(m-2k)+2g+im\pi}(c+b(m-2k))^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d(m-2k)+2(c+b(m-2k))z)^{q+1}$$

$$\left(\frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-4c+8bk-4bm}\right)+$$

$$e^{-\frac{d^2(m-2k)^2}{-4c+8bk-4bm}}(-c+2bk-bm)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(2dk+4bzk-dm-2cz-2bmz)^{q+1}$$

$$\left(-\frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(d(m-2k)+2(c+b(m-2k))z)^2}{-4c+8bk-4bm}\right)+$$

$$e^{2g-\frac{d^2(m-2k)^2}{4c+8bk-4bm}}(c+2bk-bm)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(d(2k-m)+2(c+2bk-bm)z)^{q+1}$$

$$\left(-\frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(d(m-2k)+2(-c-2bk+bm)z)^2}{4c+8bk-4bm}\right)\right)\right)/; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1783.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e+d z\right)\cosh\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-m-2}\left(4 i^{-m} c^{-2n-2} e^{-g}\binom{m}{\frac{m}{2}}\left(e^{2g}\Gamma\left(2(n+1), -c\sqrt{z}\right)+\Gamma\left(2(n+1), c\sqrt{z}\right)\right)(m \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{-g-e\,(m+2\,u)-\frac{1}{4}\left(\frac{c^2}{d\,(m-2\,u)}+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}\right)}\binom{m}{u}(d\,(m-2\,u))^{-2\,n-2}\left((-1)^m\,e^{\frac{1}{2}\left(\frac{(m-2\,u)\,b^2}{d}+4\,g+8\,e\,u+\frac{c^2}{d\,(m-2\,u)}\right)}\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)+\right.\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\,\sqrt{\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+(-1)^m\,e^{\frac{1}{2}\left(\frac{c^2}{d\,(m-2\,u)}+8\,e\,u+\frac{(m-2\,u)\,b^2+2\,c\,b}{d}\right)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-c-b\,(m-2\,u)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,m-2\,b\,u)\right.$$

$$\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\,\sqrt{\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{\frac{b\,c}{d}+2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)+\right.\right.$$

$$\left.2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\,\sqrt{-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(-c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$e^{2\,g+2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c+b\,m-2\,b\,u)\right.$$

$$\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\,\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{d\,(m-2\,u)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,d\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,u)}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1784.01

$$\int z^n \sinh^m(d\,z)\cosh\left(c\,z^2+f\,z\right)dz == 2^{-m-2}\left(-i^{-m}\,c^{-n-1}\,e^{-\frac{f^2}{4c}}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\left(e^{\frac{f^2}{2c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\left.\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,c\,z)^2}{4\,c}\right)\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(-e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c}+i\,m\,\pi}\left(\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}\,(-f+d\,(m-2\,k)-2\,c\,z)^q\right.\right.$$

$$\left.\left(\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(f+d\,(2\,k-m)+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+d\,(2\,k-m)+2\,c\,z)^2}{4\,c}\right)\right)$$

$$(-c)^{-n-1}+e^{\frac{(f+d\,(m-2\,k))^2}{4\,c}}\left(\sum_{q=0}^{n}2^{q-n}\,(f+d\,(m-2\,k))^{n-q}\,(-f+d\,(2\,k-m)-2\,c\,z)^{q+1}\right.$$

$$\left.\left(\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,(m-2\,k))^2}{4\,c}+i\,m\,\pi}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}\left(-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$(f+d\,(m-2\,k)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f+2\,d\,k-d\,m)^2}{4\,c}}\sum_{q=0}^{n}2^{q-n}\,(-f-2\,d\,k+d\,m)^{n-q}\left(-\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(f+d\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,d\,k-d\,m+2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1785.01

$$\int z^n \sinh^m(d\,z)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-m-2}\left(\frac{1}{c}\left(i^{-m}\,2^{-2\,n}\,e^{-\frac{c^2}{4\,f}}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n+1}\left(c+2\,f\,\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\right.$$

$$f\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)-e^{\frac{c^2}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-c)^{-h-k+2\,n+1}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2\,f\sqrt{\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\right.$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\right)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\binom{m}{u}\left(-e^{\frac{c^2}{-4\,f+4\,d\,m-8\,d\,u}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left(c+2\,(f-d\,m+2\,d\,u)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(-c\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)-2\,(-f+d\,m-2\,d\,u)$$

$$\left.\left.\left.\sqrt{\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-f+d\,m-2\,d\,u}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)\right)\right)\right)$$

$$(f-d\,m+2\,d\,u)^{-2\,(n+1)}+e^{-\frac{c^2}{-4\,f-4\,d\,m+8\,d\,u}}\left(-(f+d\,m-2\,d\,u)^2\right)^{-2\,n-1}\left((-1)^m\,e^{\frac{2\,c^2}{-4\,f-4\,d\,m+8\,d\,u}}\right.$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-\right.$$

$$2\,(-f-d\,m+2\,d\,u)\sqrt{-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\right)\right)(-f-d\,m+2\,d\,u)^{2\,n}+$$

$$(f+d\,m-2\,d\,u)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-2\,(f+d\,m-2\,d\,u)$$

$$\left.\left.\sqrt{\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\right)\right)-$$

$$(-1)^m\,e^{-\frac{c^2}{4\,d\,(m-2\,u)-4\,f}}\,(-f+d\,m-2\,d\,u)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}$$

$$\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\;-c\right)^{h+k}\left(-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\;-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)-c\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1786.01

$$\int z^n \sinh^m(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz == 2^{-m-2}\left(-i^{-m}\,c^{-n-1}\,e^{-\frac{f^2}{4c}}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\left(e^{\frac{f^2}{2c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\,e^{2\,e\,k-e\,m}\binom{m}{k}\left(-e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c}+2\,e\,(m-2\,k)+i\,m\,\pi}\left(\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}\,(-f+d\,(m-2\,k)-2\,c\,z)^q\right.\right.$$

$$\left.\left(\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(f+d\,(2\,k-m)+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+d\,(2\,k-m)+2\,c\,z)^2}{4\,c}\right)\right)$$

$$(-c)^{-n-1}+e^{\frac{(f+d\,(m-2\,k))^2}{4\,c}}\left(\sum_{q=0}^{n}2^{q-n}\,(f+d\,(m-2\,k))^{n-q}\,(-f+d\,(2\,k-m)-2\,c\,z)^{q+1}\right.$$

$$\left.\left(\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,(m-2\,k))^2}{4\,c}+2\,e\,(m-2\,k)+i\,m\,\pi}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}\left(-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$(f+d\,(m-2\,k)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(f+2\,d\,k-d\,m)^2}{4\,c}}\sum_{q=0}^{n}2^{q-n}\,(-f-2\,d\,k+d\,m)^{n-q}\left(-\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(f+d\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,d\,k-d\,m+2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1787.01

$$\int z^n \sinh^m(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-m-2}\left(\frac{1}{c}\left(i^{-m}\,2^{-2\,n}\,e^{-\frac{c^2}{4\,f}}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n+1}\left(c+2\,f\,\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\right.$$

$$\left.f\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)-$$

$$e^{\frac{c^2}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n+1}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(2\,f\sqrt{\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-c\left(c+2\,f\,\sqrt{z}\right)\right.$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\right)-4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\,e^{e\,m-2\,e\,u}\binom{m}{u}$$

$$\left(e^{-2\,e\,(m-2\,u)}\left(e^{-\frac{c^2}{-4\,f-4\,d\,m+8\,d\,u}-4\,e\,u}\left(-(f+d\,m-2\,d\,u)^2\right)^{-2\,n-1}\left((-1)^m\,e^{2\left(\frac{c^2}{-4\,f-4\,d\,m+8\,d\,u}+e\,m\right)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\right.\right.\right.\right.$$

$$c^{-h-k+2\,n}\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\left.\left.\left.\left.\binom{n}{k}\left(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-\right.\right.\right.\right.$$

$$2\,(-f-d\,m+2\,d\,u)\sqrt{-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\Bigg)\Bigg)$$

$$(-f-d\,m+2\,d\,u)^{2\,n}+e^{4\,e\,u}\,(f+d\,m-2\,d\,u)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}$$

$$\left(-c-2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-$$

$$2\,(f+d\,m-2\,d\,u)\sqrt{\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\Bigg)\Bigg)-e^{\frac{c^2}{-4\,f+4\,d\,m-8\,d\,u}}$$

$$(f-d\,m+2\,d\,u)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\left(c+2\,(f-d\,m+2\,d\,u)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(-c\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)-2\,(-f+d\,m-2\,d\,u)$$

$$\sqrt{\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)\Bigg)\Bigg)-$$

$$(-1)^m e^{-\frac{c^2}{4\,d\,(m-2\,u)-4\,f}} (-f+d\,m-2\,d\,u)^{-2\,(n+1)} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-c)^{-h-k+2\,n}$$

$$\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^{h+k} \left(-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)-c\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)\right)\right)\Big/;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b\,z^r)\cosh(c\,z^r+f\,z)$

01.20.21.1788.01

$$\int z^n \sinh^m\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z\right)dz == -(-1)^n\,i^m\,2^{-m-2}\,c^{-n-1}\,e^{\frac{f^2}{4c}}\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$e^{-\frac{f^2}{2c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{f^2}{4\,c+8\,b\,k-4\,b\,m}}\left(\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\left(\frac{(f+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}(-f-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z)^{q+1}\right.\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)(-c-2\,b\,k+b\,m)^{-n-1}+$$

$$e^{\frac{f^2}{-4\,c+8\,b\,k-4\,b\,m}}(c-2\,b\,k+b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2\,(c-2\,b\,k+b\,m)\,z)^{q+1}$$

$$\left(-\frac{(f+2\,(c-2\,b\,k+b\,m)\,z)^2}{c-2\,b\,k+b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{f^2}{-4\,c+8\,b\,k-4\,b\,m}+i\,m\,\pi}(-c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,f^{n-q}\,(-f-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(f+2\,(c-2\,b\,k+b\,m)\,z)^2}{-c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{i\,m\,\pi-\frac{f^2}{4\,c+8\,b\,k-4\,b\,m}}(c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(f+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1789.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-m-2}\left(\frac{1}{c}\left(i^{-m}\,2^{-2\,n}\,e^{-\frac{c^2}{4\,f}}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n+1}\left(c+2\,f\,\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-2\right.$$

$$\left. f \sqrt{-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right) - e^{\frac{c^2}{2 f}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k$$

$$(-c)^{-h-k+2 n+1}\left(-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(2 f \sqrt{\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right)\right)\Bigg)+$$

$$(-1)^m 2^{-2 n} f^{-2(n+1)} \sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u \binom{m}{u}\left(e^{\frac{(c+b(m-2u))^2}{4 f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(-c-b m+2 b u)^{-h-k+2 n}\right.\right.$$

$$\left(-c-b(m-2u)-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b(m-2u))\left(c+b(m-2u)+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{4 f}\right)-\right.$$

$$\left.2 f \sqrt{\frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{4 f}\right)\right)+$$

$$(-1)^m e^{-\frac{(c+b(m-2u))^2}{2 f}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(c+b(m-2u))^{-h-k+2 n}\left(c+b(m-2u)+2 f \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$(-1)^m\,e^{\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\,\sqrt{\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c-b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+e\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1790.01

$$\int z^n \sinh^m\left(b z^2+e\right)\cosh\left(c z^2+f z\right) dz == -(-1)^n i^m 2^{-m-2} c^{-n-1} e^{\frac{f^2}{4c}} \binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\left(\sum_{q=0}^{n}(-1)^q 2^{q-n} f^{n-q} (f+2cz)^{q+1}\left(\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(f+2cz)^2}{4c}\right)+\right.$$

$$\left. e^{-\frac{f^2}{2c}}\sum_{q=0}^{n}(-1)^q 2^{q-n} f^{n-q} (f+2cz)^{q+1}\left(-\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f+2cz)^2}{4c}\right)\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-2ek+em}\binom{m}{k}\left(e^{\frac{f^2}{4c+8bk-4bm}}\left(\sum_{q=0}^{n}2^{q-n} f^{n-q}\left(\frac{(f+2cz+4bkz-2bmz)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.\left.(-f-2cz-4bkz+2bmz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(f+2cz+4bkz-2bmz)^2}{4c+8bk-4bm}\right)\right)(-c-2bk+bm)^{-n-1}+\right.$$

$$e^{\frac{f^2}{-4c+8bk-4bm}}(c-2bk+bm)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f)^{n-q}(f+2(c-2bk+bm)z)^{q+1}$$

$$\left(-\frac{(f+2(c-2bk+bm)z)^2}{c-2bk+bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(f+2(c-2bk+bm)z)^2}{-4c+8bk-4bm}\right)+$$

$$e^{-\frac{f^2}{-4c+8bk-4bm}+e(4k-2m)+im\pi}(-c+2bk-bm)^{-n-1}\sum_{q=0}^{n}2^{q-n} f^{n-q}(-f-2cz+4bkz-2bmz)^{q+1}$$

$$\left(-\frac{(f+2(c-2bk+bm)z)^2}{-c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f+2(c-2bk+bm)z)^2}{-4c+8bk-4bm}\right)+$$

$$e^{-\frac{f^2}{4c+8bk-4bm}+e(4k-2m)+im\pi}(c+2bk-bm)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f)^{n-q}(f+2cz+4bkz-2bmz)^{q+1}$$

$$\left.\left(-\frac{(f+2cz+4bkz-2bmz)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(f+2cz+4bkz-2bmz)^2}{4c+8bk-4bm}\right)\right) /; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1791.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+f z\right) dz ==$$

$$2^{-m-2}\left(\frac{1}{c}\left(i^{-m}2^{-2n}e^{-\frac{c^2}{4f}}f^{-2(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k c^{-h-k+2n+1}\left(c+2f\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-2\right.$$

$$\left. f \sqrt{-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right)-e^{\frac{c^2}{2 f}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k$$

$$(-c)^{-h-k+2 n+1}\left(-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(2 f \sqrt{\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right)\right)+$$

$$(-1)^m 2^{-2 n} f^{-2(n+1)} \sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u e^{e m-2 e u}\binom{m}{u}\left(e^{\frac{(c+b(m-2u))^2}{4 f}}\left(e^{-2 e(m-2 u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(-c-b m+2 b u)^{-h-k+2 n}\right.\right.$$

$$\left(-c-b(m-2 u)-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b(m-2 u))\left(c+b(m-2 u)+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{4 f}\right)-\right.$$

$$\left.\left.2 f \sqrt{\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{4 f}\right)\right)+$$

$$(-1)^m e^{-\frac{(c+b(m-2u))^2}{2 f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(c+b(m-2 u))^{-h-k+2 n}\left(c+b(m-2 u)+2 f \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$(-1)^m\,e^{\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}-2\,e\,(m-2\,u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c-b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.1792.01

$$\int z^n \sinh^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z\right)dz == -(-1)^n\,i^m\,2^{-m-2}\,c^{-n-1}\,e^{\frac{f^2}{4c}}\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$e^{-\frac{f^2}{2c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}\left(\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}\left(\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$(-f-2\,d\,k+d\,m-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z)^{q+1}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)(-c-2\,b\,k+b\,m)^{-n-1}+\right.$$

$$e^{\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}}(c-2\,b\,k+b\,m)^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^{q+1}$$

$$\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{c-2\,b\,k+b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}+i\,m\,\pi}(-c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(f-2\,d\,k+d\,m)^{n-q}$$

$$(-f+2\,d\,k-d\,m-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{i\,m\,\pi-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}(c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-f-2\,d\,k+d\,m)^{n-q}\,(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

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$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right) \cosh\left(\sqrt{z}\ c + f\,z\right) dz == i^m\, 2^{-m-2\,n-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\, f^{-2\,n-2}$$

$$\left(e^{\frac{c^2}{4\,f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-c)^{-h-k+2\,n} \left(-c - 2\,f\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-c \left(-c - 2\,f\,\sqrt{z}\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) - 2\,f \sqrt{\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) \right) +$$

$$e^{-\frac{c^2}{4\,f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, c^{-h-k+2\,n} \left(c + 2\,f\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(c \left(c + 2\,f\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f} \right) \right) \right) + 2^{-m-2\,n-2} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u}$$

$$\left((-1)^m\, e^{-\frac{(b\,(2\,u-m)-c)^2}{4\,(d\,(2\,u-m)-f)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b\,(2\,u-m)-c)^{-h-k+2\,n} \left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^2}{d\,(2\,u-m)-f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b\,(2\,u-m)-c) \left(-c + b\,(2\,u-m) + \right.\right.$$

$$\left. \left. 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^2}{4\,(d\,(2\,u-m)-f)} \right) + 2 \right.$$

$$\left. \left. \sqrt{-\frac{\left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^2}{d\,(2\,u-m)-f}}\ (d\,(2\,u-m)-f) \right) \right)$$

$$\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{4(d(2u-m)-f)}\right)\Bigg)(d(2u-m)-f)^{-2n-2}+$$

$$(-1)^m e^{-\frac{(c+b(2u-m))^2}{4(f+d(2u-m))}}(f+d(2u-m))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c+b(2u-m))^{-h-k+2n}$$

$$\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{f+d(2u-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((c+b(2u-m))\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{4(f+d(2u-m))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{f+d(2u-m)}}\,(f+d(2u-m))\,\Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{4(f+d(2u-m))}\Bigg)\Bigg)+e^{-\frac{(b(m-2u)-c)^2}{4(d(m-2u)-f)}}(d(m-2u)-f)^{-2n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b(m-2u)-c)^{-h-k+2n}\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^2}{d(m-2u)-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((b(m-2u)-c)\left(-c+b(m-2u)+\right.$$

$$\left.2(d(m-2u)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^2}{4(d(m-2u)-f)}\right)+$$

$$2\sqrt{-\frac{\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^2}{d(m-2u)-f}}\,(d(m-2u)-f)\,\Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,u)-f)}\Bigg)+e^{-\frac{(c+b\,(m-2\,u))^2}{4\,(f+d\,(m-2\,u))}}\,(f+d\,(m-2\,u))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,(m-2\,u))^{-h-k+2\,n}\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+\right.$$

$$\left.2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}}\;(f+d\,(m-2\,u))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\sinh^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z\right)$

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$$\int z^n\sinh^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z\right)dz==-(-1)^n\,i^m\,2^{-m-2}\,c^{-n-1}\,e^{\frac{f^2}{4\,c}}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$e^{-\frac{f^2}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{e\,m-2\,e\,k}\binom{m}{k}\Bigg(e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}\Bigg(\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}$$

$$\left(\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}(-f-2\,d\,k+d\,m-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z)^{q+1}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)(-c-2\,b\,k+b\,m)^{-n-1}+$$

$$e^{\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}}(c-2\,b\,k+b\,m)^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^{q+1}$$

$$\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{c-2\,b\,k+b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}+e\,(4\,k-2\,m)+i\,m\,\pi}(-c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}(f-2\,d\,k+d\,m)^{n-q}$$

$$(-f+2\,d\,k-d\,m-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}+e\,(4\,k-2\,m)+i\,m\,\pi}(c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-2\,d\,k+d\,m)^{n-q}$$

$$(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

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$$\int z^n\sinh^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz=i^m\,2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,f^{-2\,n-2}$$

$$\left(e^{\frac{c^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{c^2}{4f}} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, c^{-h-k+2n} \left(c+2f\sqrt{z}\right)^{h+k} \left(-\frac{\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(c\left(c+2f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right) + 2\sqrt{-\frac{\left(c+2f\sqrt{z}\right)^2}{f}}\; f\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right) +$$

$$2^{-m-2n-2} \sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^u \binom{m}{u} \left((-1)^m e^{e(2u-m)-\frac{(b(2u-m)-c)^2}{4(d(2u-m)-f)}} \left(\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b(2u-m)-c)^{-h-k+2n}\right.\right.$$

$$\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{d(2u-m)-f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left((b(2u-m)-c)\left(-c+b(2u-m)+\right.\right.$$

$$\left.2(d(2u-m)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{4(d(2u-m)-f)}\right) + 2$$

$$(d(2u-m)-f)\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{4(d(2u-m)-f)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{d(2u-m)-f}}\right)\right) (d(2u-m)-f)^{-2n-2} +$$

$$(-1)^m e^{e(2u-m)-\frac{(c+b(2u-m))^2}{4(f+d(2u-m))}} (f+d(2u-m))^{-2n-2} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (c+b(2u-m))^{-h-k+2n}$$

$$\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^{h+k} \left(-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{f+d(2u-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left((c+b(2u-m))\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$-\frac{\left(c+b\,(2\,u-m)+2\,(f+d\,(2\,u-m))\,\sqrt{z}\right)^2}{4\,(f+d\,(2\,u-m))}\Bigg)+2\,(f+d\,(2\,u-m))\,\Gamma\Bigg(\frac{1}{2}\,(h+k+2),$$

$$-\frac{\left(c+b\,(2\,u-m)+2\,(f+d\,(2\,u-m))\,\sqrt{z}\right)^2}{4\,(f+d\,(2\,u-m))}\Bigg)\sqrt{-\frac{\left(c+b\,(2\,u-m)+2\,(f+d\,(2\,u-m))\,\sqrt{z}\right)^2}{f+d\,(2\,u-m)}}\Bigg)+$$

$$e^{e\,(m-2\,u)-\frac{(b\,(m-2\,u)-c)^2}{4\,(d\,(m-2\,u)-f)}}\,(d\,(m-2\,u)-f)^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)-c)^{-h-k+2\,n}$$

$$\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^{h+k}\Bigg(-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{d\,(m-2\,u)-f}\Bigg)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b\,(m-2\,u)-c)\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,u)-f)}\Bigg)+$$

$$2\,(d\,(m-2\,u)-f)\,\Gamma\Bigg(\frac{1}{2}\,(h+k+2),\,-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,u)-f)}\Bigg)$$

$$\sqrt{-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{d\,(m-2\,u)-f}}\Bigg)+e^{e\,(m-2\,u)-\frac{(c+b\,(m-2\,u))^2}{4\,(f+d\,(m-2\,u))}}\,(f+d\,(m-2\,u))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,(m-2\,u))^{-h-k+2\,n}\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^{h+k}$$

$$\Bigg(-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}\Bigg)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+\right.$$

$$2\,(f+d\,(m-2\,u))\,\sqrt{z}\,\Big)\,\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)+$$

$$2\,(f+d\,(m-2\,u))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)$$

$$\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}}\Bigg)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \sinh^m(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == 2^{-m-2}\left(-i^{-m}\,c^{-n-1}\,e^{\frac{4\,c\,g-f^2}{4\,c}}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\left(e^{\frac{f^2-4\,c\,g}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$e^{-g}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\left(-e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c}+i\,m\,\pi}\left(\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}\,(-f+d\,(m-2\,k)-2\,c\,z)^q\right.\right.$$

$$\left.\left(\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(f+d\,(2\,k-m)+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(f+d\,(2\,k-m)+2\,c\,z)^2}{4\,c}\right)\right)$$

$$(-c)^{-n-1}+e^{\frac{(f+d\,(m-2\,k))^2}{4\,c}}\left(\sum_{q=0}^{n}2^{q-n}\,(f+d\,(m-2\,k))^{n-q}\,(-f+d\,(2\,k-m)-2\,c\,z)^{q+1}\right.$$

$$\left.\left(\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,(m-2\,k))^2}{4\,c}+2\,g+i\,m\,\pi}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}\left(-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$(f+d\,(m-2\,k)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{2\,g-\frac{(f+2\,d\,k-d\,m)^2}{4\,c}}\sum_{q=0}^{n}2^{q-n}\,(-f-2\,d\,k+d\,m)^{n-q}\left(-\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(f+d\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(f+2\,d\,k-d\,m+2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

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$$\int z^n \sinh^m(d\,z)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$2^{-m-2}\left(\frac{1}{c}\left(i^{-m}\,2^{-2\,n}\,e^{\frac{4\,f\,g-c^2}{4\,f}}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n+1}\left(c+2\,f\,\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\right.$$

$$\left.f\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)-e^{-\frac{4\,f\,g-c^2}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-c)^{-h-k+2\,n+1}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2\,f\sqrt{\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\right.$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\right)-$$

$$4^{-n}\,e^{-g}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\binom{m}{u}\left(-e^{\frac{c^2}{-4\,f+4\,d\,m-8\,d\,u}+2\,g}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left(c+2\,(f-d\,m+2\,d\,u)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(-c\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)-2\,(-f+d\,m-2\,d\,u)$$

$$\left.\left.\left.\sqrt{\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-f+d\,m-2\,d\,u}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)\right)\right)$$

$$(f-d\,m+2\,d\,u)^{-2\,(n+1)}+e^{-\frac{c^2}{-4\,f-4\,d\,m+8\,d\,u}}\left(-(f+d\,m-2\,d\,u)^2\right)^{-2\,n-1}\left((-1)^m\,e^{2\left(\frac{c^2}{-4\,f-4\,d\,m+8\,d\,u}+g\right)}\right.$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-\right.$$

$$2\,(-f-d\,m+2\,d\,u)\sqrt{-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\right)\right)(-f-d\,m+2\,d\,u)^{2\,n}+$$

$$(f+d\,m-2\,d\,u)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-2\,(f+d\,m-2\,d\,u)$$

$$\left.\left.\sqrt{\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\right)\right)-$$

$$(-1)^m\,e^{-\frac{c^2}{4\,d\,(m-2\,u)-4\,f}}\,(-f+d\,m-2\,d\,u)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}$$

$$\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^{h+k}\left(-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2(-f+d\,m-2\,d\,u)\sqrt{-\frac{\left(2(-f+d\,m-2\,d\,u)\sqrt{z}-c\right)^2}{-f+d\,m-2\,d\,u}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(2(-f+d\,m-2\,d\,u)\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)-c\left(2(-f+d\,m-2\,d\,u)\sqrt{z}-c\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(2(-f+d\,m-2\,d\,u)\sqrt{z}-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \sinh^m(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == 2^{-m-2}\left(-i^{-m}\,c^{-n-1}\,e^{\frac{4\,c\,g-f^2}{4\,c}}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\left(e^{\frac{f^2-4\,c\,g}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\,e^{-g+2\,e\,k-e\,m}\binom{m}{k}\left(-e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c}+2\,e\,(m-2\,k)+i\,m\,\pi}\left(\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}\,(-f+d\,(m-2\,k)-2\,c\,z)^q\right.\right.$$

$$\left.\left(\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(f+d\,(2\,k-m)+2\,c\,z)\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+d\,(2\,k-m)+2\,c\,z)^2}{4\,c}\right)\right)$$

$$(-c)^{-n-1}+e^{\frac{(f+d\,(m-2\,k))^2}{4\,c}}\left(\sum_{q=0}^{n}2^{q-n}\,(f+d\,(m-2\,k))^{n-q}\,(-f+d\,(2\,k-m)-2\,c\,z)^{q+1}\right.$$

$$\left.\left(\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-f+d\,(2\,k-m)-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f+d\,(m-2\,k))^2}{4\,c}+2\,g+2\,e\,(m-2\,k)+i\,m\,\pi}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}\left(-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$(f+d\,(m-2\,k)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f-2\,d\,k+d\,m+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{2\,g-\frac{(f+2\,d\,k-d\,m)^2}{4\,c}}\sum_{q=0}^{n}2^{q-n}\,(-f-2\,d\,k+d\,m)^{n-q}\left(-\frac{(-f+d\,(m-2\,k)-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(f+d\,(2\,k-m)+2\,c\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,d\,k-d\,m+2\,c\,z)^2}{4\,c}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1799.01

$$\int z^n \sinh^m(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-m-2}\left(\frac{1}{c}\left(i^{-m}\,2^{-2\,n}\,e^{\frac{4\,f\,g-c^2}{4\,f}}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n+1}\left(c+2\,f\,\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\right.$$

$$\left.f\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)-$$

$$e^{-\frac{4\,f\,g-c^2}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n+1}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left(2\,f\sqrt{\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-c\left(c+2\,f\,\sqrt{z}\right)\right.$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\right)-4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\,e^{-g+e\,m-2\,e\,u}\binom{m}{u}$$

$$\left(e^{-2\,e\,(m-2\,u)}\left(e^{-\frac{c^2}{-4\,f-4\,d\,m+8\,d\,u}-4\,e\,u}\left(-(f+d\,m-2\,d\,u)^2\right)^{-2\,n-1}\left((-1)^m\,e^{2\left(\frac{c^2}{-4\,f-4\,d\,m+8\,d\,u}+g+e\,m\right)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\right.\right.\right.\right.$$

$$c^{-h-k+2\,n}\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\left.\left.\left.\left.\binom{n}{k}\left(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-\right.\right.\right.\right.$$

$$2\,(-f-d\,m+2\,d\,u)\sqrt{-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\Bigg)\Bigg)$$

$$(-f-d\,m+2\,d\,u)^{2\,n}+e^{4\,e\,u}\,(f+d\,m-2\,d\,u)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}$$

$$\left(-c-2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(c\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)-$$

$$2\,(f+d\,m-2\,d\,u)\sqrt{\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{f+d\,m-2\,d\,u}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c+2\,(f+d\,m-2\,d\,u)\,\sqrt{z}\right)^2}{4\,(f+d\,m-2\,d\,u)}\right)\Bigg)\Bigg)-e^{\frac{c^2}{-4\,f+4\,d\,m-8\,d\,u}+2\,g}$$

$$(f-d\,m+2\,d\,u)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\left(c+2\,(f-d\,m+2\,d\,u)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(-c\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)-2\,(-f+d\,m-2\,d\,u)$$

$$\sqrt{\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-4\,f+4\,d\,m-8\,d\,u}\right)\Bigg)\Bigg)-$$

$$(-1)^m\, e^{-\frac{c^2}{4\,d\,(m-2\,u)-4\,f}}\,(-f+d\,m-2\,d\,u)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}$$

$$\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^{h+k}\left(-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{-f+d\,m-2\,d\,u}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)-c\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,(-f+d\,m-2\,d\,u)\,\sqrt{z}\,-c\right)^2}{4\,d\,(m-2\,u)-4\,f}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1800.01

$$\int z^n \sinh^m\left(b z^2\right) \cosh\left(c z^2 + f z + g\right) dz == -(-1)^n i^m 2^{-m-2} c^{-n-1} e^{\frac{f^2-4cg}{4c}} \binom{m}{\frac{m}{2}}$$

$$(1 - m \bmod 2) \left(\sum_{q=0}^{n} (-1)^q 2^{q-n} f^{n-q} (f + 2cz)^{q+1} \left(\frac{(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f+2cz)^2}{4c} \right) + \right.$$

$$\left. e^{-\frac{f^2-4cg}{2c}} \sum_{q=0}^{n} (-1)^q 2^{q-n} f^{n-q} (f + 2cz)^{q+1} \left(-\frac{(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f+2cz)^2}{4c} \right) \right) -$$

$$2^{-m-2} e^g \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{f^2}{4c+8bk-4bm} - 2g} \left(\sum_{q=0}^{n} 2^{q-n} f^{n-q} \left(\frac{(f + 2cz + 4bkz - 2bmz)^2}{c + 2bk - bm} \right)^{\frac{1}{2}(-q-1)} \right. \right.$$

$$\left. \left. (-f - 2cz - 4bkz + 2bmz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f+2cz+4bkz-2bmz)^2}{4c+8bk-4bm} \right) \right) (-c - 2bk + bm)^{-n-1} + \right.$$

$$e^{\frac{f^2}{-4c+8bk-4bm}} (c - 2bk + bm)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-f)^{n-q} (f + 2(c - 2bk + bm)z)^{q+1}$$

$$\left(-\frac{(f + 2(c - 2bk + bm)z)^2}{c - 2bk + bm} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f+2(c-2bk+bm)z)^2}{-4c+8bk-4bm} \right) +$$

$$e^{-\frac{f^2}{-4c+8bk-4bm} - 2g + im\pi} (-c + 2bk - bm)^{-n-1} \sum_{q=0}^{n} 2^{q-n} f^{n-q} (-f - 2cz + 4bkz - 2bmz)^{q+1}$$

$$\left(-\frac{(f + 2(c - 2bk + bm)z)^2}{-c + 2bk - bm} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f+2(c-2bk+bm)z)^2}{-4c+8bk-4bm} \right) +$$

$$e^{im\pi - \frac{f^2}{4c+8bk-4bm}} (c + 2bk - bm)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-f)^{n-q} (f + 2cz + 4bkz - 2bmz)^{q+1}$$

$$\left. \left(-\frac{(f + 2cz + 4bkz - 2bmz)^2}{c + 2bk - bm} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f+2cz+4bkz-2bmz)^2}{4c+8bk-4bm} \right) \right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1801.01

$$\int z^n \sinh^m\left(b \sqrt{z}\right) \cosh\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$2^{-m-2} \left(\frac{1}{c} \left(i^{-m} 2^{-2n} e^{\frac{4fg-c^2}{4f}} f^{-2(n+1)} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k c^{-h-k+2n+1} \left(c + 2f\sqrt{z} \right)^{h+k} \right. \right. \right.$$

$$\left(-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-2\right.$$

$$\left. f \sqrt{-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right)-e^{-\frac{4 f g-c^2}{2 f}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k$$

$$(-c)^{-h-k+2 n+1}\left(-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(2 f \sqrt{\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right)\right)+$$

$$(-1)^m\, 2^{-2 n}\, f^{-2(n+1)}\, e^{-g} \sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u \binom{m}{u}\left(e^{\frac{(c+b(m-2u))^2}{4 f}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(-c-b m+2 b u)^{-h-k+2 n}\right.\right.$$

$$\left(-c-b(m-2u)-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b(m-2u))\left(c+b(m-2u)+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{4 f}\right)-\right.$$

$$\left.\left.2 f \sqrt{\frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{4 f}\right)\right)+$$

$$(-1)^m\, e^{2 g-\frac{(c+b(m-2u))^2}{2 f}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(c+b(m-2u))^{-h-k+2 n}\left(c+b(m-2u)+2 f \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b(m-2u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$(-1)^m\,e^{\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\,\sqrt{\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{2\,g-\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c-b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b\,z^r+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.1802.01

$$\int z^n \sinh^m\left(b z^2+e\right)\cosh\left(c z^2+f z+g\right)dz == -(-1)^n\, i^m\, 2^{-m-2}\, c^{-n-1}\, e^{\frac{f^2-4cg}{4c}}\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\left(\sum_{q=0}^{n}(-1)^q\, 2^{q-n}\, f^{n-q}\,(f+2cz)^{q+1}\left(\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2cz)^2}{4c}\right)+\right.$$

$$e^{-\frac{f^2-4cg}{2c}}\sum_{q=0}^{n}(-1)^q\, 2^{q-n}\, f^{n-q}\,(f+2cz)^{q+1}\left(-\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2cz)^2}{4c}\right)\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\, e^{g-2ek+em}\binom{m}{k}\left(e^{\frac{f^2}{4c+8bk-4bm}-2g}\left(\sum_{q=0}^{n}2^{q-n}\, f^{n-q}\left(\frac{(f+2cz+4bkz-2bmz)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.\left.(-f-2cz-4bkz+2bmz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2cz+4bkz-2bmz)^2}{4c+8bk-4bm}\right)\right)(-c-2bk+bm)^{-n-1}+\right.$$

$$e^{\frac{f^2}{-4c+8bk-4bm}}(c-2bk+bm)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2(c-2bk+bm)z)^{q+1}$$

$$\left(-\frac{(f+2(c-2bk+bm)z)^2}{c-2bk+bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2(c-2bk+bm)z)^2}{-4c+8bk-4bm}\right)+$$

$$e^{-\frac{f^2}{-4c+8bk-4bm}-2g+e(4k-2m)+im\pi}(-c+2bk-bm)^{-n-1}\sum_{q=0}^{n}2^{q-n}\, f^{n-q}\,(-f-2cz+4bkz-2bmz)^{q+1}$$

$$\left(-\frac{(f+2(c-2bk+bm)z)^2}{-c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2(c-2bk+bm)z)^2}{-4c+8bk-4bm}\right)+$$

$$e^{-\frac{f^2}{4c+8bk-4bm}+e(4k-2m)+im\pi}(c+2bk-bm)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-f)^{n-q}\,(f+2cz+4bkz-2bmz)^{q+1}$$

$$\left.\left.\left(-\frac{(f+2cz+4bkz-2bmz)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2cz+4bkz-2bmz)^2}{4c+8bk-4bm}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1803.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g+f z\right)dz ==$$

$$2^{-m-2}\left(\frac{1}{c}\left(i^{-m}\, 2^{-2n}\, e^{\frac{4fg-c^2}{4f}}\, f^{-2(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, c^{-h-k+2n+1}\left(c+2f\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-2\right.$$

$$\left. f \sqrt{-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right)-e^{-\frac{4 f g-c^2}{2 f}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k$$

$$(-c)^{-h-k+2 n+1}\left(-c-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left(2 f \sqrt{\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)-c\left(c+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\right)\right)+$$

$$(-1)^m 2^{-2 n} f^{-2(n+1)} \sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u e^{-g+e m-2 e u}\binom{m}{u}\left(e^{\frac{(c+b(m-2u))^2}{4 f}}\left(e^{-2 e(m-2 u)} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(-c-b m+2 b u)^{-h-k+2 n}\right.\right.$$

$$\left(-c-b(m-2 u)-2 f \sqrt{z}\right)^{h+k}\left(\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b(m-2 u))\left(c+b(m-2 u)+2 f \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{4 f}\right)-\right.$$

$$\left.\left.2 f \sqrt{\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{4 f}\right)\right)+$$

$$(-1)^m e^{2 g-\frac{(c+b(m-2u))^2}{2 f}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(c+b(m-2 u))^{-h-k+2 n}\left(c+b(m-2 u)+2 f \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b(m-2 u)+2 f \sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$(-1)^m\,e^{\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c+b\,m-2\,b\,u)^{-h-k+2\,n}\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{-\frac{(-c+b\,m-2\,b\,u)^2}{4\,f}+2\,g-2\,e\,(m-2\,u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c-b\,m+2\,b\,u)^{-h-k+2\,n}\left(-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c-b\,(m-2\,u)+2\,f\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((-c+b\,m-2\,b\,u)\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(-c+b\,(m-2\,u)-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1804.01

$$\int z^n \sinh^m\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z+g\right)dz == -(-1)^n\,i^m\,2^{-m-2}\,c^{-n-1}\,e^{\frac{f^2-4cg}{4c}}\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.e^{-\frac{f^2-4cg}{2c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^g\binom{m}{k}\left(e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}-2\,g}\left(\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}\left(\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$(-f-2\,d\,k+d\,m-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z)^{q+1}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)(-c-2\,b\,k+b\,m)^{-n-1}+\right.$$

$$e^{\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}}(c-2\,b\,k+b\,m)^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^{q+1}$$

$$\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{c-2\,b\,k+b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}-2\,g+i\,m\,\pi}(-c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(f-2\,d\,k+d\,m)^{n-q}$$

$$(-f+2\,d\,k-d\,m-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{i\,m\,\pi-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}}(c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-f-2\,d\,k+d\,m)^{n-q}\,(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1805.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right) \cosh\left(\sqrt{z}\ c + g + f\,z\right) dz == i^m\, 2^{-m-2\,n-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\ f^{-2\,n-2}$$

$$\left(e^{\frac{c^2}{4\,f} - g} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-c)^{-h-k+2\,n} \left(-c - 2\,f\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-c \left(-c - 2\,f\,\sqrt{z}\right) \right. \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f}\right) - 2\,f \sqrt{\frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-c - 2\,f\,\sqrt{z}\right)^2}{4\,f}\right) \Bigg) +$$

$$e^{g - \frac{c^2}{4\,f}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, c^{-h-k+2\,n} \left(c + 2\,f\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(c \left(c + 2\,f\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f}\right) + \right.$$

$$\left. 2 \sqrt{-\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{f}}\ f\ \Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c + 2\,f\,\sqrt{z}\right)^2}{4\,f}\right) \right) + 2^{-m-2\,n-2} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u}$$

$$\left((-1)^m\, e^{-\frac{(b\,(2\,u-m)-c)^2}{4\,(d\,(2\,u-m)-f)} - g} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b\,(2\,u-m)-c)^{-h-k+2\,n} \left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^{h+k} \right. \right.$$

$$\left(-\frac{\left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^2}{d\,(2\,u-m)-f} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b\,(2\,u-m)-c) \left(-c + b\,(2\,u-m) + \right. \right.$$

$$\left. \left. 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^2}{4\,(d\,(2\,u-m)-f)}\right) + 2 \right.$$

$$\left. \left. \sqrt{-\frac{\left(-c + b\,(2\,u-m) + 2\,(d\,(2\,u-m)-f)\,\sqrt{z}\right)^2}{d\,(2\,u-m)-f}}\ (d\,(2\,u-m)-f) \right. \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{4(d(2u-m)-f)}\right)\Bigg)(d(2u-m)-f)^{-2n-2}+$$

$$(-1)^m e^{g-\frac{(c+b(2u-m))^2}{4(f+d(2u-m))}}(f+d(2u-m))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c+b(2u-m))^{-h-k+2n}$$

$$\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{f+d(2u-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((c+b(2u-m))\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{4(f+d(2u-m))}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{f+d(2u-m)}}\,(f+d(2u-m))\,\Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{4(f+d(2u-m))}\Bigg)\Bigg)+e^{-\frac{(b(m-2u)-c)^2}{4(d(m-2u)-f)}-g}(d(m-2u)-f)^{-2n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b(m-2u)-c)^{-h-k+2n}\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^2}{d(m-2u)-f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((b(m-2u)-c)\left(-c+b(m-2u)+\right.$$

$$\left.2(d(m-2u)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^2}{4(d(m-2u)-f)}\right)+$$

$$2\sqrt{-\frac{\left(-c+b(m-2u)+2(d(m-2u)-f)\sqrt{z}\right)^2}{d(m-2u)-f}}\,(d(m-2u)-f)\,\Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,u)-f)}\Bigg)+e^{g-\frac{(c+b\,(m-2\,u))^2}{4\,(f+d\,(m-2\,u))}}\,(f+d\,(m-2\,u))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,(m-2\,u))^{-h-k+2\,n}\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+\right.$$

$$\left.2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)+$$

$$2\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}}\;(f+d\,(m-2\,u))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\sinh^m\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1806.01

$$\int z^n\sinh^m\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz==-(-1)^n\,i^m\,2^{-m-2}\,c^{-n-1}\,e^{\frac{f^2-4\,c\,g}{4\,c}}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$e^{-\frac{f^2-4\,c\,g}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,c\,z)^2}{4\,c}\right)-$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{g-2\,e\,k+e\,m}\binom{m}{k}\Bigg(e^{\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}-2\,g}\,(-c-2\,b\,k+b\,m)^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}\,(f+2\,d\,k-d\,m)^{n-q}\left(\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$(-f-2\,d\,k+d\,m-2\,c\,z-4\,b\,k\,z+2\,b\,m\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}}(c-2\,b\,k+b\,m)^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)-\frac{f}{2}\right)^{n-q}(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^{q+1}$$

$$\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{c-2\,b\,k+b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{(f-2\,d\,k+d\,m)^2}{-4\,c+8\,b\,k-4\,b\,m}-2\,g+e\,(4\,k-2\,m)+i\,m\,\pi}(-c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}(f-2\,d\,k+d\,m)^{n-q}$$

$$(-f+2\,d\,k-d\,m-2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+d\,(m-2\,k)+2\,(c-2\,b\,k+b\,m)\,z)^2}{-4\,c+8\,b\,k-4\,b\,m}\right)+$$

$$e^{-\frac{(f+2\,d\,k-d\,m)^2}{4\,c+8\,b\,k-4\,b\,m}+e\,(4\,k-2\,m)+i\,m\,\pi}(c+2\,b\,k-b\,m)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f-2\,d\,k+d\,m)^{n-q}$$

$$(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f+2\,d\,k-d\,m+2\,c\,z+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,c+8\,b\,k-4\,b\,m}\right)\right/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

01.20.21.1807.01

$$\int z^n\sinh^m\left(\sqrt{z}\;b+d\,z+e\right)\cosh\left(\sqrt{z}\;c+f\,z+g\right)dz=i^m\,2^{-m-2\,n-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,f^{-2\,n-2}$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{g-\frac{c^2}{4\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,f\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)+2 \sqrt{-\frac{\left(c+2 f \sqrt{z}\right)^2}{f}}\ f \Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c+2 f \sqrt{z}\right)^2}{4 f}\right)\Bigg)\Bigg)+$$

$$2^{-m-2 n-2} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} \Bigg((-1)^m e^{-\frac{(b(2u-m)-c)^2}{4(d(2u-m)-f)}-g+e(2u-m)} (d(2u-m)-f)^{-2n-2}$$

$$\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b(2u-m)-c)^{-h-k+2n} \left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{d(2u-m)-f}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \Bigg((b(2u-m)-c)\left(-c+b(2u-m)+\right.$$

$$\left.2(d(2u-m)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{4(d(2u-m)-f)}\right)+$$

$$2(d(2u-m)-f)\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{4(d(2u-m)-f)}\right)$$

$$\left.\sqrt{-\frac{\left(-c+b(2u-m)+2(d(2u-m)-f)\sqrt{z}\right)^2}{d(2u-m)-f}}\right)+$$

$$(-1)^m e^{-\frac{(c+b(2u-m))^2}{4(f+d(2u-m))}+g+e(2u-m)} (f+d(2u-m))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c+b(2u-m))^{-h-k+2n}$$

$$\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^{h+k} \left(-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{f+d(2u-m)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \Bigg((c+b(2u-m))\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.$$

$$\left.-\frac{\left(c+b(2u-m)+2(f+d(2u-m))\sqrt{z}\right)^2}{4(f+d(2u-m))}\right)+2(f+d(2u-m))\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$-\frac{\left(c+b\,(2\,u-m)+2\,(f+d\,(2\,u-m))\,\sqrt{z}\right)^2}{4\,(f+d\,(2\,u-m))}\Bigg)\sqrt{-\frac{\left(c+b\,(2\,u-m)+2\,(f+d\,(2\,u-m))\,\sqrt{z}\right)^2}{f+d\,(2\,u-m)}}\Bigg)+$$

$$e^{-\frac{(b\,(m-2\,u)-c)^2}{4\,(d\,(m-2\,u)-f)}-g+e\,(m-2\,u)}\,(d\,(m-2\,u)-f)^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)-c)^{-h-k+2\,n}$$

$$\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{d\,(m-2\,u)-f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b\,(m-2\,u)-c)\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+k+1),\,-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,u)-f)}\Bigg)+$$

$$2\,(d\,(m-2\,u)-f)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,u)-f)}\right)$$

$$\sqrt{-\frac{\left(-c+b\,(m-2\,u)+2\,(d\,(m-2\,u)-f)\,\sqrt{z}\right)^2}{d\,(m-2\,u)-f}}\Bigg)+e^{-\frac{(c+b\,(m-2\,u))^2}{4\,(f+d\,(m-2\,u))}+g+e\,(m-2\,u)}\,(f+d\,(m-2\,u))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c+b\,(m-2\,u))^{-h-k+2\,n}\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((c+b\,(m-2\,u))\left(c+b\,(m-2\,u)+\right.$$

$$\left.2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)+$$

$$2\,(f+d\,(m-2\,u))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{4\,(f+d\,(m-2\,u))}\right)$$

$$\left.\sqrt{-\frac{\left(c+b\,(m-2\,u)+2\,(f+d\,(m-2\,u))\,\sqrt{z}\right)^2}{f+d\,(m-2\,u)}}\Bigg)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving products of sinh and power

Involving $z^{\alpha-1}\sinh(a\,z)\sinh(b\,z)\cosh(c\,z)$

01.20.21.1808.01

$$\int z^{\alpha-1}\sinh(a\,z)\sinh(b\,z)\cosh(c\,z)\,dz ==$$
$$\frac{1}{8}z^{\alpha}\left(-(-(a+b-c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a+b-c)\,z)-((a+b-c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+b-c)\,z)+(-(a-b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a-b+c)\,z)+\right.$$
$$((a-b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a-b+c)\,z)+(-(-a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(-a+b+c)\,z)+$$
$$\left.((-a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(-a+b+c)\,z)-(-(a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a+b+c)\,z)-((a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+b+c)\,z)\right)$$

Involving hyperbolic and exponential functions

Involving sinh and exp

Involving $e^{p\,z}\sinh(c\,z)\cosh(a\,z)$

01.20.21.1809.01

$$\int e^{p\,z}\sinh(c\,z)\cosh(a\,z)\,dz ==$$
$$\left(e^{p\,z}\left(a\sinh(a\,z)\left(2\,p\,c\cosh(c\,z)+\left(a^2-p^2-c^2\right)\sinh(c\,z)\right)-\cosh(a\,z)\left(c\left(a^2+p^2-c^2\right)\cosh(c\,z)+p\left(a^2-p^2+c^2\right)\sinh(c\,z)\right)\right)\right)\Big/$$
$$((a-p-c)\,(a+p-c)\,(a-p+c)\,(a+p+c))$$

01.20.21.1810.01

$$\int e^{c\,z}\sinh(c\,z)\cosh(a\,z)\,dz == \frac{\left(\left(-1+e^{2\,c\,z}\right)a^2+4\,c^2\right)\sinh(a\,z)-2\,a\,c\,e^{2\,c\,z}\cosh(a\,z)}{2\left(a^3-4\,a\,c^2\right)}$$

01.20.21.1811.01

$$\int e^{a\,z}\sinh(a\,z)\cosh(a\,z)\,dz == \frac{e^{-a\,z}\left(3+e^{4\,a\,z}\right)}{12\,a}$$

Involving $e^{p\,z}\sinh(c\,z+d)\cosh(a\,z)$

01.20.21.1812.01

$$\int e^{p\,z}\sinh(d+c\,z)\cosh(a\,z)\,dz ==$$
$$\frac{1}{2}e^{p\,z}\left(-\frac{\cosh((a-c)\,z)\,((a-c)\cosh(d)+p\sinh(d))}{(a-c-p)\,(a-c+p)}+\frac{\cosh((a+c)\,z)\,((a+c)\cosh(d)-p\sinh(d))}{(a+c-p)\,(a+c+p)}+\right.$$
$$\left.\frac{(p\cosh(d)-(c-a)\sinh(d))\sinh((a-c)\,z)}{(a-c-p)\,(a-c+p)}+\frac{((a+c)\sinh(d)-p\cosh(d))\sinh((a+c)\,z)}{(a+c-p)\,(a+c+p)}\right)$$

Involving $e^{p\,z}\sinh(c\,z)\cosh(a\,z+b)$

01.20.21.1813.01

$$\int e^{p z} \sinh(c z) \cosh(b + a z)\, dz ==$$
$$\frac{1}{2} e^{p z} \left(-\frac{\cosh((a-c) z)\,((a-c)\cosh(b) - p \sinh(b))}{(a-c-p)(a-c+p)} + \frac{\cosh((a+c) z)\,((a+c)\cosh(b) - p \sinh(b))}{(a+c-p)(a+c+p)} + \right.$$
$$\left. \frac{(p \cosh(b) + (c-a)\sinh(b))\sinh((a-c) z)}{(a-c-p)(a-c+p)} + \frac{((a+c)\sinh(b) - p\cosh(b))\sinh((a+c) z)}{(a+c-p)(a+c+p)} \right)$$

Involving $e^{p z} \sinh(c z + d) \cosh(a z + b)$

01.20.21.1814.01

$$\int e^{p z} \sinh(d + c z) \cosh(b + a z)\, dz ==$$
$$\frac{1}{2} e^{p z} \left(-\frac{\cosh((a-c) z)\,((a-c)\cosh(b-d) - p \sinh(b-d))}{(a-c-p)(a-c+p)} + \frac{\cosh((a+c) z)\,((a+c)\cosh(b+d) - p \sinh(b+d))}{(a+c-p)(a+c+p)} + \right.$$
$$\left. \frac{(p \cosh(b-d) + (c-a)\sinh(b-d))\sinh((a-c) z)}{(a-c-p)(a-c+p)} + \frac{((a+c)\sinh(b+d) - p\cosh(b+d))\sinh((a+c) z)}{(a+c-p)(a+c+p)} \right)$$

Involving $e^{p z^r} \sinh(b z^2) \cosh(c z)$

01.20.21.1815.01

$$\int e^{p z^2} \sinh(b z^2) \cosh(c z)\, dz == \frac{1}{8}\sqrt{\pi} \left(\frac{1}{\sqrt{b+p}} e^{-\frac{c^2}{4(b+p)}} \left(\operatorname{erfi}\left(\frac{2(b+p) z - c}{2\sqrt{b+p}} \right) + \operatorname{erfi}\left(\frac{c + 2(b+p) z}{2\sqrt{b+p}} \right) \right) - \right.$$
$$\left. \frac{1}{\sqrt{p-b}} e^{\frac{c^2}{4b-4p}} \left(\operatorname{erfi}\left(\frac{-c - 2 b z + 2 p z}{2\sqrt{p-b}} \right) + \operatorname{erfi}\left(\frac{c + 2(p-b) z}{2\sqrt{p-b}} \right) \right) \right)$$

01.20.21.1816.01

$$\int e^{p\sqrt{z}} \sinh\left(b\sqrt{z}\right) \cosh(c z)\, dz ==$$
$$\frac{1}{8} \left(\frac{e^{\frac{(b-p)^2}{4c}} (p-b)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{-b+p-2c\sqrt{z}}{2\sqrt{-c}} \right)}{(-c)^{3/2}} + \frac{c\, e^{\frac{(b+p)^2}{4c}} (b+p)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{b+p-2c\sqrt{z}}{2\sqrt{-c}} \right)}{(-c)^{5/2}} + \frac{e^{-\frac{(b-p)^2}{4c}} (p-b)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{-b+p+2c\sqrt{z}}{2\sqrt{c}} \right)}{c^{3/2}} + \right.$$
$$\left. \frac{8\, e^{p\sqrt{z}} \sinh\left(b\sqrt{z}\right)\sinh(c z)}{c} - \frac{e^{-\frac{(b+p)^2}{4c}} (b+p)\sqrt{\pi}\, \operatorname{erfi}\left(\frac{b+p+2c\sqrt{z}}{2\sqrt{c}} \right)}{c^{3/2}} \right)$$

Involving $e^{p z^r} \sinh(b z) \cosh(c z)$

01.20.21.1817.01

$$\int e^{p z^2} \sinh(b z) \cosh(c z)\, dz ==$$
$$\frac{1}{8\sqrt{p}}\left(i\sqrt{\pi}\left(e^{-\frac{(-b-c)^2-2\pi i p}{4p}}\operatorname{erfi}\left(\frac{-b-c+2pz}{2\sqrt{p}}\right)+e^{-\frac{(b-c)^2+2\pi i p}{4p}}\operatorname{erfi}\left(\frac{b-c+2pz}{2\sqrt{p}}\right)+e^{-\frac{(c-b)^2-2\pi i p}{4p}}\operatorname{erfi}\left(\frac{-b+c+2pz}{2\sqrt{p}}\right)+\right.\right.$$
$$\left.\left.e^{-\frac{(b+c)^2+2\pi i p}{4p}}\operatorname{erfi}\left(\frac{b+c+2pz}{2\sqrt{p}}\right)\right)\right)$$

01.20.21.1818.01

$$\int e^{p\sqrt{z}} \sinh(b z) \cosh(c z)\, dz ==$$
$$\frac{1}{8}\left(\frac{8e^{p\sqrt{z}}\,(b\cosh(bz)\cosh(cz)-c\sinh(bz)\sinh(cz))}{(b-c)(b+c)}+\frac{e^{\frac{p^2}{4(c+b)}}p\sqrt{\pi}\operatorname{erfi}\left(\frac{p-2(c+b)\sqrt{z}}{2\sqrt{-c-b}}\right)}{(-c-b)^{3/2}}+\frac{e^{\frac{p^2}{4b-4c}}p\sqrt{\pi}\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c-b)+p}{2\sqrt{c-b}}\right)}{(c-b)^{3/2}}-\right.$$
$$\left.\frac{e^{\frac{p^2}{4c-4b}}p\sqrt{\pi}\operatorname{erfi}\left(\frac{2\sqrt{z}\,(b-c)+p}{2\sqrt{b-c}}\right)}{(b-c)^{3/2}}-\frac{e^{-\frac{p^2}{4(c+b)}}p\sqrt{\pi}\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+b)+p}{2\sqrt{c+b}}\right)}{(c+b)^{3/2}}\right)$$

Involving $e^{p z}\sinh(b z^r)\cosh(c z)$

01.20.21.1819.01

$$\int e^{p z}\sinh\left(b z^2\right)\cosh(c z)\, dz ==$$
$$-\frac{1}{8b}\left(i\sqrt{\pi}\left(\sqrt{-b}\;e^{\frac{(p-c)^2+2\pi i b}{4b}}\operatorname{erfi}\left(\frac{-c+p-2bz}{2\sqrt{-b}}\right)+\sqrt{-b}\;e^{\frac{(c+p)^2+2\pi i b}{4b}}\operatorname{erfi}\left(\frac{c+p-2bz}{2\sqrt{-b}}\right)-\sqrt{b}\right.\right.$$
$$\left.\left.e^{-\frac{(p-c)^2+2\pi i b}{4b}}\operatorname{erfi}\left(\frac{-c+p+2bz}{2\sqrt{b}}\right)-\sqrt{b}\;e^{-\frac{(c+p)^2+2\pi i b}{4b}}\operatorname{erfi}\left(\frac{c+p+2bz}{2\sqrt{b}}\right)\right)\right)$$

01.20.21.1820.01

$$\int e^{p z}\sinh\left(b\sqrt{z}\right)\cosh(c z)\, dz ==$$
$$\frac{1}{8}\left(\frac{8e^{pz}\sinh\left(b\sqrt{z}\right)(c\sinh(cz)-p\cosh(cz))}{(c-p)(c+p)}-\frac{b\,e^{\frac{b^2}{4c-4p}}\sqrt{\pi}\operatorname{erfi}\left(\frac{2(p-c)\sqrt{z}-b}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}}-\frac{b\,e^{\frac{b^2}{4c-4p}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+2(p-c)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}}-\right.$$
$$\left.\frac{b\,e^{-\frac{b^2}{4(c+p)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{2(c+p)\sqrt{z}-b}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4(c+p)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}}\right)$$

Involving $e^{p z} \sinh(b z) \cosh\left(c z^{r}\right)$

01.20.21.1821.01

$$\int e^{p z} \sinh(b z) \cosh\left(c z^2\right) dz = -\frac{i \sqrt{\pi}}{8 c}\left(\sqrt{-c}\, e^{\frac{(p-b)^2+2 \pi i c}{4 c}} \operatorname{erfi}\left(\frac{-b+p-2 c z}{2 \sqrt{-c}}\right)+\sqrt{-c}\, e^{\frac{(b+p)^2-2 \pi i c}{4 c}} \operatorname{erfi}\left(\frac{b+p-2 c z}{2 \sqrt{-c}}\right)-\sqrt{c}\, e^{-\frac{(p-b)^2-2 \pi i c}{4 c}} \operatorname{erfi}\left(\frac{-b+p+2 c z}{2 \sqrt{c}}\right)-\sqrt{c}\, e^{-\frac{(b+p)^2+2 \pi i c}{4 c}} \operatorname{erfi}\left(\frac{b+p+2 c z}{2 \sqrt{c}}\right)\right)$$

01.20.21.1822.01

$$\int e^{p z} \sinh(b z) \cosh\left(c \sqrt{z}\right) dz =$$

$$\frac{1}{8}\left(-\frac{4 e^{(p-b) z} \cosh\left(c \sqrt{z}\right)}{p-b}+\frac{4 e^{(b+p) z} \cosh\left(c \sqrt{z}\right)}{b+p}+\frac{c e^{-\frac{c^2}{4(p-b)}-i \pi} \sqrt{\pi} \operatorname{erfi}\left(\frac{2(p-b) \sqrt{z}-c}{2 \sqrt{p-b}}\right)}{(p-b)^{3/2}}+\frac{c e^{-\frac{c^2}{4(p-b)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c+2(p-b) \sqrt{z}}{2 \sqrt{p-b}}\right)}{(p-b)^{3/2}}-\frac{c e^{i \pi-\frac{c^2}{4(b+p)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{2(b+p) \sqrt{z}-c}{2 \sqrt{b+p}}\right)}{(b+p)^{3/2}}-\frac{c e^{-\frac{c^2}{4(b+p)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c+2(b+p) \sqrt{z}}{2 \sqrt{b+p}}\right)}{(b+p)^{3/2}}\right)$$

Involving $e^{p z^{r}} \sinh(b z) \cosh\left(c z^{r}\right)$

01.20.21.1823.01

$$\int e^{p z^2} \sinh(b z) \cosh\left(c z^2\right) dz =$$

$$\frac{\sqrt{\pi}}{8(p-c)(c+p)} e^{\frac{b^2 p}{2 c^2-2 p^2}}\left(-e^{\frac{b^2}{4(c+p)}} \sqrt{p-c}\,(c+p) \operatorname{erfi}\left(\frac{-b-2 c z+2 p z}{2 \sqrt{p-c}}\right)+e^{\frac{b^2}{4(c+p)}} \sqrt{p-c}\,(c+p) \operatorname{erfi}\left(\frac{b+2(p-c) z}{2 \sqrt{p-c}}\right)+e^{\frac{b^2}{4 p-4 c}}(c-p) \sqrt{c+p}\left(\operatorname{erfi}\left(\frac{2(c+p) z-b}{2 \sqrt{c+p}}\right)-\operatorname{erfi}\left(\frac{b+2(c+p) z}{2 \sqrt{c+p}}\right)\right)\right)$$

01.20.21.1824.01

$$\int e^{p \sqrt{z}} \sinh(b z) \cosh\left(c \sqrt{z}\right) dz =$$

$$\frac{1}{4}\left(\frac{4 e^{p \sqrt{z}} \cosh\left(c \sqrt{z}\right) \cosh(b z)}{b}+\frac{e^{\frac{(p-c)^2}{4 b}}(p-c) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2 \sqrt{z}\, b-c+p}{2 \sqrt{-b}}\right)}{2(-b)^{3/2}}+\frac{e^{\frac{(c+p)^2}{4 b}}(c+p) \sqrt{\pi} \operatorname{erfi}\left(\frac{-2 \sqrt{z}\, b+c+p}{2 \sqrt{-b}}\right)}{2(-b)^{3/2}}-\frac{e^{-\frac{(p-c)^2}{4 b}}(p-c) \sqrt{\pi} \operatorname{erfi}\left(\frac{2 \sqrt{z}\, b-c+p}{2 \sqrt{b}}\right)}{2 b^{3/2}}-\frac{e^{-\frac{(c+p)^2}{4 b}}(c+p) \sqrt{\pi} \operatorname{erfi}\left(\frac{2 \sqrt{z}\, b+c+p}{2 \sqrt{b}}\right)}{2 b^{3/2}}\right)$$

Involving $e^{p z} \sinh(b z^r) \cosh(c z^r)$

01.20.21.1825.01

$$\int e^{p z} \sinh(b z^2) \cosh(c z^2)\, dz == \frac{\sqrt{\pi}}{8 (b-c) (b+c)} e^{-\frac{p^2}{2 (b+c)}} \left(\sqrt{b-c}\ (b+c)\, e^{\frac{(b-3c) p^2}{4 (b^2-c^2)}} \operatorname{erfi}\left(\frac{p+2 (b-c) z}{2 \sqrt{b-c}} \right) + \sqrt{c-b}\ (b+c)\, e^{\frac{(3b-c) p^2}{4 (b^2-c^2)}} \operatorname{erfi}\left(\frac{p-2 b z+2 c z}{2 \sqrt{c-b}} \right) + (b-c)\, e^{\frac{p^2}{4 (b+c)}} \left(\sqrt{-b-c}\ e^{\frac{p^2}{2 (b+c)}} \operatorname{erfi}\left(\frac{p-2 (b+c) z}{2 \sqrt{-b-c}} \right) + \sqrt{b+c}\ \operatorname{erfi}\left(\frac{p+2 (b+c) z}{2 \sqrt{b+c}} \right) \right) \right)$$

01.20.21.1826.01

$$\int e^{p z} \sinh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{8} \left(\frac{(b-c)\, e^{-\frac{(b-c)^2}{4 p}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{b-c-2 p \sqrt{z}}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{b-c+2 p \sqrt{z}}{2 \sqrt{p}} \right) \right)}{p^{3/2}} + \frac{(b+c)\, e^{-\frac{(b+c)^2}{4 p}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{b+c-2 p \sqrt{z}}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{b+c+2 p \sqrt{z}}{2 \sqrt{p}} \right) \right)}{p^{3/2}} + \frac{4 e^{p z} \left(\sinh\left((b-c) \sqrt{z} \right) + \sinh\left((b+c) \sqrt{z} \right) \right)}{p} \right)$$

Involving $e^{p z^r} \sinh(b z^r) \cosh(c z^r)$

01.20.21.1827.01

$$\int e^{p z^r} \sinh(b z^r) \cosh(c z^r)\, dz == \frac{z}{4 r} \left(\Gamma\left(\frac{1}{r}, (c+b-p) z^r \right) ((c+b-p) z^r)^{-1/r} + (-(c-b+p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, -(c-b+p) z^r \right) - (-(-c+b+p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, -(-c+b+p) z^r \right) - (-(c+b+p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, -(c+b+p) z^r \right) \right)$$

01.20.21.1828.01

$$\int e^{p z^2} \sinh\left(b z^2\right) \cosh\left(c z^2\right) dz == \frac{1}{8} \sqrt{\pi} \left(\left((b-c-p) \sqrt{b-c+p}\ \operatorname{erfi}\left(\sqrt{b-c+p}\ z \right) + (b-c+p) \sqrt{-b+c+p}\ \operatorname{erfi}\left(\sqrt{-b+c+p}\ z \right) \right) \Big/ ((b-c-p) (b-c+p)) + \left(\sqrt{-b-c+p}\ (b+c+p) \operatorname{erfi}\left(\sqrt{-b-c+p}\ z \right) + (b+c-p) \sqrt{b+c+p}\ \operatorname{erfi}\left(\sqrt{b+c+p}\ z \right) \right) \Big/ ((b+c-p) (b+c+p)) \right)$$

01.20.21.1829.01

$$\int e^{p \sqrt{z}} \sinh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{2} \left(\frac{e^{(b-c+p) \sqrt{z}} \left((b-c+p) \sqrt{z} - 1 \right)}{(b-c+p)^2} + \frac{e^{(b+c+p) \sqrt{z}} \left((b+c+p) \sqrt{z} - 1 \right)}{(b+c+p)^2} + \frac{e^{-(b+c-p) \sqrt{z}} \left(\sqrt{z}\ b + c \sqrt{z} - p \sqrt{z} + 1 \right)}{(b+c-p)^2} - \frac{e^{(-b+c+p) \sqrt{z}} \left((-b+c+p) \sqrt{z} - 1 \right)}{(-b+c+p)^2} \right)$$

Involving $e^{b z^r+e} \sinh(a z^r+q) \cosh(c z^r+g)$

01.20.21.1830.01

$$\int e^{b z^r+e} \sinh(a z^r+q) \cosh(c z^r+g)\, dz ==$$
$$-\frac{1}{4r}\left(i z\left(e^{e+g+q-\frac{i\pi}{2}}\,\Gamma\left(\frac{1}{r},(-a-b-c)z^r\right)((-a-b-c)z^r)^{-1/r}+e^{e+g-q+\frac{i\pi}{2}}((a-b-c)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(a-b-c)z^r\right)+\right.\right.$$
$$\left.\left.e^{e-g+q-\frac{i\pi}{2}}((-a-b+c)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-a-b+c)z^r\right)+e^{e-g-q+\frac{i\pi}{2}}((a-b+c)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(a-b+c)z^r\right)\right)\right)$$

01.20.21.1831.01

$$\int e^{b z^2+e} \sinh\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz ==$$
$$\frac{1}{8} e^{e-g-q}\sqrt{\pi}\left(e^{2q}\left(\frac{\operatorname{erfi}\left(\sqrt{a+b-c}\ z\right)}{\sqrt{a+b-c}}+\frac{e^{2g}\operatorname{erfi}\left(\sqrt{a+b+c}\ z\right)}{\sqrt{a+b+c}}\right)-\frac{e^{2g}\operatorname{erf}\left(\sqrt{a-b-c}\ z\right)}{\sqrt{a-b-c}}-\frac{\operatorname{erf}\left(\sqrt{a-b+c}\ z\right)}{\sqrt{a-b+c}}\right)$$

01.20.21.1832.01

$$\int e^{\sqrt{z}\ b+e} \sinh\left(\sqrt{z}\ a+q\right) \cosh\left(\sqrt{z}\ c+g\right) dz ==$$
$$\frac{1}{2} e^{-\sqrt{z}\ a+e-g-q+b\sqrt{z}-c\sqrt{z}}\left(e^{2\left(\sqrt{z}\ c+g\right)}\left(\frac{e^{2\left(\sqrt{z}\ a+q\right)}\left(\sqrt{z}\ a+b\sqrt{z}+c\sqrt{z}-1\right)}{(a+b+c)^2}+\frac{1-(-a+b+c)\sqrt{z}}{(-a+b+c)^2}\right)+\right.$$
$$\left.\frac{e^{2\left(\sqrt{z}\ a+q\right)}\left(\sqrt{z}\ a+b\sqrt{z}-c\sqrt{z}-1\right)}{(a+b-c)^2}+\frac{\sqrt{z}}{a-b+c}+\frac{1}{(a-b+c)^2}\right)$$

Involving $e^{b z^r+d z+e} \sinh(a z^r+p z+q) \cosh(c z^r+f z+g)$

01.20.21.1833.01

$$\int e^{b z^2+d z+e} \sinh\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$
$$\frac{1}{8} i\sqrt{\pi}\left(\frac{1}{(a+b-c)(-a+b+c)}\left(i(a+b-c)\sqrt{-a+b+c}\ e^{-\frac{(d+f-p)^2}{4(-a+b+c)}+e+g-q}\operatorname{erfi}\left(\frac{d+f-p+2(-a+b+c)z}{2\sqrt{-a+b+c}}\right)-\right.\right.$$
$$\left.i\sqrt{a+b-c}\ (-a+b+c)\,e^{-\frac{(d-f+p)^2}{4(a+b-c)}+e-g+q}\operatorname{erfi}\left(\frac{d-f+p+2az+2bz-2cz}{2\sqrt{a+b-c}}\right)\right)-$$
$$\frac{1}{(a-b+c)(a+b+c)}\left(\sqrt{-a+b-c}\ (a+b+c)\,e^{\frac{(-d+f+p)^2}{4(a-b+c)}+e-g-q}\,i\operatorname{erfi}\left(\frac{d-f-p+2bz-2(a+c)z}{2\sqrt{-a+b-c}}\right)+\right.$$
$$\left.\left.(a-b+c)\sqrt{a+b+c}\ e^{-\frac{(d+f+p)^2}{4(a+b+c)}+e+g+q}\,i\operatorname{erfi}\left(\frac{d+f+p+2(a+b+c)z}{2\sqrt{a+b+c}}\right)\right)\right)$$

01.20.21.1834.01

$$\int e^{\sqrt{z}\ b+d\,z+e}\sinh\left(\sqrt{z}\ a+p\,z+q\right)\cosh\left(\sqrt{z}\ c+f\,z+g\right)dz ==$$

$$\frac{1}{8}e^{e-g-q}\left(e^{2q}\left(\frac{(-a+b+c)\,e^{-\frac{(-a+b+c)^2}{4(d+f-p)}+2g-2q}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-a+b+c+2(d+f-p)\sqrt{z}}{2\sqrt{d+f-p}}\right)}{(d+f-p)^{3/2}}-\frac{2e^{\sqrt{z}\ (-a+b+c)+2g-2q+(d+f-p)z}}{d+f-p}+\right.\right.$$

$$\left.\frac{2e^{\sqrt{z}\ (a+b-c)+(d-f+p)z}}{d-f+p}-\frac{(a+b-c)\,e^{-\frac{(a+b-c)^2}{4(d-f+p)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{a+b-c+2(d-f+p)\sqrt{z}}{2\sqrt{d-f+p}}\right)}{(d-f+p)^{3/2}}\right)-$$

$$\frac{2e^{-(-d+f+p)z-(a-b+c)\sqrt{z}}}{d-f-p}-\frac{(a-b+c)\,e^{-\frac{(a-b+c)^2}{4(d-f-p)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-a+b-c+2(d-f-p)\sqrt{z}}{2\sqrt{d-f-p}}\right)}{(d-f-p)^{3/2}}+\frac{2e^{\sqrt{z}\ (a+b+c)+2g+2q+(d+f+p)z}}{d+f+p}-$$

$$\left.\left.\frac{(a+b+c)\,e^{-\frac{(a+b+c)^2}{4(d+f+p)}+2g+2q}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{a+b+c+2(d+f+p)\sqrt{z}}{2\sqrt{d+f+p}}\right)}{(d+f+p)^{3/2}}\right)\right)$$

Involving sinh and rational functions of exp

Involving $\sinh(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1835.01

$$\int\frac{\sinh(e\,z)\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz==\frac{1}{4}a^{-n}\left(\frac{e^{-(c+e)z}}{c+e}\left(e^{2(c+e)z}\,{}_2F_1\left(\frac{c+e}{d},\,n;\,\frac{c+d+e}{d};-\frac{b\,e^{d\,z}}{a}\right)+{}_2F_1\left(-\frac{c+e}{d},\,n;-\frac{c-d+e}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)-\right.$$

$$\left.\frac{1}{c-e}\left(e^{(c-e)z}\,{}_2F_1\left(\frac{c-e}{d},\,n;\,\frac{c+d-e}{d};-\frac{b\,e^{d\,z}}{a}\right)+e^{(e-c)z}\,{}_2F_1\left(\frac{e-c}{d},\,n;\,\frac{-c+d+e}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\Big/;\,n\in\mathbb{N}^+$$

Involving $e^{p\,z}\sinh(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1836.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(c z)}{\left(a + b e^{d z}\right)^n} dz ==$$
$$\frac{1}{4} a^{-n} \left(\frac{1}{(c+e-p)(c+e+p)} \left(e^{(c+e+p) z} (c+e-p) {}_2F_1\left(\frac{c+e+p}{d}, n; \frac{c+d+e+p}{d}; -\frac{b e^{d z}}{a} \right) + e^{-(c+e-p) z} \right.\right.$$
$$\left. (c+e+p) {}_2F_1\left(-\frac{c+e-p}{d}, n; \frac{-c+d-e+p}{d}; -\frac{b e^{d z}}{a} \right) \right) -$$
$$\frac{1}{(c-e-p)(c-e+p)} \left(e^{(c-e+p) z} (c-e-p) {}_2F_1\left(\frac{c-e+p}{d}, n; \frac{c+d-e+p}{d}; -\frac{b e^{d z}}{a} \right) + \right.$$
$$\left.\left. e^{(-c+e+p) z} (c-e+p) {}_2F_1\left(\frac{-c+e+p}{d}, n; \frac{-c+d+e+p}{d}; -\frac{b e^{d z}}{a} \right) \right) \right) /; n \in \mathbb{N}^+$$

Involving sinh and algebraic functions of exp

Involving $\left(a + b e^{d z}\right)^\beta \sinh(e z) \cosh(c z)$

01.20.21.1837.01

$$\int \left(a + b e^{d z}\right)^\beta \sinh(e z) \cosh(c z) dz == -\frac{1}{4} \left(a + b e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta}$$
$$\left(\frac{1}{c-e} \left(e^{(c-e) z} {}_2F_1\left(\frac{c-e}{d}, -\beta; \frac{c+d-e}{d}; -\frac{b e^{d z}}{a} \right) + e^{(e-c) z} {}_2F_1\left(\frac{e-c}{d}, -\beta; \frac{-c+d+e}{d}; -\frac{b e^{d z}}{a} \right) \right) - \right.$$
$$\left. \frac{1}{c+e} \left(e^{(-c-e) z} {}_2F_1\left(\frac{-c-e}{d}, -\beta; \frac{-c+d-e}{d}; -\frac{b e^{d z}}{a} \right) + e^{(c+e) z} {}_2F_1\left(\frac{c+e}{d}, -\beta; \frac{c+d+e}{d}; -\frac{b e^{d z}}{a} \right) \right) \right)$$

Involving $e^{p z} \left(a + b e^{d z}\right)^\beta \sinh(e z) \cosh(c z)$

01.20.21.1838.01

$$\int e^{p z} \left(a + b e^{d z}\right)^\beta \sinh(e z) \cosh(c z) dz ==$$
$$-\frac{1}{4} \left(a + b e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta} \left(\frac{1}{(c-e-p)(c-e+p)} \left(e^{(c-e+p) z} (c-e-p) {}_2F_1\left(\frac{c-e+p}{d}, -\beta; \frac{c+d-e+p}{d}; -\frac{b e^{d z}}{a} \right) + \right.\right.$$
$$\left. e^{(-c+e+p) z} (c-e+p) {}_2F_1\left(\frac{-c+e+p}{d}, -\beta; \frac{-c+d+e+p}{d}; -\frac{b e^{d z}}{a} \right) \right) +$$
$$\frac{1}{(-c-e-p)(-c-e+p)} \left(e^{(-c-e+p) z} (-c-e-p) {}_2F_1\left(\frac{-c-e+p}{d}, -\beta; \frac{-c+d-e+p}{d}; -\frac{b e^{d z}}{a} \right) + \right.$$
$$\left.\left. e^{(c+e+p) z} (-c-e+p) {}_2F_1\left(\frac{c+e+p}{d}, -\beta; \frac{c+d+e+p}{d}; -\frac{b e^{d z}}{a} \right) \right) \right)$$

Involving powers of sinh and exp

Involving $e^{p z} \sinh^{\mu}(c z) \cosh(a z)$

01.20.21.1839.01

$$\int e^{p z} \sinh^{\mu}(c z) \cosh(a z)\, dz == \frac{1}{2}\left(1 - e^{-2 c z}\right)^{-\mu}\left(\frac{e^{(p-a) z}\, {}_2F_1\left(-\frac{-a+p+c\mu}{2c}, -\mu; 1-\frac{-a+p+c\mu}{2c}; e^{-2 c z}\right)}{-a+p+c\mu} + \frac{e^{(a+p) z}\, {}_2F_1\left(-\frac{a+p+c\mu}{2c}, -\mu; 1-\frac{a+p+c\mu}{2c}; e^{-2 c z}\right)}{a+p+c\mu}\right)\sinh^{\mu}(c z)$$

01.20.21.1840.01

$$\int e^{p z} \sinh^{m}(c z) \cosh(a z)\, dz == \binom{m}{\frac{m}{2}}\left(\frac{i}{2}\right)^{m} \frac{e^{p z}\,(a \sinh(a z) - p \cosh(a z))\,(1 - m \bmod 2)}{a^2 - p^2} + 2^{1-m}\, i^{m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} e^{p z}\left(a \sinh(a z)\right.$$
$$\left(i\left(2 p c i\,(2k-m)\cos\left(\frac{m\pi}{2}\right) + \left(-a^2 + p^2 + c^2\,(m-2k)^2\right)\sin\left(\frac{m\pi}{2}\right)\right)\sinh(c\,(m-2k)\,z) - \cosh(c\,(m-2k)\,z)\right.$$
$$\left.\left(\left(-a^2 + p^2 + c^2\,(m-2k)^2\right)\cos\left(\frac{m\pi}{2}\right) - 2 i p c\,(2k-m)\sin\left(\frac{m\pi}{2}\right)\right)\right) - \cosh(a z)\left(\cosh(c\,(m-2k)\,z)\right.$$
$$\left(p\left(a^2 - p^2 + c^2\,(m-2k)^2\right)\cos\left(\frac{m\pi}{2}\right) + c i\,(2k-m)\left(a^2 + p^2 - c^2\,(m-2k)^2\right)\sin\left(\frac{m\pi}{2}\right)\right) + \left(-c\,(2k-m)\right.$$
$$\left.\left.\left.\left(a^2 + p^2 - c^2\,(m-2k)^2\right)\cos\left(\frac{m\pi}{2}\right) - i p\left(a^2 - p^2 + c^2\,(m-2k)^2\right)\sin\left(\frac{m\pi}{2}\right)\right)\sinh(c\,(m-2k)\,z)\right)\right)\Big/$$
$$\left((a - p + 2 c k - c m)\,(a + p + 2 c k - c m)\,(a - p + c\,(m-2k))\,(a + p + c\,(m-2k))\right) /;\ m \in \mathbb{N}^{+}$$

01.20.21.1841.01

$$\int e^{p z} \sinh^{2}(a z) \cosh(a z)\, dz == \frac{1}{4\left(9 a^4 - 10 p^2 a^2 + p^4\right)}$$
$$\left(e^{p z}\left(-p\left(p^2 - 9 a^2\right)\cosh(a z) + \left(p^3 - a^2 p\right)\cosh(3 a z) + 2 a\left(-3 a^2 - p^2 + 3\left(a^2 - p^2\right)\cosh(2 a z)\right)\sinh(a z)\right)\right)$$

Involving $e^{p z} \sinh^{\mu}(c z + d) \cosh(a z + b)$

01.20.21.1842.01

$$\int e^{p z} \sinh^{\mu}(d + c z) \cosh(a z)\, dz == \frac{1}{2}\left(1 - e^{2(d+c z)}\right)^{-\mu}\left(\frac{e^{(p-a) z}}{-a+p-c\mu}\, {}_2F_1\left(\frac{-a+p-c\mu}{2c}, -\mu; \frac{-a+2c+p-c\mu}{2c}; e^{2(d+c z)}\right) + \right.$$
$$\left.\frac{e^{(a+p) z}}{a+p-c\mu}\, {}_2F_1\left(\frac{a+p-c\mu}{2c}, -\mu; \frac{1}{2}\left(\frac{a+p}{c} - \mu + 2\right); e^{2(d+c z)}\right)\right)\sinh^{\mu}(d + c z)$$

01.20.21.1843.01

$$\int e^{p z} \sinh^{m}(d + c z) \cosh(a z)\, dz == -i^{m} 2^{-m-1}\left(\frac{e^{-(a-p) z}}{a-p} + \frac{e^{(a+p) z}}{-a-p}\right)\binom{m}{\frac{m}{2}}(1 - m \bmod 2) -$$
$$2^{-m-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-2 d k - d m}\left(e^{2 d m}\left(\frac{e^{-(a+2 c k - c m - p) z}}{a + 2 c k - c m - p} + \frac{e^{-(-a+2 c k - c m - p) z}}{-a + 2 c k - c m - p}\right) + \right.$$
$$\left.e^{4 d k + i m \pi}\left(\frac{e^{-(a+c\,(m-2k)-p) z}}{a + c\,(m-2k) - p} + \frac{e^{-(-a-2 c k + c m - p) z}}{-a - 2 c k + c m - p}\right)\right)\binom{m}{k} /;\ m \in \mathbb{N}^{+}$$

Involving $e^{p z}\sinh^{\mu}(c z)\cosh(a z+b)$

01.20.21.1844.01

$$\int e^{p z}\sinh^{\mu}(c z)\cosh(b+a z)\,dz == \frac{1}{2}e^{-b}\left(1-e^{2cz}\right)^{-\mu}\left(\frac{e^{(p-a)z}}{-a+p-c\mu}\,{}_2F_1\left(\frac{-a+p-c\mu}{2c},\,-\mu;\,\frac{-a+2c+p-c\mu}{2c};\,e^{2cz}\right)+\frac{e^{2b+(a+p)z}}{a+p-c\mu}\,{}_2F_1\left(\frac{a+p-c\mu}{2c},\,-\mu;\,\frac{1}{2}\left(\frac{a+p}{c}-\mu+2\right);\,e^{2cz}\right)\right)\sinh^{\mu}(c z)$$

01.20.21.1845.01

$$\int e^{p z}\sinh^{m}(c z)\cosh(b+a z)\,dz == -i^m\,2^{-m-1}\,e^{-b}\left(\frac{e^{-(a-p)z}}{a-p}+\frac{e^{2b+(a+p)z}}{-a-p}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)-2^{-m-1}\,e^{-b}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left((-1)^m\left(\frac{e^{-(a+c(m-2k)-p)z}}{a+c(m-2k)-p}+\frac{e^{2b-(-a-2ck+cm-p)z}}{-a-2ck+cm-p}\right)+\frac{e^{2b-(-a+2ck-cm-p)z}}{-a+2ck-cm-p}+\frac{e^{-(a+2ck-cm-p)z}}{a+2ck-cm-p}\right)\binom{m}{k}\,/;\,m\in\mathbb{N}^+$$

Involving $e^{p z}\sinh^{\mu}(c z+d)\cosh(a z+b)$

01.20.21.1846.01

$$\int e^{p z}\sinh^{\mu}(d+c z)\cosh(b+a z)\,dz == \frac{1}{2}e^{-b}\left(1-e^{2(d+cz)}\right)^{-\mu}\left(\frac{e^{(p-a)z}}{-a+p-c\mu}\,{}_2F_1\left(\frac{-a+p-c\mu}{2c},\,-\mu;\,\frac{-a+2c+p-c\mu}{2c};\,e^{2(d+cz)}\right)+\frac{e^{2b+(a+p)z}}{a+p-c\mu}\,{}_2F_1\left(\frac{a+p-c\mu}{2c},\,-\mu;\,\frac{1}{2}\left(\frac{a+p}{c}-\mu+2\right);\,e^{2(d+cz)}\right)\right)\sinh^{\mu}(d+c z)$$

01.20.21.1847.01

$$\int e^{p z}\sinh^{m}(d+c z)\cosh(b+a z)\,dz == -i^m\,2^{-m-1}\,e^{-b}\left(\frac{e^{-(a-p)z}}{a-p}+\frac{e^{2b-(-a-p)z}}{-a-p}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)-2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-b-2dk-dm}\left(e^{2dm}\left(\frac{e^{-(a+2ck-cm-p)z}}{a+2ck-cm-p}+\frac{e^{2b-(-a+2ck-cm-p)z}}{-a+2ck-cm-p}\right)+e^{4dk+im\pi}\left(\frac{e^{-(a+c(m-2k)-p)z}}{a+c(m-2k)-p}+\frac{e^{2b-(-a-2ck+cm-p)z}}{-a-2ck+cm-p}\right)\right)\binom{m}{k}\,/;\,m\in\mathbb{N}^+$$

Involving $e^{p z^r}\sinh^{m}(b z^r)\cosh(c z)$

01.20.21.1848.01

$$\int e^{p z^2} \sinh^m\left(b z^2\right) \cosh(c z)\, dz ==$$

$$\frac{i^m 2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(e^{-\frac{c^2}{4p}} \operatorname{erfi}\left(\frac{2 p z - c}{2\sqrt{p}}\right) + e^{-\frac{c^2}{4p}} \operatorname{erfi}\left(\frac{c + 2 p z}{2\sqrt{p}}\right)\right) (1 - m \bmod 2)}{\sqrt{p}} + i^m 2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$\left(\left(e^{-\frac{c^2 + 2 i m (p - b(2k-m)) \pi}{4 (p - b(2k-m))}} \sqrt{p - b(2k-m)}\ (b(2k-m) + p) \operatorname{erfi}\left(\frac{-c - 2b(2k-m) z + 2 p z}{2\sqrt{p - b(2k-m)}}\right) + e^{-\frac{c^2 - 2 i m (b(2k-m) + p) \pi}{4 (b(2k-m) + p)}}\right.\right.$$

$$\left.\left.(p - b(2k-m)) \sqrt{b(2k-m) + p}\ \operatorname{erfi}\left(\frac{c + 2(b(2k-m) + p) z}{2\sqrt{b(2k-m) + p}}\right)\right) \Big/ ((p - b(2k-m))(b(2k-m) + p)) +\right.$$

$$\left(e^{-\frac{c^2 - 2 i m (p - b(m-2k)) \pi}{4 (p - b(m-2k))}} \sqrt{p - b(m-2k)}\ (b(m-2k) + p) \operatorname{erfi}\left(\frac{-c - 2b(m-2k) z + 2 p z}{2\sqrt{p - b(m-2k)}}\right) +\right.$$

$$\left.\left.e^{-\frac{c^2 + 2 i m (b(m-2k) + p) \pi}{4 (b(m-2k) + p)}} (p - b(m-2k)) \sqrt{b(m-2k) + p}\ \operatorname{erfi}\left(\frac{c + 2(b(m-2k) + p) z}{2\sqrt{b(m-2k) + p}}\right)\right) \Big/\right.$$

$$\left.((p - b(m-2k))(b(m-2k) + p))\right) /;\ m \in \mathbb{N}^+$$

01.20.21.1849.01

$$\int e^{p\sqrt{z}}\sinh^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$i^{-m}\,2^{-m-2}\binom{m}{\frac{m}{2}}\left(-\frac{e^{\frac{p^2}{4c}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2c\sqrt{z}}{2\sqrt{-c}}\right)}{(-c)^{3/2}}+\frac{4\,e^{p\sqrt{z}}\sinh(c\,z)}{c}-\frac{e^{-\frac{p^2}{4c}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+p}{2\sqrt{c}}\right)}{c^{3/2}}\right)(1-m \bmod 2)+$$

$$(-1)^m\,2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\,(p-b\,(2\,k-m))+c\,z}}{c}+\frac{e^{-\frac{(2\,i\,b\,k-i\,b\,m+i\,p)^2}{4c}}\,(2\,b\,k-b\,m+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c-b\,(2\,k-m)-p}{2\sqrt{-c}}\right)}{(-c)^{3/2}}-\right.$$

$$\frac{e^{\frac{(b\,i\,(m-2\,k)+i\,p)^2}{4c}+i\,m\,\pi}\,(p-b\,(2\,k-m))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c-b\,(2\,k-m)+p}{2\sqrt{c}}\right)}{c^{3/2}}+$$

$$(-1)^m\left(\frac{2\,e^{-i\,\pi\,m+c\,z+(p-b\,(m-2\,k))\sqrt{z}}}{c}+\frac{e^{-\frac{(b\,i\,(m-2\,k)+i\,p)^2}{4c}}\,(p-b\,(2\,k-m))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c-b\,(m-2\,k)-p}{2\sqrt{-c}}\right)}{(-c)^{3/2}}-\right.$$

$$\frac{e^{-\frac{(p-b\,(m-2\,k))^2}{4c}-i\,m\,\pi}\,(2\,b\,k-b\,m+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c-b\,(m-2\,k)+p}{2\sqrt{c}}\right)}{c^{3/2}}-$$

$$\left.\left.\frac{2\,e^{(b\,(m-2\,k)+p)\sqrt{z}-c\,z}}{c}-\frac{2\,e^{(b\,(2\,k-m)+p)\sqrt{z}-c\,z}}{c}\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $e^{p\,z^r}\sinh^m(b\,z)\cosh(c\,z)$

01.20.21.1850.01

$$\int e^{p\,z^2}\sinh^m(b\,z)\cosh(c\,z)\,dz == \frac{i^m\,2^{-m-2}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(e^{-\frac{c^2}{4\,p}}\operatorname{erfi}\left(\frac{2\,p\,z-c}{2\sqrt{p}}\right)+e^{-\frac{c^2}{4\,p}}\operatorname{erfi}\left(\frac{c+2\,p\,z}{2\sqrt{p}}\right)\right)(1-m \bmod 2)}{\sqrt{p}}+\frac{1}{\sqrt{p}}\left(i^m\,2^{-m-2}\sqrt{\pi}\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(c+b\,(2\,k-m))^2-2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{c+b\,(2\,k-m)+2\,p\,z}{2\sqrt{p}}\right)+e^{-\frac{(-c-b\,(2\,k-m))^2+2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{-c-b\,(2\,k-m)+2\,p\,z}{2\sqrt{p}}\right)+\right.$$

$$\left.\left.e^{-\frac{(c+b\,(m-2\,k))^2+2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{c+b\,(m-2\,k)+2\,p\,z}{2\sqrt{p}}\right)+e^{-\frac{(-c-b\,(m-2\,k))^2-2\,\pi\,i\,m\,p}{4\,p}}\operatorname{erfi}\left(\frac{-c-b\,(m-2\,k)+2\,p\,z}{2\sqrt{p}}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1851.01

$$\int e^{p\sqrt{z}} \sinh^m(b\,z)\cosh(c\,z)\,dz ==$$

$$i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}\left(-\frac{e^{\frac{p^2}{4c}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2c\sqrt{z}}{2\sqrt{-c}}\right)}{(-c)^{3/2}}+\frac{4\,e^{p\sqrt{z}}\sinh(c\,z)}{c}-\frac{e^{-\frac{p^2}{4c}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,c+p}{2\sqrt{c}}\right)}{c^{3/2}}\right)(1-m \bmod 2)+$$

$$2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\left(-\frac{e^{-\frac{p^2}{4(c+b(m-2k))}-i\,m\,\pi}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+b(m-2k))+p}{2\sqrt{c+b(m-2k)}}\right)}{(c+b(m-2k))^{3/2}}+\frac{2\,e^{-i\,\pi\,m+(c+b(m-2k))\,z+p\sqrt{z}}}{c+b(m-2k)}+\right.\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\,p+(-c-b(m-2k))\,z}}{-c-b(m-2k)}-\frac{e^{-\frac{p^2}{4(-c-b(m-2k))}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(-c-b(m-2k))+p}{2\sqrt{-c-b(m-2k)}}\right)}{(-c-b(m-2k))^{3/2}}\right)+$$

$$\frac{2\,e^{i\,\pi\,m+(c+b(2k-m))\,z+p\sqrt{z}}}{c+b(2k-m)}-\frac{e^{i\,m\,\pi-\frac{p^2}{4(c+b(2k-m))}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+b(2k-m))+p}{2\sqrt{c+b(2k-m)}}\right)}{(c+b(2k-m))^{3/2}}+$$

$$\left.\frac{2\,e^{\sqrt{z}\,p+(-c-b(2k-m))\,z}}{-c-b(2k-m)}-\frac{e^{-\frac{p^2}{4(-c-b(2k-m))}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(-c-b(2k-m))+p}{2\sqrt{-c-b(2k-m)}}\right)}{(-c-b(2k-m))^{3/2}}\right)\Big/;\ m\in\mathbb{N}^+$$

Involving $e^{p\,z}\sinh^m(b\,z^r)\cosh(c\,z)$

01.20.21.1852.01

$$\int e^{p\,z}\sinh^m\left(b\,z^2\right)\cosh(c\,z)\,dz == \frac{\left(\frac{i}{2}\right)^m e^{p\,z}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,(c\sinh(c\,z)-p\cosh(c\,z))}{(c-p)\,(c+p)}-$$

$$\frac{1}{b}\left(i^m\,2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{2k-m}\left((-1)^k\binom{m}{k}\left(e^{\frac{(p-c)^2-2\,i\,b\,(2k-m)\,m\,\pi}{4\,b\,(2k-m)}}\sqrt{-b\,(2k-m)}\,\operatorname{erfi}\left(\frac{-c+p-2\,b\,(2k-m)\,z}{2\sqrt{-b\,(2k-m)}}\right)-\right.\right.\right.$$

$$e^{-\frac{(c+p)^2-2\,i\,b\,(2k-m)\,m\,\pi}{4\,b\,(2k-m)}}\sqrt{b\,(2k-m)}\,\operatorname{erfi}\left(\frac{c+p+2\,b\,(2k-m)\,z}{2\sqrt{b\,(2k-m)}}\right)-e^{\frac{(p-c)^2+2\,b\,i\,m\,(m-2k)\,\pi}{4\,b\,(m-2k)}}\sqrt{-b\,(m-2k)}\,\operatorname{erfi}\left(\right.$$

$$\left.\left.\left.\frac{-c+p-2\,b\,(m-2k)\,z}{2\sqrt{-b\,(m-2k)}}\right)+e^{-\frac{(c+p)^2+2\,b\,i\,m\,(m-2k)\,\pi}{4\,b\,(m-2k)}}\sqrt{b\,(m-2k)}\,\operatorname{erfi}\left(\frac{c+p+2\,b\,(m-2k)\,z}{2\sqrt{b\,(m-2k)}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.1853.01

$$\int e^{p z} \sinh^m\left(b \sqrt{z}\right) \cosh(c z)\, dz == i^m 2^{-m-1} \left(\frac{e^{(c+p) z}}{c+p} + \frac{e^{(p-c) z}}{p-c}\right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2) + 2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$\left(-\frac{b\, e^{-\frac{b^2 (2k-m)^2}{4(p-c)}} (2k-m) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(2k-m)+2(c-p)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}} + (-1)^m \left(-\frac{b\, e^{-\frac{b^2 (m-2k)^2}{4(p-c)}} (m-2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2(c-p)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}} - \right.\right.$$

$$\frac{b\, e^{-\frac{b^2 (m-2k)^2}{4(c+p)} - i m \pi} (m-2k) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}} +$$

$$\left.\left. \frac{2\, e^{(p-c) z - b(m-2k)\sqrt{z}}}{p-c} + \frac{2\, e^{-i\pi m + (c+p) z + b(m-2k)\sqrt{z}}}{c+p} \right) + \frac{2\, e^{(p-c) z - b(2k-m)\sqrt{z}}}{p-c} + \right.$$

$$\left. \frac{2\, e^{b\sqrt{z}\,(2k-m) + (c+p) z + i m \pi}}{c+p} - \frac{b\, e^{i m \pi - \frac{b^2 (2k-m)^2}{4(c+p)}} (2k-m) \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(2k-m)+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}} \right) /;\ m \in \mathbb{N}^+$$

Involving $e^{p z} \sinh^m(b z) \cosh\left(c z^r\right)$

01.20.21.1854.01

$$\int e^{p z} \sinh^m(b z) \cosh\left(c z^2\right) dz ==$$

$$-\frac{i^m 2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(\sqrt{-c}\ e^{\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p-2cz}{2\sqrt{-c}}\right) - \sqrt{c}\ e^{-\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p+2cz}{2\sqrt{c}}\right)\right) (1 - m \bmod 2)}{c} - \frac{1}{c} i^m 2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$\left(\sqrt{-c}\ e^{\frac{(p-b(2k-m))^2 - 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{-b(2k-m)+p-2cz}{2\sqrt{-c}}\right) + \sqrt{-c}\ e^{\frac{(p-b(m-2k))^2 + 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{-b(m-2k)+p-2cz}{2\sqrt{-c}}\right) - \sqrt{c} \right.$$

$$\left. e^{-\frac{(b(2k-m)+p)^2 - 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{b(2k-m)+p+2cz}{2\sqrt{c}}\right) - \sqrt{c}\ e^{-\frac{(b(m-2k)+p)^2 + 2\pi i c m}{4c}} \operatorname{erfi}\left(\frac{b(m-2k)+p+2cz}{2\sqrt{c}}\right) \right) /;\ m \in \mathbb{N}^+$$

01.20.21.1855.01

$$\int e^{p z} \sinh^m(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$i^{-m} 2^{-m-2} \binom{m}{\frac{m}{2}} \left(\frac{4 e^{p z} \cosh\left(c \sqrt{z}\right)}{p} - \frac{c e^{-\frac{c^2}{4 p}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{c+2 p \sqrt{z}}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{2 p \sqrt{z} - c}{2 \sqrt{p}} \right) \right)}{p^{3/2}} \right) (1 - m \bmod 2) +$$

$$2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left((-1)^m \left(\frac{c e^{i m \pi - \frac{c^2}{4(-2 b k + b m + p)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{2(-2 b k + b m + p) \sqrt{z} - c}{2 \sqrt{-2 b k + b m + p}} \right)}{(-2 b k + b m + p)^{3/2}} + \right.\right.$$

$$\frac{2 e^{-\sqrt{z}\, c + (-2 b k + b m + p) z + i m \pi}}{-2 b k + b m + p} + \frac{2 e^{\sqrt{z}\, c + (2 b k - b m + p) z}}{2 b k - b m + p} - \frac{c e^{-\frac{c^2}{4(2 b k - b m + p)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c + 2(2 b k - b m + p) \sqrt{z}}{2 \sqrt{2 b k - b m + p}} \right)}{(2 b k - b m + p)^{3/2}} +$$

$$\frac{c e^{-\frac{c^2}{4(2 b k - b m + p)} - i m \pi} \sqrt{\pi} \operatorname{erfi}\left(\frac{2(2 b k - b m + p) \sqrt{z} - c}{2 \sqrt{2 b k - b m + p}} \right)}{(2 b k - b m + p)^{3/2}} + \frac{2 e^{\sqrt{z}\, c + (-2 b k + b m + p) z}}{-2 b k + b m + p} -$$

$$\left.\left. \frac{c e^{-\frac{c^2}{4(-2 b k + b m + p)}} \sqrt{\pi} \operatorname{erfi}\left(\frac{c + 2(-2 b k + b m + p) \sqrt{z}}{2 \sqrt{-2 b k + b m + p}} \right)}{(-2 b k + b m + p)^{3/2}} + \frac{2 e^{-\sqrt{z}\, c + (2 b k - b m + p) z - i m \pi}}{2 b k - b m + p} \right) \right) /; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \sinh^m(b z) \cosh\left(c z^r\right)$

01.20.21.1856.01

$$\int e^{p z^2} \sinh^m(b z) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{(p-c)(c+p)} \left(i^m 2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(\sqrt{p-c}\, (c+p) \operatorname{erfi}\left(\frac{2 p z - 2 c z}{2 \sqrt{p-c}} \right) + (p-c) \sqrt{c+p}\, \operatorname{erfi}\left(\sqrt{c+p}\, z \right) \right) (1 - m \bmod 2) \right) +$$

$$i^m 2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\frac{1}{(p-c)(c+p)} \left(e^{-\frac{b^2 (2k-m)^2 + 2 i m (p-c) \pi}{4 (p-c)}} \sqrt{p-c}\, (c+p) \operatorname{erfi}\left(\frac{-b(2k-m) - 2 c z + 2 p z}{2 \sqrt{p-c}} \right) + \right.\right.$$

$$\left. e^{-\frac{b^2 (2k-m)^2 - 2 i m (c+p) \pi}{4 (c+p)}} (p-c) \sqrt{c+p}\, \operatorname{erfi}\left(\frac{b(2k-m) + 2(c+p) z}{2 \sqrt{c+p}} \right) \right) +$$

$$\frac{1}{(p-c)(c+p)} \left(e^{-\frac{b^2 (m-2k)^2 - 2 i m (p-c) \pi}{4 (p-c)}} \sqrt{p-c}\, (c+p) \operatorname{erfi}\left(\frac{-b(m-2k) - 2 c z + 2 p z}{2 \sqrt{p-c}} \right) + \right.$$

$$\left.\left. e^{-\frac{b^2 (m-2k)^2 + 2 i m (c+p) \pi}{4 (c+p)}} (p-c) \sqrt{c+p}\, \operatorname{erfi}\left(\frac{b(m-2k) + 2(c+p) z}{2 \sqrt{c+p}} \right) \right) \right) /; m \in \mathbb{N}^+$$

01.20.21.1857.01

$$\int e^{p\sqrt{z}}\sinh^m(b\,z)\cosh\left(c\sqrt{z}\right)dz == \frac{1}{\left(p^2-c^2\right)^2}\left(i^{-m}\,2^{1-m}\,e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$
$$\left.\left(\left(\sqrt{z}\;p^3-p^2-c^2\sqrt{z}\;p-c^2\right)\cosh\left(c\sqrt{z}\right)-c\left(-\sqrt{z}\;c^2-2\,p+p^2\sqrt{z}\right)\sinh\left(c\sqrt{z}\right)\right)\right)+$$
$$2^{-m-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\left(-\frac{e^{\frac{(p-c)^2}{4\,b\,(m-2\,k)}}\,(p-c)\,\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-c+p-2\,b\,(m-2\,k)\,\sqrt{z}}{2\sqrt{-b\,(m-2\,k)}}\right)}{2\,(-b\,(m-2\,k))^{3/2}}-\frac{e^{(p-c)\sqrt{z}-b\,(m-2\,k)\,z}}{b\,(m-2\,k)}\right)+\right.$$
$$(-1)^m\left(-\frac{e^{\frac{(c+p)^2}{4\,b\,(m-2\,k)}}\,(c+p)\,\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+p-2\,b\,(m-2\,k)\,\sqrt{z}}{2\sqrt{-b\,(m-2\,k)}}\right)}{2\,(-b\,(m-2\,k))^{3/2}}-\frac{e^{(c+p)\sqrt{z}-b\,(m-2\,k)\,z}}{b\,(m-2\,k)}\right)+$$
$$\frac{e^{\sqrt{z}\;(p-c)+b\,(m-2\,k)\,z}}{b\,(m-2\,k)}+\frac{e^{\sqrt{z}\;(c+p)+b\,(m-2\,k)\,z}}{b\,(m-2\,k)}-\frac{e^{-\frac{(p-c)^2}{4\,b\,(m-2\,k)}}\,(p-c)\,\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-c+p+2\,b\,(m-2\,k)\,\sqrt{z}}{2\sqrt{b\,(m-2\,k)}}\right)}{2\,(b\,(m-2\,k))^{3/2}}-$$
$$\left.\left.\frac{e^{-\frac{(c+p)^2}{4\,b\,(m-2\,k)}}\,(c+p)\,\sqrt{\pi}\;\operatorname{erfi}\left(\frac{c+p+2\,b\,(m-2\,k)\,\sqrt{z}}{2\sqrt{b\,(m-2\,k)}}\right)}{2\,(b\,(m-2\,k))^{3/2}}\right)\right)/;\; m\in\mathbb{N}^+$$

Involving $e^{p\,z}\sinh^m\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1858.01

$$\int e^{p\,z}\sinh^m\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == -\frac{i^m\,2^{-m-2}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\left(\sqrt{-c}\;e^{\frac{p^2}{4c}}\operatorname{erfi}\left(\frac{p-2\,c\,z}{2\sqrt{-c}}\right)-\sqrt{c}\;e^{-\frac{p^2}{4c}}\operatorname{erfi}\left(\frac{p+2\,c\,z}{2\sqrt{c}}\right)\right)(1-m \bmod 2)}{c}+$$
$$i^m\,2^{-m-2}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(e^{-\frac{p^2-2\,i\,(c+b\,(2\,k-m))\,m\,\pi}{4\,(c+b\,(2\,k-m))}}\sqrt{c+b\,(2\,k-m)}\;(-c-b\,(2\,k-m))\operatorname{erfi}\left(\frac{p+2\,(c+b\,(2\,k-m))\,z}{2\sqrt{c+b\,(2\,k-m)}}\right)+\right.\right.$$
$$\left.e^{-\frac{p^2+2\,i\,(-c-b\,(2\,k-m))\,m\,\pi}{4\,(-c-b\,(2\,k-m))}}\,(c+b\,(2\,k-m))\sqrt{-c-b\,(2\,k-m)}\;\operatorname{erfi}\left(\frac{p-2\,(c+b\,(2\,k-m))\,z}{2\sqrt{-c-b\,(2\,k-m)}}\right)\right)\Big/$$
$$\left((-c-b\,(2\,k-m))\,(c+b\,(2\,k-m))\right)+\left(e^{-\frac{p^2+2\,i\,m\,(c+b\,(m-2\,k))\,\pi}{4\,(c+b\,(m-2\,k))}}\sqrt{c+b\,(m-2\,k)}\;(-c-b\,(m-2\,k))\right.$$
$$\operatorname{erfi}\left(\frac{p+2\,(c+b\,(m-2\,k))\,z}{2\sqrt{c+b\,(m-2\,k)}}\right)+e^{-\frac{p^2-2\,i\,m\,(-c-b\,(m-2\,k))\,\pi}{4\,(-c-b\,(m-2\,k))}}\,(c+b\,(m-2\,k))\sqrt{-c-b\,(m-2\,k)}$$
$$\left.\left.\operatorname{erfi}\left(\frac{p-2\,(c+b\,(m-2\,k))\,z}{2\sqrt{-c-b\,(m-2\,k)}}\right)\right)\Big/\left((-c-b\,(m-2\,k))\,(c+b\,(m-2\,k))\right)\right)/;\; m\in\mathbb{N}^+$$

01.20.21.1859.01

$$\int e^{p z} \sinh^m\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$i^{-m} 2^{-m-2} \binom{m}{\frac{m}{2}} \left(\frac{4 e^{p z} \cosh\left(c \sqrt{z}\right)}{p} + \frac{e^{-\frac{c^2}{4 p}} \left(c \sqrt{\pi}\right) \left(\operatorname{erfi}\left(\frac{2 p \sqrt{z} - c}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{c + 2 p \sqrt{z}}{2 \sqrt{p}} \right) \right)}{p^{3/2}} \right) (1 - m \bmod 2) + 2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$\left(\frac{4 e^{p z - \frac{i m \pi}{2}} \cos\left(\frac{\pi m}{2} + (-i c + 2 i b k - i b m) \sqrt{z} \right)}{p} - \frac{e^{-\frac{(-c - b (m-2k))^2}{4 p} - i m \pi} (-c - b (m - 2 k)) \sqrt{\pi} \operatorname{erfi}\left(\frac{-c - b (m-2k) + 2 p \sqrt{z}}{2 \sqrt{p}} \right)}{p^{3/2}} + \right.$$

$$(-1)^m \left(\frac{4 e^{\frac{i \pi m}{2} + p z} \cos\left(\frac{\pi m}{2} + (i c + 2 i b k - i b m) \sqrt{z} \right)}{p} - \right.$$

$$\frac{e^{i m \pi - \frac{(-c - 2 b k + b m)^2}{4 p}} (-c - 2 b k + b m) \sqrt{\pi} \operatorname{erfi}\left(\frac{-c - b (2k - m) + 2 p \sqrt{z}}{2 \sqrt{p}} \right)}{p^{3/2}} -$$

$$\left. \left. \frac{e^{-\frac{(c + 2 b k - b m)^2}{4 p}} (c + 2 b k - b m) \sqrt{\pi} \operatorname{erfi}\left(\frac{c - b (m-2k) + 2 p \sqrt{z}}{2 \sqrt{p}} \right)}{p^{3/2}} \right) - \right.$$

$$\left. \frac{e^{-\frac{(c - 2 b k + b m)^2}{4 p}} (c - 2 b k + b m) \sqrt{\pi} \operatorname{erfi}\left(\frac{c - b (2k - m) + 2 p \sqrt{z}}{2 \sqrt{p}} \right)}{p^{3/2}} \right) /; m \in \mathbb{N}^+$$

Involving $e^{p z^r} \sinh^m\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.1860.01

$$\int e^{p z} \sinh^m\left(b z^2\right) \cosh\left(c z^2\right) dz == -\frac{i^m 2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(\sqrt{-c}\ e^{\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p-2cz}{2\sqrt{-c}}\right) - \sqrt{c}\ e^{-\frac{p^2}{4c}} \operatorname{erfi}\left(\frac{p+2cz}{2\sqrt{c}}\right)\right)(1-m \bmod 2)}{c} +$$

$$i^m 2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left(\left(e^{-\frac{p^2-2i(c+b(2k-m))m\pi}{4(c+b(2k-m))}} \sqrt{c+b(2k-m)}\ (-c-b(2k-m)) \operatorname{erfi}\left(\frac{p+2(c+b(2k-m))z}{2\sqrt{c+b(2k-m)}}\right) + \right.\right.$$

$$\left.\left. e^{-\frac{p^2+2i(-c-b(2k-m))m\pi}{4(-c-b(2k-m))}} (c+b(2k-m)) \sqrt{-c-b(2k-m)}\ \operatorname{erfi}\left(\frac{p-2(c+b(2k-m))z}{2\sqrt{-c-b(2k-m)}}\right)\right) \Big/ \right.$$

$$\left.((-c-b(2k-m))(c+b(2k-m))) + \left(e^{-\frac{p^2+2im(c+b(m-2k))\pi}{4(c+b(m-2k))}} \sqrt{c+b(m-2k)}\ (-c-b(m-2k)) \right.\right.$$

$$\operatorname{erfi}\left(\frac{p+2(c+b(m-2k))z}{2\sqrt{c+b(m-2k)}}\right) + e^{-\frac{p^2-2im(-c-b(m-2k))\pi}{4(-c-b(m-2k))}} (c+b(m-2k)) \sqrt{-c-b(m-2k)}$$

$$\left.\left.\operatorname{erfi}\left(\frac{p-2(c+b(m-2k))z}{2\sqrt{-c-b(m-2k)}}\right)\right) \Big/ ((-c-b(m-2k))(c+b(m-2k)))\right) /;\ m \in \mathbb{N}^+$$

01.20.21.1861.01

$$\int e^{p z^2} \sinh^m\left(b z^2\right) \cosh\left(c z^2\right) dz == i^m 2^{-m-2} \sqrt{\pi} \binom{m}{\frac{m}{2}} \left(\frac{\operatorname{erfi}\left(\sqrt{p-c}\ z\right)}{\sqrt{p-c}} + \frac{\operatorname{erfi}\left(\sqrt{c+p}\ z\right)}{\sqrt{c+p}}\right)(1-m \bmod 2) +$$

$$i^m 2^{-m-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left(\left(\frac{\operatorname{erfi}\left(\sqrt{-c-2bk+bm+p}\ z\right)}{\sqrt{-c-2bk+bm+p}} + \frac{\operatorname{erfi}\left(\sqrt{c-2bk+bm+p}\ z\right)}{\sqrt{c-2bk+bm+p}} + \right.\right.$$

$$\left.\left.\frac{\operatorname{erfi}\left(\sqrt{-c+2bk-bm+p}\ z\right)}{\sqrt{-c+2bk-bm+p}} + \frac{\operatorname{erfi}\left(\sqrt{c+2bk-bm+p}\ z\right)}{\sqrt{c+2bk-bm+p}}\right) \cos\left(\frac{m\pi}{2}\right) + \right.$$

$$i\left(-\frac{\operatorname{erfi}\left(\sqrt{-c-2bk+bm+p}\ z\right)}{\sqrt{-c-2bk+bm+p}} + \frac{\operatorname{erfi}\left(\sqrt{-c+2bk-bm+p}\ z\right)}{\sqrt{-c+2bk-bm+p}} + \frac{\operatorname{erfi}\left(\sqrt{c+2bk-bm+p}\ z\right)}{\sqrt{c+2bk-bm+p}} - \right.$$

$$\left.\left.\frac{\operatorname{erfi}\left(\sqrt{c-2bk+bm+p}\ z\right)}{\sqrt{c-2bk+bm+p}}\right) \sin\left(\frac{m\pi}{2}\right)\right) /;\ m \in \mathbb{N}^+$$

01.20.21.1862.01

$$\int e^{p\sqrt{z}}\sinh^m\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right)dz == \frac{1}{\left(p^2-c^2\right)^2}\left(i^m\,2^{1-m}\,e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left(\left(p^2\left(p\sqrt{z}-1\right)-c^2\left(\sqrt{z}\,p+1\right)\right)\cosh\left(c\sqrt{z}\right)-c\left(-\sqrt{z}\,c^2-2p+p^2\sqrt{z}\right)\sinh\left(c\sqrt{z}\right)\right)+$$

$$i^m\,2^{1-m}\,e^{p\sqrt{z}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(\left(p^2\left(p\sqrt{z}-1\right)-(-c+2bk-bm)^2\left(\sqrt{z}\,p+1\right)\right)\cosh\left((-c+2bk-bm)\sqrt{z}\right)-\right.\right.$$

$$\left.(-c+2bk-bm)\left(-\sqrt{z}\,(-c+2bk-bm)^2-2p+p^2\sqrt{z}\right)\sinh\left((-c+2bk-bm)\sqrt{z}\right)\right)\Big/$$

$$\left(p^2-(-c+2bk-bm)^2\right)^2+\frac{1}{\left(p^2-(c+2bk-bm)^2\right)^2}$$

$$\left(\left(p^2\left(p\sqrt{z}-1\right)-(c+2bk-bm)^2\left(\sqrt{z}\,p+1\right)\right)\cosh\left((c+2bk-bm)\sqrt{z}\right)-\right.$$

$$\left.\left.(c+2bk-bm)\left(-\sqrt{z}\,(c+2bk-bm)^2-2p+p^2\sqrt{z}\right)\sinh\left((c+2bk-bm)\sqrt{z}\right)\right)\cos\left(\frac{m\pi}{2}\right)+\right.$$

$$\left(\left(i\left(p^2\left(p\sqrt{z}-1\right)-(-c+2bk-bm)^2\left(\sqrt{z}\,p+1\right)\right)\sinh\left((-c+2bk-bm)\sqrt{z}\right)-\right.\right.$$

$$\left.i\,(-c+2bk-bm)\left(-\sqrt{z}\,(-c+2bk-bm)^2-2p+p^2\sqrt{z}\right)\cosh\left((-c+2bk-bm)\sqrt{z}\right)\right)\Big/$$

$$\left(p^2-(-c+2bk-bm)^2\right)^2+\frac{1}{\left(p^2-(c+2bk-bm)^2\right)^2}$$

$$\left(i\left(p^2\left(p\sqrt{z}-1\right)-(c+2bk-bm)^2\left(\sqrt{z}\,p+1\right)\right)\sinh\left((c+2bk-bm)\sqrt{z}\right)-i\,(c+2bk-bm)\right.$$

$$\left.\left.\left(-\sqrt{z}\,(c+2bk-bm)^2-2p+p^2\sqrt{z}\right)\cosh\left((c+2bk-bm)\sqrt{z}\right)\right)\sin\left(\frac{m\pi}{2}\right)\right)/;\ m\in\mathbb{N}^+$$

Involving $e^{b z^r+e}\sinh^m\left(a z^r+q\right)\cosh\left(c z^r+g\right)$

01.20.21.1863.01

$$\int e^{b z^r+e} \sinh^m(a z^r+q) \cosh(c z^r+g)\, dz ==$$

$$-\frac{i^m 2^{-m-1} z}{r}\left(\binom{m}{\frac{m}{2}}\left(e^{e+g}\,\Gamma\left(\frac{1}{r},(-b-c)z^r\right)((-b-c)z^r)^{-1/r}+e^{e-g}\,((c-b)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)z^r\right)\right)(1-m \bmod 2)+\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g+2kq-mq+\frac{im\pi}{2}}\,\Gamma\left(\frac{1}{r},(-b-c-2ak+am)z^r\right)((-b-c-2ak+am)z^r)^{-1/r}+\right.$$

$$e^{e-g+2kq-mq+\frac{im\pi}{2}}\,((-b+c-2ak+am)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-2ak+am)z^r\right)+$$

$$e^{e+g-2kq+mq-\frac{im\pi}{2}}\,((-b-c+2ak-am)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+2ak-am)z^r\right)+$$

$$\left.\left.e^{e-g-2kq+mq-\frac{im\pi}{2}}\,((-b+c+2ak-am)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+2ak-am)z^r\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1864.01

$$\int e^{b z^2+e} \sinh^m\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz ==$$

$$i^{-m} 2^{-m-2} e^{e+g}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\frac{e^{-2g}\,\operatorname{erfi}\left(\sqrt{b-c}\,z\right)}{\sqrt{b-c}}+\frac{\operatorname{erfi}\left(\sqrt{b+c}\,z\right)}{\sqrt{b+c}}\right)(1-m \bmod 2)+i^{-m}2^{-m-2}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{e-g+(m-2k)q+\frac{im\pi}{2}}\,\operatorname{erfi}\left(\sqrt{b-c+a(m-2k)}\,z\right)}{\sqrt{b-c+a(m-2k)}}+\frac{e^{e+g+(m-2k)q+\frac{im\pi}{2}}\,\operatorname{erfi}\left(\sqrt{b+c+a(m-2k)}\,z\right)}{\sqrt{b+c+a(m-2k)}}+\right.$$

$$\left.\frac{e^{e-g-(m-2k)q-\frac{im\pi}{2}}\,\operatorname{erfi}\left(\sqrt{b-c-a(m-2k)}\,z\right)}{\sqrt{b-c-a(m-2k)}}+\frac{e^{e+g-(m-2k)q-\frac{im\pi}{2}}\,\operatorname{erfi}\left(\sqrt{b+c-a(m-2k)}\,z\right)}{\sqrt{b+c-a(m-2k)}}\right)/;\ m\in\mathbb{N}^+$$

01.20.21.1865.01

$$\int e^{\sqrt{z}\,b+e}\sinh^m\left(\sqrt{z}\,a+q\right)\cosh\left(\sqrt{z}\,c+g\right)dz ==$$

$$\left(\frac{e^{\sqrt{z}\,(b-c)+e-g}\left((b-c)\sqrt{z}-1\right)}{(b-c)^2}+\frac{e^{\sqrt{z}\,(b+c)+e+g}\left((b+c)\sqrt{z}-1\right)}{(b+c)^2}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,(2i)^{-m}+$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left(\frac{e^{e-g+(m-2k)q+(b-c+a(m-2k))\sqrt{z}+\frac{im\pi}{2}}\left((b-c+a(m-2k))\sqrt{z}-1\right)}{(b-c+a(m-2k))^2}+\right.\right.$$

$$\frac{e^{e+g+(m-2k)q+(b+c+a(m-2k))\sqrt{z}+\frac{im\pi}{2}}\left((b+c+a(m-2k))\sqrt{z}-1\right)}{(b+c+a(m-2k))^2}+$$

$$\frac{e^{e-g-(m-2k)q+(b-c-a(m-2k))\sqrt{z}-\frac{im\pi}{2}}\left((b-c-a(m-2k))\sqrt{z}-1\right)}{(b-c-a(m-2k))^2}+$$

$$\left.\left.\frac{e^{e+g-(m-2k)q+(b+c-a(m-2k))\sqrt{z}-\frac{im\pi}{2}}\left((b+c-a(m-2k))\sqrt{z}-1\right)}{(b+c-a(m-2k))^2}\right)\binom{m}{k}\right)(2i)^{-m}\ /;\ m\in\mathbb{N}^+$$

Involving $e^{b z^r+d z+e}\sinh^m\left(a z^r+p z+q\right)\cosh\left(c z^r+f z+g\right)$

01.20.21.1866.01

$$\int e^{b z^2+d z+e} \sinh^m\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{(b-c)(b+c)}\left(i^m 2^{-m-2}\sqrt{\pi}\binom{m}{\frac{m}{2}}\left(\sqrt{b-c}\,(b+c)\, e^{-\frac{(d-f)^2-4(b-c)(e-g)}{4(b-c)}}\operatorname{erfi}\left(\frac{d-f+2bz-2cz}{2\sqrt{b-c}}\right)+\right.\right.$$

$$\left.\left.(b-c)\sqrt{b+c}\, e^{-\frac{(d+f)^2-4(b+c)(e+g)}{4(b+c)}}\operatorname{erfi}\left(\frac{d+f+2(b+c)z}{2\sqrt{b+c}}\right)\right)(1-m \bmod 2)\right)+$$

$$i^m 2^{-m-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(e^{-\frac{(d+f+(2k-m)p)^2-4(b+c+a(2k-m))\left(e+g+(2k-m)q+\frac{i m\pi}{2}\right)}{4(b+c+a(2k-m))}}\sqrt{b+c+a(2k-m)}\right.\right.$$

$$(b-c-a(2k-m))\operatorname{erfi}\left(\frac{d+f+(2k-m)p+2(b+c+a(2k-m))z}{2\sqrt{b+c+a(2k-m)}}\right)+$$

$$e^{-\frac{(d-f-(2k-m)p)^2-4(b-c-a(2k-m))\left(e-g-(2k-m)q-\frac{i m\pi}{2}\right)}{4(b-c-a(2k-m))}}(b+c+a(2k-m))\sqrt{b-c-a(2k-m)}$$

$$\left.\operatorname{erfi}\left(\frac{d-f-(2k-m)p+2bz-2(c+a(2k-m))z}{2\sqrt{b-c-a(2k-m)}}\right)\right)\Big/((b-c-a(2k-m))(b+c+a(2k-m)))+$$

$$\left(e^{-\frac{(d+f+(m-2k)p)^2-4(b+c+a(m-2k))\left(e+g+(m-2k)q-\frac{i m\pi}{2}\right)}{4(b+c+a(m-2k))}}\sqrt{b+c+a(m-2k)}\,(b-c-a(m-2k))\right.$$

$$\operatorname{erfi}\left(\frac{d+f+(m-2k)p+2(b+c+a(m-2k))z}{2\sqrt{b+c+a(m-2k)}}\right)+e^{-\frac{(d-f-(m-2k)p)^2-4(b-c-a(m-2k))\left(e-g-(m-2k)q+\frac{i m\pi}{2}\right)}{4(b-c-a(m-2k))}}$$

$$(b+c+a(m-2k))\sqrt{b-c-a(m-2k)}\,\operatorname{erfi}\left(\frac{d-f-(m-2k)p+2bz-2(c+a(m-2k))z}{2\sqrt{b-c-a(m-2k)}}\right)\Big)\Big/$$

$$\left.((b-c-a(m-2k))(b+c+a(m-2k)))\right);\ m\in\mathbb{N}^+$$

01.20.21.1867.01

$$\int e^{\sqrt{z}\ b+d\,z+e}\sinh^m\left(\sqrt{z}\ a+p\,z+q\right)\cosh\left(\sqrt{z}\ c+f\,z+g\right)dz ==$$

$$i^m\,2^{-m-2}\,e^{e-g}\binom{m}{\frac{m}{2}}\left(\sqrt{\pi}\left(-\frac{(b-c)\,e^{-\frac{(b-c)^2}{4(d-f)}}\operatorname{erfi}\left(\frac{b-c+2(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}-\frac{(b+c)\,e^{2g-\frac{(b+c)^2}{4(d+f)}}\operatorname{erfi}\left(\frac{b+c+2(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b-c)+(d-f)\,z}}{d-f}+\frac{2\,e^{\sqrt{z}\ (b+c)+2g+(d+f)\,z}}{d+f}\right)(1-m\bmod 2)+$$

$$i^m\,2^{-m-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e-g-(2k-m)\,q-\frac{i\,m\,\pi}{2}}\left(\frac{2\,e^{\sqrt{z}\ (b-c-2\,a\,k+a\,m)+(d-f-2\,k\,p+m\,p)\,z}}{d-f-2\,k\,p+m\,p}-\right.\right.$$

$$\left.\left(e^{-\frac{(b-c-2\,a\,k+a\,m)^2}{4(d-f-2\,k\,p+m\,p)}}(b-c-2\,a\,k+a\,m)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c+a(m-2k)+2(d-f-2\,k\,p+m\,p)\sqrt{z}}{2\sqrt{d-f-2\,k\,p+m\,p}}\right)\right)\Big/$$

$$(d-f-2\,k\,p+m\,p)^{3/2}+\frac{2\,e^{2g+4\,k\,q-2\,m\,q+(d+f+2\,k\,p-m\,p)\,z+(b+c+2\,a\,k-a\,m)\sqrt{z}\ +i\,m\,\pi}}{d+f+2\,k\,p-m\,p}-$$

$$\frac{1}{(d+f+2\,k\,p-m\,p)^{3/2}}\left(e^{-\frac{(b+c+2\,a\,k-a\,m)^2}{4(d+f+2\,k\,p-m\,p)}+2g+4\,k\,q-2\,m\,q+i\,m\,\pi}(b+c+2\,a\,k-a\,m)\sqrt{\pi}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b+c+a(2k-m)+2(d+f+2\,k\,p-m\,p)\sqrt{z}}{2\sqrt{d+f+2\,k\,p-m\,p}}\right)\right)\right)+e^{e-g-(m-2k)\,q+\frac{i\,m\,\pi}{2}}$$

$$\left(\frac{2\,e^{2g+2(m-2k)\,q+(d+f-2\,k\,p+m\,p)\,z+(b+c-2\,a\,k+a\,m)\sqrt{z}\ -i\,m\,\pi}}{d+f-2\,k\,p+m\,p}-\frac{1}{(d+f-2\,k\,p+m\,p)^{3/2}}\left(e^{-\frac{(b+c+a(m-2k))^2}{4(d+f-2\,k\,p+m\,p)}+2g+2(m-2k)\,q-i\,m\,\pi}\right.\right.$$

$$\left.(b+c+a(m-2k))\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+a(m-2k)+2(d+f-2\,k\,p+m\,p)\sqrt{z}}{2\sqrt{d+f-2\,k\,p+m\,p}}\right)\right)+$$

$$\frac{2\,e^{\sqrt{z}\ (b-c+2\,a\,k-a\,m)+(d-f+2\,k\,p-m\,p)\,z}}{d-f+2\,k\,p-m\,p}-\left(e^{-\frac{(b-c+2\,a\,k-a\,m)^2}{4(d-f+2\,k\,p-m\,p)}}(b-c+2\,a\,k-a\,m)\sqrt{\pi}\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b-c+a(2k-m)+2(d-f+2\,k\,p-m\,p)\sqrt{z}}{2\sqrt{d-f+2\,k\,p-m\,p}}\right)\right)\Big/(d-f+2\,k\,p-m\,p)^{3/2}\right)\right);\ m\in\mathbb{N}^+$$

Involving powers of sinh and rational functions of exp

Involving $\sinh^m(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1868.01

$$\int \frac{\sinh^m(e\,z)\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}\,dz ==$$

$$\frac{i^m\,2^{-m-1}\,a^{-n}\,(1-m \bmod 2)}{c}\binom{m}{\frac{m}{2}}\left(e^{c\,z}\,{}_2F_1\left(\frac{c}{d},\,n;\,\frac{c+d}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,z}\,{}_2F_1\left(-\frac{c}{d},\,n;\,\frac{d-c}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$i^m\,2^{-m-1}\,a^{-n}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(\frac{1}{c+2\,e\,k-e\,m}\left(e^{(c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,e\,k-e\,m}{d},\,n;\,\frac{c+d+2\,e\,k-e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.$$

$$\left.e^{(-c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,e\,k+e\,m}{d},\,n;\,\frac{-c+d-2\,e\,k+e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-c+2\,e\,k-e\,m}\left(e^{(-c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,e\,k-e\,m}{d},\,n;\,\frac{-c+d+2\,e\,k-e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.\left.e^{(c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,e\,k+e\,m}{d},\,n;\,\frac{c+d-2\,e\,k+e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\cos\left(\frac{m\,\pi}{2}\right)+$$

$$i\left(\frac{1}{c+2\,e\,k-e\,m}\left(e^{(-c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,e\,k+e\,m}{d},\,n;\,\frac{-c+d-2\,e\,k+e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.e^{(c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,e\,k-e\,m}{d},\,n;\,\frac{c+d+2\,e\,k-e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-c+2\,e\,k-e\,m}\left(e^{(c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,e\,k+e\,m}{d},\,n;\,\frac{c+d-2\,e\,k+e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.$$

$$\left.\left.\left.e^{(-c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,e\,k-e\,m}{d},\,n;\,\frac{-c+d+2\,e\,k-e\,m}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\sin\left(\frac{m\,\pi}{2}\right)\right)\Big/;\,n\in\mathbb{N}^+\bigwedge m\in\mathbb{N}^+$$

Involving $e^{p\,z}\sinh^m(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.1869.01

$$\int \frac{e^{p z} \sinh^m(e z) \cosh(c z)}{\left(a + b\, e^{d z}\right)^n}\, dz ==$$

$$\frac{1}{(c-p)(c+p)}\left(i^m\, 2^{-m-1}\, a^{-n} \binom{m}{\frac{m}{2}}\left(e^{(c+p) z}\,(c-p)\,{}_2F_1\left(\frac{c+p}{d}, n; \frac{c+d+p}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(p-c) z}\,(c+p)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{p-c}{d}, n; \frac{-c+d+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right)(1 - m \bmod 2)\right) + i^m\, 2^{-m-1}\, a^{-n}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}\left(\left(\left(e^{(c+2ek-em+p) z}\,(c+2ek-em-p)\,{}_2F_1\left(\frac{c+2ek-em+p}{d}, n; \frac{c+d+2ek-em+p}{d}; -\frac{b\, e^{d z}}{a}\right) - \right.\right.\right.$$

$$e^{(-c-2ek+em+p) z}\,(c+2ek-em+p)\,{}_2F_1\left(\frac{-c-2ek+em+p}{d}, n;\right.$$

$$\left.\left.\left.\frac{-c+d-2ek+em+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/ ((c+2ek-em-p)(c+2ek-em+p)) +$$

$$\left(e^{(-c+2ek-em+p) z}\,(-c+2ek-em-p)\,{}_2F_1\left(\frac{-c+2ek-em+p}{d}, n; \frac{-c+d+2ek-em+p}{d}; -\frac{b\, e^{d z}}{a}\right) - \right.$$

$$\left.e^{(c-2ek+em+p) z}\,(-c+2ek-em+p)\,{}_2F_1\left(\frac{c-2ek+em+p}{d}, n; \frac{c+d-2ek+em+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/$$

$$\left.((-c+2ek-em-p)(-c+2ek-em+p))\right) \cos\left(\frac{m\pi}{2}\right) +$$

$$i\left(\left(e^{(-c-2ek+em+p) z}\,(c+2ek-em+p)\,{}_2F_1\left(\frac{-c-2ek+em+p}{d}, n; \frac{-c+d-2ek+em+p}{d}; -\frac{b\, e^{d z}}{a}\right) + \right.\right.$$

$$\left.e^{(c+2ek-em+p) z}\,(c+2ek-em-p)\,{}_2F_1\left(\frac{c+2ek-em+p}{d}, n; \frac{c+d+2ek-em+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/$$

$$((c+2ek-em-p)(c+2ek-em+p)) + \left(e^{(c-2ek+em+p) z}\,(-c+2ek-em+p)\,{}_2F_1\right.$$

$$\left(\frac{c-2ek+em+p}{d}, n; \frac{c+d-2ek+em+p}{d}; -\frac{b\, e^{d z}}{a}\right) + e^{(-c+2ek-em+p) z}$$

$$\left.\left.(-c+2ek-em-p)\,{}_2F_1\left(\frac{-c+2ek-em+p}{d}, n; \frac{-c+d+2ek-em+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/\right.$$

$$\left.((-c+2ek-em-p)(-c+2ek-em+p))\right) \sin\left(\frac{m\pi}{2}\right)\Big) /; n \in \mathbb{N}^+ \bigwedge m \in \mathbb{N}^+$$

Involving powers of sinh and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^\beta \sinh^m(e z) \cosh(c z)$

01.20.21.1870.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta} \sinh^{m}(e\,z)\cosh(c\,z)\,dz ==$$

$$\frac{1}{c}\left(i^{m}\,2^{-m-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\left(e^{c\,z}\,{}_2F_1\left(\frac{c}{d},-\beta;\frac{c+d}{d};-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,z}\,{}_2F_1\left(-\frac{c}{d},-\beta;\frac{d-c}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)\right.$$

$$\left.(1-m \bmod 2)\right)+i^{m}\,2^{-m-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(\left(\frac{1}{c+2\,e\,k-e\,m}\left(e^{(c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,e\,k-e\,m}{d},-\beta;\frac{c+d+2\,e\,k-e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.e^{(-c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,e\,k+e\,m}{d},-\beta;\frac{-c+d-2\,e\,k+e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)+\right.$$

$$\left.\frac{1}{-c+2\,e\,k-e\,m}\left(e^{(-c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,e\,k-e\,m}{d},-\beta;\frac{-c+d+2\,e\,k-e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.\left.\left.e^{(c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,e\,k+e\,m}{d},-\beta;\frac{c+d-2\,e\,k+e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\cos\left(\frac{m\,\pi}{2}\right)+\right.$$

$$i\left(\frac{1}{c+2\,e\,k-e\,m}\left(e^{(-c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{-c-2\,e\,k+e\,m}{d},-\beta;\frac{-c+d-2\,e\,k+e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.\left.e^{(c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{c+2\,e\,k-e\,m}{d},-\beta;\frac{c+d+2\,e\,k-e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)+\right.$$

$$\left.\frac{1}{-c+2\,e\,k-e\,m}\left(e^{(c-2\,e\,k+e\,m)\,z}\,{}_2F_1\left(\frac{c-2\,e\,k+e\,m}{d},-\beta;\frac{c+d-2\,e\,k+e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.\left.\left.e^{(-c+2\,e\,k-e\,m)\,z}\,{}_2F_1\left(\frac{-c+2\,e\,k-e\,m}{d},-\beta;\frac{-c+d+2\,e\,k-e\,m}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\sin\left(\frac{m\,\pi}{2}\right)\right)/;\ m\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\sinh^{m}(e\,z)\cosh(c\,z)$

01.20.21.1871.01

$$\int e^{p z}\left(a+b\,e^{d z}\right)^{\beta}\sinh^{m}(e z)\cosh(c z)\,dz ==$$

$$\frac{1}{(c-p)(c+p)}\left(i^{m}\,2^{-m-1}\left(a+b\,e^{d z}\right)^{\beta}\left(\frac{e^{d z}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\left(e^{(c+p)z}(c-p)\,{}_2F_1\left(\frac{c+p}{d},-\beta;\frac{c+d+p}{d};-\frac{b\,e^{d z}}{a}\right)-\right.\right.$$

$$\left.\left.e^{(p-c)z}(c+p)\,{}_2F_1\left(\frac{p-c}{d},-\beta;\frac{-c+d+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)(1-m \bmod 2)\right)+i^{m}\,2^{-m-1}\left(a+b\,e^{d z}\right)^{\beta}\left(\frac{e^{d z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(\left(\left(e^{(c+2ek-em+p)z}(c+2ek-em-p)\,{}_2F_1\left(\frac{c+2ek-em+p}{d},-\beta;\frac{c+d+2ek-em+p}{d};-\frac{b\,e^{d z}}{a}\right)-\right.\right.\right.$$

$$e^{(-c-2ek+em+p)z}(c+2ek-em+p)\,{}_2F_1\left(\frac{-c-2ek+em+p}{d},-\beta;\right.$$

$$\left.\left.\left.\frac{-c+d-2ek+em+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/((c+2ek-em-p)(c+2ek-em+p))+$$

$$\left(e^{(-c+2ek-em+p)z}(-c+2ek-em-p)\,{}_2F_1\left(\frac{-c+2ek-em+p}{d},-\beta;\frac{-c+d+2ek-em+p}{d};-\frac{b\,e^{d z}}{a}\right)-\right.$$

$$\left.e^{(c-2ek+em+p)z}(-c+2ek-em+p)\,{}_2F_1\left(\frac{c-2ek+em+p}{d},-\beta;\frac{c+d-2ek+em+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$

$$\left.((-c+2ek-em-p)(-c+2ek-em+p))\right)\cos\left(\frac{m\pi}{2}\right)+$$

$$i\left(\left(e^{(-c-2ek+em+p)z}(c+2ek-em+p)\,{}_2F_1\left(\frac{-c-2ek+em+p}{d},-\beta;\frac{-c+d-2ek+em+p}{d};-\frac{b\,e^{d z}}{a}\right)+\right.\right.$$

$$\left.\left.e^{(c+2ek-em+p)z}(c+2ek-em-p)\,{}_2F_1\left(\frac{c+2ek-em+p}{d},-\beta;\frac{c+d+2ek-em+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/\right.$$

$$((c+2ek-em-p)(c+2ek-em+p))+\left(e^{(c-2ek+em+p)z}(-c+2ek-em+p)\,{}_2F_1\right.$$

$$\left(\frac{c-2ek+em+p}{d},-\beta;\frac{c+d-2ek+em+p}{d};-\frac{b\,e^{d z}}{a}\right)+e^{(-c+2ek-em+p)z}$$

$$\left.(-c+2ek-em-p)\,{}_2F_1\left(\frac{-c+2ek-em+p}{d},-\beta;\frac{-c+d+2ek-em+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$

$$\left.\left.((-c+2ek-em-p)(-c+2ek-em+p))\right)\sin\left(\frac{m\pi}{2}\right)\right)/;\ m\in\mathbb{N}^{+}$$

Involving products of sinh and exp

Involving $e^{p z}\sinh(a z)\sinh(b z)\cosh(c z)$

01.20.21.1872.01

$$\int e^{p z} \sinh(a z) \sinh(b z) \cosh(c z)\, dz ==$$
$$\frac{1}{4} e^{p z} \left(\frac{p \cosh((a-b-c) z) + (-a+b+c) \sinh((a-b-c) z)}{a^2 - 2(b+c) a + b^2 + c^2 - p^2 + 2 b c} + \frac{(a+b-c) \sinh((a+b-c) z) - p \cosh((a+b-c) z)}{(a+b-c-p)(a+b-c+p)} + \right.$$
$$\left. \frac{p \cosh((a-b+c) z) - (a-b+c) \sinh((a-b+c) z)}{(a-b+c-p)(a-b+c+p)} + \frac{(a+b+c) \sinh((a+b+c) z) - p \cosh((a+b+c) z)}{(a+b+c-p)(a+b+c+p)} \right)$$

Involving rational functions of sinh and exp

Involving $\frac{e^{p z} \cosh(c z)}{a + b \sinh(d z)}$

01.20.21.1873.01

$$\int \frac{e^{p z} \cosh(c z)}{a + b \sinh(d z)}\, dz ==$$
$$-\frac{1}{2} \left(\frac{1}{b \sqrt{a^2+b^2}\ (-c+d+p)} \left(e^{(-c+d+p) z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{-c+d+p}{d}, 1; \frac{p-c}{d} + 2; \frac{b e^{d z}}{\sqrt{a^2+b^2} - a} \right) + \right. \right. \right.$$
$$\left. \left. \left. \left(\sqrt{a^2+b^2} - a \right) {}_2F_1\left(\frac{-c+d+p}{d}, 1; \frac{p-c}{d} + 2; -\frac{b e^{d z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) +$$
$$\frac{1}{b \sqrt{a^2+b^2}\ (c+d+p)} \left(e^{(c+d+p) z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{c+d+p}{d}, 1; \frac{c+p}{d} + 2; \frac{b e^{d z}}{\sqrt{a^2+b^2} - a} \right) + \right. \right.$$
$$\left. \left. \left. \left(\sqrt{a^2+b^2} - a \right) {}_2F_1\left(\frac{c+d+p}{d}, 1; \frac{c+p}{d} + 2; -\frac{b e^{d z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) \right)$$

01.20.21.1874.01

$$\int \frac{e^{p z} \cosh(c z)}{a + b \sinh(c z)}\, dz ==$$
$$\frac{1}{2 b \sqrt{a^2+b^2}} \left(-\frac{1}{2 c + p} \left(e^{(2 c+p) z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{p}{c} + 2, 1; \frac{p}{c} + 3; \frac{b e^{c z}}{\sqrt{a^2+b^2} - a} \right) + \left(\sqrt{a^2+b^2} - a \right) \right. \right. \right.$$
$$\left. \left. \left. {}_2F_1\left(\frac{p}{c} + 2, 1; \frac{p}{c} + 3; -\frac{b e^{c z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) -$$
$$\left. \frac{1}{p} \left(e^{p z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{p}{c}, 1; \frac{c+p}{c}; \frac{b e^{c z}}{\sqrt{a^2+b^2} - a} \right) + \left(\sqrt{a^2+b^2} - a \right) {}_2F_1\left(\frac{p}{c}, 1; \frac{c+p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) \right)$$

01.20.21.1875.01

$$\int \frac{e^{c z} \cosh(c z)}{a + b \sinh(c z)}\, dz == \frac{2\left(a^2 + b^2\right)}{b^2 \sqrt{-a^2 - b^2}\; c} \tan^{-1}\left(\frac{a + b\, e^{c z}}{\sqrt{-a^2 - b^2}}\right) + \frac{e^{c z}}{b\, c} - \frac{a \log\left(2\, e^{c z}\, a + b\, e^{2 c z} - b\right)}{b^2\, c}$$

Involving $e^{p z} (a + b \sinh(d z))^{-n} \cosh(c z)$

01.20.21.1876.01

$$\int \frac{e^{p z} \cosh(c z)}{(a + b \sinh(d z))^2}\, dz ==$$

$$\frac{1}{2}\left(\frac{1}{b\left(a^2 + b^2\right)^{3/2}(-c + d + p)}\left(e^{(-c+d+p) z}\left(-a\left(a + \sqrt{a^2 + b^2}\right){}_2F_1\left(\frac{-c + d + p}{d}, 1; \frac{p - c}{d} + 2; \frac{b\, e^{d z}}{\sqrt{a^2 + b^2} - a}\right) + \right.\right.\right.$$

$$a\left(a - \sqrt{a^2 + b^2}\right){}_2F_1\left(\frac{-c + d + p}{d}, 1; \frac{p - c}{d} + 2; -\frac{b\, e^{d z}}{a + \sqrt{a^2 + b^2}}\right) +$$

$$\left(a^2 + \sqrt{a^2 + b^2}\; a + b^2\right){}_2F_1\left(\frac{-c + d + p}{d}, 2; \frac{p - c}{d} + 2; \frac{b\, e^{d z}}{\sqrt{a^2 + b^2} - a}\right) +$$

$$\left.\left.\left(-a^2 + \sqrt{a^2 + b^2}\; a - b^2\right){}_2F_1\left(\frac{-c + d + p}{d}, 2; \frac{p - c}{d} + 2; -\frac{b\, e^{d z}}{a + \sqrt{a^2 + b^2}}\right)\right)\right) +$$

$$\frac{1}{b\left(a^2 + b^2\right)^{3/2}(c + d + p)}\left(e^{(c+d+p) z}\left(-a\left(a + \sqrt{a^2 + b^2}\right){}_2F_1\left(\frac{c + d + p}{d}, 1; \frac{c + p}{d} + 2; \frac{b\, e^{d z}}{\sqrt{a^2 + b^2} - a}\right) + \right.\right.$$

$$a\left(a - \sqrt{a^2 + b^2}\right){}_2F_1\left(\frac{c + d + p}{d}, 1; \frac{c + p}{d} + 2; -\frac{b\, e^{d z}}{a + \sqrt{a^2 + b^2}}\right) +$$

$$\left(a^2 + \sqrt{a^2 + b^2}\; a + b^2\right){}_2F_1\left(\frac{c + d + p}{d}, 2; \frac{c + p}{d} + 2; \frac{b\, e^{d z}}{\sqrt{a^2 + b^2} - a}\right) +$$

$$\left.\left.\left.\left(-a^2 + \sqrt{a^2 + b^2}\; a - b^2\right){}_2F_1\left(\frac{c + d + p}{d}, 2; \frac{c + p}{d} + 2; -\frac{b\, e^{d z}}{a + \sqrt{a^2 + b^2}}\right)\right)\right)\right)$$

Involving $\frac{e^{p z} \cosh(c z)}{a + b \sinh^2(d z)}$

01.20.21.1877.01

$$\int \frac{e^{p z} \cosh(c z)}{a + b \sinh^2(d z)}\, dz == \frac{1}{2\sqrt{a}\,\sqrt{a-b}\,b}$$
$$\left(\frac{1}{-c-2d+p}\left(e^{(-c-2d+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{c+2d-p}{2d}, 1; \frac{c+4d-p}{2d}; \frac{b e^{-2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c+2d-p}{2d}, 1; \frac{c+4d-p}{2d}; \frac{b e^{-2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)+$$
$$\frac{1}{c-2d+p}\left(e^{(c-2d+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{c+p}{2d}, 1; 2-\frac{c+p}{2d}; \frac{b e^{-2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{c+p}{2d}, 1; 2-\frac{c+p}{2d}; \frac{b e^{-2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

01.20.21.1878.01

$$\int \frac{e^{p z} \cosh(c z)}{a + b \sinh^2(c z)}\, dz ==$$
$$\frac{1}{2\sqrt{a}\,\sqrt{a-b}\,b}\left(\frac{1}{p-c}\left(e^{(p-c)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{c-p}{2c}, 1; \frac{3}{2}-\frac{p}{2c}; \frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c-p}{2c}, 1; \frac{3}{2}-\frac{p}{2c}; \frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)+$$
$$\frac{1}{p-3c}\left(e^{(p-3c)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{3}{2}-\frac{p}{2c}, 1; \frac{5}{2}-\frac{p}{2c}; \frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{3}{2}-\frac{p}{2c}, 1; \frac{5}{2}-\frac{p}{2c}; \frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $e^{p z}\left(a + b \sinh^2(d z)\right)^{-n} \cosh(c z)$

01.20.21.1879.01

$$\int \frac{e^{p z} \cosh(c z)}{\left(a + b \sinh^2(d z)\right)^2} dz ==$$

$$\frac{1}{2}\left(\left(e^{(-c+2d+p)z}\left((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{p-c}{2d}+1, 1; \frac{p-c}{2d}+2; \frac{b e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{p-c}{2d}+1, 1; \frac{p-c}{2d}+2; \frac{b e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{p-c}{2d}+1, 2; \frac{p-c}{2d}+2; \frac{b e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\right)\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{p-c}{2d}+1, 2; \frac{p-c}{2d}+2; \frac{b e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/$$
$$\left(2a^{3/2}(a-b)^{3/2}b(-c+2d+p)\right)+\frac{1}{2a^{3/2}(a-b)^{3/2}b(c+2d+p)}$$
$$\left(e^{(c+2d+p)z}\left((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{c+p}{2d}+1, 1; \frac{c+p}{2d}+2; \frac{b e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c+p}{2d}+1, 1; \frac{c+p}{2d}+2; \frac{b e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{c+p}{2d}+1, 2; \frac{c+p}{2d}+2; \frac{b e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\right)\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c+p}{2d}+1, 2; \frac{c+p}{2d}+2; \frac{b e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\frac{e^{p z}\sinh(e z)\cosh(c z)}{a+b\sinh(d z)}$

01.20.21.1880.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(c z)}{a + b \sinh(d z)} dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2+b^2}\,(-c+d-e+p)}\left(e^{(-c+d-e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d-e+p}{d}, 1; \frac{-c-e+p}{d}+2; \frac{b\,e^{dz}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{-c+d-e+p}{d}, 1; \frac{-c-e+p}{d}+2; -\frac{b\,e^{dz}}{a+\sqrt{a^2+b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d-e+p)}\left(e^{(c+d-e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e+p}{d}, 1; \frac{c-e+p}{d}+2; \frac{b\,e^{dz}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d-e+p}{d}, 1; \frac{c-e+p}{d}+2; -\frac{b\,e^{dz}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(-c+d+e+p)}\left(e^{(-c+d+e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d+e+p}{d}, 1; \frac{-c+e+p}{d}+2; \frac{b\,e^{dz}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{-c+d+e+p}{d}, 1; \frac{-c+e+p}{d}+2; -\frac{b\,e^{dz}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d+e+p)}\left(e^{(c+d+e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e+p}{d}, 1; \frac{c+e+p}{d}+2; \frac{b\,e^{dz}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d+e+p}{d}, 1; \frac{c+e+p}{d}+2; -\frac{b\,e^{dz}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \sinh(e z) \cosh(c z) (a + b \sinh(d z))^{-n}$

01.20.21.1881.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(c z)}{(a + b \sinh(d z))^2} dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2+b^2\right)^{3/2}(-c+d+e+p)}\left(e^{(-c+d+e+p)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d+e+p}{d}, 1; \frac{-c+e+p}{d}+2; \frac{b\,e^{dz}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d+e+p}{d}, 1; \frac{-c+e+p}{d}+2; -\frac{b\,e^{dz}}{a+\sqrt{a^2+b^2}}\right)+$$
$$\left.\left.\left.\left(a^2+\sqrt{a^2+b^2}\,a+b^2\right){}_2F_1\left(\frac{-c+d+e+p}{d}, 2; \frac{-c+e+p}{d}+2; \frac{b\,e^{dz}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$

$$\left(-a^2+\sqrt{a^2+b^2}\ a-b^2\right){}_2F_1\left(\frac{-c+d+e+p}{d},\,2;\,\frac{-c+e+p}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+e+p)}\left(e^{(c+d+e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e+p}{d},\,1;\,\frac{c+e+p}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e+p}{d},\,1;\,\frac{c+e+p}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\ a+b^2\right){}_2F_1\left(\frac{c+d+e+p}{d},\,2;\,\frac{c+e+p}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(-a^2+\sqrt{a^2+b^2}\ a-b^2\right)$$

$${}_2F_1\left(\frac{c+d+e+p}{d},\,2;\,\frac{c+e+p}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)-\frac{1}{b\left(a^2+b^2\right)^{3/2}(-c+d-e+p)}$$

$$\left(e^{(-c+d-e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d-e+p}{d},\,1;\,\frac{-c-e+p}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{-c+d-e+p}{d},\,1;\,\frac{-c-e+p}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\ a+b^2\right){}_2F_1\left(\frac{-c+d-e+p}{d},\,2;\,\frac{-c-e+p}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\ a-b^2\right){}_2F_1\left(\frac{-c+d-e+p}{d},\,2;\,\frac{-c-e+p}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)-$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-e+p)}\left(e^{(c+d-e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e+p}{d},\,1;\,\frac{c-e+p}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e+p}{d},\,1;\,\frac{c-e+p}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\ a+b^2\right){}_2F_1\left(\frac{c+d-e+p}{d},\,2;\,\frac{c-e+p}{d}+2;\,\frac{b\,e^{d\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\ a-b^2\right){}_2F_1\left(\frac{c+d-e+p}{d},\,2;\,\frac{c-e+p}{d}+2;\,-\frac{b\,e^{d\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{e^{p z}\sinh(e z)\cosh(c z)}{a+b\sinh^2(d z)}$

01.20.21.1882.01

$$\int \frac{e^{p z}\sinh(e z)\cosh(c z)}{a+b\sinh^2(d z)}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-c-2d+e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-c+e+p}{2d},1;2-\frac{-c+e+p}{2d};\frac{b e^{-2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-c+e+p}{2d},1;2-\frac{-c+e+p}{2d};\frac{b e^{-2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-c-2d+e+p)\right)+\left(e^{(c-2d+e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{c+e+p}{2d},1;2-\frac{c+e+p}{2d};\frac{b e^{-2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{c+e+p}{2d},1;2-\frac{c+e+p}{2d};\frac{b e^{-2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(c-2d+e+p)\right)-\left(e^{(-c-2d-e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-c-e+p}{2d},1;2-\frac{-c-e+p}{2d};\frac{b e^{-2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-c-e+p}{2d},1;2-\frac{-c-e+p}{2d};\frac{b e^{-2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-c-2d-e+p)\right)-\left(e^{(c-2d-e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{c-e+p}{2d},1;2-\frac{c-e+p}{2d};\frac{b e^{-2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{c-e+p}{2d},1;2-\frac{c-e+p}{2d};\frac{b e^{-2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(c-2d-e+p)\right)\right)$$

Involving $e^{p z}\sinh(e z)\cosh(c z)\left(a+b\sinh^2(d z)\right)^{-n}$

01.20.21.1883.01

$$\int \frac{e^{p z}\sinh(e z)\cosh(c z)}{\left(a+b\sinh^2(d z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-c+2d+e+p)z}\left((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-c+e+p}{2d}+1,1;\frac{-c+e+p}{2d}+2;\frac{b e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-c+e+p}{2d}+1,1;\frac{-c+e+p}{2d}+2;\frac{b e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{-c+e+p}{2d}+1,2;\frac{-c+e+p}{2d}+2;\right.\right.\right.\right.$$

$$\frac{b\,e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{-c+e+p}{2d}+1,\,2;\,\frac{-c+e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(-c+2d+e+p)\Big)+$$

$$\Big(e^{(c+2d+e+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big)\,{}_2F_1\Big(\frac{c+e+p}{2d}+1,\,1;\,\frac{c+e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$

$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big)\,{}_2F_1\Big(\frac{c+e+p}{2d}+1,\,1;\,\frac{c+e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$

$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{c+e+p}{2d}+1,\,2;\,\frac{c+e+p}{2d}+2;$$

$$\frac{b\,e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{c+e+p}{2d}+$$

$$1,\,2;\,\frac{c+e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(c+2d+e+p)\Big)-$$

$$\Big(e^{(-c+2d-e+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big)\,{}_2F_1\Big(\frac{-c-e+p}{2d}+1,\,1;\,\frac{-c-e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$

$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big)\,{}_2F_1\Big(\frac{-c-e+p}{2d}+1,\,1;\,\frac{-c-e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$

$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{-c-e+p}{2d}+1,\,2;\,\frac{-c-e+p}{2d}+2;$$

$$\frac{b\,e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{-c-e+p}{2d}+$$

$$1,\,2;\,\frac{-c-e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(-c+2d-e+p)\Big)-$$

$$\Big(e^{(c+2d-e+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big)\,{}_2F_1\Big(\frac{c-e+p}{2d}+1,\,1;\,\frac{c-e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$

$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big)\,{}_2F_1\Big(\frac{c-e+p}{2d}+1,\,1;\,\frac{c-e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$

$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{c-e+p}{2d}+1,\,2;\,\frac{c-e+p}{2d}+2;$$

$$\frac{b\,e^{2dz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{c-e+p}{2d}+$$

$$1,\,2;\,\frac{c-e+p}{2d}+2;\,\frac{b\,e^{2dz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(c+2d-e+p)\Big)\Big)$$

Involving algebraic functions of sinh and exp

Involving $e^{p z}(a + b \sinh(d z))^{\beta} \cosh(c z)$

01.20.21.1884.01

$$\int e^{p z} (a + b \sinh(d z))^{\beta} \cosh(c z)\, dz ==$$

$$\frac{1}{2}\left(\frac{1}{-c + p - d\beta}\left(e^{(p-c) z}\left(\frac{e^{d z} b}{a - \sqrt{a^2 + b^2}} + 1\right)^{-\beta}\left(\frac{e^{d z} b}{a + \sqrt{a^2 + b^2}} + 1\right)^{-\beta} F_1\left(\frac{p - c}{d} - \beta; -\beta,\right.\right.\right.$$

$$\left.\left.\left. -\beta; \frac{p - c}{d} - \beta + 1; -\frac{b e^{d z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{d z}}{\sqrt{a^2 + b^2} - a}\right)(a + b \sinh(d z))^{\beta}\right) +\right.$$

$$\frac{1}{c + p - d\beta}\left(e^{(c+p) z}\left(\frac{e^{d z} b}{a - \sqrt{a^2 + b^2}} + 1\right)^{-\beta}\left(\frac{e^{d z} b}{a + \sqrt{a^2 + b^2}} + 1\right)^{-\beta} F_1\left(\frac{c + p}{d} - \beta; -\beta, -\beta;\right.\right.$$

$$\left.\left.\left.\left.\frac{c + p}{d} - \beta + 1; -\frac{b e^{d z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{d z}}{\sqrt{a^2 + b^2} - a}\right)(a + b \sinh(d z))^{\beta}\right)\right)\right)$$

01.20.21.1885.01

$$\int e^{p z} (a + b \sinh(c z))^{\beta} \cosh(c z)\, dz ==$$

$$\frac{1}{2}\left(\frac{1}{-\beta c - c + p}\left(e^{(p-c) z}\left(\frac{e^{c z} b}{a - \sqrt{a^2 + b^2}} + 1\right)^{-\beta}\left(\frac{e^{c z} b}{a + \sqrt{a^2 + b^2}} + 1\right)^{-\beta} F_1\left(\frac{p - c}{c} - \beta; -\beta,\right.\right.\right.$$

$$\left.\left.\left. -\beta; \frac{p - c}{c} - \beta + 1; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right)(a + b \sinh(c z))^{\beta}\right) +\right.$$

$$\frac{1}{-\beta c + c + p}\left(e^{(c+p) z}\left(\frac{e^{c z} b}{a - \sqrt{a^2 + b^2}} + 1\right)^{-\beta}\left(\frac{e^{c z} b}{a + \sqrt{a^2 + b^2}} + 1\right)^{-\beta} F_1\left(\frac{c + p}{c} - \beta; -\beta, -\beta;\right.\right.$$

$$\left.\left.\left.\left.\frac{c + p}{c} - \beta + 1; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right)(a + b \sinh(c z))^{\beta}\right)\right)\right)$$

Involving $e^{p z}\left(a + b \sinh^2(d z)\right)^{\beta} \cosh(c z)$

01.20.21.1886.01

$$\int e^{p z} \left(b \sinh^2(d z) + a\right)^{\beta} \cosh(c z)\, dz ==$$

$$\left(\left(\frac{e^{2 d z} b}{2 a - b + 2 \sqrt{a (a-b)}} + 1\right)^{-\beta} \left(1 - \frac{b e^{2 d z}}{-2 a + b + 2 \sqrt{a (a-b)}}\right)^{-\beta} \left(\frac{1}{4} b e^{-2 d z} \left(-1 + e^{2 d z}\right)^2 + a\right)^{\beta}\right.$$
$$\left(e^{(c+p) z} (c - p + 2 d \beta) F_1\left(\frac{c + p - 2 d \beta}{2 d}; -\beta, -\beta; \frac{c + p}{2 d} - \beta + 1; \frac{b e^{2 d z}}{-2 a + b - 2 \sqrt{a (a-b)}}, \frac{b e^{2 d z}}{-2 a + b + 2 \sqrt{a (a-b)}}\right) -\right.$$
$$e^{(p-c) z} (c + p - 2 d \beta) F_1\left(-\frac{c - p + 2 d \beta}{2 d}; -\beta, -\beta; \frac{p - c}{2 d} - \beta + 1;\right.$$
$$\left.\left.\left.\frac{b e^{2 d z}}{-2 a + b - 2 \sqrt{a (a-b)}}, \frac{b e^{2 d z}}{-2 a + b + 2 \sqrt{a (a-b)}}\right)\right)\right) \Big/ (2 (c + p - 2 d \beta) (c - p + 2 d \beta))$$

01.20.21.1887.01

$$\int e^{p z} \left(a + b \sinh^2(c z)\right)^{\beta} \cosh(c z)\, dz ==$$

$$\left(\left(\frac{e^{2 c z} b}{2 a - b + 2 \sqrt{a (a-b)}} + 1\right)^{-\beta} \left(1 - \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a-b)}}\right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(-1 + e^{2 c z}\right)^2 + a\right)^{\beta}\right.$$
$$\left(e^{(c+p) z} (2 \beta c + c - p) F_1\left(\frac{-2 \beta c + c + p}{2 c}; -\beta, -\beta; \frac{1}{2}\left(\frac{p}{c} - 2 \beta + 3\right); \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a-b)}},\right.\right.$$
$$\left.\frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a-b)}}\right) + e^{(p-c) z} (2 \beta c - c - p) F_1\left(\frac{1}{2}\left(\frac{p}{c} - 2 \beta - 1\right); -\beta, -\beta; \frac{-2 \beta c + c + p}{2 c};\right.$$
$$\left.\left.\left.\frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a-b)}}, \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a-b)}}\right)\right)\right) \Big/ (2 (-2 \beta c + c + p) (2 \beta c + c - p))$$

Involving $e^{p z} \sinh(e z) \cosh(c z) (a + b \sinh(d z))^{\beta}$

01.20.21.1888.01

$$\int e^{p z} \sinh(e z) \cosh(c z) (a + b \sinh(d z))^{\beta} dz == \frac{1}{4}\left(\frac{e^{-d z} b}{\sqrt{a^2+b^2}-a}+1\right)^{-\beta}$$
$$\left(1-\frac{b e^{-d z}}{a+\sqrt{a^2+b^2}}\right)^{-\beta}\left(\frac{e^{(-c-e+p) z} F_1\left(\frac{c+e-p-d\beta}{d}; -\beta, -\beta; -\frac{i(i d+i(c+e-p)-i d \beta)}{d}; \frac{b e^{-d z}}{a+\sqrt{a^2+b^2}}, \frac{b e^{-d z}}{a-\sqrt{a^2+b^2}}\right)}{c+e-p-d\beta}-\right.$$
$$\frac{e^{(c-e+p) z} F_1\left(-\frac{c-e+p}{d}-\beta; -\beta, -\beta; -\frac{c-e+p}{d}-\beta+1; \frac{b e^{-d z}}{a+\sqrt{a^2+b^2}}, \frac{b e^{-d z}}{a-\sqrt{a^2+b^2}}\right)}{c-e+p+d\beta}+$$
$$\frac{e^{(-c+e+p) z} F_1\left(-\frac{-c+e+p}{d}-\beta; -\beta, -\beta; -\frac{-c+e+p}{d}-\beta+1; \frac{b e^{-d z}}{a+\sqrt{a^2+b^2}}, \frac{b e^{-d z}}{a-\sqrt{a^2+b^2}}\right)}{-c+e+p+d\beta}+$$
$$\left.\frac{e^{(c+e+p) z} F_1\left(-\frac{c+e+p}{d}-\beta; -\beta, -\beta; -\frac{c+e+p}{d}-\beta+1; \frac{b e^{-d z}}{a+\sqrt{a^2+b^2}}, \frac{b e^{-d z}}{a-\sqrt{a^2+b^2}}\right)}{c+e+p+d\beta}\right)(a+b\sinh(d z))^{\beta}$$

Involving $e^{p z} \sinh(e z) \cosh(c z) \left(a + b \sinh^2(d z)\right)^{\beta}$

01.20.21.1889.01

$$\int e^{p z} \sinh(e z) \cosh(c z) \left(a + b \sinh^2(d z)\right)^{\beta} dz ==$$
$$\frac{1}{4}\left(\frac{e^{-2 d z} b}{2a-b-2\sqrt{a(a-b)}}+1\right)^{-\beta}\left(\frac{e^{-2 d z} b}{2a-b+2\sqrt{a(a-b)}}+1\right)^{-\beta}\left(\frac{1}{4} b e^{2 d z}\left(-1+e^{-2 d z}\right)^2+a\right)^{\beta}$$
$$\left(\frac{e^{(-c-e+p) z}}{c+e-p-2 d\beta} F_1\left(\frac{c+e-p-2 d\beta}{2 d}; -\beta, -\beta; \frac{c+e-p}{2 d}-\beta+1; -\frac{b e^{-2 d z}}{2a-b+2\sqrt{a(a-b)}}, -\frac{b e^{-2 d z}}{2a-b-2\sqrt{a(a-b)}}\right)-\right.$$
$$\frac{e^{(c-e+p) z}}{c-e+p+2 d\beta} F_1\left(-\frac{c-e+p}{2 d}-\beta; -\beta, -\beta; -\frac{c-e+p}{2 d}-\beta+1;\right.$$
$$\left.-\frac{b e^{-2 d z}}{2a-b+2\sqrt{a(a-b)}}, -\frac{b e^{-2 d z}}{2a-b-2\sqrt{a(a-b)}}\right)-\frac{e^{(-c+e+p) z}}{c-e-p-2 d\beta}$$
$$F_1\left(-\frac{-c+e+p}{2 d}-\beta; -\beta, -\beta; -\frac{-c+e+p}{2 d}-\beta+1; -\frac{b e^{-2 d z}}{2a-b+2\sqrt{a(a-b)}}, -\frac{b e^{-2 d z}}{2a-b-2\sqrt{a(a-b)}}\right)+$$
$$\left.\frac{e^{(c+e+p) z}}{c+e+p+2 d\beta} F_1\left(-\frac{c+e+p}{2 d}-\beta; -\beta, -\beta; -\frac{c+e+p}{2 d}-\beta+1; -\frac{b e^{-2 d z}}{2a-b+2\sqrt{a(a-b)}}, -\frac{b e^{-2 d z}}{2a-b-2\sqrt{a(a-b)}}\right)\right)$$

Involving hyperbolic and trigonometric functions

Involving sin and sinh

Involving $\sin(a z^r + q) \sinh(w z^r + t) \cosh(c z^r + g)$

01.20.21.1890.01

$$\int \sin(a z^r + q) \sinh(w z^r + t) \cosh(c z^r + g)\, dz ==$$
$$-\frac{i z}{8 r}\left(e^{g+i q+t-i \pi}\, \Gamma\left(\frac{1}{r}, (-c - i a - w) z^r\right) ((-c - i a - w) z^r)^{-1/r} + e^{g-i q+t}\, ((-c + i a - w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-c + i a - w) z^r\right) + \right.$$
$$e^{-g+i q+t-i \pi}\, ((c - i a - w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c - i a - w) z^r\right) + e^{-g-i q+t}\, ((c + i a - w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c + i a - w) z^r\right) +$$
$$e^{g+i q-t}\, ((-c - i a + w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-c - i a + w) z^r\right) + e^{g-i q-t+i \pi}\, ((-c + i a + w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-c + i a + w) z^r\right) +$$
$$\left. e^{-g+i q-t}\, ((c - i a + w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c - i a + w) z^r\right) + e^{-g-i q-t+i \pi}\, ((c + i a + w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c + i a + w) z^r\right)\right)$$

Involving $\sin(a z^r + p z + q) \sinh(w z^r + s z + t) \cosh(c z^r + f z + g)$

01.20.21.1891.01

$$\int \sin(a z^2 + p z + q) \sinh(w z^2 + s z + t) \cosh(c z^2 + f z + g)\, dz ==$$

$$-i \left(-\frac{e^{g-i q+t-\frac{-f^2+2 i p f-2 s f+p^2-s^2+2 i p s}{4(-c+i a-w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{-f+i p-s-2 c z+2 i a z-2 w z}{2\sqrt{-c+i a-w}}\right)}{16\sqrt{-c+i a-w}} + \right.$$

$$\frac{e^{g-i q-t-\frac{-f^2+2 i p f+2 s f+p^2-s^2-2 i p s}{4(-c+i a+w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{-f+i p+s-2 c z+2 i a z+2 w z}{2\sqrt{-c+i a+w}}\right)}{16\sqrt{-c+i a+w}} +$$

$$\frac{e^{-g-i q-t-\frac{-f^2-2 i p f-2 s f+p^2-s^2-2 i p s}{4(c+i a+w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{f+i p+s+2 c z+2 i a z+2 w z}{2\sqrt{c+i a+w}}\right)}{16\sqrt{c+i a+w}} +$$

$$\frac{e^{-g+i q-t-\frac{f^2-2 i p f+2 s f-p^2+s^2-2 i p s}{4(-c+i a-w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f-i p+s-2 i a z+2 c z+2 w z}{2\sqrt{-c+i a-w}}\right)}{16\sqrt{-c+i a-w}} +$$

$$\frac{e^{g+i q+t-\frac{f^2+2 i p f+2 s f-p^2+s^2+2 i p s}{4(c+i a+w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f+i p+s+2 c z+2 i a z+2 w z}{2\sqrt{c+i a+w}}\right)}{16\sqrt{c+i a+w}} -$$

$$\frac{e^{-g-i q+t-\frac{-f^2-2 i p f+2 s f+p^2-s^2+2 i p s}{4(c+i a-w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{f+i p-s+2 c z+2 i a z-2 w z}{2\sqrt{c+i a-w}}\right)}{16\sqrt{c+i a-w}} -$$

$$\frac{e^{g+i q+t-\frac{f^2+2 i p f-2 s f-p^2+s^2-2 i p s}{4(c+i a-w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f+i p-s+2 c z+2 i a z-2 w z}{2\sqrt{c+i a-w}}\right)}{16\sqrt{c+i a-w}} -$$

$$\left. \frac{e^{-g+i q+t-\frac{f^2-2 i p f-2 s f-p^2+s^2+2 i p s}{4(-c+i a+w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f-i p-s-2 i a z+2 c z-2 w z}{2\sqrt{-c+i a+w}}\right)}{16\sqrt{-c+i a+w}} \right)$$

01.20.21.1892.01

$$\int \sin(\sqrt{z}\ a + p z + q) \sinh(w \sqrt{z}\ + s z + t) \cosh(\sqrt{z}\ c + f z + g)\, dz ==$$

$$-i \left(\frac{i a\, e^{-g-i q+t-\frac{a^2-2 i c a+2 i w a-c^2-w^2+2 c w}{4(f+i p-s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c+i a-w+2 f\sqrt{z}+2 i p\sqrt{z}-2 s\sqrt{z}}{2\sqrt{f+i p-s}}\right)}{16 (f + i p - s)^{3/2}} + \right.$$

$$\frac{c\, e^{-g-i q+t-\frac{a^2-2 i c a+2 i w a-c^2-w^2+2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c+i a-w+2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}} +$$

$$\frac{i a\, e^{-g+i q+t-\frac{a^2+2 i c a-2 i w a-c^2-w^2+2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c-i a-w+2 f \sqrt{z}-2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}} +$$

$$\frac{e^{-g+i q+t-\frac{a^2+2 i c a-2 i w a-c^2-w^2+2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c-i a-w+2 f \sqrt{z}-2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}} +$$

$$\frac{c\, e^{-g+i q-t-\frac{a^2+2 i c a+2 i w a-c^2-w^2-2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c-i a+w+2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}} +$$

$$\frac{e^{-g+i q-t-\frac{a^2+2 i c a+2 i w a-c^2-w^2-2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c-i a+w+2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}} +$$

$$\frac{e^{g+i q-t-\frac{-a^2+2 i c a-2 i w a+c^2+w^2-2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ w \operatorname{erfi}\left(\frac{-c-i a+w-2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}} +$$

$$\frac{i a\, e^{g+i q-t-\frac{-a^2+2 i c a-2 i w a+c^2+w^2-2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i a-w+2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}} +$$

$$\frac{c\, e^{g+i q-t-\frac{-a^2+2 i c a-2 i w a+c^2+w^2-2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i a-w+2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}} +$$

$$\frac{c\, e^{g-i q+t-\frac{-a^2-2 i c a-2 i w a+c^2+w^2+2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c-i a+w+2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}} +$$

$$\frac{e^{g-i q+t-\frac{-a^2-2 i c a-2 i w a+c^2+w^2+2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ w \operatorname{erfi}\left(\frac{c-i a+w+2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}} +$$

$$\frac{i a\, e^{g-i q+t-\frac{-a^2-2 i c a-2 i w a+c^2+w^2+2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+i a-w-2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}} -$$

$$\frac{e^{g+i q-t+(f+i p-s) z+(c+i a-w) \sqrt{z}}}{8 (f+i p-s)}+\frac{e^{-g-i q+t-(f+i p-s) z-(c+i a-w) \sqrt{z}}}{8 (f+i p-s)}-$$

$$\frac{e^{-g-i q+t-\frac{a^2-2 i c a+2 i w a-c^2-w^2+2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c+i a-w+2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}}+\frac{e^{g-i q-t+(f-i p-s) z-(-c+i a+w) \sqrt{z}}}{8 (f-i p-s)}-$$

$$\frac{e^{-g+i q+t-(f-i p-s) z+(-c+i a+w) \sqrt{z}}}{8 (f-i p-s)}-\frac{c\, e^{-g+i q+t-\frac{a^2+2 i c a-2 i w a-c^2-w^2+2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c-i a-w+2 f \sqrt{z}-2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}}-$$

$$\frac{i a e^{g-i q-t-\frac{-a^2-2 i c a+2 i w a+c^2+w^2-2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+i a+w-2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}}-$$

$$\frac{e^{g-i q-t-\frac{-a^2-2 i c a+2 i w a+c^2+w^2-2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ w \operatorname{erfi}\left(\frac{-c+i a+w-2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}}-$$

$$\frac{c\, e^{g-i q-t-\frac{-a^2-2 i c a+2 i w a+c^2+w^2-2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c-i a-w+2 f \sqrt{z}-2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}}+\frac{e^{g+i q+t+(f+i p+s) z+(c+i a+w) \sqrt{z}}}{8 (f+i p+s)}-$$

$$\frac{e^{-g-i q-t-(f+i p+s) z-(c+i a+w) \sqrt{z}}}{8 (f+i p+s)}-\frac{i a e^{-g-i q-t-\frac{a^2-2 i c a-2 i w a-c^2-w^2-2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}}-$$

$$\frac{c\, e^{-g-i q-t-\frac{a^2-2 i c a-2 i w a-c^2-w^2-2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}}-$$

$$\frac{e^{-g-i q-t-\frac{a^2-2 i c a-2 i w a-c^2-w^2-2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}}-$$

$$\frac{i a e^{g+i q+t-\frac{-a^2+2 i c a+2 i w a+c^2+w^2+2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}}-$$

$$\frac{c\, e^{g+i q+t-\frac{-a^2+2 i c a+2 i w a+c^2+w^2+2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ \text{erfi}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}} -$$

$$\frac{e^{g+i q+t-\frac{-a^2+2 i c a+2 i w a+c^2+w^2+2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ w\, \text{erfi}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}} - \frac{e^{g-i q+t+(f-i p+s) z-(-c+i a-w) \sqrt{z}}}{8 (f-i p+s)} +$$

$$\frac{e^{-g+i q-t-(f-i p+s) z+(-c+i a-w) \sqrt{z}}}{8 (f-i p+s)} - \frac{i a\, e^{-g+i q-t-\frac{a^2+2 i c a+2 i w a-c^2-w^2-2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ \text{erf}\left(\frac{c-i a+w+2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}}\Bigg)$$

Involving powers of sin and powers of sinh

Involving $\sin^m(a z^r + q) \sinh^u(w z^r + t) \cosh(c z^r + g)$

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$$\int \sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{i^u\,2^{-m-u-1}\,z\,(1-m \bmod 2)\,(1-u \bmod 2)}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(e^{g}\,\Gamma\left(\frac{1}{r},-c\,z^r\right)(-c\,z^r)^{-1/r}+e^{-g}\,(c\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},c\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-1}\,z}{r}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{g+2\,i\,k\,q-i\,m\,q+\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{1}{r},(-c-2\,i\,a\,k+i\,a\,m)\,z^r\right)\right.$$

$$((-c-2\,i\,a\,k+i\,a\,m)\,z^r)^{-1/r}+e^{-g+2\,i\,k\,q-i\,m\,q+\frac{i\,m\,\pi}{2}}\,((c-2\,i\,a\,k+i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,i\,a\,k+i\,a\,m)\,z^r\right)+$$

$$e^{g-2\,i\,k\,q+i\,m\,q-\frac{i\,m\,\pi}{2}}\,((-c+2\,i\,a\,k-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-c+2\,i\,a\,k-i\,a\,m)\,z^r\right)+$$

$$\left.e^{-g-2\,i\,k\,q+i\,m\,q-\frac{i\,m\,\pi}{2}}\,((c+2\,i\,a\,k-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,i\,a\,k-i\,a\,m)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-1}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{g+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{1}{r},(-c-2\,k\,w+u\,w)\,z^r\right)((-c-2\,k\,w+u\,w)\,z^r)^{-1/r}+\right.$$

$$e^{-g+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,((c-2\,k\,w+u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,k\,w+u\,w)\,z^r\right)+e^{g-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((-c+2\,k\,w-u\,w)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-c+2\,k\,w-u\,w)\,z^r\right)+e^{-g-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((c+2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,k\,w-u\,w)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-1}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{g+2\,i\,k\,q-i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{1}{r},(-c-2\,i\,a\,k+i\,a\,m-2\,j\,w+u\,w)\,z^r\right)\right.$$

$$((-c-2\,i\,a\,k+i\,a\,m-2\,j\,w+u\,w)\,z^r)^{-1/r}+e^{-g+2\,i\,k\,q-i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}$$

$$((c-2\,i\,a\,k+i\,a\,m-2\,j\,w+u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,i\,a\,k+i\,a\,m-2\,j\,w+u\,w)\,z^r\right)+$$

$$e^{g-2\,i\,k\,q+i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,((-c+2\,i\,a\,k-i\,a\,m-2\,j\,w+u\,w)\,z^r)^{-1/r}$$

$$\Gamma\left(\frac{1}{r},(-c+2\,i\,a\,k-i\,a\,m-2\,j\,w+u\,w)\,z^r\right)+e^{-g-2\,i\,k\,q+i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}$$

$$((c+2\,i\,a\,k-i\,a\,m-2\,j\,w+u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,i\,a\,k-i\,a\,m-2\,j\,w+u\,w)\,z^r\right)+$$

$$e^{g+2\,i\,k\,q-i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,((-c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r)^{-1/r}$$

$$\Gamma\left(\frac{1}{r},(-c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r\right)+e^{-g+2\,i\,k\,q-i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}$$

$$((c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r\right)+$$

$$e^{g-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,((-c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r)^{-1/r}$$

$$\Gamma\left(\frac{1}{r},(-c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r\right)+e^{-g-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}$$

$$\left.((c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

Involving $\sin^m(a z^r + p z + q) \sinh^u(w z^r + s z + t) \cosh(c z^r + f z + g)$

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$$\int \sin^m\left(a z^2 + p z + q\right) \sinh^u\left(w z^2 + s z + t\right) \cosh\left(c z^2 + f z + g\right) dz ==$$

$$-i^u\, 2^{-m-u-2} \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} \left(\frac{e^{g-\frac{f^2}{4c}} (f + 2cz)\, \Gamma\left(\frac{1}{2}, -\frac{(f+2cz)^2}{4c}\right)}{c\sqrt{-\frac{(f+2cz)^2}{c}}} - \frac{e^{\frac{f^2}{4c}-g} (-f - 2cz)\, \Gamma\left(\frac{1}{2}, \frac{(-f-2cz)^2}{4c}\right)}{c\sqrt{\frac{(-f-2cz)^2}{c}}} \right) (1 - m \bmod 2)\,(1 - u \bmod 2) -$$

$$i^u\, 2^{-m-u-2} \binom{u}{\frac{u}{2}} (1 - u \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\left(e^{-\frac{(i(2k-m)p-f)^2}{4(ia(2k-m)-c)} - g + i(2k-m)q + \frac{im\pi}{2}} \right.\right.$$

$$\left.\left. (-f + i(2k-m)p + 2(ia(2k-m)-c)z)\, \Gamma\left(\frac{1}{2}, -\frac{(-f + i(2k-m)p + 2(ia(2k-m)-c)z)^2}{4(ia(2k-m)-c)}\right) \right) \Big/ \right.$$

$$\left((ia(2k-m)-c) \sqrt{-\frac{(-f + i(2k-m)p + 2(ia(2k-m)-c)z)^2}{ia(2k-m)-c}} \right) + \left(e^{-\frac{(f+i(2k-m)p)^2}{4(c+ai(2k-m))} + g + i(2k-m)q + \frac{im\pi}{2}} \right.$$

$$\left. (f + i(2k-m)p + 2(c + ai(2k-m))z)\, \Gamma\left(\frac{1}{2}, -\frac{(f + i(2k-m)p + 2(c+ai(2k-m))z)^2}{4(c+ai(2k-m))}\right) \right) \Big/$$

$$\left((c + ai(2k-m)) \sqrt{-\frac{(f + i(2k-m)p + 2(c+ai(2k-m))z)^2}{c+ai(2k-m)}} \right) + \left(e^{-\frac{(i(m-2k)p-f)^2}{4(ia(m-2k)-c)} - g + i(m-2k)q - \frac{im\pi}{2}} \right.$$

$$\left. (-f + i(m-2k)p + 2(ia(m-2k)-c)z)\, \Gamma\left(\frac{1}{2}, -\frac{(-f + i(m-2k)p + 2(ia(m-2k)-c)z)^2}{4(ia(m-2k)-c)}\right) \right) \Big/$$

$$\left((ia(m-2k)-c) \sqrt{-\frac{(-f + i(m-2k)p + 2(ia(m-2k)-c)z)^2}{ia(m-2k)-c}} \right) + \left(e^{-\frac{(f+i(m-2k)p)^2}{4(c+ai(m-2k))} + g + i(m-2k)q - \frac{im\pi}{2}} \right.$$

$$\left. (f + i(m-2k)p + 2(c + ai(m-2k))z)\, \Gamma\left(\frac{1}{2}, -\frac{(f + i(m-2k)p + 2(c+ai(m-2k))z)^2}{4(c+ai(m-2k))}\right) \right) \Big/$$

$$\left. \left((c + ai(m-2k)) \sqrt{-\frac{(f + i(m-2k)p + 2(c+ai(m-2k))z)^2}{c+ai(m-2k)}} \right) \right) -$$

$$i^u\, 2^{-m-u-2} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^k \binom{u}{k} \left(\left(e^{-\frac{(s(2k-u)-f)^2}{4((2k-u)w-c)} - g + t(2k-u) + \frac{i\pi u}{2}} (-f + s(2k-u) + 2((2k-u)w - c)z) \right.\right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}, -\frac{(-f + s(2k-u) + 2((2k-u)w-c)z)^2}{4((2k-u)w-c)}\right) \right) \Big/ \right.$$

$$\left(((2k-u)w-c)\sqrt{-\frac{(-f+s(2k-u)+2((2k-u)w-c)z)^2}{(2k-u)w-c}}\right)+\left(e^{-\frac{(f+s(2k-u))^2}{4(c+(2k-u)w)}+g+t(2k-u)+\frac{i\pi u}{2}}\right.$$

$$\left.(f+s(2k-u)+2(c+(2k-u)w)z)\,\Gamma\left(\frac{1}{2},-\frac{(f+s(2k-u)+2(c+(2k-u)w)z)^2}{4(c+(2k-u)w)}\right)\right)\Big/$$

$$\left((c+(2k-u)w)\sqrt{-\frac{(f+s(2k-u)+2(c+(2k-u)w)z)^2}{c+(2k-u)w}}\right)+\left(e^{-\frac{(s(u-2k)-f)^2}{4((u-2k)w-c)}-g+t(u-2k)-\frac{i\pi u}{2}}\right.$$

$$\left.(-f+s(u-2k)+2((u-2k)w-c)z)\,\Gamma\left(\frac{1}{2},-\frac{(-f+s(u-2k)+2((u-2k)w-c)z)^2}{4((u-2k)w-c)}\right)\right)\Big/$$

$$\left(((u-2k)w-c)\sqrt{-\frac{(-f+s(u-2k)+2((u-2k)w-c)z)^2}{(u-2k)w-c}}\right)+\left(e^{-\frac{(f+s(u-2k))^2}{4(c+(u-2k)w)}+g+t(u-2k)-\frac{i\pi u}{2}}\right.$$

$$\left.(f+s(u-2k)+2(c+(u-2k)w)z)\,\Gamma\left(\frac{1}{2},-\frac{(f+s(u-2k)+2(c+(u-2k)w)z)^2}{4(c+(u-2k)w)}\right)\right)\Big/$$

$$\left.\left((c+(u-2k)w)\sqrt{-\frac{(f+s(u-2k)+2(c+(u-2k)w)z)^2}{c+(u-2k)w}}\right)\right)-$$

$$i^u\,2^{-m-u-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(-f+i(2k-m)p+s(2j-u))^2}{4(-c+ai(2k-m)+(2j-u)w)}-g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}\right.\right.$$

$$(-f+i(2k-m)p+s(2j-u)+2(-c+ai(2k-m)+(2j-u)w)z)$$

$$\Gamma\left(\frac{1}{2},-(-f+i(2k-m)p+s(2j-u)+2(-c+ai(2k-m)+(2j-u)w)z)^2\Big/\right.$$

$$\left.\left.(4(-c+ai(2k-m)+(2j-u)w))\right)\right)\Big/\left((-c+ai(2k-m)+(2j-u)w)\sqrt{\left(-(-f+i(2k-m)p+\right.\right.$$

$$\left.\left.s(2j-u)+2(-c+ai(2k-m)+(2j-u)w)z)^2\Big/(-c+ai(2k-m)+(2j-u)w)\right)\right)+$$

$$\left(e^{-\frac{(f+i(2k-m)p+s(2j-u))^2}{4(c+ai(2k-m)+(2j-u)w)}+g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}(f+i(2k-m)p+s(2j-u)+2(c+ai(2k-m)+\right.$$

$$(2j-u)w)z)\,\Gamma\left(\frac{1}{2},-(f+i(2k-m)p+s(2j-u)+2(c+ai(2k-m)+(2j-u)w)z)^2\Big/\right.$$

$$\left.\left.(4(c+ai(2k-m)+(2j-u)w))\right)\right)\Big/\left((c+ai(2k-m)+(2j-u)w)\sqrt{\left(-(f+i(2k-m)p+\right.\right.$$

$$\left.\left.s(2j-u)+2(c+ai(2k-m)+(2j-u)w)z)^2\Big/(c+ai(2k-m)+(2j-u)w)\right)\right)+$$

$$\left(e^{-\frac{(-f+i(m-2k)p+s(2j-u))^2}{4(-c+ai(m-2k)+(2j-u)w)}-g+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}-\frac{im\pi}{2}}(-f+i(m-2k)p+s(2j-u)+2(-c+ai(m-2k)+\right.$$

$$\left.(2j-u)w)z)\,\Gamma\left(\frac{1}{2},-(-f+i(m-2k)p+s(2j-u)+2(-c+ai(m-2k)+(2j-u)w)z)^2\Big/\right.$$

$$(4(-c+a\,i\,(m-2k)+(2j-u)w))\Big)\Big/\Big((-c+a\,i\,(m-2k)+(2j-u)w)$$
$$\sqrt{\big(-(-f+i\,(m-2k)p+s(2j-u)+2(-c+a\,i\,(m-2k)+(2j-u)w)z)^2\big/}$$
$$(-c+a\,i\,(m-2k)+(2j-u)w)\big)\big)+\Bigg(e^{-\frac{(f+i(m-2k)p+s(2j-u))^2}{4(c+a\,i\,(m-2k)+(2j-u)w)}+g+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$
$$(f+i\,(m-2k)p+s(2j-u)+2(c+a\,i\,(m-2k)+(2j-u)w)z)\,\Gamma\Big(\frac{1}{2},-(f+i\,(m-2k)p+$$
$$s(2j-u)+2(c+a\,i\,(m-2k)+(2j-u)w)z)^2\big/(4(c+a\,i\,(m-2k)+(2j-u)w))\Big)\Big)\Big/$$
$$\Big((c+a\,i\,(m-2k)+(2j-u)w)\sqrt{\big(-(f+i\,(m-2k)p+s(2j-u)+2(c+a\,i\,(m-2k)+(2j-u)w)z)^2\big/}$$
$$(c+a\,i\,(m-2k)+(2j-u)w)\big)\big)+\Bigg(e^{-\frac{(-f+i(2k-m)p+s(u-2j))^2}{4(-c+a\,i\,(2k-m)+(u-2j)w)}-g+i(2k-m)q+t(u-2j)-\frac{i\pi u}{2}+\frac{im\pi}{2}}$$
$$(-f+i\,(2k-m)p+s(u-2j)+2(-c+a\,i\,(2k-m)+(u-2j)w)z)$$
$$\Gamma\Big(\frac{1}{2},-(-f+i\,(2k-m)p+s(u-2j)+2(-c+a\,i\,(2k-m)+(u-2j)w)z)^2\big/$$
$$(4(-c+a\,i\,(2k-m)+(u-2j)w))\Big)\Big)\Big/\Big((-c+a\,i\,(2k-m)+(u-2j)w)$$
$$\sqrt{\big(-(-f+i\,(2k-m)p+s(u-2j)+2(-c+a\,i\,(2k-m)+(u-2j)w)z)^2\big/}$$
$$(-c+a\,i\,(2k-m)+(u-2j)w)\big)\big)+\Bigg(e^{-\frac{(f+i(2k-m)p+s(u-2j))^2}{4(c+a\,i\,(2k-m)+(u-2j)w)}+g+i(2k-m)q+t(u-2j)-\frac{i\pi u}{2}+\frac{im\pi}{2}}$$
$$(f+i\,(2k-m)p+s(u-2j)+2(c+a\,i\,(2k-m)+(u-2j)w)z)\,\Gamma\Big(\frac{1}{2},-(f+i\,(2k-m)p+$$
$$s(u-2j)+2(c+a\,i\,(2k-m)+(u-2j)w)z)^2\big/(4(c+a\,i\,(2k-m)+(u-2j)w))\Big)\Big)\Big/$$
$$\Big((c+a\,i\,(2k-m)+(u-2j)w)\sqrt{\big(-(f+i\,(2k-m)p+s(u-2j)+2(c+a\,i\,(2k-m)+(u-2j)w)z)^2\big/}$$
$$(c+a\,i\,(2k-m)+(u-2j)w)\big)\big)+\Bigg(e^{-\frac{(-f+i(m-2k)p+s(u-2j))^2}{4(-c+a\,i\,(m-2k)+(u-2j)w)}-g+i(m-2k)q+t(u-2j)-\frac{i\pi u}{2}-\frac{im\pi}{2}}$$
$$(-f+i\,(m-2k)p+s(u-2j)+2(-c+a\,i\,(m-2k)+(u-2j)w)z)$$
$$\Gamma\Big(\frac{1}{2},-(-f+i\,(m-2k)p+s(u-2j)+2(-c+a\,i\,(m-2k)+(u-2j)w)z)^2\big/$$
$$(4(-c+a\,i\,(m-2k)+(u-2j)w))\Big)\Big)\Big/\Big((-c+a\,i\,(m-2k)+(u-2j)w)$$
$$\sqrt{\big(-(-f+i\,(m-2k)p+s(u-2j)+2(-c+a\,i\,(m-2k)+(u-2j)w)z)^2\big/}$$
$$(-c+a\,i\,(m-2k)+(u-2j)w)\big)\big)+\Bigg(e^{-\frac{(f+i(m-2k)p+s(u-2j))^2}{4(c+a\,i\,(m-2k)+(u-2j)w)}+g+i(m-2k)q+t(u-2j)-\frac{i\pi u}{2}-\frac{im\pi}{2}}$$
$$(f+i\,(m-2k)p+s(u-2j)+2(c+a\,i\,(m-2k)+(u-2j)w)z)\,\Gamma\Big(\frac{1}{2},-(f+i\,(m-2k)p+$$
$$s(u-2j)+2(c+a\,i\,(m-2k)+(u-2j)w)z)^2\big/(4(c+a\,i\,(m-2k)+(u-2j)w))\Big)\Big)\Big/$$
$$\Big((c+a\,i\,(m-2k)+(u-2j)w)\sqrt{\big(-(f+i\,(m-2k)p+s(u-2j)+2(c+a\,i\,(m-2k)+(u-2j)w)z)^2\big/}$$
$$(c+a\,i\,(m-2k)+(u-2j)w)\big)\big)\Big)\Big/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

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$$\int \sin^m\left(\sqrt{z}\ a+p\,z+q\right)\sinh^u\left(w\sqrt{z}\ +s\,z+t\right)\cosh\left(\sqrt{z}\ c+f\,z+g\right)dz == i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}$$

$$\left(\frac{1}{f^2\sqrt{\frac{\left(-c-2\,f\sqrt{z}\right)^2}{f}}}\left(e^{\frac{c^2}{4f}-g}\left(-2\,e^{-\frac{\left(-c-2\,f\sqrt{z}\right)^2}{4f}}\sqrt{\frac{\left(-c-2\,f\sqrt{z}\right)^2}{f}}\ f-c\left(-c-2\,f\sqrt{z}\right)\Gamma\left(\frac{1}{2},\frac{\left(-c-2\,f\sqrt{z}\right)^2}{4f}\right)\right)\right)+\right.$$

$$\left.\frac{e^{g-\frac{c^2}{4f}}\left(2\,e^{\frac{\left(c+2\,f\sqrt{z}\right)^2}{4f}}\sqrt{-\frac{\left(c+2\,f\sqrt{z}\right)^2}{f}}\ f+c\left(c+2\,f\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(c+2\,f\sqrt{z}\right)^2}{4f}\right)\right)}{f^2\sqrt{-\frac{\left(c+2\,f\sqrt{z}\right)^2}{f}}}\right)$$

$$(1-m \bmod 2)\,(1-u \bmod 2)+i^u\,2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\left(e^{-\frac{(i\,a\,(2k-m)-c)^2}{4\,(i\,(2k-m)\,p-f)}-g+i\,(2k-m)\,q+\frac{i\,m\,\pi}{2}}\left(2\,e^{\frac{\left(-c+a\,i\,(2k-m)+2\,(i\,(2k-m)\,p-f)\sqrt{z}\right)^2}{4\,(i\,(2k-m)\,p-f)}}\sqrt{-\frac{\left(-c+a\,i\,(2k-m)+2\,(i\,(2k-m)\,p-f)\sqrt{z}\right)^2}{i\,(2k-m)\,p-f}}\right.\right.\right.$$

$$(i\,(2k-m)\,p-f)+(i\,a\,(2k-m)-c)\left(-c+a\,i\,(2k-m)+2\,(i\,(2k-m)\,p-f)\sqrt{z}\right)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(-c+a\,i\,(2k-m)+2\,(i\,(2k-m)\,p-f)\sqrt{z}\right)^2}{4\,(i\,(2k-m)\,p-f)}\right)\right)\right)\Big/$$

$$\left((i\,(2k-m)\,p-f)^2\sqrt{-\frac{\left(-c+a\,i\,(2k-m)+2\,(i\,(2k-m)\,p-f)\sqrt{z}\right)^2}{i\,(2k-m)\,p-f}}\right)+$$

$$\left(e^{-\frac{(c+a\,i\,(2k-m))^2}{4\,(f+i\,(2k-m)\,p)}+g+i\,(2k-m)\,q+\frac{i\,m\,\pi}{2}}\left(2\,e^{\frac{\left(c+a\,i\,(2k-m)+2\,(f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4\,(f+i\,(2k-m)\,p)}}\sqrt{-\frac{\left(c+a\,i\,(2k-m)+2\,(f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{f+i\,(2k-m)\,p}}\right.\right.$$

$$(f+i\,(2k-m)\,p)+(c+a\,i\,(2k-m))\left(c+a\,i\,(2k-m)+2\,(f+i\,(2k-m)\,p)\sqrt{z}\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(c+a\,i\,(2k-m)+2\,(f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4\,(f+i\,(2k-m)\,p)}\right)\right)\right)\Big/$$

$$\left((f+i(2k-m)p)^2\sqrt{-\frac{\left(c+a\,i\,(2k-m)+2\,(f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{f+i\,(2k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(i\,a\,(m-2k)-c)^2}{4\,(i\,(m-2k)\,p-f)}-g+i\,(m-2k)\,q-\frac{i\,m\,\pi}{2}}\left((i\,a\,(m-2k)-c)\left(-c+a\,i\,(m-2k)+2\,(i\,(m-2k)\,p-f)\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(-c+a\,i\,(m-2k)+2\,(i\,(m-2k)\,p-f)\sqrt{z}\right)^2}{4\,(i\,(m-2k)\,p-f)}\right)+$$

$$\left.\left.2\,e^{\frac{\left(-c+a\,i\,(m-2k)+2\,(i\,(m-2k)\,p-f)\sqrt{z}\right)^2}{4\,(i\,(m-2k)\,p-f)}}(i\,(m-2k)\,p-f)\sqrt{-\frac{\left(-c+a\,i\,(m-2k)+2\,(i\,(m-2k)\,p-f)\sqrt{z}\right)^2}{i\,(m-2k)\,p-f}}\right)\right)\Big/$$

$$\left((i\,(m-2k)\,p-f)^2\sqrt{-\frac{\left(-c+a\,i\,(m-2k)+2\,(i\,(m-2k)\,p-f)\sqrt{z}\right)^2}{i\,(m-2k)\,p-f}}\right)+$$

$$\left(e^{-\frac{(c+a\,i\,(m-2k))^2}{4\,(f+i\,(m-2k)\,p)}+g+i\,(m-2k)\,q-\frac{i\,m\,\pi}{2}}\left(2\,e^{\frac{\left(c+a\,i\,(m-2k)+2\,(f+i\,(m-2k)\,p)\sqrt{z}\right)^2}{4\,(f+i\,(m-2k)\,p)}}\sqrt{-\frac{\left(c+a\,i\,(m-2k)+2\,(f+i\,(m-2k)\,p)\sqrt{z}\right)^2}{f+i\,(m-2k)\,p}}\right.\right.$$

$$(f+i\,(m-2k)\,p)+(c+a\,i\,(m-2k))\left(c+a\,i\,(m-2k)+2\,(f+i\,(m-2k)\,p)\sqrt{z}\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(c+a\,i\,(m-2k)+2\,(f+i\,(m-2k)\,p)\sqrt{z}\right)^2}{4\,(f+i\,(m-2k)\,p)}\right)\right)\right)\Big/$$

$$\left.\left((f+i\,(m-2k)\,p)^2\sqrt{-\frac{\left(c+a\,i\,(m-2k)+2\,(f+i\,(m-2k)\,p)\sqrt{z}\right)^2}{f+i\,(m-2k)\,p}}\right)\right)+$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{((2k-u)\,w-c)^2}{4\,(s\,(2k-u)-f)}-g+t\,(2k-u)+\frac{i\,\pi\,u}{2}}\left(2\,e^{\frac{\left(-c+(2k-u)\,w+2\,(s\,(2k-u)-f)\sqrt{z}\right)^2}{4\,(s\,(2k-u)-f)}}\right.\right.\right.$$

$$\sqrt{-\frac{\left(-c+(2k-u)\,w+2\,(s\,(2k-u)-f)\sqrt{z}\right)^2}{s\,(2k-u)-f}}\;(s\,(2k-u)-f)+((2k-u)\,w-c)$$

$$\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{4(s(2k-u)-f)}\right)\Bigg)\Bigg)\Bigg/$$

$$\left((s(2k-u)-f)^2\sqrt{-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{s(2k-u)-f}}\right)+\Bigg(e^{-\frac{(c+(2k-u)w)^2}{4(f+s(2k-u))}+g+t(2k-u)+\frac{i\pi u}{2}}$$

$$\left(2e^{\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{4(f+s(2k-u))}}\sqrt{-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{f+s(2k-u)}}\,(f+s(2k-u))+(c+(2k-u)w)\right.$$

$$\left.\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{4(f+s(2k-u))}\right)\right)\Bigg)\Bigg/$$

$$\left((f+s(2k-u))^2\sqrt{-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{f+s(2k-u)}}\right)+$$

$$\left(e^{-\frac{((u-2k)w-c)^2}{4(s(u-2k)-f)}-g+t(u-2k)-\frac{i\pi u}{2}}\left(2e^{\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}}\sqrt{-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}}\right.\right.$$

$$(s(u-2k)-f)+((u-2k)w-c)\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}\right)\right)\right)\Bigg/$$

$$\left((s(u-2k)-f)^2\sqrt{-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}}\right)+\Bigg(e^{-\frac{(c+(u-2k)w)^2}{4(f+s(u-2k))}+g+t(u-2k)-\frac{i\pi u}{2}}$$

$$\left(2e^{\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}}\sqrt{-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}}\,(f+s(u-2k))+(c+(u-2k)w)\right.$$

$$\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}\right)\Bigg)\Bigg)\Bigg/$$

$$\left((f+s(u-2k))^2\sqrt{-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}}\right)\Bigg)+i^u\,2^{-m-u-2}$$

$$\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\lfloor\frac{u-1}{2}\rfloor}(-1)^j\binom{u}{j}\Bigg(\Bigg(e^{-\frac{(-c+a\,i\,(2k-m)+(2j-u)w)^2}{4(-f+i(2k-m)p+s(2j-u))}-g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}\Bigg(\Bigg(-c+a\,i\,(2k-m)+(2j-u)w)$$

$$\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(4(-f+i\,(2k-m)p+s(2j-u)))\Bigg)+2\,e^{\frac{\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(-f+i(2k-m)p+s(2j-u))}}$$

$$(-f+i\,(2k-m)p+s(2j-u))\sqrt{\left(-\left(-c+a\,i\,(2k-m)+(2j-u)w+\right.\right.}$$

$$\left.\left.2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(-f+i\,(2k-m)p+s(2j-u))\right)\Bigg)\Bigg)\Bigg/$$

$$\Bigg((-f+i\,(2k-m)p+s(2j-u))^2\sqrt{\left(-\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)\right.\right.}$$

$$\left.\left.p+s(2j-u))\sqrt{z}\right)^2\Big/(-f+i\,(2k-m)p+s(2j-u))\right)\Bigg)+$$

$$\Bigg(e^{-\frac{(c+a\,i\,(2k-m)+(2j-u)w)^2}{4(f+i(2k-m)p+s(2j-u))}+g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}\Bigg(\Bigg(c+a\,i\,(2k-m)+(2j-u)w)$$

$$\left(c+a\,i\,(2k-m)+(2j-u)w+2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(c+a\,i\,(2k-m)+(2j-u)w+2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(f+i\,(2k-m)p+s(2j-u)))\right)+2\,e^{\frac{\left(c+a\,i\,(2k-m)+(2j-u)w+2(f+i(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(f+i(2k-m)p+s(2j-u))}}$$

$$(f+i\,(2k-m)p+s(2j-u))\sqrt{\left(-\left(c+a\,i\,(2k-m)+(2j-u)w+\right.\right.}$$

$$\left.\left.2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(f+i\,(2k-m)p+s(2j-u))\right)\Bigg)\Bigg)\Bigg/$$

$$\Bigg((f+i\,(2k-m)p+s(2j-u))^2\sqrt{\left(-\left(c+a\,i\,(2k-m)+(2j-u)w+2(f+i\,(2k-m)p+\right.\right.}$$

$$\left.\left.s(2j-u))\sqrt{z}\right)^2\Big/(f+i\,(2k-m)p+s(2j-u))\right)\Bigg)+$$

$$\Bigg(e^{-\frac{(-c+a\,i\,(m-2k)+(2j-u)w)^2}{4(-f+i(m-2k)p+s(2j-u))}-g+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}-\frac{im\pi}{2}}\Bigg(\Bigg(-c+a\,i\,(m-2k)+(2j-u)w)\left(-c+a\,i\,(m-2k)+\right.$$

$$(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2},\,-\big(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+$$
$$2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2$$
$$e^{\frac{\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))$$
$$\sqrt{\Big(-\big(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)\Big/\Big((-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2$$
$$\sqrt{\Big(-\big(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)+\Big(e^{-\frac{(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}$$
$$\Big((c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,\big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2},\,-\big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,e^{\frac{\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}$$
$$(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{\Big(-\big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+$$
$$2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)\Big/$$
$$\Big((f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\,\sqrt{\Big(-\big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+$$
$$s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)+$$
$$\Big(e^{-\frac{(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\Big(\big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w\big)$$
$$\big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2},\,-\big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,e^{\frac{\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$
$$(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\Big(-\big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+$$
$$2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)\Big/$$
$$\Big((-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\Big(-\big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)$$

$$p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$\Bigg(e^{-\frac{(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\Bigg(\Big(c+a\,i\,(2\,k-m)+(u-2\,j)\,w\Big)$$

$$\Big(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2},-\Big(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,e^{\frac{\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$

$$(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\Big(-\Big(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+$$

$$2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)}\Bigg)\Bigg)\Bigg/$$

$$\Big((f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\Big(-\Big(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+$$

$$s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)}\Big)+$$

$$\Bigg(e^{-\frac{(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\Bigg(\Big(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w\Big)$$

$$\Big(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2},-\Big(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,e^{\frac{\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}$$

$$(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\Big(-\Big(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+$$

$$2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)}\Bigg)\Bigg)\Bigg/$$

$$\Big((-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\,\sqrt{\Big(-\Big(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)$$

$$p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)}\Big)+$$

$$\Bigg(e^{-\frac{(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\Bigg(\Big(c+a\,i\,(m-2\,k)+(u-2\,j)\,w\Big)$$

$$\Big(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2},-\Big(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,e^{\frac{\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}$$

$$(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\Big(-\Big(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+$$

$$2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big/$$

$$\Big((f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\,\sqrt{\Big(-\big(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+$$

$$s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big/;\ m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+$$

Involving rational functions of sin and sinh

Involving $\frac{\sinh(e\,z)\cosh(d\,z)}{a+b\sin(c\,z)}$

01.20.21.1896.01

$$\int\frac{\sinh(e\,z)\cosh(d\,z)}{a+b\sin(c\,z)}\,dz==$$

$$\frac{1}{4}\Bigg(\frac{1}{b\sqrt{a^2-b^2}\,(-d-e+i\,c)}\Bigg(i\,e^{(-d-e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)+$$

$$\frac{1}{b\sqrt{a^2-b^2}\,(d-e+i\,c)}\Bigg(i\,e^{(d-e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)-$$

$$\frac{1}{b\sqrt{a^2-b^2}\,(-d+e+i\,c)}\Bigg(i\,e^{(-d+e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)-$$

$$\frac{1}{b\sqrt{a^2-b^2}\,(d+e+i\,c)}\Bigg(i\,e^{(d+e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)\Bigg)$$

Involving $\sinh(e\,z)\cosh(d\,z)\,(a+b\sin(c\,z))^{-n}$

01.20.21.1897.01

$$\int \frac{\sinh(e\,z)\cosh(d\,z)}{(a+b\sin(c\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c)}\left(i\,e^{(-d+e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c)}\left(i\,e^{(d+e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right)$$

$$\left.\left.{}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c)}$$

$$\left(i\,e^{(-d-e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c)}\left(i\,e^{(d-e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

Involving $\frac{\sinh(e\,z)\cosh(d\,z)}{a+b\sin^2(c\,z)}$

01.20.21.1898.01

$$\int\frac{\sinh(e\,z)\cosh(d\,z)}{a+b\sin^2(c\,z)}\,dz=$$

$$\frac{1}{4}\left(\left(e^{(-d-e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,(-d-e)}{2\,c},\,1;\,2+\frac{i\,(-d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,(-d-e)}{2\,c},\,1;\,2+\frac{i\,(-d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)\Big/$$

$$\left(\sqrt{a}\;b\sqrt{a+b}\;(-d-e-2\,i\,c)\right)+\left(e^{(d-e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right)\right.\right.$$

$${}_2F_1\left(1+\frac{i\,(d-e)}{2\,c},\,1;\,2+\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right)$$

$$\left.\left.{}_2F_1\left(1+\frac{i\,(d-e)}{2\,c},\,1;\,2+\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)\Big/\left(\sqrt{a}\;b\sqrt{a+b}\;(d-e-2\,i\,c)\right)-$$

$$\left(e^{(-d+e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,(e-d)}{2\,c},\,1;\,2+\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\right.\right.$$

$$\left.\left.\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,(e-d)}{2\,c},\,1;\,2+\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)\Big/$$

$$\left(\sqrt{a}\;b\sqrt{a+b}\;(-d+e-2\,i\,c)\right)-\left(e^{(d+e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right)\right.\right.$$

$${}_2F_1\left(1+\frac{i\,(d+e)}{2\,c},\,1;\,2+\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right)$$

$$\left.\left.{}_2F_1\left(1+\frac{i\,(d+e)}{2\,c},\,1;\,2+\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)\Big/\left(\sqrt{a}\;b\sqrt{a+b}\;(d+e-2\,i\,c)\right)\Big)$$

Involving $\sinh(e\,z)\cosh(d\,z)\left(a+b\sin^2(c\,z)\right)^{-n}$

01.20.21.1899.01

$$\int \frac{\sinh(e\,z)\cosh(d\,z)}{\left(a+b\sin^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}\left(\left(e^{(-d-e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},1;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},1;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},2;2-\frac{i(-d-e)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},\right.$$
$$\left.\left.\left.\left.2;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-d-e+2ic)\right)+$$
$$\left(e^{(d-e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d-e)}{2c},1;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d-e)}{2c},1;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d-e)}{2c},2;2-\frac{i(d-e)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1$$
$$\left.\left.\left.\left(1-\frac{i(d-e)}{2c},2;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d-e+2ic)\right)-$$
$$\left(e^{(-d+e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(e-d)}{2c},1;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(e-d)}{2c},1;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(e-d)}{2c},2;2-\frac{i(e-d)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\right.$$
$$\left.\left.\left.\left.\frac{i(e-d)}{2c},2;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-d+e+2ic)\right)-$$

$$\left(e^{(d+e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d+e)}{2c},1;2-\frac{i(d+e)}{2c};-\frac{be^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d+e)}{2c},1;2-\frac{i(d+e)}{2c};-\frac{be^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e)}{2c},2;2-\frac{i(d+e)}{2c};\right.\right.$$
$$\left.-\frac{be^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(1-\frac{i(d+e)}{2c},2;2-\frac{i(d+e)}{2c};-\frac{be^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d+e+2ic)\right)\right)$$

Involving algebraic functions of sin and sinh

Involving $\sinh(e\,z)\cosh(d\,z)(a+b\sin(c\,z))^{\beta}$

01.20.21.1900.01

$$\int \sinh(ez)\cosh(dz)(a+b\sin(cz))^{\beta}\,dz == \frac{1}{4}\left(1+\frac{ibe^{icz}}{\sqrt{a^2-b^2}-a}\right)^{-\beta}\left(1-\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}(a+b\sin(cz))^{\beta}$$
$$\left(\frac{e^{-(d+e)z}}{d+e+ic\beta}F_1\left(\frac{i(d+e+ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c+(d+e)i}{c};\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)-\right.$$
$$\frac{e^{(e-d)z}}{d-e+ic\beta}F_1\left(\frac{i(d-e)}{c}-\beta;-\beta,-\beta;1+\frac{i(d-e)}{c}-\beta;\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)-$$
$$\frac{e^{(d-e)z}}{d-e-ic\beta}F_1\left(-\frac{i(d-e)}{c}-\beta;-\beta,-\beta;1-\frac{i(d-e)}{c}-\beta;\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)+$$
$$\left.\frac{e^{(d+e)z}}{d+e-ic\beta}F_1\left(-\frac{i(d+e)}{c}-\beta;-\beta,-\beta;1-\frac{i(d+e)}{c}-\beta;\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)\right)$$

Involving $\sinh(e\,z)\cosh(d\,z)\left(a+b\sin^2(c\,z)\right)^{\beta}$

01.20.21.1901.01

$$\int \sinh(e\,z)\cosh(d\,z)\left(a+b\sin^2(c\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{4}\left(1-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(1-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(a-\frac{1}{4}\,b\,e^{-2\,i\,c\,z}\left(-1+e^{2\,i\,c\,z}\right)^2\right)^{\beta}$$
$$\left(\frac{e^{-(d+e)\,z}}{d+e+2\,i\,c\,\beta}\,F_1\left(\frac{i\,(d+e+2\,i\,c\,\beta)}{2\,c};-\beta,-\beta;\frac{i\,(d+e)-2\,c\,(\beta-1)}{2\,c};\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-\right.$$
$$\frac{e^{(e-d)\,z}}{d-e+2\,i\,c\,\beta}\,F_1\left(\frac{i\,(d-e)}{2\,c}-\beta;-\beta,-\beta;1+\frac{i\,(d-e)}{2\,c}-\beta;\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-$$
$$\frac{e^{(d-e)\,z}}{d-e-2\,i\,c\,\beta}\,F_1\left(-\frac{i\,(d-e)}{2\,c}-\beta;-\beta,-\beta;1-\frac{i\,(d-e)}{2\,c}-\beta;\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+$$
$$\left.\frac{e^{(d+e)\,z}}{d+e-2\,i\,c\,\beta}\,F_1\left(-\frac{i\,(d+e)}{2\,c}-\beta;-\beta,-\beta;1-\frac{i\,(d+e)}{2\,c}-\beta;\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)$$

Involving rational functions of sinh and sin

Involving $\frac{\sin(e\,z)\cosh(d\,z)}{a+b\sinh(c\,z)}$

01.20.21.1902.01

$$\int \frac{\sin(e\,z)\cosh(d\,z)}{a+b\sinh(c\,z)}\,dz ==$$

$$\frac{1}{4}i\left(\frac{1}{b\sqrt{a^2+b^2}\,(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $\sin(e\,z)\cosh(d\,z)\,(a+b\sinh(c\,z))^{-n}$

01.20.21.1903.01

$$\int \frac{\sin(e\,z)\cosh(d\,z)}{(a+b\sinh(c\,z))^2}\,dz ==$$

$$\frac{1}{4}i\left(\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$
$$\left.\left.\left.\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\Bigg)-$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\Bigg)-$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\Bigg)$$

Involving $\frac{\sin(e\,z)\cosh(d\,z)}{a+b\sinh^2(c\,z)}$

01.20.21.1904.01

$$\int \frac{\sin(e\,z)\cosh(d\,z)}{a+b\sinh^2(c\,z)}\,dz ==$$

$$\frac{1}{4}i\left(\left(e^{(-2c-d-ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-d-ie}{2c},1;2-\frac{-d-ie}{2c};\frac{b\,e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-d-ie}{2c},1;2-\frac{-d-ie}{2c};\frac{b\,e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d-ie)\right)+\left(e^{(-2c+d-ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d-ie}{2c},1;2-\frac{d-ie}{2c};\frac{b\,e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d-ie}{2c},1;2-\frac{d-ie}{2c};\frac{b\,e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d-ie)\right)-\left(e^{(-2c-d+ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{ie-d}{2c},1;2-\frac{ie-d}{2c};\frac{b\,e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{ie-d}{2c},1;2-\frac{ie-d}{2c};\frac{b\,e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d+ie)\right)-\left(e^{(-2c+d+ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d+ie}{2c},1;2-\frac{d+ie}{2c};\frac{b\,e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d+ie}{2c},1;2-\frac{d+ie}{2c};\frac{b\,e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d+ie)\right)\right)$$

Involving $\sin(e\,z)\cosh(d\,z)\left(a+b\sinh^2(c\,z)\right)^{-n}$

01.20.21.1905.01

$$\int \frac{\sin(e\,z)\cosh(d\,z)}{\left(a+b\sinh^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}i\left(\left(e^{(2c-d-ie)z}\left((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-ie}{2c}+1,1;\frac{-d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-ie}{2c}+1,1;\frac{-d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{-d-ie}{2c}+1,2;\frac{-d-ie}{2c}+\right.\right.\right.\right.$$

$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{-d-ie}{2c}+1,2;\frac{-d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c-d-ie)\Big)+$$
$$\Big(e^{(2c+d-ie)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big){}_2F_1\Big(\frac{d-ie}{2c}+1,1;\frac{d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big){}_2F_1\Big(\frac{d-ie}{2c}+1,1;\frac{d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big){}_2F_1\Big(\frac{d-ie}{2c}+1,2;\frac{d-ie}{2c}+$$
$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{d-ie}{2c}+1,2;\frac{d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c+d-ie)\Big)-$$
$$\Big(e^{(2c-d+ie)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big){}_2F_1\Big(\frac{ie-d}{2c}+1,1;\frac{ie-d}{2c}+2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big){}_2F_1\Big(\frac{ie-d}{2c}+1,1;\frac{ie-d}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big){}_2F_1\Big(\frac{ie-d}{2c}+1,2;\frac{ie-d}{2c}+$$
$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{ie-d}{2c}+1,2;\frac{ie-d}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c-d+ie)\Big)-$$
$$\Big(e^{(2c+d+ie)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big){}_2F_1\Big(\frac{d+ie}{2c}+1,1;\frac{d+ie}{2c}+2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big){}_2F_1\Big(\frac{d+ie}{2c}+1,1;\frac{d+ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big){}_2F_1\Big(\frac{d+ie}{2c}+1,2;\frac{d+ie}{2c}+$$
$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{d+ie}{2c}+1,2;\frac{d+ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c+d+ie)\Big)\Big)$$

Involving algebraic functions of sinh and sin

Involving $\sin(e\,z)\cosh(d\,z)\,(a+b\sinh(c\,z))^{\beta}$

01.20.21.1906.01

$$\int \sin(e\,z)\cosh(d\,z)\,(a+b\sinh(c\,z))^{\beta}\,dz == \frac{1}{4}\,i\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2+b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2+b^2}}+1\right)^{-\beta}(a+b\sinh(c\,z))^{\beta}$$
$$\left(-\frac{e^{(d+i\,e)\,z}}{d+i\,e-c\,\beta}F_1\left(\frac{d+i\,e-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+d+i\,e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.$$
$$\frac{e^{(d-i\,e)\,z}}{d-i\,e-c\,\beta}F_1\left(\frac{d-i\,e-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+d-i\,e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)-$$
$$\frac{e^{-(d+i\,e)\,z}}{d+i\,e+c\,\beta}F_1\left(-\frac{d+i\,e+c\,\beta}{c};-\beta,-\beta;-\frac{d+i\,e+c\,(\beta-1)}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$
$$\left.\frac{e^{-(d-i\,e)\,z}}{d-i\,e+c\,\beta}F_1\left(-\frac{d-i\,e+c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-d+i\,e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)\right)$$

Involving $\sin(e\,z)\cosh(d\,z)\left(a+b\sinh^2(c\,z)\right)^{\beta}$

01.20.21.1907.01

$$\int \sin(e\,z)\cosh(d\,z)\left(a+b\sinh^2(c\,z)\right)^{\beta}\,dz ==$$
$$\frac{1}{4}\,i\left(\frac{e^{2\,c\,z}\,b}{2\,a-b+2\sqrt{a\,(a-b)}}+1\right)^{-\beta}\left(1-\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(-1+e^{2\,c\,z}\right)^2+a\right)^{\beta}$$
$$\left(-\frac{e^{(d+i\,e)\,z}}{d+i\,e-2\,c\,\beta}F_1\left(\frac{d+i\,e-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{d+i\,e}{2\,c}-\beta+1;\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)+\right.$$
$$\frac{e^{(d-i\,e)\,z}}{d-i\,e-2\,c\,\beta}F_1\left(\frac{d-i\,e-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{d-i\,e}{2\,c}-\beta+1;\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)-$$
$$\frac{e^{-(d+i\,e)\,z}}{d+i\,e+2\,c\,\beta}F_1\left(-\frac{d+i\,e+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{d+i\,e+2\,c\,(\beta-1)}{2\,c};\right.$$
$$\left.\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)+$$
$$\left.\frac{e^{-(d-i\,e)\,z}}{d-i\,e+2\,c\,\beta}F_1\left(-\frac{d-i\,e+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{d-i\,e}{2\,c}-\beta+1;\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)\right)$$

Involving cos and sinh

Involving $\cos(a z^r + q) \sinh(w z^r + t) \cosh(c z^r + g)$

01.20.21.1908.01

$$\int \cos(a z^r + q) \sinh(w z^r + t) \cosh(c z^r + g)\, dz ==$$
$$\frac{1}{8} z \left(-e^{g+i q+t} \Gamma\left(\frac{1}{r}, (-c - i a - w) z^r\right) ((-c - i a - w) z^r)^{-1/r} - e^{g-i q+t} ((-c + i a - w) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-c + i a - w) z^r\right) - \right.$$
$$e^{-g+i q+t} ((c - i a - w) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (c - i a - w) z^r\right) - e^{-g-i q+t} ((c + i a - w) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (c + i a - w) z^r\right) +$$
$$e^{g+i q-t} ((-c - i a + w) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-c - i a + w) z^r\right) + e^{g-i q-t} ((-c + i a + w) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-c + i a + w) z^r\right) +$$
$$\left. e^{-g+i q-t} ((c - i a + w) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (c - i a + w) z^r\right) + e^{-g-i q-t} ((c + i a + w) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (c + i a + w) z^r\right) \right)$$

Involving $\cos(a z^r + p z + q) \sinh(w z^r + s z + t) \cosh(c z^2 + f z + g)$

01.20.21.1909.01

$$\int \cos(a z^2 + p z + q) \sinh(w z^2 + s z + t) \cosh(c z^2 + f z + g)\, dz ==$$
$$\frac{e^{g-i q+t-\frac{-f^2+2 i p f-2 s f+p^2-s^2+2 i p s}{4(-c+i a-w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{-f+i p-s-2 c z+2 i a z-2 w z}{2\sqrt{-c+i a-w}}\right)}{16\sqrt{-c+i a-w}} + \frac{e^{-g-i q+t-\frac{-f^2-2 i p f+2 s f+p^2-s^2+2 i p s}{4(c+i a-w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{f+i p-s+2 c z+2 i a z-2 w z}{2\sqrt{c+i a-w}}\right)}{16\sqrt{c+i a-w}} +$$
$$\frac{e^{-g+i q-t-\frac{f^2-2 i p f+2 s f-p^2+s^2-2 i p s}{4(-c+i a-w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f-i p+s-2 i a z+2 c z+2 w z}{2\sqrt{-c+i a-w}}\right)}{16\sqrt{-c+i a-w}} + \frac{e^{g+i q+t-\frac{f^2+2 i p f+2 s f-p^2+s^2+2 i p s}{4(c+i a+w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f+i p+s+2 c z+2 i a z+2 w z}{2\sqrt{c+i a+w}}\right)}{16\sqrt{c+i a+w}} -$$
$$\frac{e^{g+i q-t-\frac{f^2+2 i p f-2 s f-p^2+s^2-2 i p s}{4(c+i a-w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f+i p-s+2 c z+2 i a z-2 w z}{2\sqrt{c+i a-w}}\right)}{16\sqrt{c+i a-w}} - \frac{e^{g-i q-t-\frac{-f^2+2 i p f+2 s f+p^2-s^2-2 i p s}{4(-c+i a+w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{-f+i p+s-2 c z+2 i a z+2 w z}{2\sqrt{-c+i a+w}}\right)}{16\sqrt{-c+i a+w}} -$$
$$\frac{e^{-g+i q+t-\frac{f^2-2 i p f-2 s f-p^2+s^2+2 i p s}{4(-c+i a+w)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{f-i p-s-2 i a z+2 c z-2 w z}{2\sqrt{-c+i a+w}}\right)}{16\sqrt{-c+i a+w}} - \frac{e^{-g-i q-t-\frac{-f^2-2 i p f-2 s f+p^2-s^2-2 i p s}{4(c+i a+w)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{f+i p+s+2 c z+2 i a z+2 w z}{2\sqrt{c+i a+w}}\right)}{16\sqrt{c+i a+w}}$$

01.20.21.1910.01

$$\int \cos(\sqrt{z}\ a + p z + q) \sinh(w \sqrt{z}\ + s z + t) \cosh(\sqrt{z}\ c + f z + g)\, dz ==$$
$$\frac{e^{-g-i q+t-\frac{a^2-2 i c a+2 i w a-c^2-w^2+2 c w}{4(f+i p-s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c+i a-w+2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2\sqrt{f+i p-s}}\right)}{16 (f + i p - s)^{3/2}} +$$
$$\frac{i a e^{-g+i q+t-\frac{a^2+2 i c a-2 i w a-c^2-w^2+2 c w}{4(f-i p-s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c-i a-w+2 f \sqrt{z}-2 i p \sqrt{z}-2 s \sqrt{z}}{2\sqrt{f-i p-s}}\right)}{16 (f - i p - s)^{3/2}} +$$

$$\frac{e^{-g+i q+t-\frac{a^2+2 i c a-2 i w a-c^2-w^2+2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c-i a-w+2 f \sqrt{z}-2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}}+$$

$$\frac{i a e^{-g-i q-t-\frac{a^2-2 i c a-2 i w a-c^2-w^2-2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}}+$$

$$\frac{c e^{-g-i q-t-\frac{a^2-2 i c a-2 i w a-c^2-w^2-2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}}+$$

$$\frac{e^{-g-i q-t-\frac{a^2-2 i c a-2 i w a-c^2-w^2-2 c w}{4 (f+i p+s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c+i a+w+2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p+s}}\right)}{16 (f+i p+s)^{3/2}}+$$

$$\frac{c e^{-g+i q-t-\frac{a^2+2 i c a+2 i w a-c^2-w^2-2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ \operatorname{erf}\left(\frac{c-i a+w+2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}}+$$

$$\frac{e^{-g+i q-t-\frac{a^2+2 i c a+2 i w a-c^2-w^2-2 c w}{4 (f-i p+s)}} \sqrt{\pi}\ w \operatorname{erf}\left(\frac{c-i a+w+2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p+s}}\right)}{16 (f-i p+s)^{3/2}}+$$

$$\frac{e^{g+i q-t-\frac{-a^2+2 i c a-2 i w a+c^2+w^2-2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ w \operatorname{erfi}\left(\frac{-c-i a+w-2 f \sqrt{z}-2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}}+$$

$$\frac{i a e^{g+i q-t-\frac{-a^2+2 i c a-2 i w a+c^2+w^2-2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i a-w+2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}}+$$

$$\frac{c e^{g+i q-t-\frac{-a^2+2 i c a-2 i w a+c^2+w^2-2 c w}{4 (f+i p-s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{c+i a-w+2 f \sqrt{z}+2 i p \sqrt{z}-2 s \sqrt{z}}{2 \sqrt{f+i p-s}}\right)}{16 (f+i p-s)^{3/2}}+$$

$$\frac{i a e^{g-i q-t-\frac{-a^2-2 i c a+2 i w a+c^2+w^2-2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-c+i a+w-2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}}+$$

$$\frac{e^{g-i q-t-\frac{-a^2-2 i c a+2 i w a+c^2+w^2-2 c w}{4 (f-i p-s)}} \sqrt{\pi}\ w \operatorname{erfi}\left(\frac{-c+i a+w-2 f \sqrt{z}+2 i p \sqrt{z}+2 s \sqrt{z}}{2 \sqrt{f-i p-s}}\right)}{16 (f-i p-s)^{3/2}}+$$

$$\frac{c\,e^{g-i\,q-t-\frac{-a^2-2\,i\,c\,a+2\,i\,w\,a+c^2+w^2-2\,c\,w}{4\,(f-i\,p-s)}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c-i\,a-w+2\,f\,\sqrt{z}-2\,i\,p\,\sqrt{z}-2\,s\,\sqrt{z}}{2\,\sqrt{f-i\,p-s}}\right)}{16\,(f-i\,p-s)^{3/2}}-\frac{e^{g+i\,q-t+(f+i\,p-s)\,z+(c+i\,a-w)\,\sqrt{z}}}{8\,(f+i\,p-s)}-$$

$$\frac{e^{-g-i\,q+t-(f+i\,p-s)\,z-(c+i\,a-w)\,\sqrt{z}}}{8\,(f+i\,p-s)}-\frac{i\,a\,e^{-g-i\,q+t-\frac{a^2-2\,i\,c\,a+2\,i\,w\,a-c^2-w^2+2\,c\,w}{4\,(f+i\,p-s)}}\,\sqrt{\pi}\,\operatorname{erf}\left(\frac{c+i\,a-w+2\,f\,\sqrt{z}+2\,i\,p\,\sqrt{z}-2\,s\,\sqrt{z}}{2\,\sqrt{f+i\,p-s}}\right)}{16\,(f+i\,p-s)^{3/2}}-$$

$$\frac{c\,e^{-g-i\,q+t-\frac{a^2-2\,i\,c\,a+2\,i\,w\,a-c^2-w^2+2\,c\,w}{4\,(f+i\,p-s)}}\,\sqrt{\pi}\,\operatorname{erf}\left(\frac{c+i\,a-w+2\,f\,\sqrt{z}+2\,i\,p\,\sqrt{z}-2\,s\,\sqrt{z}}{2\,\sqrt{f+i\,p-s}}\right)}{16\,(f+i\,p-s)^{3/2}}-$$

$$\frac{e^{g-i\,q-t+(f-i\,p-s)\,z-(-c+i\,a+w)\,\sqrt{z}}}{8\,(f-i\,p-s)}-\frac{e^{-g+i\,q+t-(f-i\,p-s)\,z+(-c+i\,a+w)\,\sqrt{z}}}{8\,(f-i\,p-s)}-$$

$$\frac{c\,e^{-g+i\,q+t-\frac{a^2+2\,i\,c\,a-2\,i\,w\,a-c^2-w^2+2\,c\,w}{4\,(f-i\,p-s)}}\,\sqrt{\pi}\,\operatorname{erf}\left(\frac{c-i\,a-w+2\,f\,\sqrt{z}-2\,i\,p\,\sqrt{z}-2\,s\,\sqrt{z}}{2\,\sqrt{f-i\,p-s}}\right)}{16\,(f-i\,p-s)^{3/2}}+\frac{e^{g+i\,q+t+(f+i\,p+s)\,z+(c+i\,a+w)\,\sqrt{z}}}{8\,(f+i\,p+s)}+$$

$$\frac{e^{-g-i\,q-t-(f+i\,p+s)\,z-(c+i\,a+w)\,\sqrt{z}}}{8\,(f+i\,p+s)}-\frac{i\,a\,e^{g+i\,q+t-\frac{-a^2+2\,i\,c\,a+2\,i\,w\,a+c^2+w^2+2\,c\,w}{4\,(f+i\,p+s)}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+i\,a+w+2\,f\,\sqrt{z}+2\,i\,p\,\sqrt{z}+2\,s\,\sqrt{z}}{2\,\sqrt{f+i\,p+s}}\right)}{16\,(f+i\,p+s)^{3/2}}-$$

$$\frac{c\,e^{g+i\,q+t-\frac{-a^2+2\,i\,c\,a+2\,i\,w\,a+c^2+w^2+2\,c\,w}{4\,(f+i\,p+s)}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c+i\,a+w+2\,f\,\sqrt{z}+2\,i\,p\,\sqrt{z}+2\,s\,\sqrt{z}}{2\,\sqrt{f+i\,p+s}}\right)}{16\,(f+i\,p+s)^{3/2}}-$$

$$\frac{e^{g+i\,q+t-\frac{-a^2+2\,i\,c\,a+2\,i\,w\,a+c^2+w^2+2\,c\,w}{4\,(f+i\,p+s)}}\,\sqrt{\pi}\,w\,\operatorname{erfi}\left(\frac{c+i\,a+w+2\,f\,\sqrt{z}+2\,i\,p\,\sqrt{z}+2\,s\,\sqrt{z}}{2\,\sqrt{f+i\,p+s}}\right)}{16\,(f+i\,p+s)^{3/2}}+\frac{e^{g-i\,q+t+(f-i\,p+s)\,z-(-c+i\,a-w)\,\sqrt{z}}}{8\,(f-i\,p+s)}+$$

$$\frac{e^{-g+i\,q-t-(f-i\,p+s)\,z+(-c+i\,a-w)\,\sqrt{z}}}{8\,(f-i\,p+s)}-\frac{i\,a\,e^{-g+i\,q-t-\frac{a^2+2\,i\,c\,a+2\,i\,w\,a-c^2-w^2-2\,c\,w}{4\,(f-i\,p+s)}}\,\sqrt{\pi}\,\operatorname{erf}\left(\frac{c-i\,a+w+2\,f\,\sqrt{z}-2\,i\,p\,\sqrt{z}+2\,s\,\sqrt{z}}{2\,\sqrt{f-i\,p+s}}\right)}{16\,(f-i\,p+s)^{3/2}}-$$

$$\frac{c\,e^{g-i\,q+t-\frac{-a^2-2\,i\,c\,a-2\,i\,w\,a+c^2+w^2+2\,c\,w}{4\,(f-i\,p+s)}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{c-i\,a+w+2\,f\,\sqrt{z}-2\,i\,p\,\sqrt{z}+2\,s\,\sqrt{z}}{2\,\sqrt{f-i\,p+s}}\right)}{16\,(f-i\,p+s)^{3/2}}-$$

$$\frac{e^{g-i\,q+t-\frac{-a^2-2\,i\,c\,a-2\,i\,w\,a+c^2+w^2+2\,c\,w}{4\,(f-i\,p+s)}}\,\sqrt{\pi}\,w\,\operatorname{erfi}\left(\frac{c-i\,a+w+2\,f\,\sqrt{z}-2\,i\,p\,\sqrt{z}+2\,s\,\sqrt{z}}{2\,\sqrt{f-i\,p+s}}\right)}{16\,(f-i\,p+s)^{3/2}}-$$

$$\frac{i\,a\,e^{g-i\,q+t-\frac{-a^2-2\,i\,c\,a-2\,i\,w\,a+c^2+w^2+2\,c\,w}{4\,(f-i\,p+s)}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-c+i\,a-w-2\,f\,\sqrt{z}+2\,i\,p\,\sqrt{z}-2\,s\,\sqrt{z}}{2\,\sqrt{f-i\,p+s}}\right)}{16\,(f-i\,p+s)^{3/2}}$$

Involving powers of cos and powers of sinh

Involving $\cos^m(a z^r + q) \sinh^u(w z^r + t) \cosh(c z^r + g)$

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$$\int \cos^m(a z^r + q) \sinh^u(w z^r + t) \cosh(c z^r + g)\, dz ==$$

$$-\frac{1}{r}\left(i^u\, 2^{-m-u-1}\, z \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} \left(e^g\, \Gamma\left(\frac{1}{r}, -c z^r\right)(-c z^r)^{-1/r} + e^{-g}\, (c z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, c z^r\right)\right)(1 - m \bmod 2)\,(1 - u \bmod 2)\right) -$$

$$\frac{1}{r}\left(i^u\, 2^{-m-u-1}\, z \binom{u}{\frac{u}{2}}(1 - u \bmod 2)\right.$$

$$\sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \left(e^{g+2 i j q - i m q}\, \Gamma\left(\frac{1}{r}, (-c - 2 i a j + i a m) z^r\right)((-c - 2 i a j + i a m) z^r)^{-1/r} + e^{-g+2 i j q - i m q}\right.$$

$$((c - 2 i a j + i a m) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c - 2 i a j + i a m) z^r\right) + e^{g-2 i j q + i m q}\, ((-c + 2 i a j - i a m) z^r)^{-1/r}$$

$$\left.\left.\Gamma\left(\frac{1}{r}, (-c + 2 i a j - i a m) z^r\right) + e^{-g-2 i j q + i m q}\, ((c + 2 i a j - i a m) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c + 2 i a j - i a m) z^r\right)\right)\right) -$$

$$\frac{1}{r}\left(i^u\, 2^{-m-u-1}\, z \binom{m}{\frac{m}{2}}(1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^k \binom{u}{k} \left(e^{g+2 k t - t u + \frac{i \pi u}{2}}\, \Gamma\left(\frac{1}{r}, (-c - 2 k w + u w) z^r\right)((-c - 2 k w + u w) z^r)^{-1/r} + \right.$$

$$e^{-g+2 k t - t u + \frac{i \pi u}{2}}\, ((c - 2 k w + u w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c - 2 k w + u w) z^r\right) + e^{g-2 k t + t u - \frac{i \pi u}{2}}\, ((-c + 2 k w - u w) z^r)^{-1/r}$$

$$\left.\left.\Gamma\left(\frac{1}{r}, (-c + 2 k w - u w) z^r\right) + e^{-g-2 k t + t u - \frac{i \pi u}{2}}\, ((c + 2 k w - u w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c + 2 k w - u w) z^r\right)\right)\right) -$$

$$\frac{1}{r}\left(i^u\, 2^{-m-u-1}\, z \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \sum_{k=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^k \binom{u}{k} \left(e^{g+2 i j q - i m q + 2 k t - t u + \frac{i \pi u}{2}}\, \Gamma\left(\frac{1}{r}, (-c - 2 i a j + i a m - 2 k w + u w) z^r\right)\right.\right.$$

$$((-c - 2 i a j + i a m - 2 k w + u w) z^r)^{-1/r} + e^{-g+2 i j q - i m q + 2 k t - t u + \frac{i \pi u}{2}}\, ((c - 2 i a j + i a m - 2 k w + u w)$$

$$z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c - 2 i a j + i a m - 2 k w + u w) z^r\right) + e^{g-2 i j q + i m q + 2 k t - t u + \frac{i \pi u}{2}}$$

$$((-c + 2 i a j - i a m - 2 k w + u w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-c + 2 i a j - i a m - 2 k w + u w) z^r\right) +$$

$$e^{-g-2 i j q + i m q + 2 k t - t u + \frac{i \pi u}{2}}\, ((c + 2 i a j - i a m - 2 k w + u w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (c + 2 i a j - i a m - 2 k w + u w)\right.$$

$$\left.z^r\right) + e^{g+2 i j q - i m q - 2 k t + t u - \frac{i \pi u}{2}}\, ((-c - 2 i a j + i a m + 2 k w - u w) z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r}, (-c - 2 i a j + i a m + 2 k w - u w) z^r\right) + e^{-g+2 i j q - i m q - 2 k t + t u - \frac{i \pi u}{2}}\right.$$

$$((c-2\,i\,a\,j+i\,a\,m+2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-2\,i\,a\,j+i\,a\,m+2\,k\,w-u\,w)\,z^r\right)+$$

$$e^{g-2\,i\,j\,q+i\,m\,q-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((-c+2\,i\,a\,j-i\,a\,m+2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-c+2\,i\,a\,j-i\,a\,m+2\,k\,w-u\,w)\right.$$

$$\left.z^r\right)+e^{-g-2\,i\,j\,q+i\,m\,q-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((c+2\,i\,a\,j-i\,a\,m+2\,k\,w-u\,w)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},\,(c+2\,i\,a\,j-i\,a\,m+2\,k\,w-u\,w)\,z^r\right)\right)\Bigg)\Big/;\,m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0$$

Involving $\cos^m(a\,z^r+p\,z+q)\sinh^u(w\,z^r+s\,z+t)\cosh(c\,z^r+f\,z+g)$

01.20.21.1912.01

$$\int\cos^m(a\,z^2+p\,z+q)\sinh^u(w\,z^2+s\,z+t)\cosh(c\,z^2+f\,z+g)\,dz==$$

$$-i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(\frac{e^{g-\frac{f^2}{4c}}\,(f+2\,c\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(f+2\,c\,z)^2}{4\,c}\right)}{c\,\sqrt{-\frac{(f+2\,c\,z)^2}{c}}}-\frac{e^{\frac{f^2}{4c}-g}\,(-f-2\,c\,z)\,\Gamma\left(\frac{1}{2},\,\frac{(-f-2\,c\,z)^2}{4\,c}\right)}{c\,\sqrt{\frac{(-f-2\,c\,z)^2}{c}}}\right)(1-m\bmod 2)\,(1-u\bmod 2)-$$

$$i^u\,2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\left(e^{-\frac{(i\,(2\,k-m)\,p-f)^2}{4\,(i\,a\,(2\,k-m)-c)}-g+i\,(2\,k-m)\,q}\right.\right.$$

$$\left.(-f+i\,(2\,k-m)\,p+2\,(i\,a\,(2\,k-m)-c)\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(-f+i\,(2\,k-m)\,p+2\,(i\,a\,(2\,k-m)-c)\,z)^2}{4\,(i\,a\,(2\,k-m)-c)}\right)\right)\Big/$$

$$\left((i\,a\,(2\,k-m)-c)\,\sqrt{-\frac{(-f+i\,(2\,k-m)\,p+2\,(i\,a\,(2\,k-m)-c)\,z)^2}{i\,a\,(2\,k-m)-c}}\right)+\left(e^{-\frac{(f+i\,(2\,k-m)\,p)^2}{4\,(c+a\,i\,(2\,k-m))}+g+i\,(2\,k-m)\,q}\right.$$

$$\left.(f+i\,(2\,k-m)\,p+2\,(c+a\,i\,(2\,k-m))\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(f+i\,(2\,k-m)\,p+2\,(c+a\,i\,(2\,k-m))\,z)^2}{4\,(c+a\,i\,(2\,k-m))}\right)\right)\Big/$$

$$\left((c+a\,i\,(2\,k-m))\,\sqrt{-\frac{(f+i\,(2\,k-m)\,p+2\,(c+a\,i\,(2\,k-m))\,z)^2}{c+a\,i\,(2\,k-m)}}\right)+\left(e^{-\frac{(i\,(m-2\,k)\,p-f)^2}{4\,(i\,a\,(m-2\,k)-c)}-g+i\,(m-2\,k)\,q}\right.$$

$$\left.(-f+i\,(m-2\,k)\,p+2\,(i\,a\,(m-2\,k)-c)\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(-f+i\,(m-2\,k)\,p+2\,(i\,a\,(m-2\,k)-c)\,z)^2}{4\,(i\,a\,(m-2\,k)-c)}\right)\right)\Big/$$

$$\left((i\,a\,(m-2\,k)-c)\,\sqrt{-\frac{(-f+i\,(m-2\,k)\,p+2\,(i\,a\,(m-2\,k)-c)\,z)^2}{i\,a\,(m-2\,k)-c}}\right)+\left(e^{-\frac{(f+i\,(m-2\,k)\,p)^2}{4\,(c+a\,i\,(m-2\,k))}+g+i\,(m-2\,k)\,q}\right.$$

$$\left.(f+i\,(m-2\,k)\,p+2\,(c+a\,i\,(m-2\,k))\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(f+i\,(m-2\,k)\,p+2\,(c+a\,i\,(m-2\,k))\,z)^2}{4\,(c+a\,i\,(m-2\,k))}\right)\right)\Big/$$

$$\left((c+a\,i\,(m-2\,k))\sqrt{-\frac{(f+i\,(m-2\,k)\,p+2\,(c+a\,i\,(m-2\,k))\,z)^2}{c+a\,i\,(m-2\,k)}}\right)\Bigg)-$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\Bigg(\Bigg(e^{-\frac{(s\,(2\,i-u)-f)^2}{4\,((2\,i-u)\,w-c)}-g+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}(-f+s\,(2\,i-u)+2\,((2\,i-u)\,w-c)\,z)$$

$$\Gamma\left(\frac{1}{2},-\frac{(-f+s\,(2\,i-u)+2\,((2\,i-u)\,w-c)\,z)^2}{4\,((2\,i-u)\,w-c)}\right)\Bigg)\Bigg/$$

$$\left(((2\,i-u)\,w-c)\sqrt{-\frac{(-f+s\,(2\,i-u)+2\,((2\,i-u)\,w-c)\,z)^2}{(2\,i-u)\,w-c}}\right)+$$

$$\left(e^{-\frac{(f+s\,(2\,i-u))^2}{4\,(c+(2\,i-u)\,w)}+g+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}(f+s\,(2\,i-u)+2\,(c+(2\,i-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(f+s\,(2\,i-u)+2\,(c+(2\,i-u)\,w)\,z)^2}{4\,(c+(2\,i-u)\,w)}\right)\right)\Bigg/$$

$$\left((c+(2\,i-u)\,w)\sqrt{-\frac{(f+s\,(2\,i-u)+2\,(c+(2\,i-u)\,w)\,z)^2}{c+(2\,i-u)\,w}}\right)+\Bigg(e^{-\frac{(s\,(u-2\,i)-f)^2}{4\,((u-2\,i)\,w-c)}-g+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}$$

$$(-f+s\,(u-2\,i)+2\,((u-2\,i)\,w-c)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(-f+s\,(u-2\,i)+2\,((u-2\,i)\,w-c)\,z)^2}{4\,((u-2\,i)\,w-c)}\right)\Bigg)\Bigg/$$

$$\left(((u-2\,i)\,w-c)\sqrt{-\frac{(-f+s\,(u-2\,i)+2\,((u-2\,i)\,w-c)\,z)^2}{(u-2\,i)\,w-c}}\right)+$$

$$\left(e^{-\frac{(f+s\,(u-2\,i))^2}{4\,(c+(u-2\,i)\,w)}+g+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}(f+s\,(u-2\,i)+2\,(c+(u-2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(f+s\,(u-2\,i)+2\,(c+(u-2\,i)\,w)\,z)^2}{4\,(c+(u-2\,i)\,w)}\right)\right)\Bigg/$$

$$\left((c+(u-2\,i)\,w)\sqrt{-\frac{(f+s\,(u-2\,i)+2\,(c+(u-2\,i)\,w)\,z)^2}{c+(u-2\,i)\,w}}\right)\Bigg)-i^u\,2^{-m-u-2}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}$$

$$\Bigg(\Bigg(\Bigg(e^{-\frac{(-f+i\,(2\,j-m)\,p+s\,(2\,i-u))^2}{4\,(-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)}-g+i\,(2\,j-m)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}(-f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)$$

$$\Gamma\Bigg(\frac{1}{2},-(-f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/$$

$$(4\,(-c+a\,i\,(2\,j-m)+(2\,i-u)\,w))\Bigg)\Bigg)\Bigg/\Big((-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\sqrt{\big(-(-f+i\,(2\,j-m)\,p+$$

$$s\,(2\,i-u)+2\,(-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/(-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\big)}\Big)+$$

$$\Bigg(e^{-\frac{(f+i\,(2\,j-m)\,p+s\,(2\,i-u))^2}{4\,(c+a\,i\,(2\,j-m)+(2\,i-u)\,w)}+g+i\,(2\,j-m)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}(f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)$$

$$\Gamma\Bigg(\frac{1}{2},-(f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/$$

$$(4\,(c+a\,i\,(2\,j-m)+(2\,i-u)\,w))\Big)\Big/\Big((c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,\sqrt{\big(-(f+i\,(2\,j-m)\,p+$$
$$s\,(2\,i-u)+2\,(c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/(c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\big)}\Big)+$$
$$\Bigg(e^{-\frac{(-f+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)}-g+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\,(-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(-c+a\,i\,(m-2\,j)+$$
$$(2\,i-u)\,w)\,z)\,\Gamma\Big(\frac{1}{2},\,-(-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/$$
$$(4\,(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\Big)\Big/\Big((-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,\sqrt{\big(-(-f+i\,(m-2\,j)\,p+$$
$$s\,(2\,i-u)+2\,(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\big)}\Big)+$$
$$\Bigg(e^{-\frac{(f+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+g+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\,(f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)$$
$$\Gamma\Big(\frac{1}{2},\,-(f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/$$
$$(4\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\Big)\Big/\Big((c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,\sqrt{\big(-(f+i\,(m-2\,j)\,p+$$
$$s\,(2\,i-u)+2\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\big)}\Big)+$$
$$\Bigg(e^{-\frac{(-f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}-g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(2\,j-m)+$$
$$(u-2\,i)\,w)\,z)\,\Gamma\Big(\frac{1}{2},\,-(-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\Big)\Big/\Big((-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,\sqrt{\big(-(-f+i\,(2\,j-m)\,p+$$
$$s\,(u-2\,i)+2\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\big)}\Big)+$$
$$\Bigg(e^{-\frac{(f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)$$
$$\Gamma\Big(\frac{1}{2},\,-(f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\Big)\Big/\Big((c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,\sqrt{\big(-(f+i\,(2\,j-m)\,p+$$
$$s\,(u-2\,i)+2\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\big)}\Big)+$$
$$\Bigg(e^{-\frac{(-f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}-g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(m-2\,j)+$$
$$(u-2\,i)\,w)\,z)\,\Gamma\Big(\frac{1}{2},\,-(-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\Big)\Big/\Big((-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,\sqrt{\big(-(-f+i\,(m-2\,j)\,p+$$
$$s\,(u-2\,i)+2\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\big)}\Big)+$$
$$\Bigg(e^{-\frac{(f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)$$
$$\Gamma\Big(\frac{1}{2},\,-(f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\Big)\Big)\Big/$$

$$\Big((c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,\sqrt{\left(-(f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z\right)^2}\Big/$$

$$(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\Big)\Big)\Big/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

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$$\int\cos^m\left(\sqrt{z}\ a+q+p\,z\right)\sinh^u\left(t+s\,z+w\,\sqrt{z}\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz==i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}$$

$$\left(\frac{1}{f^2\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}}\left(e^{\frac{c^2}{4\,f}-g}\left(-2\,e^{-\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}}\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\ f-c\left(-c-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)+\right.$$

$$\left.\frac{e^{g-\frac{c^2}{4\,f}}\left(2\,e^{\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}}\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f+c\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)}{f^2\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}}\right)$$

$$(1-m\bmod 2)\,(1-u\bmod 2)+i^u\,2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\left(e^{-\frac{(i\,a\,(2\,k-m)-c)^2}{4\,(i\,(2\,k-m)\,p-f)}-g+i\,(2\,k-m)\,q}\left(2\,e^{\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p-f)}}\sqrt{-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p-f}}\right.\right.\right.$$

$$\left.\left.(i\,(2\,k-m)\,p-f)+(i\,a\,(2\,k-m)-c)\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p-f)}\right)\right)\Big/$$

$$\left((i\,(2\,k-m)\,p-f)^2\sqrt{-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p-f}}\right)+$$

$$\left(e^{-\frac{(c+a\,i\,(2\,k-m))^2}{4\,(f+i\,(2\,k-m)\,p)}+g+i\,(2\,k-m)\,q}\left(2\,e^{\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p)}}\sqrt{-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{f+i\,(2\,k-m)\,p}}\right.\right.$$

$$\left.\left.(f+i\,(2\,k-m)\,p)+(c+a\,i\,(2\,k-m))\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p)}\right)\Bigg)\Bigg)\Bigg/$$

$$\left((f+i\,(2\,k-m)\,p)^2\sqrt{-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{f+i\,(2\,k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(i\,a\,(m-2\,k)-c)^2}{4\,(i\,(m-2\,k)\,p-f)}-g+i\,(m-2\,k)\,q}\left((i\,a\,(m-2\,k)-c)\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p-f)}\right)+$$

$$\left.\left.2\,e^{\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p-f)}}\,(i\,(m-2\,k)\,p-f)\sqrt{-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p-f}}\right)\right)\Bigg/$$

$$\left((i\,(m-2\,k)\,p-f)^2\sqrt{-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p-f}}\right)+$$

$$\left(e^{-\frac{(c+a\,i\,(m-2\,k))^2}{4\,(f+i\,(m-2\,k)\,p)}+g+i\,(m-2\,k)\,q}\left(2\,e^{\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p)}}\sqrt{-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{f+i\,(m-2\,k)\,p}}\right.\right.$$

$$(f+i\,(m-2\,k)\,p)+(c+a\,i\,(m-2\,k))\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p)}\right)\right)\Bigg)\Bigg/$$

$$\left.\left.\left((f+i\,(m-2\,k)\,p)^2\sqrt{-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{f+i\,(m-2\,k)\,p}}\right)\right)+\right.$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{((2\,k-u)\,w-c)^2}{4\,(s\,(2\,k-u)-f)}-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\left(2\,e^{\frac{\left(-c+(2\,k-u)\,w+2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)^2}{4\,(s\,(2\,k-u)-f)}}\right.\right.\right.$$

$$\sqrt{-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{s(2k-u)-f}}\,(s(2k-u)-f)+((2k-u)w-c)$$

$$\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{4(s(2k-u)-f)}\right)\Bigg)\Bigg)\Bigg/$$

$$\left((s(2k-u)-f)^2\sqrt{-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{s(2k-u)-f}}\right)+\left(e^{-\frac{(c+(2k-u)w)^2}{4(f+s(2k-u))}+g+t(2k-u)+\frac{i\pi u}{2}}\right.$$

$$\left(2e^{\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{4(f+s(2k-u))}}\sqrt{-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{f+s(2k-u)}}\,(f+s(2k-u))+(c+(2k-u)w)\right.$$

$$\left.\left.\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{4(f+s(2k-u))}\right)\right)\right)\Bigg/$$

$$\left((f+s(2k-u))^2\sqrt{-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{f+s(2k-u)}}\right)+$$

$$\left(e^{-\frac{((u-2k)w-c)^2}{4(s(u-2k)-f)}-g+t(u-2k)-\frac{i\pi u}{2}}\left(2e^{\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}}\sqrt{-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}}\right.\right.$$

$$(s(u-2k)-f)+((u-2k)w-c)\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}\right)\right)\right)\Bigg/$$

$$\left((s(u-2k)-f)^2\sqrt{-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}}\right)+\left(e^{-\frac{(c+(u-2k)w)^2}{4(f+s(u-2k))}+g+t(u-2k)-\frac{i\pi u}{2}}\right.$$

$$\left(2e^{\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}}\sqrt{-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}}\,(f+s(u-2k))+(c+(u-2k)w)\right.$$

$$\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}\right)\Bigg)\Bigg)\Bigg/$$

$$\left((f+s(u-2k))^2\sqrt{-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}}\right)+i^u\,2^{-m-u-2}$$

$$\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}\binom{m}{k}\sum_{j=0}^{\lfloor\frac{u-1}{2}\rfloor}(-1)^j\binom{u}{j}\Bigg(\Bigg(e^{-\frac{(-c+a\,i\,(2k-m)+(2j-u)w)^2}{4(-f+i\,(2k-m)p+s(2j-u))}-g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}\Bigg(\Bigg(-c+a\,i\,(2k-m)+(2j-u)w$$

$$\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(4(-f+i\,(2k-m)p+s(2j-u)))\Bigg)+2\,e^{\frac{\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(-f+i\,(2k-m)p+s(2j-u))}}$$

$$(-f+i\,(2k-m)p+s(2j-u))\sqrt{\left(-\left(-c+a\,i\,(2k-m)+(2j-u)w+\right.\right.}$$

$$\left.\left.2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(-f+i\,(2k-m)p+s(2j-u))\right)\Bigg)\Bigg)\Bigg/$$

$$\Bigg((-f+i\,(2k-m)p+s(2j-u))^2\sqrt{\left(-\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)\right.\right.}$$

$$\left.\left.p+s(2j-u))\sqrt{z}\right)^2\Big/(-f+i\,(2k-m)p+s(2j-u))\right)\Bigg)+$$

$$\Bigg(e^{-\frac{(c+a\,i\,(2k-m)+(2j-u)w)^2}{4(f+i\,(2k-m)p+s(2j-u))}+g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}\Bigg(\Bigg(c+a\,i\,(2k-m)+(2j-u)w\Big)\Big(c+a\,i\,(2k-m)+$$

$$(2j-u)w+2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\Big)\Gamma\Bigg(\frac{1}{2},-\Big(c+a\,i\,(2k-m)+(2j-u)w+$$

$$2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\Big)^2\Big/(4(f+i\,(2k-m)p+s(2j-u)))\Bigg)+2$$

$$e^{\frac{\left(c+a\,i\,(2k-m)+(2j-u)w+2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(f+i\,(2k-m)p+s(2j-u))}}(f+i\,(2k-m)p+s(2j-u))$$

$$\sqrt{\left(-\left(c+a\,i\,(2k-m)+(2j-u)w+2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(f+i\,(2k-m)p+\right.}$$

$$\left.s(2j-u))\right)\Bigg)\Bigg)\Bigg/\Bigg((f+i\,(2k-m)p+s(2j-u))^2\sqrt{\left(-\left(c+a\,i\,(2k-m)+(2j-u)w+\right.\right.}$$

$$\left.\left.2(f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(f+i\,(2k-m)p+s(2j-u))\right)\Bigg)+$$

$$\Bigg(e^{-\frac{(-c+a\,i\,(m-2k)+(2j-u)w)^2}{4(-f+i\,(m-2k)p+s(2j-u))}-g+i\,(m-2k)q+t(2j-u)+\frac{i\pi u}{2}}\Bigg(\Bigg(-c+a\,i\,(m-2k)+(2j-u)w\Big)\Big(-c+a\,i\,(m-2k)+$$

$$(2j-u)w+2(-f+i\,(m-2k)p+s(2j-u))\sqrt{z}\Big)\Gamma\Bigg(\frac{1}{2},-\Big(-c+a\,i\,(m-2k)+(2j-u)w+$$

$$2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\left(4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+2$$

$$e^{\frac{\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))$$

$$\sqrt{\left(-\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\right)\Big/\left((-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\right.$$

$$\sqrt{\left(-\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+\left(e^{-\frac{(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$\Big((c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,e^{\frac{\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}$$

$$(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{\left(-\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.}$$

$$\left.\left.2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\left(f+i\,(m-2\,k)\,p+s\,(2\,j-u)\right)\right)\Big)\Big/$$

$$\Big((f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\,\sqrt{\left(-\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+\right.\right.\right.}$$

$$\left.\left.\left.s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\left(f+i\,(m-2\,k)\,p+s\,(2\,j-u)\right)\right)\right)+$$

$$\left(e^{-\frac{(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\right.\Big(\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w\right)\left(-c+a\,i\,(2\,k-m)+\right.$$

$$\left.(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.\right.$$

$$\left.\left.2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\left(4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\right)+2$$

$$e^{\frac{\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))$$

$$\sqrt{\left(-\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\right)\Big/\left((-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\right.$$

$$\sqrt{\left(-\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Big)+\left(e^{-\frac{(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\right.$$

$$\left((c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},\,-\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$
$$(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.\right.}$$
$$\left.\left.2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Bigg)\Bigg/$$
$$\left((f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+\right.\right.\right.}$$
$$\left.\left.\left.s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\right)+$$
$$\left(e^{-\frac{(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\left((-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\left(-c+a\,i\,(m-2\,k)+\right.\right.\right.$$
$$\left.\left.\left.(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\,-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+\right.\right.\right.\right.$$
$$\left.\left.\left.\left.2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\right.$$
$$e^{\frac{\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))$$
$$\sqrt{\left(-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Bigg/\left((-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\right.$$
$$\sqrt{\left(-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}$$
$$\left.(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\Bigg)+\left(e^{-\frac{(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\right.$$
$$\left((c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},\,-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}$$
$$(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+\right.\right.}$$

$$2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big/$$

$$\Big((f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\,\sqrt{\Big(-\big(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+$$

$$s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big/;\ m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+$$

Involving rational functions of cos and sinh

Involving $\frac{\sinh(e\,z)\cosh(d\,z)}{a+b\cos(c\,z)}$

01.20.21.1914.01

$$\int\frac{\sinh(e\,z)\cosh(d\,z)}{a+b\cos(c\,z)}\,dz==$$

$$\frac{1}{4}\Bigg(\frac{1}{b\sqrt{a^2-b^2}\,(-d+e+i\,c)}\Bigg(e^{(-d+e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)+$$

$$\frac{1}{b\sqrt{a^2-b^2}\,(d+e+i\,c)}\Bigg(e^{(d+e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)-$$

$$\frac{1}{b\sqrt{a^2-b^2}\,(-d-e+i\,c)}\Bigg(e^{(-d-e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)-$$

$$\frac{1}{b\sqrt{a^2-b^2}\,(d-e+i\,c)}\Bigg(e^{(d-e+i\,c)\,z}\Bigg(\Big(a+\sqrt{a^2-b^2}\Big)\,{}_2F_1\Bigg(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\Bigg)+$$

$$\Big(\sqrt{a^2-b^2}-a\Big)\,{}_2F_1\Bigg(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)\Bigg)$$

Involving $\sinh(e\,z)\cosh(d\,z)\,(a+b\cos(c\,z))^{-n}$

01.20.21.1915.01

$$\int \frac{\sinh(e\,z)\cosh(d\,z)}{(a+b\cos(c\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c)}\left(e^{(-d+e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\right.\right.$$

$$\left.\left.\left.2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c)}\left(e^{(d+e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\right.\right.$$

$$\left.\left.-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c)}$$

$$\left(e^{(-d-e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c)}\left(e^{(d-e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\right.\right.$$

$$\left.\left.2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\frac{\sinh(e\,z)\cosh(d\,z)}{a+b\cos^2(c\,z)}$

01.20.21.1916.01

$$\int \frac{\sinh(e\,z)\cosh(d\,z)}{b\cos^2(c\,z)+a}\,dz ==$$

$$\frac{1}{4}\left(\left(e^{(-d-e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\,1;\,2-\frac{i\,(-d-e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\,1;\,2-\frac{i\,(-d-e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-d-e+2\,i\,c)\right)+\left(e^{(d-e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i\,(d-e)}{2\,c},\,1;\,2-\frac{i\,(d-e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{i\,(d-e)}{2\,c},\,1;\,2-\frac{i\,(d-e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(d-e+2\,i\,c)\right)-$$
$$\left(e^{(-d+e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(e-d)}{2\,c},\,1;\,2-\frac{i\,(e-d)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i\,(e-d)}{2\,c},\,1;\,2-\frac{i\,(e-d)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-d+e+2\,i\,c)\right)-\left(e^{(d+e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i\,(d+e)}{2\,c},\,1;\,2-\frac{i\,(d+e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{i\,(d+e)}{2\,c},\,1;\,2-\frac{i\,(d+e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(d+e+2\,i\,c)\right)\Bigg)$$

Involving $\sinh(e\,z)\cosh(d\,z)\left(a+b\cos^2(c\,z)\right)^{-n}$

01.20.21.1917.01

$$\int \frac{\sinh(e\,z)\cosh(d\,z)}{\left(b\cos^2(c\,z)+a\right)^2}\,dz ==$$

$$\frac{1}{4}\left(\left(e^{(-d-e+2\,i\,c)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\,1;\,2-\frac{i\,(-d-e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\,1;\,2-\frac{i\,(-d-e)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\,2;\,2-\frac{i\,(-d-e)}{2\,c};\right.\right.$$
$$\left.\left.-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\right.$$

$$2;\,2-\frac{i\,(-d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-d-e+2\,i\,c)\right)+$$

$$\Bigg(e^{(d-e+2\,i\,c)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\Bigg(1-\frac{i\,(d-e)}{2\,c},\,1;\,2-\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\Bigg(1-\frac{i\,(d-e)}{2\,c},\,1;\,2-\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\Bigg(1-\frac{i\,(d-e)}{2\,c},\,2;\,2-\frac{i\,(d-e)}{2\,c};$$

$$-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(d-e)}{2\,c},\,2;\,2-\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(d-e+2\,i\,c)\right)-$$

$$\Bigg(e^{(-d+e+2\,i\,c)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\Bigg(1-\frac{i\,(e-d)}{2\,c},\,1;\,2-\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\Bigg(1-\frac{i\,(e-d)}{2\,c},\,1;\,2-\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\Bigg(1-\frac{i\,(e-d)}{2\,c},\,2;\,2-\frac{i\,(e-d)}{2\,c};$$

$$-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1$$

$$\Bigg(1-\frac{i\,(e-d)}{2\,c},\,2;\,2-\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-d+e+2\,i\,c)\right)-$$

$$\Bigg(e^{(d+e+2\,i\,c)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\Bigg(1-\frac{i\,(d+e)}{2\,c},\,1;\,2-\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\Bigg(1-\frac{i\,(d+e)}{2\,c},\,1;\,2-\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\Bigg(1-\frac{i\,(d+e)}{2\,c},\,2;\,2-\frac{i\,(d+e)}{2\,c};$$

$$-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(d+e)}{2\,c},\,2;\,2-\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(d+e+2\,i\,c)\right)\Bigg)$$

Involving algebraic functions of cos and sinh

Involving $\sinh(e\,z)\cosh(d\,z)\,(a+b\cos(c\,z))^{\beta}$

01.20.21.1918.01

$$\int \sinh(e\,z)\cosh(d\,z)\,(a+b\cos(c\,z))^{\beta}\,dz == \frac{1}{4}\left(\frac{e^{i\,c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{i\,c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-i\,c\,z}\left(1+e^{2\,i\,c\,z}\right)\right)^{\beta}$$
$$\left(-\frac{e^{(e-d)\,z}}{d-e+i\,c\,\beta}F_1\left(\frac{i\,(d-e+i\,c\,\beta)}{c};-\beta,-\beta;\frac{-\beta\,c+c+(d-e)\,i}{c};-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\frac{e^{-(d+e)\,z}}{d+e+i\,c\,\beta}F_1\left(\frac{i\,(d+e+i\,c\,\beta)}{c};-\beta,-\beta;\frac{-\beta\,c+c+(d+e)\,i}{c};-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\frac{e^{(d-e)\,z}}{d-e-i\,c\,\beta}F_1\left(-\frac{i\,d-i\,e+c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-i\,d+i\,e}{c};-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+$$
$$\left.\frac{e^{(d+e)\,z}}{d+e-i\,c\,\beta}F_1\left(-\frac{i\,(d+e-i\,c\,\beta)}{c};-\beta,-\beta;\frac{-\beta\,c+c-i\,(d+e)}{c};-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $\sinh(e\,z)\cosh(d\,z)\left(a+b\cos^2(c\,z)\right)^{\beta}$

01.20.21.1919.01

$$\int \sinh(e\,z)\cosh(d\,z)\left(a+b\cos^2(c\,z)\right)^{\beta}\,dz ==$$
$$\frac{1}{4}\left(\frac{e^{2\,i\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,i\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,i\,c\,z}\left(1+e^{2\,i\,c\,z}\right)^2+a\right)^{\beta}$$
$$\left(\frac{e^{-(d+e)\,z}}{d+e+2\,i\,c\,\beta}F_1\left(\frac{i\,(d+e+2\,i\,c\,\beta)}{2\,c};-\beta,-\beta;\frac{i\,(d+e)-2\,c\,(\beta-1)}{2\,c};-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-\right.$$
$$\frac{e^{(e-d)\,z}}{d-e+2\,i\,c\,\beta}F_1\left(\frac{i\,(d-e)}{2\,c}-\beta;-\beta,-\beta;1+\frac{i\,(d-e)}{2\,c}-\beta;-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-$$
$$\frac{e^{(d-e)\,z}}{d-e-2\,i\,c\,\beta}F_1\left(-\frac{i\,(d-e)}{2\,c}-\beta;-\beta,-\beta;1-\frac{i\,(d-e)}{2\,c}-\beta;-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+$$
$$\left.\frac{e^{(d+e)\,z}}{d+e-2\,i\,c\,\beta}F_1\left(-\frac{i\,(d+e)}{2\,c}-\beta;-\beta,-\beta;1-\frac{i\,(d+e)}{2\,c}-\beta;-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)$$

Involving rational functions of sinh and cos

Involving $\frac{\cos(e\,z)\cosh(d\,z)}{a+b\sinh(c\,z)}$

01.20.21.1920.01

$$\int \frac{\cos(e\,z)\cosh(d\,z)}{a+b\sinh(c\,z)}\,dz ==$$

$$\frac{1}{4}\left(-\frac{1}{b\sqrt{a^2+b^2}\,(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-\right.$$

$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$

$$\frac{1}{b\sqrt{a^2+b^2}\,(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$

$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $\cos(e\,z)\cosh(d\,z)\,(a+b\sinh(c\,z))^{-n}$

01.20.21.1921.01

$$\int \frac{\cos(e\,z)\cosh(d\,z)}{(a+b\sinh(c\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left.\left.\left.\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\cos(e\,z)\cosh(d\,z)}{a+b\sinh^2(c\,z)}$

01.20.21.1922.01

$$\int \frac{\cos(e\,z)\cosh(d\,z)}{a+b\sinh^2(c\,z)}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-2c-d+ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{ie-d}{2c},1;2-\frac{ie-d}{2c};\frac{be^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{ie-d}{2c},1;2-\frac{ie-d}{2c};\frac{be^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d+ie)\right)+\left(e^{(-2c+d+ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{d+ie}{2c},1;2-\frac{d+ie}{2c};\frac{be^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{d+ie}{2c},1;2-\frac{d+ie}{2c};\frac{be^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d+ie)\right)+$$
$$\left(e^{(-2c-d-ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-d-ie}{2c},1;2-\frac{-d-ie}{2c};\frac{be^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-d-ie}{2c},1;2-\frac{-d-ie}{2c};\frac{be^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d-ie)\right)+\left(e^{(-2c+d-ie)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{d-ie}{2c},1;2-\frac{d-ie}{2c};\frac{be^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{d-ie}{2c},1;2-\frac{d-ie}{2c};\frac{be^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d-ie)\right)$$

Involving $\cos(e\,z)\cosh(d\,z)\left(a+b\sinh^2(c\,z)\right)^{-n}$

01.20.21.1923.01

$$\int \frac{\cos(e\,z)\cosh(d\,z)}{\left(a+b\sinh^2(c\,z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(2c-d+ie)z}\left((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{ie-d}{2c}+1,1;\frac{ie-d}{2c}+2;\frac{be^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{ie-d}{2c}+1,1;\frac{ie-d}{2c}+2;\frac{be^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{ie-d}{2c}+1,2;\frac{ie-d}{2c}+\right.\right.$$

$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{ie-d}{2c}+1,2;\frac{ie-d}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c-d+ie)\Big)+$$
$$\Big(e^{(2c+d+ie)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big){}_2F_1\Big(\frac{d+ie}{2c}+1,1;\frac{d+ie}{2c}+2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big){}_2F_1\Big(\frac{d+ie}{2c}+1,1;\frac{d+ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big){}_2F_1\Big(\frac{d+ie}{2c}+1,2;\frac{d+ie}{2c}+$$
$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{d+ie}{2c}+1,2;\frac{d+ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c+d+ie)\Big)+$$
$$\Big(e^{(2c-d-ie)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big){}_2F_1\Big(\frac{-d-ie}{2c}+1,1;\frac{-d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big){}_2F_1\Big(\frac{-d-ie}{2c}+1,1;\frac{-d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big){}_2F_1\Big(\frac{-d-ie}{2c}+1,2;\frac{-d-ie}{2c}+$$
$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{-d-ie}{2c}+1,2;\frac{-d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c-d-ie)\Big)+$$
$$\Big(e^{(2c+d-ie)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big){}_2F_1\Big(\frac{d-ie}{2c}+1,1;\frac{d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big){}_2F_1\Big(\frac{d-ie}{2c}+1,1;\frac{d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big){}_2F_1\Big(\frac{d-ie}{2c}+1,2;\frac{d-ie}{2c}+$$
$$2;\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)$$
$${}_2F_1\Big(\frac{d-ie}{2c}+1,2;\frac{d-ie}{2c}+2;\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c+d-ie)\Big)\Big)$$

Involving algebraic functions of sinh and cos

Involving $\cos(e\,z)\cosh(d\,z)\,(a+b\sinh(c\,z))^{\beta}$

01.20.21.1924.01

$$\int \cos(e\,z)\cosh(d\,z)\,(a+b\sinh(c\,z))^{\beta}\,dz == \frac{1}{4}\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2+b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2+b^2}}+1\right)^{-\beta}$$
$$(a+b\sinh(c\,z))^{\beta}\left(\frac{e^{(d+i\,e)\,z}\,F_1\left(\frac{d+i\,e-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+d+i\,e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)}{d+i\,e-c\,\beta}+\right.$$
$$\frac{e^{(d-i\,e)\,z}\,F_1\left(\frac{d-i\,e-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+d-i\,e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)}{d-i\,e-c\,\beta}-$$
$$\frac{e^{-(d+i\,e)\,z}\,F_1\left(-\frac{d+i\,e+c\,\beta}{c};-\beta,-\beta;-\frac{d+i\,e+c\,(\beta-1)}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)}{d+i\,e+c\,\beta}-$$
$$\left.\frac{e^{-(d-i\,e)\,z}\,F_1\left(-\frac{d-i\,e+c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-d+i\,e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)}{d-i\,e+c\,\beta}\right)$$

Involving $\cos(e\,z)\cosh(d\,z)\left(a+b\sinh^2(c\,z)\right)^{\beta}$

01.20.21.1925.01

$$\int \cos(e\,z)\cosh(d\,z)\left(a+b\sinh^2(c\,z)\right)^{\beta}\,dz ==$$
$$\frac{1}{4}\left(\frac{e^{2\,c\,z}\,b}{2\,a-b+2\sqrt{a\,(a-b)}}+1\right)^{-\beta}\left(1-\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(-1+e^{2\,c\,z}\right)^2+a\right)^{\beta}$$
$$\left(\frac{e^{(d+i\,e)\,z}}{d+i\,e-2\,c\,\beta}\,F_1\left(\frac{d+i\,e-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{d+i\,e}{2\,c}-\beta+1;\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)+\right.$$
$$\frac{e^{(d-i\,e)\,z}}{d-i\,e-2\,c\,\beta}\,F_1\left(\frac{d-i\,e-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{d-i\,e}{2\,c}-\beta+1;\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)-$$
$$\frac{e^{-(d+i\,e)\,z}}{d+i\,e+2\,c\,\beta}\,F_1\left(-\frac{d+i\,e+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{d+i\,e+2\,c\,(\beta-1)}{2\,c};\right.$$
$$\left.\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)-$$
$$\left.\frac{e^{-(d-i\,e)\,z}}{d-i\,e+2\,c\,\beta}\,F_1\left(-\frac{d-i\,e+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{d-i\,e}{2\,c}-\beta+1;\frac{b\,e^{2\,c\,z}}{-2\,a+b-2\sqrt{a\,(a-b)}},\frac{b\,e^{2\,c\,z}}{-2\,a+b+2\sqrt{a\,(a-b)}}\right)\right)$$

Involving hyperbolic, exponential and a power functions

Involving sinh, exp and power

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh(c\,z)\cosh(a\,z)$

01.20.21.1926.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh(c\,z)\cosh(a\,z)\, dz == \frac{1}{4} z^{\alpha} \left(\Gamma(\alpha, -(a+p-c)\,z)\,(-(a+p-c)\,z)^{-\alpha} + ((a-p+c)\,z)^{-\alpha}\,\Gamma(\alpha, (a-p+c)\,z) - (-(-a+p+c)\,z)^{-\alpha}\,\Gamma(\alpha, -(-a+p+c)\,z) - (-(a+p+c)\,z)^{-\alpha}\,\Gamma(\alpha, -(a+p+c)\,z)\right)$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh(c\,z+d)\cosh(a\,z)$

01.20.21.1927.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh(d+c\,z)\cosh(a\,z)\, dz == \frac{1}{4} e^{-d}\, z^{\alpha} \left(-e^{2\,d}\, E_{1-\alpha}((a-c-p)\,z) + E_{1-\alpha}((a+c-p)\,z) + E_{1-\alpha}(-(a-c+p)\,z) - e^{2\,d}\, E_{1-\alpha}(-(a+c+p)\,z)\right)$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh(c\,z)\cosh(a\,z+b)$

01.20.21.1928.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh(c\,z)\cosh(b+a\,z)\, dz == \frac{1}{4} e^{-b}\, z^{\alpha} \left(-E_{1-\alpha}((a-c-p)\,z) + E_{1-\alpha}((a+c-p)\,z) + e^{2\,b}\,(E_{1-\alpha}(-(a-c+p)\,z) - E_{1-\alpha}(-(a+c+p)\,z))\right)$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh(c\,z+d)\cosh(a\,z+b)$

01.20.21.1929.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh(d+c\,z)\cosh(b+a\,z)\, dz == \frac{1}{4} e^{-b-d}\, z^{\alpha} \left(-e^{2\,d}\, E_{1-\alpha}((a-c-p)\,z) + E_{1-\alpha}((a+c-p)\,z) + e^{2\,b}\left(E_{1-\alpha}(-(a-c+p)\,z) - e^{2\,d}\, E_{1-\alpha}(-(a+c+p)\,z)\right)\right)$$

Involving $z^{n}\, e^{p\,z^{r}}\, \sinh\left(b\,z^{r}\right)\cosh(c\,z)$

01.20.21.1930.01

$$\int z^n e^{p z^2} \sinh\left(b z^2\right) \cosh(c z)\, dz == -\frac{1}{8\sqrt{p-b}\,\sqrt{b+p}}\left(-e^{\frac{c^2}{4b-4p}}\sqrt{b+p}\right.$$

$$\left(\sum_{q=0}^{n} 2^{q-n}(-c)^{n-q}(p-b)^{-n-\frac{1}{2}}(c+2(p-b)z)^{q+1}\left(-\frac{(c+2(p-b)z)^2}{p-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+2(p-b)z)^2}{4(p-b)}\right)+\right.$$

$$\left.\sum_{q=0}^{n} 2^{q-n} c^{n-q}(p-b)^{-n-\frac{1}{2}}\left(-\frac{(c-2(p-b)z)^2}{p-b}\right)^{\frac{1}{2}(-q-1)}(2(p-b)z-c)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-2(p-b)z)^2}{4(p-b)}\right)\right)+$$

$$e^{\frac{c^2}{-4b-4p}}\sqrt{p-b}\sum_{q=0}^{n} 2^{q-n}(-c)^{n-q}(b+p)^{-n-\frac{1}{2}}(c+2(b+p)z)^{q+1}\left(-\frac{(c+2(b+p)z)^2}{b+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+2(b+p)z)^2}{4(b+p)}\right)+e^{\frac{c^2}{-4b-4p}}\sqrt{p-b}\sum_{q=0}^{n} 2^{q-n} c^{n-q}(b+p)^{-n-\frac{1}{2}}$$

$$\left.\left(-\frac{(c-2bz-2pz)^2}{b+p}\right)^{\frac{1}{2}(-q-1)}(2(b+p)z-c)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c-2bz-2pz)^2}{4(b+p)}\right)\right) /;\ n\in\mathbb{N}$$

01.20.21.1931.01

$$\int z^n e^{p\sqrt{z}} \sinh\left(b\sqrt{z}\right)\cosh(c z)\, dz ==$$

$$2^{-2n-3} c^{-2(n+1)} e^{-\frac{(b+p)^2}{2c}}\left(-e^{\frac{3b^2+2pb+3p^2}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r(p-b)^{2n-q-r}\left(-2\sqrt{z}\,c-b+p\right)^{q+r}\left(\frac{\left(2\sqrt{z}\,c+b-p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\right.$$

$$\binom{n}{r}\binom{r}{q}\left((b-p)\left(2\sqrt{z}\,c+b-p\right)\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(2\sqrt{z}\,c+b-p\right)^2}{4c}\right)-\right.$$

$$\left.\left.2c\sqrt{\frac{\left(2\sqrt{z}\,c+b-p\right)^2}{c}}\,\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(2\sqrt{z}\,c+b-p\right)^2}{4c}\right)\right)+$$

$$e^{\frac{3(b+p)^2}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r(b+p)^{2n-q-r}\left(-2\sqrt{z}\,c+b+p\right)^{q+r}\left(\frac{\left(-2\sqrt{z}\,c+b+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}$$

$$\binom{r}{q}\left((b+p)\left(-2\sqrt{z}\,c+b+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(-2\sqrt{z}\,c+b+p\right)^2}{4c}\right)-\right.$$

$$2\,c\,\sqrt{\frac{\left(-2\sqrt{z}\;c+b+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\;\frac{\left(-2\sqrt{z}\;c+b+p\right)^2}{4\,c}\right)\Bigg)-$$

$$e^{\frac{b^2+6\,p\,b+p^2}{4\,c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(p-b)^{2\,n-q-r}\left(2\sqrt{z}\;c-b+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\;c-b+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}$$

$$\binom{r}{q}\Bigg((p-b)\left(2\sqrt{z}\;c-b+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\;-\frac{\left(2\sqrt{z}\;c-b+p\right)^2}{4\,c}\right)+$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\;c-b+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\;-\frac{\left(2\sqrt{z}\;c-b+p\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{\frac{(b+p)^2}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(b+p)^{2\,n-q-r}\left(2\sqrt{z}\;c+b+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\;c+b+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}$$

$$\binom{r}{q}\Bigg((b+p)\left(2\sqrt{z}\;c+b+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\;-\frac{\left(2\sqrt{z}\;c+b+p\right)^2}{4\,c}\right)+$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\;c+b+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\;-\frac{\left(2\sqrt{z}\;c+b+p\right)^2}{4\,c}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sinh(b\,z)\cosh(c\,z)$

01.20.21.1932.01

$$\int z^n e^{p z^2} \sinh(b z) \cosh(c z)\, dz == -\frac{1}{8\sqrt{p}} \left(i e^{-\frac{b^2+c^2+i p \pi}{2 p}} \left(e^{\frac{(b+c)^2}{4 p}+i \pi} \right.\right.$$

$$\sum_{q=0}^{n} 2^{q-n} (b-c)^{n-q} p^{-n-\frac{1}{2}} (-b+c+2 p z)^{q+1} \left(-\frac{(-b+c+2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-b+c+2 p z)^2}{4 p} \right) +$$

$$e^{\frac{(c-b)^2}{4 p}} \sum_{q=0}^{n} 2^{q-n} (-b-c)^{n-q} p^{-n-\frac{1}{2}} (b+c+2 p z)^{q+1} \left(-\frac{(b+c+2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+c+2 p z)^2}{4 p} \right) +$$

$$e^{\frac{(b+c)^2}{4 p}} \sum_{q=0}^{n} 2^{q-n} (c-b)^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(-b+c-2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)} (b-c+2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-b+c-2 p z)^2}{4 p} \right) +$$

$$e^{\frac{(c-b)^2}{4 p}+i \pi} \sum_{q=0}^{n} 2^{q-n} (b+c)^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(b+c-2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left. (-b-c+2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+c-2 p z)^2}{4 p} \right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.1933.01

$$\int z^n e^{p \sqrt{z}} \sinh(b z) \cosh(c z)\, dz ==$$

$$2^{-2 n-3} \left(-e^{\frac{p^2}{4 (c+b)}} \left(\sum_{r=0}^{n} \sum_{q=0}^{r} (-1)^{r-q} 4^r p^{2 n-q-r} \left(p-2 (c+b) \sqrt{z} \right)^{q+r} \left(\frac{\left(p-2 (c+b) \sqrt{z} \right)^2}{c+b} \right)^{\frac{1}{2}(-q-r-1)} \right.\right.$$

$$\binom{n}{r} \binom{r}{q} \left(p \left(p-2 (c+b) \sqrt{z} \right) \Gamma\left(\frac{1}{2} (q+r+1), \frac{\left(p-2 (c+b) \sqrt{z} \right)^2}{4 (c+b)} \right) - \right.$$

$$\left.\left.\left. 2 (c+b) \sqrt{\frac{\left(p-2 (c+b) \sqrt{z} \right)^2}{c+b}}\ \Gamma\left(\frac{1}{2} (q+r+2), \frac{\left(p-2 (c+b) \sqrt{z} \right)^2}{4 (c+b)} \right) \right) \right) (-c-b)^{-2 (n+1)} +$$

$$(b-c)^{-2 (n+1)} e^{\frac{p^2}{4 c-4 b}} \sum_{r=0}^{n} \sum_{q=0}^{r} (-1)^{r-q} 4^r p^{2 n-q-r} \left(2 \sqrt{z}\ (b-c)+p \right)^{q+r} \left(\frac{\left(2 \sqrt{z}\ (b-c)+p \right)^2}{c-b} \right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\ (b-c)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\ \frac{\left(2\sqrt{z}\ (b-c)+p\right)^2}{4(c-b)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(2\sqrt{z}\ (b-c)+p\right)^2}{c-b}}\ (b-c)\,\Gamma\left(\frac{1}{2}(q+r+2),\ \frac{\left(2\sqrt{z}\ (b-c)+p\right)^2}{4(c-b)}\right)\right)-$$

$$(c-b)^{-2(n+1)}\,e^{\frac{p^2}{4b-4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\ (c-b)+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{c-b}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\ (c-b)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{4(c-b)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{c-b}}\ (c-b)\,\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{4(c-b)}\right)\right)+$$

$$(c+b)^{-2(n+1)}\,e^{-\frac{p^2}{4(c+b)}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2n-q-r}\left(2\sqrt{z}\ (c+b)+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\ (c+b)+p\right)^2}{c+b}\right)^{\frac{1}{2}(-q-r-1)}$$

$$\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\ (c+b)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(2\sqrt{z}\ (c+b)+p\right)^2}{4(c+b)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(2\sqrt{z}\ (c+b)+p\right)^2}{c+b}}\ (c+b)\,\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(2\sqrt{z}\ (c+b)+p\right)^2}{4(c+b)}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\sinh\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1934.01

$$\int z^n e^{p z} \sinh\left(b z^2\right) \cosh(c z)\, dz ==$$

$$\frac{1}{8}\left(-\frac{1}{\sqrt{-b}}\left(e^{\frac{(c-p)^2}{4b}+i\pi}\sum_{q=0}^{n} 2^{q-n}(-b)^{-n-\frac{1}{2}}(c-p)^{n-q}(-c+p-2bz)^{q+1}\left(\frac{(c-p+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\left.\Gamma\left(\frac{q+1}{2},\frac{(c-p+2bz)^2}{4b}\right)\right)-\frac{1}{\sqrt{-b}}$$

$$\left(e^{\frac{(c+p)^2}{4b}+i\pi}\sum_{q=0}^{n} 2^{q-n}(-b)^{-n-\frac{1}{2}}(-c-p)^{n-q}(c+p-2bz)^{q+1}\left(\frac{(c+p-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(c+p-2bz)^2}{4b}\right)\right)-$$

$$\frac{1}{\sqrt{b}}\left(e^{-\frac{(c-p)^2}{4b}}\sum_{q=0}^{n} 2^{q-n}b^{-n-\frac{1}{2}}(c-p)^{n-q}(-c+p+2bz)^{q+1}\left(-\frac{(-c+p+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-c+p+2bz)^2}{4b}\right)\right)-\frac{1}{\sqrt{b}}\left(e^{-\frac{(c+p)^2}{4b}}\right.$$

$$\left.\left.\sum_{q=0}^{n} 2^{q-n}b^{-n-\frac{1}{2}}(-c-p)^{n-q}(c+p+2bz)^{q+1}\left(-\frac{(c+p+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c+p+2bz)^2}{4b}\right)\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.1935.01

$$\int z^n e^{p z} \sinh\left(b\sqrt{z}\right) \cosh(c z)\, dz ==$$

$$2^{-2n-3}\left(-e^{\frac{b^2}{4c-4p}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r(-b)^{2n-q-r}\left(\frac{\left(b+2(c-p)\sqrt{z}\right)^2}{c-p}\right)^{\frac{1}{2}(-q-r-1)}\left(2(p-c)\sqrt{z}-b\right)^{q+r}\right.\right.$$

$$\binom{n}{r}\binom{r}{q}\left(b\left(b+2(c-p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(b+2(c-p)\sqrt{z}\right)^2}{4(c-p)}\right)+\right.$$

$$\left.\left.2\sqrt{\frac{\left(b+2(c-p)\sqrt{z}\right)^2}{c-p}}\,(p-c)\,\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(b+2(c-p)\sqrt{z}\right)^2}{4(c-p)}\right)\right)\right)(p-c)^{-2(n+1)}+$$

$$e^{\frac{b^2}{4c-4p}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r b^{2n-q-r}\left(b+2(p-c)\sqrt{z}\right)^{q+r}\left(\frac{\left(b+2(p-c)\sqrt{z}\right)^2}{c-p}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\right.$$

$$\left(b\left(b+2(p-c)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\ \frac{\left(b+2(p-c)\sqrt{z}\right)^2}{4(c-p)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(b+2(p-c)\sqrt{z}\right)^2}{c-p}}\ (p-c)\,\Gamma\left(\frac{1}{2}(q+r+2),\ \frac{\left(b+2(p-c)\sqrt{z}\right)^2}{4(c-p)}\right)\right)(p-c)^{-2(n+1)}+$$

$$e^{-\frac{b^2}{4(c+p)}}(c+p)^{-2(n+1)}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,b^{2n-q-r}\left(b+2(c+p)\sqrt{z}\right)^{q+r}\left(-\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-q-r-1)}\right.$$

$$\binom{n}{r}\binom{r}{q}\left(b\left(b+2(c+p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{c+p}}\ (c+p)\,\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)\right)-$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(-b)^{2n-q-r}\left(-\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-q-r-1)}\left(2(c+p)\sqrt{z}-b\right)^{q+r}\binom{n}{r}$$

$$\binom{r}{q}\left(b\left(b-2(c+p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\ -\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{c+p}}\ (c+p)\,\Gamma\left(\frac{1}{2}(q+r+2),\ -\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)\right)\right)\Bigg/;\ n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\sinh(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1936.01

$$\int z^n e^{p z} \sinh(b z) \cosh\left(c z^2\right) dz ==$$

$$-\frac{i}{8} e^{-\frac{b^2+p^2+\pi i c}{2c}} \left(2^{-n-1} (-c)^{-n-1} e^{\frac{3b^2-2pb+3p^2+4\pi i c}{4c}} \sum_{q=0}^{n} (b-p)^{n-q} (-b+p-2cz)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(-b+p-2cz)^2}{4c}\right) + \right.$$

$$e^{\frac{(b+p)^2}{4c}} \left(\frac{1}{2} e^{\frac{b^2+p^2}{2c}} (-c)^{-n-1} \sum_{q=0}^{n} 2^{-q} \left(-\frac{b}{2}-\frac{p}{2}\right)^{n-q} (b+p-2cz)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(b+p-2cz)^2}{4c}\right) - \right.$$

$$2^{-n-1} c^{-n-1} \sum_{q=0}^{n} (b-p)^{n-q} (-b+p+2cz)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(-\frac{(-b+p+2cz)^2}{4c}\right) +$$

$$\left.\left.\frac{1}{2} c^{-n-1} e^{-\frac{bp}{c}} \sum_{q=0}^{n} 2^{-q} \left(-\frac{b}{2}-\frac{p}{2}\right)^{n-q} (b+p+2cz)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(-\frac{(b+p+2cz)^2}{4c}\right)\right)\right) /; n \in \mathbb{N}$$

01.20.21.4943.01

$$\int z^n e^{p z} \sinh(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-2n-3} \left(-e^{-\frac{c^2}{4(p-b)}} \left(\sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c)^{-h-i+2n} \left(2(p-b)\sqrt{z}-c\right)^{h+i} \left(-\frac{\left(2(p-b)\sqrt{z}-c\right)^2}{p-b}\right)^{\frac{1}{2}(-h-i-1)} \right.\right.$$

$$\binom{i}{h}\binom{n}{i}\left(2(p-b)\sqrt{-\frac{\left(2(p-b)\sqrt{z}-c\right)^2}{p-b}}\ \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2(p-b)\sqrt{z}-c\right)^2}{4(p-b)}\right) - \right.$$

$$\left.\left.\left.c\left(2(p-b)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2(p-b)\sqrt{z}-c\right)^2}{4(p-b)}\right)\right)\right)(p-b)^{-2(n+1)} -$$

$$e^{-\frac{c^2}{4(p-b)}} \left(\sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i c^{-h-i+2n} \left(c+2(p-b)\sqrt{z}\right)^{h+i} \left(-\frac{\left(c+2(p-b)\sqrt{z}\right)^2}{p-b}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \right.$$

$$\binom{n}{i}\left(c\left(c+2(p-b)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(c+2(p-b)\sqrt{z}\right)^2}{4(p-b)}\right) + \right.$$

$$\left.\left.2\sqrt{-\frac{\left(c+2(p-b)\sqrt{z}\right)^2}{p-b}}\ (p-b)\Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(c+2(p-b)\sqrt{z}\right)^2}{4(p-b)}\right)\right)\right)(p-b)^{-2(n+1)} +$$

$$e^{-\frac{c^2}{4(b+p)}}(b+p)^{-2(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(-c)^{-h-i+2n}\left(2(b+p)\sqrt{z}-c\right)^{h+i}\left(-\frac{\left(2(b+p)\sqrt{z}-c\right)^2}{b+p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(2(b+p)\sqrt{-\frac{\left(2(b+p)\sqrt{z}-c\right)^2}{b+p}}\;\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2(b+p)\sqrt{z}-c\right)^2}{4(b+p)}\right)-\right.$$

$$\left.c\left(2(b+p)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2(b+p)\sqrt{z}-c\right)^2}{4(b+p)}\right)\right)+$$

$$e^{-\frac{c^2}{4(b+p)}}(b+p)^{-2(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i c^{-h-i+2n}\left(c+2(b+p)\sqrt{z}\right)^{h+i}\left(-\frac{\left(c+2(b+p)\sqrt{z}\right)^2}{b+p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(c\left(c+2(b+p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+2(b+p)\sqrt{z}\right)^2}{4(b+p)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+2(b+p)\sqrt{z}\right)^2}{b+p}}\;(b+p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+2(b+p)\sqrt{z}\right)^2}{4(b+p)}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n\, e^{p\,z^r}\sinh(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1937.01

$$\int z^n e^{p z^2} \sinh(b z) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{8 \sqrt{p-c}\ \sqrt{c+p}} e^{-\frac{b^2}{4(c+p)}} \left(e^{\frac{c b^2}{2 c^2-2 p^2}} \sqrt{c+p} \sum_{q=0}^{n} 2^{q-n} b^{n-q} (p-c)^{-n-\frac{1}{2}} \left(\frac{(b+2(c-p)z)^2}{c-p} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$(-b-2cz+2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(b+2(c-p)z)^2}{4(c-p)} \right) - e^{\frac{c b^2}{2 c^2-2 p^2}} \sqrt{c+p}$$

$$\sum_{q=0}^{n} 2^{q-n} (-b)^{n-q} (p-c)^{-n-\frac{1}{2}} (b-2cz+2pz)^{q+1} \left(\frac{(b-2cz+2pz)^2}{c-p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(b-2cz+2pz)^2}{4(c-p)} \right) +$$

$$\sqrt{p-c} \left(\sum_{q=0}^{n} 2^{q-n} b^{n-q} (c+p)^{-n-\frac{1}{2}} \left(-\frac{(b-2(c+p)z)^2}{c+p} \right)^{\frac{1}{2}(-q-1)} (2(c+p)z-b)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2(c+p)z)^2}{4(c+p)} \right) - \right.$$

$$\sum_{q=0}^{n} 2^{q-n} (-b)^{n-q} (c+p)^{-n-\frac{1}{2}} (b+2(c+p)z)^{q+1}$$

$$\left. \left. \left(-\frac{(b+2(c+p)z)^2}{c+p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2(c+p)z)^2}{4(c+p)} \right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.1938.01

$$\int z^n e^{p \sqrt{z}} \sinh(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-2n-3} b^{-2(n+1)} \left(-e^{\frac{(p-c)^2}{4b}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (p-c)^{-h-i+2n} \left(-2\sqrt{z}\ b-c+p\right)^{h+i} \left(\frac{\left(-2\sqrt{z}\ b-c+p\right)^2}{b} \right)^{\frac{1}{2}(-h-i-1)} \right.$$

$$\binom{i}{h} \binom{n}{i} \left((p-c)\left(-2\sqrt{z}\ b-c+p\right) \Gamma\left(\frac{1}{2}(h+i+1), \frac{\left(-2\sqrt{z}\ b-c+p\right)^2}{4b} \right) - \right.$$

$$\left. \left. 2b \sqrt{\frac{\left(-2\sqrt{z}\ b-c+p\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+i+2), \frac{\left(-2\sqrt{z}\ b-c+p\right)^2}{4b} \right) \right) -$$

$$e^{\frac{(c+p)^2}{4b}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (c+p)^{-h-i+2n} \left(-2\sqrt{z}\ b+c+p\right)^{h+i} \left(\frac{\left(-2\sqrt{z}\ b+c+p\right)^2}{b} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}$$

$$\binom{n}{i}\left((c+p)\left(-2\sqrt{z}\,b+c+p\right)\Gamma\left(\frac{1}{2}(h+i+1),\,\frac{\left(-2\sqrt{z}\,b+c+p\right)^2}{4b}\right)-\right.$$

$$\left.2b\sqrt{\frac{\left(-2\sqrt{z}\,b+c+p\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+i+2),\,\frac{\left(-2\sqrt{z}\,b+c+p\right)^2}{4b}\right)\right)+$$

$$e^{-\frac{(p-c)^2}{4b}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c)^{-h-i+2n}\left(2\sqrt{z}\,b-c+p\right)^{h+i}\left(-\frac{\left(2\sqrt{z}\,b-c+p\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((p-c)\left(2\sqrt{z}\,b-c+p\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(2\sqrt{z}\,b-c+p\right)^2}{4b}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\,b-c+p\right)^2}{b}}\;b\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(2\sqrt{z}\,b-c+p\right)^2}{4b}\right)\right)+$$

$$e^{-\frac{(c+p)^2}{4b}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c+p)^{-h-i+2n}\left(2\sqrt{z}\,b+c+p\right)^{h+i}\left(-\frac{\left(2\sqrt{z}\,b+c+p\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((c+p)\left(2\sqrt{z}\,b+c+p\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(2\sqrt{z}\,b+c+p\right)^2}{4b}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(2\sqrt{z}\,b+c+p\right)^2}{b}}\;b\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(2\sqrt{z}\,b+c+p\right)^2}{4b}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\sinh\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1939.01

$$\int z^n e^{p z} \sinh\left(b z^2\right) \cosh\left(c z^2\right) dz =$$

$$\frac{1}{8}\left(-\frac{1}{\sqrt{b-c}}\left(e^{\frac{p^2}{4c-4b}} \sum_{q=0}^{n} 2^{q-n} (b-c)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2cz+2bz)^{q+1} \left(\frac{(p-2cz+2bz)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cz+2bz)^2}{4(c-b)}\right)\right) + \frac{1}{\sqrt{c-b}}\left(e^{\frac{p^2}{4b-4c}} \sum_{q=0}^{n} 2^{q-n} (c-b)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2(c-b)z)^{q+1} \left(-\frac{(p+2(c-b)z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(c-b)z)^2}{4(c-b)}\right)\right) + \frac{1}{\sqrt{-c-b}}\left(e^{\frac{p^2}{4(c+b)}} \sum_{q=0}^{n} 2^{q-n} (-c-b)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2(c+b)z)^{q+1} \left(\frac{(p-2(c+b)z)^2}{c+b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2(c+b)z)^2}{4(c+b)}\right)\right) - \frac{1}{\sqrt{c+b}}\left(e^{-\frac{p^2}{4(c+b)}} \sum_{q=0}^{n} 2^{q-n} (c+b)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2(c+b)z)^{q+1} \left(-\frac{(p+2(c+b)z)^2}{c+b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(c+b)z)^2}{4(c+b)}\right)\right)\right) /; n \in \mathbb{N}$$

01.20.21.1940.01

$$\int z^n e^{p z} \sinh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz =$$

$$-2^{-2n-3} p^{-2(n+1)}\left(e^{-\frac{(-b-c)^2}{4p}} \sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h} 4^i (-b-c)^{-h-i+2n} \left(-b-c+2p\sqrt{z}\right)^{h+i} \left(-\frac{\left(-b-c+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}\binom{n}{i}\left((-b-c)\left(-b-c+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-b-c+2p\sqrt{z}\right)^2}{4p}\right) + 2\sqrt{-\frac{\left(-b-c+2p\sqrt{z}\right)^2}{p}}\; p\,\Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(-b-c+2p\sqrt{z}\right)^2}{4p}\right)\right) - e^{-\frac{(b-c)^2}{4p}} \sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h} 4^i (b-c)^{-h-i+2n} \left(b-c+2p\sqrt{z}\right)^{h+i} \left(-\frac{\left(b-c+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}$$

$$\binom{n}{i}\left((b-c)\left(b-c+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b-c+2p\sqrt{z}\right)^2}{4p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b-c+2p\sqrt{z}\right)^2}{4p}\right)\right)+$$

$$e^{-\frac{(c-b)^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c-b)^{-h-i+2n}\left(-b+c+2p\sqrt{z}\right)^{h+i}\left(-\frac{\left(-b+c+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((c-b)\left(-b+c+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(-b+c+2p\sqrt{z}\right)^2}{4p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(-b+c+2p\sqrt{z}\right)^2}{4p}\right)\right)-$$

$$e^{-\frac{(b+c)^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c)^{-h-i+2n}\left(b+c+2p\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((b+c)\left(b+c+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+c+2p\sqrt{z}\right)^2}{4p}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c+2p\sqrt{z}\right)^2}{4p}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\,\sinh\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1941.01

$$\int z^{\alpha-1}\,e^{p\,z^r}\sinh(b\,z^r)\cosh(c\,z^r)\,dz==\frac{z^\alpha}{4r}\left(\Gamma\left(\frac{\alpha}{r},(c+b-p)\,z^r\right)((c+b-p)\,z^r)^{-\frac{\alpha}{r}}+(-(c-b+p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},-(c-b+p)\,z^r\right)-\right.$$

$$\left.(-(-c+b+p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},-(-c+b+p)\,z^r\right)-(-(c+b+p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},-(c+b+p)\,z^r\right)\right)$$

01.20.21.1942.01

$$\int z^n e^{p z^2} \sinh\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$
$$-\frac{1}{8} z^{n+1} \left(\Gamma\left(\frac{n+1}{2}, (-b-c-p) z^2\right) \left((-b-c-p) z^2\right)^{\frac{1}{2}(-n-1)} - \left((b-c-p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b-c-p) z^2\right) + \left((-b+c-p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+c-p) z^2\right) - \left((b+c-p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b+c-p) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1943.01

$$\int z^n e^{p \sqrt{z}} \sinh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$
$$\frac{1}{2} \left(-(-b-c-p)^{-2(n+1)} \Gamma\left(2(n+1), (-b-c-p) \sqrt{z}\right) + (b-c-p)^{-2(n+1)} \Gamma\left(2(n+1), (b-c-p) \sqrt{z}\right) - (-b+c-p)^{-2(n+1)} \Gamma\left(2(n+1), (-b+c-p) \sqrt{z}\right) + (b+c-p)^{-2(n+1)} \Gamma\left(2(n+1), (b+c-p) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r+e} \sinh\left(a z^r+q\right) \cosh\left(c z^r+g\right)$

01.20.21.1944.01

$$\int z^{\alpha-1} e^{b z^r+e} \sinh(a z^r+q) \cosh(c z^r+g) dz ==$$
$$-\frac{i z^{\alpha}}{4 r} \left(e^{e+g+q-\frac{i \pi}{2}} \Gamma\left(\frac{\alpha}{r}, (-a-b-c) z^r\right) ((-a-b-c) z^r)^{-\frac{\alpha}{r}} + e^{e+g-q+\frac{i \pi}{2}} ((a-b-c) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (a-b-c) z^r\right) + e^{e-g+q-\frac{i \pi}{2}} ((-a-b+c) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-a-b+c) z^r\right) + e^{e-g-q+\frac{i \pi}{2}} ((a-b+c) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (a-b+c) z^r\right)\right)$$

01.20.21.1945.01

$$\int z^n e^{b z^2+e} \sinh\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz ==$$
$$-\frac{1}{8} z^{n+1} \left(e^{e+g+q} \Gamma\left(\frac{n+1}{2}, (-a-b-c) z^2\right) \left((-a-b-c) z^2\right)^{\frac{1}{2}(-n-1)} - e^{e+g-q} \left((a-b-c) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (a-b-c) z^2\right) + e^{e-g+q} \left((-a-b+c) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-a-b+c) z^2\right) - e^{e-g-q} \left((a-b+c) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (a-b+c) z^2\right)\right) /; n \in \mathbb{N}$$

01.20.21.1946.01

$$\int z^n e^{\sqrt{z}\, b+e} \sinh\left(\sqrt{z}\, a+q\right) \cosh\left(\sqrt{z}\, c+g\right) dz ==$$
$$\frac{1}{2} \left(-(-a-b-c)^{-2(n+1)} e^{e+g+q} \Gamma\left(2(n+1), (-a-b-c) \sqrt{z}\right) + (a-b-c)^{-2(n+1)} e^{e+g-q} \Gamma\left(2(n+1), (a-b-c) \sqrt{z}\right) - (-a-b+c)^{-2(n+1)} e^{e-g+q} \Gamma\left(2(n+1), (-a-b+c) \sqrt{z}\right) + (a-b+c)^{-2(n+1)} e^{e-g-q} \Gamma\left(2(n+1), (a-b+c) \sqrt{z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n e^{b z^r+d z+e} \sinh\left(a z^r+p z+q\right) \cosh\left(c z^r+f z+g\right)$

01.20.21.1947.01

$$\int z^n e^{b z^2+d z+e} \sinh\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$

$$-\frac{i}{8}\left((-a+b-c)^{-n-1} e^{-\frac{(d-f-p)^2}{4(-a+b-c)}+e-g-q+\frac{i\pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d+f+p)^{n-j} (d-f-p+2(-a+b-c)z)^{j+1}\right.$$

$$\left(-\frac{(d-f-p+2(-a+b-c)z)^2}{-a+b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f-p+2(-a+b-c)z)^2}{4(-a+b-c)}\right)+$$

$$(a+b-c)^{-n-1} e^{-\frac{(d-f+p)^2}{4(a+b-c)}+e-g+q-\frac{i\pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d+f-p)^{n-j} (d-f+p+2(a+b-c)z)^{j+1}$$

$$\left(-\frac{(d-f+p+2(a+b-c)z)^2}{a+b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f+p+2(a+b-c)z)^2}{4(a+b-c)}\right)+$$

$$(-a+b+c)^{-n-1} e^{-\frac{(d+f-p)^2}{4(-a+b+c)}+e+g-q+\frac{i\pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d-f+p)^{n-j} (d+f-p+2(-a+b+c)z)^{j+1}$$

$$\left(-\frac{(d+f-p+2(-a+b+c)z)^2}{-a+b+c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f-p+2(-a+b+c)z)^2}{4(-a+b+c)}\right)+$$

$$(a+b+c)^{-n-1} e^{-\frac{(d+f+p)^2}{4(a+b+c)}+e+g+q-\frac{i\pi}{2}} \sum_{j=0}^{n} 2^{j-n} (-d-f-p)^{n-j} (d+f+p+2(a+b+c)z)^{j+1}$$

$$\left.\left(-\frac{(d+f+p+2(a+b+c)z)^2}{a+b+c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f+p+2(a+b+c)z)^2}{4(a+b+c)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.1948.01

$$\int z^n e^{\sqrt{z}\, b+d z+e} \sinh\left(\sqrt{z}\, a+p z+q\right) \cosh\left(\sqrt{z}\, c+f z+g\right) dz ==$$

$$i\, 2^{-2n-3}\left(e^{-\frac{(-a+b-c)^2}{4(d-f-p)}+e-g-q+\frac{i\pi}{2}} (d-f-p)^{-2n-2} \sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h} 4^i (-a+b-c)^{-h-i+2n} \left(-a+b-c+2(d-f-p)\sqrt{z}\right)^{h+i}\right.$$

$$\left(-\frac{\left(-a+b-c+2(d-f-p)\sqrt{z}\right)^2}{d-f-p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}\binom{n}{i}\left((-a+b-c)\left(-a+b-c+2(d-f-p)\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-a+b-c+2(d-f-p)\sqrt{z}\right)^2}{4(d-f-p)}\right)+2\sqrt{-\frac{\left(-a+b-c+2(d-f-p)\sqrt{z}\right)^2}{d-f-p}}\right.\right.$$

$$(d-f-p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(-a+b-c+2(d-f-p)\sqrt{z}\right)^2}{4(d-f-p)}\right)\Bigg)+$$

$$e^{-\frac{(-a+b+c)^2}{4(d+f-p)}+e+g-q+\frac{i\pi}{2}}(d+f-p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-a+b+c)^{-h-i+2n}\left(-a+b+c+2(d+f-p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-a+b+c+2(d+f-p)\sqrt{z}\right)^2}{d+f-p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg((-a+b+c)\left(-a+b+c+2(d+f-p)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(-a+b+c+2(d+f-p)\sqrt{z}\right)^2}{4(d+f-p)}\right)+2\sqrt{-\frac{\left(-a+b+c+2(d+f-p)\sqrt{z}\right)^2}{d+f-p}}$$

$$(d+f-p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(-a+b+c+2(d+f-p)\sqrt{z}\right)^2}{4(d+f-p)}\right)\Bigg)+e^{-\frac{(a+b-c)^2}{4(d-f+p)}+e-g+q-\frac{i\pi}{2}}(d-f+p)^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(a+b-c)^{-h-i+2n}\left(a+b-c+2(d-f+p)\sqrt{z}\right)^{h+i}\left(-\frac{\left(a+b-c+2(d-f+p)\sqrt{z}\right)^2}{d-f+p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\Bigg((a+b-c)\left(a+b-c+2(d-f+p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(a+b-c+2(d-f+p)\sqrt{z}\right)^2}{4(d-f+p)}\right)+$$

$$2\sqrt{-\frac{\left(a+b-c+2(d-f+p)\sqrt{z}\right)^2}{d-f+p}}\,(d-f+p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(a+b-c+2(d-f+p)\sqrt{z}\right)^2}{4(d-f+p)}\right)\Bigg)+$$

$$e^{-\frac{(a+b+c)^2}{4(d+f+p)}+e+g+q-\frac{i\pi}{2}}(d+f+p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(a+b+c)^{-h-i+2n}\left(a+b+c+2(d+f+p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(a+b+c+2(d+f+p)\sqrt{z}\right)^2}{d+f+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg((a+b+c)\left(a+b+c+2(d+f+p)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(a+b+c+2(d+f+p)\sqrt{z}\right)^2}{4(d+f+p)}\right)+2\sqrt{-\frac{\left(a+b+c+2(d+f+p)\sqrt{z}\right)^2}{d+f+p}}$$

$$\Bigg(\qquad\qquad\qquad

Involving powers of sinh, exp and power

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh^{\mu}(c\,z)\cosh(a\,z)$

01.20.21.1949.01

$$\int z^{\alpha-1}\, e^{p\,z}\, \sinh^{m}(c\,z)\cosh(a\,z)\,dz ==$$

$$-i^{m}\, 2^{-m-1}\, z^{\alpha}\, ((-a-p)\,z)^{-\alpha}\, ((a-p)\,z)^{-\alpha} \binom{m}{\frac{m}{2}} (\Gamma(\alpha,\,(a-p)\,z)\,((-a-p)\,z)^{\alpha} + ((a-p)\,z)^{\alpha}\,\Gamma(\alpha,\,(-a-p)\,z))\,(1-m \bmod 2) -$$

$$i^{m}\, 2^{-m-1}\, z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{k}\, ((a-p+2\,c\,k-c\,m)\,z)^{-\alpha}\, ((-a-p-2\,c\,k+c\,m)\,z)^{-\alpha}$$

$$((-a-p-c\,(m-2\,k))\,z)^{-\alpha}\, ((a-p+c\,(m-2\,k))\,z)^{-\alpha} \binom{m}{k}$$

$$\left(\left(\left(\Gamma(\alpha,\,(a-p+2\,c\,k-c\,m)\,z)\,((-a-p+2\,c\,k-c\,m)\,z)^{\alpha} + ((a-p+2\,c\,k-c\,m)\,z)^{\alpha}\,\Gamma(\alpha,\,(-a-p+2\,c\,k-c\,m)\,z)\right)\right.\right.$$

$$\left.\left(\cos\left(\frac{m\,\pi}{2}\right) - i\,\sin\left(\frac{m\,\pi}{2}\right)\right)\right)((-a-p-2\,c\,k+c\,m)\,z)^{\alpha} + ((a-p+2\,c\,k-c\,m)\,z)^{\alpha}\,((-a-p-c\,(m-2\,k))\,z)^{\alpha}$$

$$\left.\Gamma(\alpha,\,(-a-p-2\,c\,k+c\,m)\,z)\left(\cos\left(\frac{m\,\pi}{2}\right) + i\,\sin\left(\frac{m\,\pi}{2}\right)\right)\right)((a-p+c\,(m-2\,k))\,z)^{\alpha} +$$

$$((-a-p-2\,c\,k+c\,m)\,z)^{\alpha}\,((a-p+2\,c\,k-c\,m)\,z)^{\alpha}\,((-a-p-c\,(m-2\,k))\,z)^{\alpha}$$

$$\left.\Gamma(\alpha,\,(a-p+c\,(m-2\,k))\,z)\left(\cos\left(\frac{m\,\pi}{2}\right) + i\,\sin\left(\frac{m\,\pi}{2}\right)\right)\right)\Big/;\, m\in\mathbb{N}^{+}$$

01.20.21.1950.01

$$\int z^{n}\, e^{p\,z}\, \sinh^{\mu}(c\,z)\cosh(a\,z)\,dz ==$$

$$\frac{1}{2}\left(1-e^{-2\,c\,z}\right)^{-\mu} n!\,\sinh^{\mu}(c\,z)\left(e^{(p-a)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-a+p+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{-a+p+c\,\mu}{2\,c},\,\ldots,\,-\frac{-a+p+c\,\mu}{2\,c},\right.\right.$$

$$\left.-\mu;\,1-\frac{-a+p+c\,\mu}{2\,c},\,\ldots,\,1-\frac{-a+p+c\,\mu}{2\,c};\,e^{-2\,c\,z}\right) + e^{(a+p)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(a+p+c\,\mu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(-\frac{a+p+c\,\mu}{2\,c},\,\ldots,\,-\frac{a+p+c\,\mu}{2\,c},\,-\mu;\,1-\frac{a+p+c\,\mu}{2\,c},\,\ldots,\,1-\frac{a+p+c\,\mu}{2\,c};\,e^{-2\,c\,z}\right)\right)\Big/;\, n\in\mathbb{N}$$

01.20.21.1951.01

$$\int z^2\, e^{p\,z} \sinh^2(a\,z)\cosh(a\,z)\,dz == \frac{1}{4}\,e^{p\,z}\left(\frac{\left(z\,(p\,z+2)\,a^4+\left(6\,p-2\,p^3\,z^2\right)a^2+p^3\left(p^2\,z^2-2\,p\,z+2\right)\right)\cosh(a\,z)}{(a-p)^3\,(a+p)^3}+\right.$$
$$\frac{3\,a\left(81\,z^2\,a^4-18\left(p^2\,z^2-2\,p\,z-1\right)a^2+p^2\left(p^2\,z^2-4\,p\,z+6\right)\right)\sinh(3\,a\,z)}{\left(9\,a^2-p^2\right)^3}-$$
$$\frac{a\left(z^2\,a^4+\left(-2\,p^2\,z^2+4\,p\,z+2\right)a^2+p^2\left(p^2\,z^2-4\,p\,z+6\right)\right)\sinh(a\,z)}{(a-p)^3\,(a+p)^3}-$$
$$\left.\frac{\left(81\,z\,(p\,z+2)\,a^4-18\,p\left(p^2\,z^2-3\right)a^2+p^3\left(p^2\,z^2-2\,p\,z+2\right)\right)\cosh(3\,a\,z)}{\left(9\,a^2-p^2\right)^3}\right)$$

Involving $z^{\alpha-1}\,e^{p\,z}\sinh^{\mu}(c\,z+d)\cosh(a\,z)$

01.20.21.1952.01

$$\int z^{\alpha-1}\,e^{p\,z}\sinh^m(d+c\,z)\cosh(a\,z)\,dz == -i^m\,2^{-m-1}\,z^{\alpha}\binom{m}{\frac{m}{2}}\left(E_{1-\alpha}((-a-p)\,z)+E_{1-\alpha}((a-p)\,z)\right)(1-m \bmod 2)-$$
$$2^{-m-1}\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,d\,k-d\,m}\binom{m}{k}\left(e^{2\,d\,m}\left(E_{1-\alpha}((-a+2\,c\,k-c\,m-p)\,z)+E_{1-\alpha}((a+2\,c\,k-c\,m-p)\,z)\right)+\right.$$
$$\left.e^{4\,d\,k+i\,m\,\pi}\left(E_{1-\alpha}((-a-2\,c\,k+c\,m-p)\,z)+E_{1-\alpha}((a+c\,(m-2\,k)-p)\,z)\right)\right)\,/;\,m\in\mathbb{N}^+$$

01.20.21.1953.01

$$\int z^n\,e^{p\,z}\sinh^{\mu}(d+c\,z)\cosh(a\,z)\,dz ==$$
$$\frac{1}{2}\left(1-e^{-2\,(d+c\,z)}\right)^{-\mu}n!\sinh^{\mu}(d+c\,z)\left(e^{(p-a)\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a+p+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{-a+p+c\,\mu}{2\,c},\ldots,-\frac{-a+p+c\,\mu}{2\,c},\right.\right.$$
$$\left.-\mu;1-\frac{-a+p+c\,\mu}{2\,c},\ldots,1-\frac{-a+p+c\,\mu}{2\,c};e^{-2\,(d+c\,z)}\right)+e^{(a+p)\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a+p+c\,\mu)^{-j-1}}{(n-j)!}$$
$$\left.\left.{}_{j+2}F_{j+1}\left(-\frac{a+p+c\,\mu}{2\,c},\ldots,-\frac{a+p+c\,\mu}{2\,c},-\mu;1-\frac{a+p+c\,\mu}{2\,c},\ldots,1-\frac{a+p+c\,\mu}{2\,c};e^{-2\,(d+c\,z)}\right)\right)\,/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z}\sinh^{\mu}(c\,z)\cosh(a\,z+b)$

01.20.21.1954.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh^m(c\,z) \cosh(b+a\,z)\, dz == -\frac{1}{2} z^{\alpha} ((a-p)\,z)^{-\alpha} (-(a+p)\,z)^{-\alpha} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$(\Gamma(\alpha, -(a+p)\,z)\,(\cosh(b)+\sinh(b))\,((a-p)\,z)^{\alpha} + (-(a+p)\,z)^{\alpha}\,\Gamma(\alpha, (a-p)\,z)\,(\cosh(b)-\sinh(b)))\left(\frac{i}{2}\right)^m -$$

$$i^m\, 2^{-m-1}\, z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} ((a+2\,c\,k-c\,m-p)\,z)^{-\alpha}\,((a+c\,(m-2\,k)-p)\,z)^{-\alpha}$$

$$(-(a+2\,c\,k-c\,m+p)\,z)^{-\alpha}\,(-(a+c\,(m-2\,k)+p)\,z)^{-\alpha}$$

$$\left(\left(\left(\cosh\left(\frac{i\,m\,\pi}{2}\right) - \sinh\left(\frac{i\,m\,\pi}{2}\right)\right)\right)(\Gamma(\alpha, -(a-2\,c\,k+c\,m+p)\,z)\,(\cosh(b)+\sinh(b))\,((a+2\,c\,k-c\,m-p)\,z)^{\alpha} +\right.$$

$$(-(a-2\,c\,k+c\,m+p)\,z)^{\alpha}\,\Gamma(\alpha, (a+2\,c\,k-c\,m-p)\,z)\,(\cosh(b)-\sinh(b)))\,(-(a+2\,c\,k-c\,m+p)\,z)^{\alpha} +$$

$$((a+2\,c\,k-c\,m-p)\,z)^{\alpha}\,(-(a+c\,(m-2\,k)+p)\,z)^{\alpha}\,\Gamma(\alpha, -(a+2\,c\,k-c\,m+p)\,z)$$

$$\left.\left(\cosh\left(b+\frac{i\,m\,\pi}{2}\right) + \sinh\left(b+\frac{i\,m\,\pi}{2}\right)\right)\right)((a+c\,(m-2\,k)-p)\,z)^{\alpha} +$$

$$((a+2\,c\,k-c\,m-p)\,z)^{\alpha}\,(-(a+2\,c\,k-c\,m+p)\,z)^{\alpha}\,(-(a+c\,(m-2\,k)+p)\,z)^{\alpha}$$

$$\left.\Gamma(\alpha, (a+c\,(m-2\,k)-p)\,z)\left(\cosh\left(b-\frac{i\,m\,\pi}{2}\right) - \sinh\left(b-\frac{i\,m\,\pi}{2}\right)\right)\right) /;\, m \in \mathbb{N}^+$$

01.20.21.1955.01

$$\int z^n\, e^{p\,z} \sinh^{\mu}(c\,z) \cosh(b+a\,z)\, dz ==$$

$$\frac{1}{2}\left(1-e^{-2\,c\,z}\right)^{-\mu} n!\, \sinh^{\mu}(c\,z)\left(e^{(p-a)\,z-b} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (-a+p+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-a+p+c\,\mu}{2\,c}, \ldots, -\frac{-a+p+c\,\mu}{2\,c},\right.\right.$$

$$\left. -\mu; 1-\frac{-a+p+c\,\mu}{2\,c}, \ldots, 1-\frac{-a+p+c\,\mu}{2\,c}; e^{-2\,c\,z}\right) + e^{b+(a+p)\,z} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (a+p+c\,\mu)^{-j-1}}{(n-j)!}$$

$$\left.\left. {}_{j+2}F_{j+1}\left(-\frac{a+p+c\,\mu}{2\,c}, \ldots, -\frac{a+p+c\,\mu}{2\,c}, -\mu; 1-\frac{a+p+c\,\mu}{2\,c}, \ldots, 1-\frac{a+p+c\,\mu}{2\,c}; e^{-2\,c\,z}\right)\right) /;\, n \in \mathbb{N}\right.$$

Involving $z^{\alpha-1}\, e^{p\,z} \sinh^{\mu}(c\,z+d) \cosh(a\,z+b)$

01.20.21.1956.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh^m(d+c\,z)\cosh(b+a\,z)\,dz == -\frac{1}{2} z^{\alpha}\,((a-p)\,z)^{-\alpha}\,(-(a+p)\,z)^{-\alpha}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$(\Gamma(\alpha,-(a+p)\,z)\,(\cosh(b)+\sinh(b))\,((a-p)\,z)^{\alpha}+(-(a+p)\,z)^{\alpha}\,\Gamma(\alpha,(a-p)\,z)\,(\cosh(b)-\sinh(b)))\left(\frac{i}{2}\right)^m -$$

$$i^m\,2^{-m-1}\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}((a+2\,c\,k-c\,m-p)\,z)^{-\alpha}\,((a+c\,(m-2\,k)-p)\,z)^{-\alpha}\,(-(a+2\,c\,k-c\,m+p)\,z)^{-\alpha}$$

$$(-(a+c\,(m-2\,k)+p)\,z)^{-\alpha}\left(\left(\left(\cosh\left(d\,(m-2\,k)-\frac{i\,m\,\pi}{2}\right)+\sinh\left(d\,(m-2\,k)-\frac{i\,m\,\pi}{2}\right)\right)\right.\right.$$

$$\left(\Gamma(\alpha,-(a-2\,c\,k+c\,m+p)\,z)\,(\cosh(b)+\sinh(b))\,((a+2\,c\,k-c\,m-p)\,z)^{\alpha}+\right.$$

$$\left.(-(a-2\,c\,k+c\,m+p)\,z)^{\alpha}\,\Gamma(\alpha,(a+2\,c\,k-c\,m-p)\,z)\,(\cosh(b)-\sinh(b))\right)(-(a+2\,c\,k-c\,m+p)\,z)^{\alpha}+$$

$$((a+2\,c\,k-c\,m-p)\,z)^{\alpha}\,(-(a+c\,(m-2\,k)+p)\,z)^{\alpha}\,\Gamma(\alpha,-(a+2\,c\,k-c\,m+p)\,z)$$

$$\left.\left.\left(\cosh\left(b+2\,d\,k-d\,m+\frac{i\,m\,\pi}{2}\right)+\sinh\left(b+2\,d\,k-d\,m+\frac{i\,m\,\pi}{2}\right)\right)\right)((a+c\,(m-2\,k)-p)\,z)^{\alpha}+$$

$$((a+2\,c\,k-c\,m-p)\,z)^{\alpha}\,(-(a+2\,c\,k-c\,m+p)\,z)^{\alpha}\,(-(a+c\,(m-2\,k)+p)\,z)^{\alpha}\,\Gamma(\alpha,(a+c\,(m-2\,k)-p)\,z)$$

$$\left.\left(\cosh\left(b-2\,d\,k+d\,m-\frac{i\,m\,\pi}{2}\right)-\sinh\left(b-2\,d\,k+d\,m-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\, m\in\mathbb{N}^+$$

01.20.21.1957.01

$$\int z^n\, e^{p\,z}\sinh^{\mu}(d+c\,z)\cosh(b+a\,z)\,dz ==$$

$$\frac{1}{2}\left(1-e^{-2\,(d+c\,z)}\right)^{-\mu} n!\,\sinh^{\mu}(d+c\,z)\left(e^{(p-a)\,z-b}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a+p+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{-a+p+c\,\mu}{2\,c},\ldots,-\frac{-a+p+c\,\mu}{2\,c},\right.\right.$$

$$\left.-\mu;1-\frac{-a+p+c\,\mu}{2\,c},\ldots,1-\frac{-a+p+c\,\mu}{2\,c};e^{-2\,(d+c\,z)}\right)+e^{b+(a+p)\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a+p+c\,\mu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(-\frac{a+p+c\,\mu}{2\,c},\ldots,-\frac{a+p+c\,\mu}{2\,c},-\mu;1-\frac{a+p+c\,\mu}{2\,c},\ldots,1-\frac{a+p+c\,\mu}{2\,c};e^{-2\,(d+c\,z)}\right)\right)/;\, n\in\mathbb{N}$$

Involving $z^n\, e^{p\,z^r}\sinh^m(b\,z^r)\cosh(c\,z)$

01.20.21.1958.01

$$\int z^n e^{p z^2} \sinh^m\left(b z^2\right) \cosh(c z)\, dz = \frac{1}{\sqrt{p}}$$

$$\left(2^{-m-2} e^{-\frac{c^2}{4p}} \left(i^m \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} c^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(c-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)} (2pz-c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2pz)^2}{4p}\right) + \right.\right.$$

$$i^m \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} p^{-n-\frac{1}{2}} (c+2pz)^{q+1} \left(-\frac{(c+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2pz)^2}{4p}\right) +$$

$$e^{\frac{c^2}{4p}} \sqrt{p} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(-\frac{1}{\sqrt{-2bk+bm+p}}\right.$$

$$\left(e^{\frac{c^2}{8bk-4bm-4p}} \sum_{q=0}^{n} 2^{q-n} c^{n-q} (-2bk+bm+p)^{-n-\frac{1}{2}} \left(-\frac{(c+4bkz-2bmz-2pz)^2}{-2bk+bm+p}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.(2(-2bk+bm+p)z-c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+4bkz-2bmz-2pz)^2}{4(-2bk+bm+p)}\right)\right) -$$

$$\frac{1}{\sqrt{-2bk+bm+p}} \left(e^{\frac{c^2}{8bk-4bm-4p}} \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (-2bk+bm+p)^{-n-\frac{1}{2}} (c+2(-2bk+bm+p)z)^{q+1}\right.$$

$$\left.\left(-\frac{(c+2(-2bk+bm+p)z)^2}{-2bk+bm+p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2(-2bk+bm+p)z)^2}{4(-2bk+bm+p)}\right)\right) -$$

$$\frac{1}{\sqrt{2bk-bm+p}} \left(e^{\frac{c^2}{-8bk+4bm-4p}+im\pi} \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (2bk-bm+p)^{-n-\frac{1}{2}} (c+2(2bk-bm+p)z)^{q+1}\right.$$

$$\left.\left(-\frac{(c+2(2bk-bm+p)z)^2}{2bk-bm+p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2(2bk-bm+p)z)^2}{4(2bk-bm+p)}\right)\right) -$$

$$\frac{1}{\sqrt{2bk-bm+p}} \left(e^{\frac{c^2}{-8bk+4bm-4p}+im\pi} \sum_{q=0}^{n} 2^{q-n} c^{n-q} (2bk-bm+p)^{-n-\frac{1}{2}}\right.$$

$$\left.\left.\left.\left.\left(-\frac{(c-2(2bk-bm+p)z)^2}{2bk-bm+p}\right)^{\frac{1}{2}(-q-1)} (2(2bk-bm+p)z-c)^{q+1} \binom{n}{q}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(c-2(2bk-bm+p)z)^2}{4(2bk-bm+p)}\right)\right)\right)\right) /; m \in \mathbb{Z} \wedge m > 0 \wedge n \in \mathbb{N}$$

01.20.21.1959.01

$$\int z^n e^{p\sqrt{z}} \sinh^m\left(b\sqrt{z}\right)\cosh(c\,z)\,dz ==$$

$$i^m\, 2^{-m-2n-2}\, c^{-2(n+1)}\, e^{-\frac{p^2}{4c}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\, e^{-\frac{2b^2(m-2k)^2+p^2+2\pi i c m}{4c}}\binom{m}{k}\left(e^{\frac{3b^2(m-2k)^2+3p^2+b(4kp-2mp)+4\pi i c m}{4c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\right.\right.$$

$$(2bk-bm+p)^{2n-q-r}\left(-2\sqrt{z}\,c+2bk-bm+p\right)^{q+r}\left(\frac{\left(-2\sqrt{z}\,c+2bk-bm+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}$$

$$\binom{r}{q}\left((2bk-bm+p)\left(-2\sqrt{z}\,c+2bk-bm+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\sqrt{z}\,c+2bk-bm+p\right)^2}{4c}\right)-2\right.$$

$$\left.c\sqrt{\frac{\left(-2\sqrt{z}\,c+2bk-bm+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\sqrt{z}\,c+2bk-bm+p\right)^2}{4c}\right)\right)+$$

$$e^{\frac{(b(m-2k)+p)^2}{4c}}\left(e^{\frac{b^2(m-2k)^2+p^2}{2c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(-2bk+bm+p)^{2n-q-r}\left(-2\sqrt{z}\,c-2bk+bm+p\right)^{q+r}\right.$$

$$\left(\frac{\left(-2\sqrt{z}\,c-2bk+bm+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}$$

$$\left((-2bk+bm+p)\left(-2\sqrt{z}\,c-2bk+bm+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(-2\sqrt{z}\,c-2bk+bm+p\right)^2}{4c}\right)-\right.$$

$$\left.2c\sqrt{\frac{\left(-2\sqrt{z}\,c-2bk+bm+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(-2\sqrt{z}\,c-2bk+bm+p\right)^2}{4c}\right)\right)+$$

$$e^{\frac{b(2k-m)p}{c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(-2bk+bm+p)^{2n-q-r}\left(2\sqrt{z}\,c-2bk+bm+p\right)^{q+r}$$

$$\left.\left.\left(-\frac{\left(2\sqrt{z}\,c-2bk+bm+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\right)\right)$$

$$\left((-2\,b\,k+b\,m+p)\left(2\sqrt{z}\;c-2\,b\,k+b\,m+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,-\frac{\left(2\sqrt{z}\;c-2\,b\,k+b\,m+p\right)^2}{4\,c}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(2\sqrt{z}\;c-2\,b\,k+b\,m+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\,-\frac{\left(2\sqrt{z}\;c-2\,b\,k+b\,m+p\right)^2}{4\,c}\right)\right)+$$

$$e^{i\,m\,\pi}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(2\,b\,k-b\,m+p)^{2\,n-q-r}\left(2\sqrt{z}\;c+2\,b\,k-b\,m+p\right)^{q+r}$$

$$\left(-\frac{\left(2\sqrt{z}\;c+2\,b\,k-b\,m+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}$$

$$\left((2\,b\,k-b\,m+p)\left(2\sqrt{z}\;c+2\,b\,k-b\,m+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,-\frac{\left(2\sqrt{z}\;c+2\,b\,k-b\,m+p\right)^2}{4\,c}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(2\sqrt{z}\;c+2\,b\,k-b\,m+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\,-\frac{\left(2\sqrt{z}\;c+2\,b\,k-b\,m+p\right)^2}{4\,c}\right)\right)\right)\Bigg)-$$

$$\binom{m}{\frac{m}{2}}(m\bmod 2-1)\left(e^{\frac{p^2}{2\,c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2\,n-q-r}\left(p-2\,c\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\right.$$

$$\binom{r}{q}\left(p\left(p-2\,c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)-\right.$$

$$\left.2\,c\sqrt{\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)\right)+$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2\,n-q-r}\left(2\sqrt{z}\;c+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\;c+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}$$

$$\left(p\left(2\sqrt{z}\;c+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,-\frac{\left(2\sqrt{z}\;c+p\right)^2}{4\,c}\right)+\right.$$

Involving $z^n e^{p z^r} \sinh^m(b z) \cosh(c z)$

01.20.21.1960.01

$$\int z^n e^{p z^2} \sinh^m(b z) \cosh(c z)\, dz == \frac{1}{\sqrt{p}} \left(\left(i^m 2^{-m-2} \right) e^{-\frac{c^2}{4p}} \right.$$

$$\left(\binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} p^{-n-\frac{1}{2}} (c + 2 p z)^{q+1} \left(-\frac{(c+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2pz)^2}{4p} \right) + \right.$$

$$\binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} c^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(c-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} (2pz - c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2pz)^2}{4p} \right) -$$

$$e^{\frac{c^2}{4p}} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-\frac{c^2 + b^2 (m-2k)^2 + i m p \pi}{2p}} \binom{m}{k} \left(e^{\frac{(c+2bk-bm)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (-c + 2bk - bm)^{n-q} p^{-n-\frac{1}{2}} (c - 2bk + bm + 2pz)^{q+1} \right.$$

$$\left(-\frac{(c-2bk+bm+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2bk+bm+2pz)^2}{4p} \right) +$$

$$e^{\frac{(c-2bk+bm)^2}{4p} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (-c - 2bk + bm)^{n-q} p^{-n-\frac{1}{2}} (c + 2bk - bm + 2pz)^{q+1}$$

$$\left(-\frac{(c+2bk-bm+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2bk-bm+2pz)^2}{4p} \right) +$$

$$e^{\frac{(c+2bk-bm)^2}{4p} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (c - 2bk + bm)^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(c-2bk+bm-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$(-c + 2bk - bm + 2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2bk+bm-2pz)^2}{4p} \right) +$$

$$e^{\frac{(c-2bk+bm)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (c + 2bk - bm)^{n-q} p^{-n-\frac{1}{2}} \left(-\frac{(c+2bk-bm-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \left. \left. (-c - 2bk + bm + 2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2bk-bm-2pz)^2}{4p} \right) \right) \right) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge n \in \mathbb{N}$$

01.20.21.1961.01

$$\int z^n e^{p\sqrt{z}} \sinh^m(b z)\cosh(c z)\,dz == 2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(e^{\frac{p^2}{4c+8bk-4bm}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(p-2(c+2bk-bm)\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2(c+2bk-bm)\sqrt{z}\right)^2}{c+2bk-bm}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\right.\right.$$

$$\binom{r}{q}\left(p\left(p-2(c+2bk-bm)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(p-2(c+2bk-bm)\sqrt{z}\right)^2}{4(c+2bk-bm)}\right)-2(c+2bk-\right.$$

$$\left.\left.bm)\sqrt{\frac{\left(p-2(c+2bk-bm)\sqrt{z}\right)^2}{c+2bk-bm}}\,\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(p-2(c+2bk-bm)\sqrt{z}\right)^2}{4(c+2bk-bm)}\right)\right)\right)$$

$$(-c-2bk+bm)^{-2(n+1)}+e^{\frac{p^2}{4c-8bk+4bm}+im\pi}(-c+2bk-bm)^{-2(n+1)}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}$$

$$\left(p-2(c-2bk+bm)\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2(c-2bk+bm)\sqrt{z}\right)^2}{c-2bk+bm}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}$$

$$\left(p\left(p-2(c-2bk+bm)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\frac{\left(p-2(c-2bk+bm)\sqrt{z}\right)^2}{4(c-2bk+bm)}\right)-2(c-2bk+bm)\right.$$

$$\left.\sqrt{\frac{\left(p-2(c-2bk+bm)\sqrt{z}\right)^2}{c-2bk+bm}}\,\Gamma\left(\frac{1}{2}(q+r+2),\frac{\left(p-2(c-2bk+bm)\sqrt{z}\right)^2}{4(c-2bk+bm)}\right)\right)+$$

$$e^{\frac{p^2}{-4c+8bk-4bm}}(c-2bk+bm)^{-2(n+1)}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}4^r p^{2n-q-r}\left(2\sqrt{z}\,(c-2bk+bm)+p\right)^{q+r}$$

$$\left(-\frac{\left(2\sqrt{z}\,(c-2bk+bm)+p\right)^2}{c-2bk+bm}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\,(c-2bk+bm)+p\right)\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}(q+r+1),-\frac{\left(2\sqrt{z}\,(c-2bk+bm)+p\right)^2}{4(c-2bk+bm)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\,(c-2bk+bm)+p\right)^2}{c-2bk+bm}}\right.$$

$$(c-2\,b\,k+b\,m)\,\Gamma\left(\frac{1}{2}(q+r+2),\,-\frac{\left(2\sqrt{z}\;(c-2\,b\,k+b\,m)+p\right)^2}{4\,(c-2\,b\,k+b\,m)}\right)+$$

$$e^{\frac{p^2}{-4\,c-8\,b\,k+4\,b\,m}+i\,m\,\pi}\,(c+2\,b\,k-b\,m)^{-2\,(n+1)}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2\,n-q-r}\left(2\sqrt{z}\;(c+2\,b\,k-b\,m)+p\right)^{q+r}$$

$$\left(-\frac{\left(2\sqrt{z}\;(c+2\,b\,k-b\,m)+p\right)^2}{c+2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(p\left(2\sqrt{z}\;(c+2\,b\,k-b\,m)+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\right.\right.$$

$$\left.-\frac{\left(2\sqrt{z}\;(c+2\,b\,k-b\,m)+p\right)^2}{4\,(c+2\,b\,k-b\,m)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\;(c+2\,b\,k-b\,m)+p\right)^2}{c+2\,b\,k-b\,m}}\;(c+2\,b\,k-b\,m)\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(q+r+2),\,-\frac{\left(2\sqrt{z}\;(c+2\,b\,k-b\,m)+p\right)^2}{4\,(c+2\,b\,k-b\,m)}\right)\right)-i^m\,2^{-m-2\,n-2}\,c^{-2\,(n+1)}\,e^{-\frac{p^2}{4\,c}}$$

$$\binom{m}{\frac{m}{2}}(m\bmod 2-1)\left(e^{\frac{p^2}{2\,c}}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2\,n-q-r}\left(p-2\,c\sqrt{z}\right)^{q+r}\left(\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\right.$$

$$\left(p\left(p-2\,c\sqrt{z}\right)\Gamma\left(\frac{1}{2}(q+r+1),\,\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)-2\,c\sqrt{\frac{\left(p-2\,c\sqrt{z}\right)^2}{c}}\;\Gamma\left(\frac{1}{2}(q+r+2),\,\frac{\left(p-2\,c\sqrt{z}\right)^2}{4\,c}\right)\right)+$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,p^{2\,n-q-r}\left(2\sqrt{z}\;c+p\right)^{q+r}\left(-\frac{\left(2\sqrt{z}\;c+p\right)^2}{c}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}$$

$$\left(p\left(2\sqrt{z}\;c+p\right)\Gamma\left(\frac{1}{2}(q+r+1),\,-\frac{\left(2\sqrt{z}\;c+p\right)^2}{4\,c}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(2\sqrt{z}\;c+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}(q+r+2),\,-\frac{\left(2\sqrt{z}\;c+p\right)^2}{4\,c}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh^m\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.1962.01

$$\int z^n e^{p z} \sinh^m\left(b z^2\right) \cosh(c z)\, dz ==$$

$$i^m 2^{-m-1} z^n \binom{m}{\frac{m}{2}} \left(\frac{(-(c+p) z)^{-n} \Gamma(n+1, -(c+p) z)}{c+p} - z ((c-p) z)^{-n-1} \Gamma(n+1, (c-p) z) \right) (1 - m \bmod 2) +$$

$$2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(-\frac{1}{\sqrt{b (2k-m)}} \left(e^{\frac{(c-p)^2}{4 b (m-2 k)} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (b (2k-m))^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p+4 b k z-2 b m z)^{q+1} \right.\right.$$

$$\left.\left(\frac{(c-p+2 b (m-2 k) z)^2}{b (m-2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c-p+2 b (m-2 k) z)^2}{4 b (m-2 k)} \right) \right) -$$

$$\frac{1}{\sqrt{b (2k-m)}} \left(e^{\frac{(c+p)^2}{4 b (m-2 k)} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (b (2k-m))^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p+4 b k z-2 b m z)^{q+1} \right.$$

$$\left. \left(\frac{(c+p+4 b k z-2 b m z)^2}{b (m-2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c+p+4 b k z-2 b m z)^2}{4 b (m-2 k)} \right) \right) -$$

$$\frac{1}{\sqrt{b (m-2 k)}} \left(e^{\frac{(c-p)^2}{b (8 k-4 m)}} \sum_{q=0}^{n} 2^{q-n} (b (m-2 k))^{-n-\frac{1}{2}} (c-p)^{n-q} (-c+p+2 b (m-2 k) z)^{q+1} \right.$$

$$\left. \left(-\frac{(-c+p+2 b (m-2 k) z)^2}{b (m-2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-c+p+2 b (m-2 k) z)^2}{b (8 k-4 m)} \right) \right) -$$

$$\frac{1}{\sqrt{b (m-2 k)}} \left(e^{\frac{(c+p)^2}{b (8 k-4 m)}} \sum_{q=0}^{n} 2^{q-n} (b (m-2 k))^{-n-\frac{1}{2}} (-c-p)^{n-q} (c+p+2 b (m-2 k) z)^{q+1} \right.$$

$$\left.\left. \left(-\frac{(c+p+2 b (m-2 k) z)^2}{b (m-2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c+p+2 b (m-2 k) z)^2}{b (8 k-4 m)} \right) \right) \right) \Big/; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1963.01

$$\int z^n e^{p z} \sinh^m\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$-i^m 2^{-m-1} \binom{m}{\frac{m}{2}} \left(\Gamma(n+1, -(c+p) z) (-c-p)^{-n-1} + (c-p)^{-n-1} \Gamma(n+1, (c-p) z) \right) (1 - m \bmod 2) +$$

$$2^{-m-2 n-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{b^2 (m-2 k)^2}{4 (c-p)} + i m \pi} \right.$$

$$\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^{r}\,(b\,(2\,k-m))^{2\,n-q-r}\left(\frac{\left(b\,(m-2\,k)+2\,(c-p)\,\sqrt{z}\right)^{2}}{c-p}\right)^{\frac{1}{2}\,(-q-r-1)}\left(b\,(2\,k-m)+2\,(p-c)\,\sqrt{z}\right)^{q+r}\right.$$

$$\binom{n}{r}\binom{r}{q}\left(2\,(p-c)\,\sqrt{\frac{\left(b\,(m-2\,k)+2\,(c-p)\,\sqrt{z}\right)^{2}}{c-p}}\;\Gamma\left(\frac{1}{2}\,(q+r+2),\;\frac{\left(b\,(m-2\,k)+2\,(c-p)\,\sqrt{z}\right)^{2}}{4\,(c-p)}\right)-\right.$$

$$\left.\left.b\,(m-2\,k)\left(b\,(2\,k-m)+2\,(p-c)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\;\frac{\left(b\,(m-2\,k)+2\,(c-p)\,\sqrt{z}\right)^{2}}{4\,(c-p)}\right)\right)\right)$$

$$(p-c)^{-2\,(n+1)}+e^{\frac{b^{2}\,(m-2\,k)^{2}}{4\,(c-p)}}\left(\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^{r}\,(b\,(m-2\,k))^{2\,n-q-r}\left(b\,(m-2\,k)+2\,(p-c)\,\sqrt{z}\right)^{q+r}\right.$$

$$\left(-\frac{\left(b\,(m-2\,k)+2\,(p-c)\,\sqrt{z}\right)^{2}}{p-c}\right)^{\frac{1}{2}\,(-q-r-1)}\binom{n}{r}\binom{r}{q}\left(b\,(m-2\,k)\left(b\,(m-2\,k)+2\,(p-c)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(q+r+1),\;-\frac{\left(b\,(m-2\,k)+2\,(p-c)\,\sqrt{z}\right)^{2}}{4\,(p-c)}\right)+2\,\sqrt{-\frac{\left(b\,(m-2\,k)+2\,(p-c)\,\sqrt{z}\right)^{2}}{p-c}}$$

$$\left.\left.(p-c)\,\Gamma\left(\frac{1}{2}\,(q+r+2),\;-\frac{\left(b\,(m-2\,k)+2\,(p-c)\,\sqrt{z}\right)^{2}}{4\,(p-c)}\right)\right)\right)(p-c)^{-2\,(n+1)}+$$

$$e^{-\frac{b^{2}\,(m-2\,k)^{2}}{4\,(c+p)}}\,(c+p)^{-2\,(n+1)}\left(e^{i\,m\,\pi}\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^{r}\,(b\,(2\,k-m))^{2\,n-q-r}\left(b\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)^{q+r}\right.$$

$$\left(-\frac{\left(b\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)^{2}}{c+p}\right)^{\frac{1}{2}\,(-q-r-1)}\binom{n}{r}\binom{r}{q}$$

$$\left(2\,(c+p)\,\sqrt{-\frac{\left(b\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)^{2}}{c+p}}\;\Gamma\left(\frac{1}{2}\,(q+r+2),\;-\frac{\left(b\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)^{2}}{4\,(c+p)}\right)-\right.$$

$$b\,(m-2\,k)\left(b\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(q+r+1),\,-\frac{\left(b\,(2\,k-m)+2\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\Bigg)+$$

$$\sum_{r=0}^{n}\sum_{q=0}^{r}(-1)^{r-q}\,4^r\,(b\,(m-2\,k))^{2\,n-q-r}\left(b\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^{q+r}$$

$$\left(-\frac{\left(b\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-q-r-1)}\binom{n}{r}\binom{r}{q}\Bigg(b\,(m-2\,k)\left(b\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(q+r+1),\,-\frac{\left(b\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)+2\,\sqrt{-\frac{\left(b\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^2}{c+p}}$$

$$(c+p)\,\Gamma\left(\frac{1}{2}\,(q+r+2),\,-\frac{\left(b\,(m-2\,k)+2\,(c+p)\,\sqrt{z}\right)^2}{4\,(c+p)}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\,m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1964.01

$$\int z^n e^{p z} \sinh^m(b z) \cosh\left(c z^2\right) dz == \left(\frac{i}{2}\right)^m e^{-\frac{p^2}{4c}} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1)$$

$$\left(e^{\frac{p^2}{2c}} \sum_{q=0}^{n} 2^{-n+q-2} (-c)^{-n-1} (-p)^{n-q} (p - 2 c z)^{q+1} \left(\frac{(p-2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cz)^2}{4c}\right) + \right.$$

$$\left. \sum_{q=0}^{n} 2^{-n+q-2} c^{-n-1} (-p)^{n-q} (p + 2 c z)^{q+1} \left(-\frac{(p+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2cz)^2}{4c}\right) \right) -$$

$$i^m 2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-\frac{b^2 (m-2k)^2 + p^2 + \pi i c m}{2c}} \binom{m}{k} \left(2^{-n-1} e^{\frac{3 b^2 (m-2k)^2 + 3 p^2 + b (4 k p - 2 m p) + 4 \pi i c m}{4c}} (-c)^{-n-1} \right.$$

$$\sum_{q=0}^{n} (b (m-2k) - p)^{n-q} (2 b k - b m + p - 2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(\frac{(2bk - bm + p - 2cz)^2}{4c}\right) +$$

$$e^{\frac{(b(m-2k)+p)^2}{4c}} \left(\frac{1}{2} (-c)^{-n-1} e^{\frac{b^2 (m-2k)^2 + p^2}{2c}} \sum_{q=0}^{n} 2^{-q} \left(b\left(k - \frac{m}{2}\right) - \frac{p}{2}\right)^{n-q} (b (m-2k) + p - 2 c z)^{q+1} \binom{n}{q} \right.$$

$$E_{\frac{1-q}{2}}\left(\frac{(b(m-2k) + p - 2cz)^2}{4c}\right) + 2^{-n-1} c^{-n-1} e^{i m \pi} \sum_{q=0}^{n} (b (m-2k) - p)^{n-q} (2 b k - b m + p + 2 c z)^{q+1}$$

$$\binom{n}{q} E_{\frac{1-q}{2}}\left(-\frac{(2bk - bm + p + 2cz)^2}{4c}\right) + \frac{1}{2} c^{-n-1} e^{\frac{b(2k-m)p}{c}} \sum_{q=0}^{n} 2^{-q} \left(b\left(k - \frac{m}{2}\right) - \frac{p}{2}\right)^{n-q}$$

$$\left. \left. (b (m-2k) + p + 2 c z)^{q+1} \binom{n}{q} E_{\frac{1-q}{2}}\left(-\frac{(b(m-2k) + p + 2cz)^2}{4c}\right) \right) \right) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1965.01

$$\int z^n e^{p z} \sinh^m(b z) \cosh\left(c \sqrt{z}\right) dz == i^{-m} 2^{-m-2n-2} p^{-2(n+1)} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(e^{-\frac{c^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c)^{-h-i+2n} \left(2 p \sqrt{z} - c\right)^{h+i} \left(-\frac{\left(2 p \sqrt{z} - c\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \right.$$

$$\left. \left(2 p \sqrt{-\frac{\left(2 p \sqrt{z} - c\right)^2}{p}} \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4p}\right) - c \left(2 p \sqrt{z} - c\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2 p \sqrt{z} - c\right)^2}{4p}\right) \right) +$$

$$e^{-\frac{c^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i c^{-h-i+2n} \left(c + 2 p \sqrt{z}\right)^{h+i} \left(-\frac{\left(c + 2 p \sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left(c \left(c + 2 p \sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+2p\sqrt{z}\right)^2}{4p}\right)+2\sqrt{-\frac{\left(c+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+2p\sqrt{z}\right)^2}{4p}\right)\Bigg)\Bigg)+$$

$$i^{-m}\,2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{c^2}{4(p-b(m-2k))}-\frac{im\pi}{2}}\Bigg(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c)^{-h-i+2n}\left(2(p-b(m-2k))\sqrt{z}-c\right)^{h+i}$$

$$\left(-\frac{\left(2(p-b(m-2k))\sqrt{z}-c\right)^2}{p-b(m-2k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg(2(p-b(m-2k))$$

$$\sqrt{-\frac{\left(2(p-b(m-2k))\sqrt{z}-c\right)^2}{p-b(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2(p-b(m-2k))\sqrt{z}-c\right)^2}{4(p-b(m-2k))}\right)-c$$

$$\left(2(p-b(m-2k))\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2(p-b(m-2k))\sqrt{z}-c\right)^2}{4(p-b(m-2k))}\right)\Bigg)\Bigg)$$

$$(p-b(m-2k))^{-2(n+1)}+e^{-\frac{c^2}{4(p-b(m-2k))}-\frac{im\pi}{2}}\Bigg(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,c^{-h-i+2n}\left(c+2(p-b(m-2k))\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(c+2(p-b(m-2k))\sqrt{z}\right)^2}{p-b(m-2k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg(c\left(c+2(p-b(m-2k))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+2(p-b(m-2k))\sqrt{z}\right)^2}{4(p-b(m-2k))}\right)+2\sqrt{-\frac{\left(c+2(p-b(m-2k))\sqrt{z}\right)^2}{p-b(m-2k)}}$$

$$(p-b(m-2k))\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(c+2(p-b(m-2k))\sqrt{z}\right)^2}{4(p-b(m-2k))}\right)\Bigg)\Bigg)(p-b(m-2k))^{-2(n+1)}+$$

$$e^{\frac{im\pi}{2}-\frac{c^2}{4(b(m-2k)+p)}}(b(m-2k)+p)^{-2(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c)^{-h-i+2n}\left(2(b(m-2k)+p)\sqrt{z}-c\right)^{h+i}$$

$$\left(-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\right)^2}{b\,(m-2\,k)+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left(2\,(b\,(m-2\,k)+p)\sqrt{-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\right)^2}{b\,(m-2\,k)+p}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\right)^2}{4\,(b\,(m-2\,k)+p)}\right)-\right.$$

$$\left.c\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\right)^2}{4\,(b\,(m-2\,k)+p)}\right)\right)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{c^2}{4\,(b\,(m-2\,k)+p)}}\,(b\,(m-2\,k)+p)^{-2\,(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,c^{-h-i+2\,n}\left(c+2\,(b\,(m-2\,k)+p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(c+2\,(b\,(m-2\,k)+p)\,\sqrt{z}\right)^2}{b\,(m-2\,k)+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(c\left(c+2\,(b\,(m-2\,k)+p)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+i+1),\,-\frac{\left(c+2\,(b\,(m-2\,k)+p)\,\sqrt{z}\right)^2}{4\,(b\,(m-2\,k)+p)}\right)+2\sqrt{-\frac{\left(c+2\,(b\,(m-2\,k)+p)\,\sqrt{z}\right)^2}{b\,(m-2\,k)+p}}$$

$$\left.\left.(b\,(m-2\,k)+p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(c+2\,(b\,(m-2\,k)+p)\,\sqrt{z}\right)^2}{4\,(b\,(m-2\,k)+p)}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sinh^m(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.1966.01

$$\int z^n e^{p z^2} \sinh^m(b z) \cosh\left(c z^2\right) dz ==$$

$$i^m 2^{-m-2} z^{n+1} \binom{m}{\frac{m}{2}} \left(-\left((c-p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (c-p) z^2\right) - \left(-(c+p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -(c+p) z^2\right)\right) (1 - m \bmod 2) -$$

$$2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{\sqrt{p-c}\ \sqrt{c+p}} \left((-1)^k e^{-\frac{b^2 (m-2k)^2}{4(c+p)}} \binom{m}{k} \right.$$

$$\left(e^{\frac{1}{4}\left(\frac{b^2 (m-2k)^2}{c-p} + \frac{b^2 (m-2k)^2}{c+p} + 4\pi i m\right)} \sqrt{c+p} \sum_{q=0}^{n} 2^{q-n} (b(m-2k))^{n-q} (p-c)^{-n-\frac{1}{2}} \left(\frac{(b(m-2k) + 2(c-p) z)^2}{c-p} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$(2bk - bm - 2cz + 2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(b(m-2k) + 2(c-p) z)^2}{4(c-p)}\right) +$$

$$e^{\frac{c b^2 (m-2k)^2}{2(c-p)(c+p)}} \sqrt{c+p} \sum_{q=0}^{n} \left(b\left(k - \frac{m}{2}\right)\right)^{n-q} (p-c)^{-n-\frac{1}{2}} (-2bk + bm - 2cz + 2pz)^{q+1}$$

$$\left(\frac{(-2bk + bm - 2cz + 2pz)^2}{c-p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2bk + bm - 2cz + 2pz)^2}{4(c-p)}\right) +$$

$$\sqrt{p-c} \left(e^{i m \pi} \sum_{q=0}^{n} 2^{q-n} (b(m-2k))^{n-q} (c+p)^{-n-\frac{1}{2}} (b(2k-m) + 2(c+p) z)^{q+1} \right.$$

$$\left(-\frac{(b(2k-m) + 2(c+p) z)^2}{c+p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b(2k-m) + 2(c+p) z)^2}{4(c+p)}\right) +$$

$$\sum_{q=0}^{n} \left(b\left(k - \frac{m}{2}\right)\right)^{n-q} (c+p)^{-n-\frac{1}{2}} (b(m-2k) + 2(c+p) z)^{q+1} \left(-\frac{(b(m-2k) + 2(c+p) z)^2}{c+p} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b(m-2k) + 2(c+p) z)^2}{4(c+p)}\right) \right) \right) \Big/; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1967.01

$$\int z^n e^{p \sqrt{z}} \sinh^m(b z) \cosh\left(c \sqrt{z}\right) dz ==$$

$$-2^{-m} i^{-m} \binom{m}{\frac{m}{2}} \left(\Gamma\left(2(n+1), (c-p)\sqrt{z}\right) (c-p)^{-2(n+1)} + (c+p)^{-2(n+1)} \Gamma\left(2(n+1), (-c-p)\sqrt{z}\right)\right) (1 - m \bmod 2) +$$

$$2^{-m-2n-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k (b(m-2k))^{-2(n+1)} \binom{m}{k} \left((-1)^m e^{\frac{(p-c)^2}{4b(m-2k)}} \right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^{i}\,(p-c)^{-h-i+2\,n}\left(-c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(\frac{\left(-c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((p-c)\left(-c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,\frac{\left(-c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{4\,b\,(m-2\,k)}\right)-2\,b\,(m-2\,k)\right.$$

$$\left.\sqrt{\frac{\left(-c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,\frac{\left(-c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{4\,b\,(m-2\,k)}\right)\right)+(-1)^{m}\,e^{\frac{(c+p)^{2}}{4\,b\,(m-2\,k)}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^{i}\,(c+p)^{-h-i+2\,n}\left(c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(\frac{\left(c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((c+p)\left(c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,\frac{\left(c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{4\,b\,(m-2\,k)}\right)-2\,b\,(m-2\,k)\right.$$

$$\left.\sqrt{\frac{\left(c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,\frac{\left(c+p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{4\,b\,(m-2\,k)}\right)\right)+e^{-\frac{(p-c)^{2}}{4\,b\,(m-2\,k)}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^{i}\,(p-c)^{-h-i+2\,n}\left(-c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(-c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((p-c)\left(-c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(-c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{4\,b\,(m-2\,k)}\right)+\right.$$

$$\left.2\,b\,(m-2\,k)\sqrt{-\frac{\left(-c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{4\,b\,(m-2\,k)}\right)\right)+$$

$$e^{-\frac{(c+p)^{2}}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^{i}\,(c+p)^{-h-i+2\,n}\left(c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^{2}}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((c+p)\left(c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)+\right.$$

$$2\,b\,(m-2\,k)\sqrt{-\frac{\left(c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+i+2),\right.$$

$$\left.\left.-\frac{\left(c+p+2\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)\right)\Bigg)\Big/;\; m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh^m\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.1968.01

$$\int z^n e^{p z} \sinh^m\left(b z^2\right) \cosh\left(c z^2\right) dz == i^m 2^{-m-2} (-c)^{-n-1} e^{-\frac{p^2}{4c}} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1)$$

$$\left(e^{\frac{p^2}{2c}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p - 2 c z)^{q+1} \left(\frac{(p - 2 c z)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p - 2 c z)^2}{4 c} \right) - \right.$$

$$\left. (-1)^n \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p + 2 c z)^{q+1} \left(-\frac{(p + 2 c z)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p + 2 c z)^2}{4 c} \right) \right) + 2^{-m-2}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(-\frac{1}{\sqrt{-c - 2 b k + b m}} \left(e^{\frac{p^2}{4 c + 8 b k - 4 b m}} \sum_{q=0}^{n} 2^{q-n} (-c - 2 b k + b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p - 2 (c + 2 b k - b m) z)^{q+1} \right. \right.$$

$$\left. \left(\frac{(p - 2 (c + 2 b k - b m) z)^2}{c + 2 b k - b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p - 2 (c + 2 b k - b m) z)^2}{4 (c + 2 b k - b m)} \right) \right) -$$

$$\frac{1}{\sqrt{c - 2 b k + b m}} \left(e^{\frac{p^2}{-4 c + 8 b k - 4 b m}} \sum_{q=0}^{n} 2^{q-n} (c - 2 b k + b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p + 2 (c - 2 b k + b m) z)^{q+1} \right.$$

$$\left. \left(-\frac{(p + 2 (c - 2 b k + b m) z)^2}{c - 2 b k + b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p + 2 (c - 2 b k + b m) z)^2}{4 (c - 2 b k + b m)} \right) \right) -$$

$$\frac{1}{\sqrt{-c + 2 b k - b m}} \left(e^{\frac{p^2}{4 c - 8 b k + 4 b m} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (-c + 2 b k - b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p - 2 (c - 2 b k + b m) z)^{q+1} \right.$$

$$\left. \left(\frac{(p - 2 (c - 2 b k + b m) z)^2}{c - 2 b k + b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p - 2 (c - 2 b k + b m) z)^2}{4 (c - 2 b k + b m)} \right) \right) -$$

$$\frac{1}{\sqrt{c + 2 b k - b m}} \left(e^{\frac{p^2}{-4 c - 8 b k + 4 b m} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (c + 2 b k - b m)^{-n-\frac{1}{2}} (-p)^{n-q} (p + 2 (c + 2 b k - b m) z)^{q+1} \right.$$

$$\left. \left. \left(-\frac{(p + 2 (c + 2 b k - b m) z)^2}{c + 2 b k - b m} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p + 2 (c + 2 b k - b m) z)^2}{4 (c + 2 b k - b m)} \right) \right) \right) /; m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1969.01

$$\int z^n e^{p z} \sinh^m\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz = i^{-m} 2^{-m-2 n-2} p^{-2 (n+1)} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(e^{-\frac{c^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c)^{-h-i+2 n} \left(2 p \sqrt{z} - c\right)^{h+i} \left(- \frac{\left(2 p \sqrt{z} - c\right)^2}{p} \right)^{\frac{1}{2} (-h-i-1)} \binom{i}{h} \binom{n}{i} \left(2 p \sqrt{ - \frac{\left(2 p \sqrt{z} - c\right)^2}{p} } \right.\right.$$

$$\Gamma\left(\frac{1}{2} (h+i+2), - \frac{\left(2 p \sqrt{z} - c\right)^2}{4 p} \right) - c \left(2 p \sqrt{z} - c\right) \Gamma\left(\frac{1}{2} (h+i+1), - \frac{\left(2 p \sqrt{z} - c\right)^2}{4 p} \right) \Bigg) +$$

$$e^{-\frac{c^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i c^{-h-i+2 n} \left(c + 2 p \sqrt{z}\right)^{h+i} \left(- \frac{\left(c + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2} (-h-i-1)} \binom{i}{h} \binom{n}{i} \left(c \left(c + 2 p \sqrt{z}\right) \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2} (h+i+1), - \frac{\left(c + 2 p \sqrt{z}\right)^2}{4 p} \right) + 2 \sqrt{ - \frac{\left(c + 2 p \sqrt{z}\right)^2}{p} } \; p \Gamma\left(\frac{1}{2} (h+i+2), - \frac{\left(c + 2 p \sqrt{z}\right)^2}{4 p} \right) \right) \right) +$$

$$i^{-m} 2^{-m-2 n-2} p^{-2 (n+1)} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i m \pi}{2} - \frac{(b (m-2 k) - c)^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (b (m-2 k) - c)^{-h-i+2 n} \right.$$

$$\left(-c + b (m-2 k) + 2 p \sqrt{z}\right)^{h+i} \left(- \frac{\left(-c + b (m-2 k) + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2} (-h-i-1)} \binom{i}{h} \binom{n}{i}$$

$$\left((b (m-2 k) - c) \left(-c + b (m-2 k) + 2 p \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h+i+1), - \frac{\left(-c + b (m-2 k) + 2 p \sqrt{z}\right)^2}{4 p} \right) + \right.$$

$$\left. 2 \sqrt{ - \frac{\left(-c + b (m-2 k) + 2 p \sqrt{z}\right)^2}{p} } \; p \Gamma\left(\frac{1}{2} (h+i+2), - \frac{\left(-c + b (m-2 k) + 2 p \sqrt{z}\right)^2}{4 p} \right) \right) +$$

$$\left. e^{\frac{i m \pi}{2} - \frac{(c + b (m-2 k))^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (c + b (m-2 k))^{-h-i+2 n} \left(c + b (m-2 k) + 2 p \sqrt{z}\right)^{h+i} \right)$$

$$\left(-\frac{\left(c+b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((c+b\,(m-2\,k))\left(c+b\,(m-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(c+b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(c+b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(c+b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(-c-b\,(m-2\,k))^2}{4\,p}-\frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c-b\,(m-2\,k))^{-h-i+2\,n}\left(-c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-c-b\,(m-2\,k))\left(-c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(-c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(-c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(c-b\,(m-2\,k))^2}{4\,p}-\frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c-b\,(m-2\,k))^{-h-i+2\,n}\left(c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((c-b\,(m-2\,k))\left(c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+i+1),\,-\frac{\left(c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+i+2),\,-\frac{\left(c-b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\Big/;\,m\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\, z^r}\, \sinh^m(b\, z^r)\cosh(c\, z^r)$

01.20.21.1970.01

$$\int z^{\alpha-1}\, e^{p\, z^r}\, \sinh^m(b\, z^r)\cosh(c\, z^r)\, dz ==$$

$$-\frac{z^\alpha}{2^{m+1}\, r}\left(i^m \binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\Gamma\left(\frac{\alpha}{r}, (c-p)\, z^r\right)((c-p)\, z^r)^{-\frac{\alpha}{r}} + (-(c+p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, -(c+p)\, z^r\right)\right) + \right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k \binom{m}{k}\left(e^{i\, m\, \pi}\, \Gamma\left(\frac{\alpha}{r}, (c-2\, b\, k+b\, m-p)\, z^r\right)((c-2\, b\, k+b\, m-p)\, z^r)^{-\frac{\alpha}{r}} + ((c+2\, b\, k-b\, m-p)\, z^r)^{-\frac{\alpha}{r}}\right.$$

$$\Gamma\left(\frac{\alpha}{r}, (c+2\, b\, k-b\, m-p)\, z^r\right) + (-(c-2\, b\, k+b\, m+p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, -(c-2\, b\, k+b\, m+p)\, z^r\right) +$$

$$\left.\left.e^{i\, m\, \pi}\, (-(c+2\, b\, k-b\, m+p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, -(c+2\, b\, k-b\, m+p)\, z^r\right)\right)\right) /;\ m \in \mathbb{N}^+$$

01.20.21.4944.01

$$\int z^n\, e^{p\, z^2}\, \sinh^m\left(b\, z^2\right)\cosh\left(c\, z^2\right)\, dz ==$$

$$-i^{-m}\, 2^{-m-2}\, z^{n+1}\binom{m}{\frac{m}{2}}\left(\Gamma\left(\frac{n+1}{2}, (-c-p)\, z^2\right)\left((-c-p)\, z^2\right)^{\frac{1}{2}(-n-1)} + \left((c-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c-p)\, z^2\right)\right)(1-m \bmod 2) -$$

$$i^{-m}\, 2^{-m-2}\, z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k \binom{m}{k}\left(e^{-\frac{1}{2}i\, m\, \pi}\, \Gamma\left(\frac{n+1}{2}, (-c+b\, (m-2\, k)-p)\, z^2\right)\left((-c+b\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$e^{-\frac{1}{2}i\, m\, \pi}\left((c+b\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c+b\, (m-2\, k)-p)\, z^2\right) +$$

$$e^{\frac{i\, m\, \pi}{2}}\left((-c-b\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-c-b\, (m-2\, k)-p)\, z^2\right) +$$

$$\left.e^{\frac{i\, m\, \pi}{2}}\left((c-b\, (m-2\, k)-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (c-b\, (m-2\, k)-p)\, z^2\right)\right) /;\ m \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.1971.01

$$\int z^n e^{p\sqrt{z}} \sinh^m\left(b\sqrt{z}\right)\cosh\left(c\sqrt{z}\right) dz ==$$

$$-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{1}{2}i m\pi}\,\Gamma\left(2(n+1),(-c+b(m-2k)-p)\sqrt{z}\right)(-c+b(m-2k)-p)^{-2(n+1)}+\right.$$

$$e^{-\frac{1}{2}i m\pi}\,(c+b(m-2k)-p)^{-2(n+1)}\,\Gamma\left(2(n+1),(c+b(m-2k)-p)\sqrt{z}\right)+$$

$$e^{\frac{i m\pi}{2}}\,(-c-b(m-2k)-p)^{-2(n+1)}\,\Gamma\left(2(n+1),(-c-b(m-2k)-p)\sqrt{z}\right)+$$

$$\left.e^{\frac{i m\pi}{2}}\,(c-b(m-2k)-p)^{-2(n+1)}\,\Gamma\left(2(n+1),(c-b(m-2k)-p)\sqrt{z}\right)\right)(2i)^{-m}-$$

$$(2i)^{-m}\binom{m}{\frac{m}{2}}\left(\Gamma\left(2(n+1),(-c-p)\sqrt{z}\right)(-c-p)^{-2(n+1)}+(c-p)^{-2(n+1)}\,\Gamma\left(2(n+1),(c-p)\sqrt{z}\right)\right)$$

$$(1-m \bmod 2)\ /;\ m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\sinh^m\left(a\,z^r+q\right)\cosh\left(c\,z^r+g\right)$

01.20.21.1972.01

$$\int z^{\alpha-1}\,e^{b\,z^r+e}\sinh^m(a\,z^r+q)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{i^m\,2^{-m-1}\,z^\alpha}{r}\left(\binom{m}{\frac{m}{2}}\left(e^{e+g}\,\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}+e^{e-g}\,((c-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)\right)(1-m \bmod 2)+\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g+2kq-mq+\frac{i m\pi}{2}}\,\Gamma\left(\frac{\alpha}{r},(-b-c-2ak+am)\,z^r\right)((-b-c-2ak+am)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-g+2kq-mq+\frac{i m\pi}{2}}\,((-b+c-2ak+am)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+c-2ak+am)\,z^r\right)+$$

$$e^{e+g-2kq+mq-\frac{i m\pi}{2}}\,((-b-c+2ak-am)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b-c+2ak-am)\,z^r\right)+$$

$$\left.\left.e^{e-g-2kq+mq-\frac{i m\pi}{2}}\,((-b+c+2ak-am)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+c+2ak-am)\,z^r\right)\right)\right)\ /;\ m\in\mathbb{N}^+$$

01.20.21.1973.01

$$\int z^n\, e^{b\,z^2+e}\sinh^m\left(a\,z^2+q\right)\cosh\left(c\,z^2+g\right)dz == -i^{-m}\,2^{-m-2}\,z^{n+1}\binom{m}{\frac{m}{2}}$$
$$\left(e^{e+g}\,\Gamma\left(\frac{n+1}{2},\,(-b-c)\,z^2\right)\left((-b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{e-g}\left((c-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(c-b)\,z^2\right)\right)(1-m \bmod 2)-$$
$$i^{-m}\,2^{-m-2}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g-(m-2k)\,q-\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{n+1}{2},\,(-b-c+a\,(m-2k))\,z^2\right)\left((-b-c+a\,(m-2k))\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$
$$e^{e-g-(m-2k)\,q-\frac{i\,m\,\pi}{2}}\left((-b+c+a\,(m-2k))\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b+c+a\,(m-2k))\,z^2\right)+$$
$$e^{e+g+(m-2k)\,q+\frac{i\,m\,\pi}{2}}\left((-b-c-a\,(m-2k))\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b-c-a\,(m-2k))\,z^2\right)+$$
$$\left.e^{e-g+(m-2k)\,q+\frac{i\,m\,\pi}{2}}\left((-b+c-a\,(m-2k))\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b+c-a\,(m-2k))\,z^2\right)\right)/;\,m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

01.20.21.1974.01

$$\int z^n\, e^{\sqrt{z}\;b+e}\sinh^m\left(\sqrt{z}\;a+q\right)\cosh\left(\sqrt{z}\;c+g\right)dz ==$$
$$-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g-(m-2k)\,q-\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\,(-b-c+a\,(m-2k))\,\sqrt{z}\right)(-b-c+a\,(m-2k))^{-2\,(n+1)}+\right.$$
$$e^{e-g-(m-2k)\,q-\frac{i\,m\,\pi}{2}}\,(-b+c+a\,(m-2k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b+c+a\,(m-2k))\,\sqrt{z}\right)+$$
$$e^{e+g+(m-2k)\,q+\frac{i\,m\,\pi}{2}}\,(-b-c-a\,(m-2k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b-c-a\,(m-2k))\,\sqrt{z}\right)+$$
$$\left.e^{e-g+(m-2k)\,q+\frac{i\,m\,\pi}{2}}\,(-b+c-a\,(m-2k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b+c-a\,(m-2k))\,\sqrt{z}\right)\right)(2\,i)^{-m}-$$
$$(2\,i)^{-m}\binom{m}{\frac{m}{2}}\left(e^{e+g}\,\Gamma\left(2\,(n+1),\,(-b-c)\,\sqrt{z}\right)(-b-c)^{-2\,(n+1)}+(c-b)^{-2\,(n+1)}\,e^{e-g}\,\Gamma\left(2\,(n+1),\,(c-b)\,\sqrt{z}\right)\right)$$
$$(1-m \bmod 2)\,/;\,m\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\, e^{b\,z^r+d\,z+e}\sinh^m\left(a\,z^r+p\,z+q\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.1975.01

$$\int z^n\, e^{b\,z^2+d\,z+e}\sinh^m\left(a\,z^2+p\,z+q\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$
$$-i^m\,2^{-m-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left((b-c)^{-n-1}\,e^{-\frac{(d-f)^2}{4\,(b-c)}+e-g}\sum_{j=0}^{n}2^{j-n}\,(f-d)^{n-j}\,(d-f+2\,(b-c)\,z)^{j+1}\right.$$
$$\left(-\frac{(d-f+2\,(b-c)\,z)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d-f+2\,(b-c)\,z)^2}{4\,(b-c)}\right)+(b+c)^{-n-1}\,e^{-\frac{(d+f)^2}{4\,(b+c)}+e+g}$$
$$\left.\sum_{j=0}^{n}2^{j-n}\,(-d-f)^{n-j}\,(d+f+2\,(b+c)\,z)^{j+1}\left(-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+f+2\,(b+c)\,z)^2}{4\,(b+c)}\right)\right)-$$

$$i^m\, 2^{-m-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{(d-f+(2k-m)\,p)^2}{4\,(b-c+a\,(2k-m))}+e-g+(2k-m)\,q+\frac{i\,m\,\pi}{2}} (b-c+a\,(2k-m))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d+f-(2k-m)\,p)^{n-j} \right.$$

$$(d-f+(2k-m)\,p+2\,(b-c+a\,(2k-m))\,z)^{j+1} \left(-\frac{(d-f+(2k-m)\,p+2\,(b-c+a\,(2k-m))\,z)^2}{b-c+a\,(2k-m)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f+(2k-m)\,p+2\,(b-c+a\,(2k-m))\,z)^2}{4\,(b-c+a\,(2k-m))} \right) +$$

$$e^{-\frac{(d+f+(2k-m)\,p)^2}{4\,(b+c+a\,(2k-m))}+e+g+(2k-m)\,q+\frac{i\,m\,\pi}{2}} (b+c+a\,(2k-m))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d-f-(2k-m)\,p)^{n-j}$$

$$(d+f+(2k-m)\,p+2\,(b+c+a\,(2k-m))\,z)^{j+1} \left(-\frac{(d+f+(2k-m)\,p+2\,(b+c+a\,(2k-m))\,z)^2}{b+c+a\,(2k-m)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f+(2k-m)\,p+2\,(b+c+a\,(2k-m))\,z)^2}{4\,(b+c+a\,(2k-m))} \right) +$$

$$e^{-\frac{(d-f+(m-2k)\,p)^2}{4\,(b-c+a\,(m-2k))}+e-g+(m-2k)\,q-\frac{i\,m\,\pi}{2}} (b-c+a\,(m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d+f-(m-2k)\,p)^{n-j}$$

$$(d-f+(m-2k)\,p+2\,(b-c+a\,(m-2k))\,z)^{j+1} \left(-\frac{(d-f+(m-2k)\,p+2\,(b-c+a\,(m-2k))\,z)^2}{b-c+a\,(m-2k)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f+(m-2k)\,p+2\,(b-c+a\,(m-2k))\,z)^2}{4\,(b-c+a\,(m-2k))} \right) +$$

$$e^{-\frac{(d+f+(m-2k)\,p)^2}{4\,(b+c+a\,(m-2k))}+e+g+(m-2k)\,q-\frac{i\,m\,\pi}{2}} (b+c+a\,(m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d-f-(m-2k)\,p)^{n-j}$$

$$(d+f+(m-2k)\,p+2\,(b+c+a\,(m-2k))\,z)^{j+1} \left(-\frac{(d+f+(m-2k)\,p+2\,(b+c+a\,(m-2k))\,z)^2}{b+c+a\,(m-2k)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f+(m-2k)\,p+2\,(b+c+a\,(m-2k))\,z)^2}{4\,(b+c+a\,(m-2k))} \right) \right) /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

01.20.21.1976.01

$$\int z^n\, e^{\sqrt{z}\ b+d\,z+e} \sinh^m\left(\sqrt{z}\ a+p\,z+q\right) \cosh\left(\sqrt{z}\ c+f\,z+g\right) dz == i^m\, 2^{-m-2\,n-2} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\left(e^{-\frac{(b-c)^2}{4\,(d-f)}+e-g}\, (d-f)^{-2\,n-2} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h}\, 4^i\, (b-c)^{-h-i+2\,n} \left(b-c+2\,(d-f)\,\sqrt{z}\right)^{h+i} \left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f} \right)^{\frac{1}{2}(-h-i-1)} \right.$$

$$\binom{i}{h}\binom{n}{i}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+e^{-\frac{(b+c)^2}{4(d+f)}+e+g}$$

$$(d+f)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c)^{-h-i+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)+$$

$$i^m\,2^{-m-2n-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(b-c+a(2k-m))^2}{4(d-f+(2k-m)p)}+e-g+(2k-m)q+\frac{i\,m\,\pi}{2}}\,(d-f+(2k-m)\,p)^{-2n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-c+a(2k-m))^{-h-i+2n}\left(b-c+a(2k-m)+2(d-f+(2k-m)\,p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c+a(2k-m)+2(d-f+(2k-m)\,p)\sqrt{z}\right)^2}{d-f+(2k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b-c+a(2k-m))\left(b-c+a(2k-m)+2(d-f+(2k-m)\,p)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+i+1),-\frac{\left(b-c+a(2k-m)+2(d-f+(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+(2k-m)\,p)}\right)+$$

$$2\sqrt{-\frac{\left(b-c+a(2k-m)+2(d-f+(2k-m)\,p)\sqrt{z}\right)^2}{d-f+(2k-m)\,p}}\,(d-f+(2k-m)\,p)\,\Gamma\left(\right.$$

$$\frac{1}{2}(h+i+2),\ -\frac{\left(b-c+a(2k-m)+2(d-f+(2k-m)p)\sqrt{z}\right)^2}{4(d-f+(2k-m)p)}\Bigg)\Bigg)+$$

$$e^{-\frac{(b+c+a(2k-m))^2}{4(d+f+(2k-m)p)}+e+g+(2k-m)q+\frac{im\pi}{2}}(d+f+(2k-m)p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b+c+a(2k-m))^{-h-i+2n}$$

$$\left(b+c+a(2k-m)+2(d+f+(2k-m)p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+a(2k-m)+2(d+f+(2k-m)p)\sqrt{z}\right)^2}{d+f+(2k-m)p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b+c+a(2k-m))\left(b+c+a(2k-m)+2(d+f+(2k-m)p)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+1),\ -\frac{\left(b+c+a(2k-m)+2(d+f+(2k-m)p)\sqrt{z}\right)^2}{4(d+f+(2k-m)p)}\Bigg)+$$

$$2\sqrt{-\frac{\left(b+c+a(2k-m)+2(d+f+(2k-m)p)\sqrt{z}\right)^2}{d+f+(2k-m)p}}\ (d+f+(2k-m)p)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+2),\ -\frac{\left(b+c+a(2k-m)+2(d+f+(2k-m)p)\sqrt{z}\right)^2}{4(d+f+(2k-m)p)}\Bigg)\Bigg)+$$

$$e^{-\frac{(b-c+a(m-2k))^2}{4(d-f+(m-2k)p)}+e-g+(m-2k)q-\frac{im\pi}{2}}(d-f+(m-2k)p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b-c+a(m-2k))^{-h-i+2n}$$

$$\left(b-c+a(m-2k)+2(d-f+(m-2k)p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c+a(m-2k)+2(d-f+(m-2k)p)\sqrt{z}\right)^2}{d-f+(m-2k)p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b-c+a(m-2k))\left(b-c+a(m-2k)+2(d-f+(m-2k)p)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+1),\ -\frac{\left(b-c+a(m-2k)+2(d-f+(m-2k)p)\sqrt{z}\right)^2}{4(d-f+(m-2k)p)}\Bigg)+$$

$$2(d-f+(m-2k)p)\,\Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{\left(b-c+a(m-2k)+2(d-f+(m-2k)p)\sqrt{z}\right)^2}{4(d-f+(m-2k)p)}\right)$$

$$\sqrt{-\frac{\left(b-c+a(m-2k)+2(d-f+(m-2k)p)\sqrt{z}\right)^2}{d-f+(m-2k)p}}\Bigg)+$$

$$e^{-\frac{(b+c+a(m-2k))^2}{4(d+f+(m-2k)p)}+e+g+(m-2k)q-\frac{im\pi}{2}}(d+f+(m-2k)p)^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b+c+a(m-2k))^{-h-i+2n}$$

$$\left(b+c+a(m-2k)+2(d+f+(m-2k)p)\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+c+a(m-2k)+2(d+f+(m-2k)p)\sqrt{z}\right)^2}{d+f+(m-2k)p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b+c+a(m-2k))\left(b+c+a(m-2k)+2(d+f+(m-2k)p)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+1),\ -\frac{\left(b+c+a(m-2k)+2(d+f+(m-2k)p)\sqrt{z}\right)^2}{4(d+f+(m-2k)p)}\Bigg)+$$

$$2(d+f+(m-2k)p)\,\Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{\left(b+c+a(m-2k)+2(d+f+(m-2k)p)\sqrt{z}\right)^2}{4(d+f+(m-2k)p)}\right)$$

$$\sqrt{-\frac{\left(b+c+a(m-2k)+2(d+f+(m-2k)p)\sqrt{z}\right)^2}{d+f+(m-2k)p}}\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving hyperbolic, exponential and trigonometric functions

Involving sin, sinh and exp

Involving $e^{b z^r+e}\sin(a z^r+q)\sinh(w z^r+t)\cosh(c z^r+g)$

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$$\int e^{b z^r+e} \sin(a z^r+q) \sinh(w z^r+t) \cosh(c z^r+g)\, dz ==$$

$$-\frac{i z}{8 r}\left(-e^{e+g+i q+t}\,\Gamma\left(\frac{1}{r},(-b-c-i a-w) z^r\right)((-b-c-i a-w) z^r)^{-1/r}+e^{e+g-i q+t}((-b-c+i a-w) z^r)^{-1/r}\right.$$
$$\Gamma\left(\frac{1}{r},(-b-c+i a-w) z^r\right)-e^{e-g+i q+t}((-b+c-i a-w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-i a-w) z^r\right)+$$
$$e^{e-g-i q+t}((-b+c+i a-w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+i a-w) z^r\right)+e^{e+g+i q-t}((-b-c-i a+w) z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b-c-i a+w) z^r\right)-e^{e+g-i q-t}((-b-c+i a+w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+i a+w) z^r\right)+e^{e-g+i q-t}$$
$$\left.((-b+c-i a+w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-i a+w) z^r\right)-e^{e-g-i q-t}((-b+c+i a+w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+i a+w) z^r\right)\right)$$

Involving $e^{b z^r+d z+e} \sin(a z^r+p z+q) \sinh(w z^r+s z+t) \cosh(c z^r+f z+g)$

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$$\int e^{b z^2+d z+e} \sin(a z^2+p z+q) \sinh(w z^2+s z+t) \cosh(c z^2+f z+g)\, dz ==$$

$$-\frac{1}{16} i\left(-\left(e^{-\frac{(d-f-i p-s)^2}{4(b-c-i a-w)}+e-g-i q-t}(d-f-i p-s+2(b-c-i a-w) z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f-i p-s+2(b-c-i a-w) z)^2}{4(b-c-i a-w)}\right)\right)\Big/\right.$$
$$\left.\left((b-c-i a-w)\sqrt{-\frac{(d-f-i p-s+2(b-c-i a-w) z)^2}{b-c-i a-w}}\right)+\right.$$
$$\left(e^{-\frac{(d-f+i p-s)^2}{4(b-c+i a-w)}+e-g+i q-t}(d-f+i p-s+2(b-c+i a-w) z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f+i p-s+2(b-c+i a-w) z)^2}{4(b-c+i a-w)}\right)\right)\Big/$$
$$\left((b-c+i a-w)\sqrt{-\frac{(d-f+i p-s+2(b-c+i a-w) z)^2}{b-c+i a-w}}\right)+$$
$$\left(e^{-\frac{(d+f+i p-s)^2}{4(b+c+i a-w)}+e+g+i q-t}(d+f+i p-s+2(b+c+i a-w) z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+i p-s+2(b+c+i a-w) z)^2}{4(b+c+i a-w)}\right)\right)\Big/$$
$$\left((b+c+i a-w)\sqrt{-\frac{(d+f+i p-s+2(b+c+i a-w) z)^2}{b+c+i a-w}}\right)+$$
$$\left(e^{-\frac{(d-f-i p+s)^2}{4(b-c-i a+w)}+e-g-i q+t}(d-f-i p+s+2(b-c-i a+w) z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f-i p+s+2(b-c-i a+w) z)^2}{4(b-c-i a+w)}\right)\right)\Big/$$
$$\left((b-c-i a+w)\sqrt{-\frac{(d-f-i p+s+2(b-c-i a+w) z)^2}{b-c-i a+w}}\right)+$$

$$\left(e^{-\frac{(d+f-i\,p+s)^2}{4\,(b+c-i\,a\,+w)}+e+g-i\,q+t}\,(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)^2}{4\,(b+c-i\,a\,+w)}\right)\right)\Big/$$

$$\left((b+c-i\,a\,+w)\sqrt{-\frac{(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)^2}{b+c-i\,a\,+w}}\right)-$$

$$\left(e^{-\frac{(d+f-i\,p-s)^2}{4\,(b+c-i\,a\,-w)}+e+g-i\,q-t}\,(d+f-i\,p-s+2\,(b+c-i\,a\,-w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f-i\,p-s+2\,(b+c-i\,a\,-w)\,z)^2}{4\,(b+c-i\,a\,-w)}\right)\right)\Big/$$

$$\left((b+c-i\,a\,-w)\sqrt{-\frac{(d+f-i\,p-s+2\,(b+c-i\,a\,-w)\,z)^2}{b+c-i\,a\,-w}}\right)-$$

$$\left(e^{-\frac{(d-f+i\,p+s)^2}{4\,(b-c+i\,a\,+w)}+e-g+i\,q+t}\,(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)^2}{4\,(b-c+i\,a\,+w)}\right)\right)\Big/$$

$$\left((b-c+i\,a\,+w)\sqrt{-\frac{(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)^2}{b-c+i\,a\,+w}}\right)-$$

$$\left(e^{-\frac{(d+f+i\,p+s)^2}{4\,(b+c+i\,a\,+w)}+e+g+i\,q+t}\,(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)^2}{4\,(b+c+i\,a\,+w)}\right)\right)\Big/$$

$$\left((b+c+i\,a\,+w)\sqrt{-\frac{(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)^2}{b+c+i\,a\,+w}}\right)\Bigg)$$

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$$\int e^{\sqrt{z}\,b+e+d\,z}\sin\left(\sqrt{z}\,a+q+p\,z\right)\sinh\left(t+s\,z+w\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{1}{16}\,i$$

$$\left(\left(\left(e^{-\frac{(b-c+i\,a\,-w)^2}{4\,(d-f+i\,p-s)}+e-g+i\,q-t}\left(2\,e^{\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}}\sqrt{-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{d-f+i\,p-s}}\,(d-f+i\,p-s)+(b-c+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.i\,a\,-w)\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d-f+i\,p-s)^2\sqrt{-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{d-f+i\,p-s}}\right)+\left(e^{-\frac{(b+c+i\,a\,-w)^2}{4\,(d+f+i\,p-s)}+e+g+i\,q-t}\right.$$

$$\left(2\, e^{\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}}\sqrt{-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}}\;(d+f+i\,p-s)+(b+c+i\,a\,-w)\right.$$

$$\left.\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}\right)\right)\Big/$$

$$\left((d+f+i\,p-s)^2\sqrt{-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}}\right)-\left(e^{-\frac{(b-c+-i\,a-w)^2}{4\,(d-f-i\,p-s)}+e-g-i\,q-t}\right.$$

$$\left(2\, e^{\frac{\left(b-c+-i\,a-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}}\sqrt{-\frac{\left(b-c+-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}}\;(d-f-i\,p-s)+(b-c+-i\,a\,-w)\right.$$

$$\left.\left.\left(b-c+-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c+-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d-f-i\,p-s)^2\sqrt{-\frac{\left(b-c+-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}}\right)+\left(e^{-\frac{(b-c+-i\,a+w)^2}{4\,(d-f-i\,p+s)}+e-g-i\,q+t}\right.$$

$$\left(2\, e^{\frac{\left(b-c+-i\,a+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p+s)}}\sqrt{-\frac{\left(b-c+-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{d-f-i\,p+s}}\;(d-f-i\,p+s)+(b-c+-i\,a\,+w)\right.$$

$$\left.\left.\left(b-c+-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c+-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p+s)}\right)\right)\right)\Big/$$

$$\left((d-f-i\,p+s)^2\sqrt{-\frac{\left(b-c+-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{d-f-i\,p+s}}\right)+\left(e^{-\frac{(b+c+-i\,a+w)^2}{4\,(d+f-i\,p+s)}+e+g-i\,q+t}\right.$$

$$\left(2\, e^{\frac{\left(b+c+-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}}\sqrt{-\frac{\left(b+c+-i\,a\,+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}}\;(d+f-i\,p+s)+(b+c+-i\,a\,+w)\right.$$

$$\left(b+c+-i\,a\,+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c+-i\,a\,+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}\right)\Bigg)\Bigg/$$

$$\left((d+f-i\,p+s)^2\sqrt{-\frac{\left(b+c+-i\,a\,+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}}\right)-\Bigg(e^{-\frac{(b+c+-i\,a\,-w)^2}{4\,(d+f-i\,p-s)}+e+g-i\,q-t}$$

$$\left(2\,e^{\frac{\left(b+c+-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}}\sqrt{-\frac{\left(b+c+-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}}\;(d+f-i\,p-s)+(b+c+-i\,a\,-w)\right.$$

$$\left.\left(b+c+-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c+-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}\right)\Bigg)\Bigg/$$

$$\left((d+f-i\,p-s)^2\sqrt{-\frac{\left(b+c+-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}}\right)-\Bigg(e^{-\frac{(b-c+i\,a+w)^2}{4\,(d-f+i\,p+s)}+e-g+i\,q+t}$$

$$\left(2\,e^{\frac{\left(b-c+i\,a+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}}\sqrt{-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}}\;(d-f+i\,p+s)+(b-c+i\,a\,+w)\right.$$

$$\left.\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}\right)\Bigg)\Bigg/$$

$$\left((d-f+i\,p+s)^2\sqrt{-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}}\right)-\Bigg(e^{-\frac{(b+c+i\,a\,+w)^2}{4\,(d+f+i\,p+s)}+e+g+i\,q+t}$$

$$\left(2\,e^{\frac{\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p+s)}}\sqrt{-\frac{\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{d+f+i\,p+s}}\;(d+f+i\,p+s)+(b+c+i\,a\,+w)\right.$$

$$\left.\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p+s)}\right)\Bigg)\Bigg/$$

$$($$

Involving powers of sin, powers of sinh and exp

Involving $e^{b z^r+e} \sin^m(a z^r+q) \sinh^u(w z^r+t) \cosh(c z^r+g)$

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$$\int e^{b z^r+e} \sin^m(a z^r+q) \sinh^u(w z^r+t) \cosh(c z^r+g)\, dz ==$$

$$-\frac{1}{r}\left(\left(i^u\, 2^{-m-u-1} z\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(e^{e+g}\,\Gamma\left(\frac{1}{r},(-b-c)z^r\right)((-b-c)z^r)^{-1/r}+e^{e-g}\,((c-b)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)z^r\right)\right)\right.$$

$$\left.(1-m \bmod 2)\,(1-u \bmod 2)\right)-\frac{1}{r}\left(\left(i^u\, 2^{-m-u-1} z\right)\binom{u}{\frac{u}{2}}(1-u \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g+2ikq-imq+\frac{im\pi}{2}}\,\Gamma\left(\frac{1}{r},(-b-c-2iak+iam)z^r\right)((-b-c-2iak+iam)z^r)^{-1/r}+\right.$$

$$e^{e-g+2ikq-imq+\frac{im\pi}{2}}((-b+c-2iak+iam)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-2iak+iam)z^r\right)+$$

$$e^{e+g-2ikq+imq-\frac{im\pi}{2}}((-b-c+2iak-iam)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+2iak-iam)z^r\right)+$$

$$\left.\left.e^{e-g-2ikq+imq-\frac{im\pi}{2}}((-b+c+2iak-iam)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+2iak-iam)z^r\right)\right)\right)-\frac{1}{r}\left(\left(i^u\, 2^{-m-u-1} z\right)\right.$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{e+g+2kt-tu+\frac{i\pi u}{2}}\,\Gamma\left(\frac{1}{r},(-b-c-2kw+uw)z^r\right)((-b-c-2kw+uw)z^r)^{-1/r}+\right.$$

$$e^{e-g+2kt-tu+\frac{i\pi u}{2}}((-b+c-2kw+uw)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-2kw+uw)z^r\right)+$$

$$e^{e+g-2kt+tu-\frac{i\pi u}{2}}((-b-c+2kw-uw)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+2kw-uw)z^r\right)+$$

$$\left.\left.e^{e-g-2kt+tu-\frac{i\pi u}{2}}((-b+c+2kw-uw)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+2kw-uw)z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(\left(i^u\, 2^{-m-u-1} z\right)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{e+g+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+\frac{im\pi}{2}}\right.\right.$$

$$\Gamma\left(\frac{1}{r},(-b-c-2iak+iam-2jw+uw)z^r\right)((-b-c-2iak+iam-2jw+uw)z^r)^{-1/r}+$$

$$e^{e-g+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+\frac{im\pi}{2}}((-b+c-2iak+iam-2jw+uw)z^r)^{-1/r}$$

$$\Gamma\left(\frac{1}{r},(-b+c-2iak+iam-2jw+uw)z^r\right)+e^{e+g-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$

$$((-b-c+2iak-iam-2jw+uw)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+2iak-iam-2jw+uw)z^r\right)+$$

$$e^{e-g-2\,i\,k\,q+i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\left((-b+c+2\,i\,a\,k-i\,a\,m-2\,j\,w+u\,w)\,z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},\,(-b+c+2\,i\,a\,k-i\,a\,m-2\,j\,w+u\,w)\,z^r\right)+e^{e+g+2\,i\,k\,q-i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}$$
$$\left((-b-c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},\,(-b-c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r\right)+$$
$$e^{e-g+2\,i\,k\,q-i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\left((-b+c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},\,(-b+c-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r\right)+e^{e+g-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}$$
$$\left((-b-c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},\,(-b-c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r\right)+$$
$$e^{e-g-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\left((-b+c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r\right)^{-1/r}$$
$$\left.\Gamma\left(\frac{1}{r},\,(-b+c+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r\right)\right)\Bigg)\Bigg/;\,m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0$$

Involving $e^{b\,z^r+d\,z+e}\sin^m\left(a\,z^r+p\,z+q\right)\sinh^u\left(w\,z^r+s\,z+t\right)\cosh\left(c\,z^r+f\,z+g\right)$

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$$\int e^{b\,z^2+d\,z+e}\sin^m\left(a\,z^2+p\,z+q\right)\sinh^u\left(w\,z^2+s\,z+t\right)\cosh\left(c\,z^2+f\,z+g\right)dz==-i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}$$
$$\left(\frac{e^{-\frac{(d-f)^2}{4\,(b-c)}+e-g}\,(d-f+2\,(b-c)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f+2\,(b-c)\,z)^2}{4\,(b-c)}\right)}{(b-c)\sqrt{-\frac{(d-f+2\,(b-c)\,z)^2}{b-c}}}+\frac{e^{-\frac{(d+f)^2}{4\,(b+c)}+e+g}\,(d+f+2\,(b+c)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+2\,(b+c)\,z)^2}{4\,(b+c)}\right)}{(b+c)\sqrt{-\frac{(d+f+2\,(b+c)\,z)^2}{b+c}}}\right)$$
$$(1-m\bmod 2)\,(1-u\bmod 2)-i^u\,2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u\bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(\Bigg(e^{-\frac{(d-f+i\,(2\,k-m)\,p)^2}{4\,(b-c+a\,i\,(2\,k-m))}+e-g+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)$$
$$\Gamma\left(\frac{1}{2},-\frac{(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)^2}{4\,(b-c+a\,i\,(2\,k-m))}\right)\Bigg)\Bigg/$$
$$\left((b-c+a\,i\,(2\,k-m))\sqrt{-\frac{(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)^2}{b-c+a\,i\,(2\,k-m)}}\right)+$$
$$\Bigg(e^{-\frac{(d+f+i\,(2\,k-m)\,p)^2}{4\,(b+c+a\,i\,(2\,k-m))}+e+g+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z)$$
$$\Gamma\left(\frac{1}{2},-\frac{(d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z)^2}{4\,(b+c+a\,i\,(2\,k-m))}\right)\Bigg)\Bigg/$$

$$\left((b+c+a\,i\,(2\,k-m))\sqrt{-\frac{(d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z)^2}{b+c+a\,i\,(2\,k-m)}}\right)+$$

$$\left(e^{-\frac{(d-f+i\,(m-2\,k)\,p)^2}{4\,(b-c+a\,i\,(m-2\,k))}+e-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z)^2}{4\,(b-c+a\,i\,(m-2\,k))}\right)\right)\Big/$$

$$\left((b-c+a\,i\,(m-2\,k))\sqrt{-\frac{(d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z)^2}{b-c+a\,i\,(m-2\,k)}}\right)+$$

$$\left(e^{-\frac{(d+f+i\,(m-2\,k)\,p)^2}{4\,(b+c+a\,i\,(m-2\,k))}+e+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)^2}{4\,(b+c+a\,i\,(m-2\,k))}\right)\right)\Big/$$

$$\left((b+c+a\,i\,(m-2\,k))\sqrt{-\frac{(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)^2}{b+c+a\,i\,(m-2\,k)}}\right)\Bigg)-$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{(d-f+s\,(2\,k-u))^2}{4\,(b-c+(2\,k-u)\,w)}+e-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\,(d-f+s\,(2\,k-u)+2\,(b-c+(2\,k-u)\,w)\,z)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-f+s\,(2\,k-u)+2\,(b-c+(2\,k-u)\,w)\,z)^2}{4\,(b-c+(2\,k-u)\,w)}\right)\right)\Big/$$

$$\left((b-c+(2\,k-u)\,w)\sqrt{-\frac{(d-f+s\,(2\,k-u)+2\,(b-c+(2\,k-u)\,w)\,z)^2}{b-c+(2\,k-u)\,w}}\right)+\left(e^{-\frac{(d+f+s\,(2\,k-u))^2}{4\,(b+c+(2\,k-u)\,w)}+e+g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$\left.(d+f+s\,(2\,k-u)+2\,(b+c+(2\,k-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+s\,(2\,k-u)+2\,(b+c+(2\,k-u)\,w)\,z)^2}{4\,(b+c+(2\,k-u)\,w)}\right)\right)\Big/$$

$$\left((b+c+(2\,k-u)\,w)\sqrt{-\frac{(d+f+s\,(2\,k-u)+2\,(b+c+(2\,k-u)\,w)\,z)^2}{b+c+(2\,k-u)\,w}}\right)+\left(e^{-\frac{(d-f+s\,(u-2\,k))^2}{4\,(b-c+(u-2\,k)\,w)}+e-g+t\,(u-2\,k)-\frac{i\,\pi\,u}{2}}\right.$$

$$\left.(d-f+s\,(u-2\,k)+2\,(b-c+(u-2\,k)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f+s\,(u-2\,k)+2\,(b-c+(u-2\,k)\,w)\,z)^2}{4\,(b-c+(u-2\,k)\,w)}\right)\right)\Big/$$

$$\left((b-c+(u-2\,k)\,w)\sqrt{-\frac{(d-f+s\,(u-2\,k)+2\,(b-c+(u-2\,k)\,w)\,z)^2}{b-c+(u-2\,k)\,w}}\right)+\left(e^{-\frac{(d+f+s\,(u-2\,k))^2}{4\,(b+c+(u-2\,k)\,w)}+e+g+t\,(u-2\,k)-\frac{i\,\pi\,u}{2}}\right.$$

$$(d+f+s(u-2k)+2(b+c+(u-2k)w)z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+s(u-2k)+2(b+c+(u-2k)w)z)^2}{4(b+c+(u-2k)w)}\right)\Bigg/$$

$$\left((b+c+(u-2k)w)\sqrt{-\frac{(d+f+s(u-2k)+2(b+c+(u-2k)w)z)^2}{b+c+(u-2k)w}}\right)-$$

$$i^u\,2^{-m-u-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(\Bigg(e^{-\frac{(d-f+i(2k-m)p+s(2j-u))^2}{4(b-c+ai(2k-m)+(2j-u)w)}+e-g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$(d-f+i(2k-m)p+s(2j-u)+2(b-c+ai(2k-m)+(2j-u)w)z)$$

$$\Gamma\left(\frac{1}{2},-(d-f+i(2k-m)p+s(2j-u)+2(b-c+ai(2k-m)+(2j-u)w)z)^2\Big/\right.$$

$$\left.(4(b-c+ai(2k-m)+(2j-u)w))\right)\Big/\left((b-c+ai(2k-m)+(2j-u)w)\right.$$

$$\sqrt{\left(-(d-f+i(2k-m)p+s(2j-u)+2(b-c+ai(2k-m)+(2j-u)w)z)^2\Big/\right.}$$

$$\left.(b-c+ai(2k-m)+(2j-u)w)\right)+\Bigg(e^{-\frac{(d+f+i(2k-m)p+s(2j-u))^2}{4(b+c+ai(2k-m)+(2j-u)w)}+e+g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$(d+f+i(2k-m)p+s(2j-u)+2(b+c+ai(2k-m)+(2j-u)w)z)$$

$$\Gamma\left(\frac{1}{2},-(d+f+i(2k-m)p+s(2j-u)+2(b+c+ai(2k-m)+(2j-u)w)z)^2\Big/\right.$$

$$\left.(4(b+c+ai(2k-m)+(2j-u)w))\right)\Big/\left((b+c+ai(2k-m)+(2j-u)w)\right.$$

$$\sqrt{\left(-(d+f+i(2k-m)p+s(2j-u)+2(b+c+ai(2k-m)+(2j-u)w)z)^2\Big/\right.}$$

$$\left.(b+c+ai(2k-m)+(2j-u)w)\right)+\Bigg(e^{-\frac{(d-f+i(m-2k)p+s(2j-u))^2}{4(b-c+ai(m-2k)+(2j-u)w)}+e-g+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$

$$(d-f+i(m-2k)p+s(2j-u)+2(b-c+ai(m-2k)+(2j-u)w)z)$$

$$\Gamma\left(\frac{1}{2},-(d-f+i(m-2k)p+s(2j-u)+2(b-c+ai(m-2k)+(2j-u)w)z)^2\Big/\right.$$

$$\left.(4(b-c+ai(m-2k)+(2j-u)w))\right)\Big/\left((b-c+ai(m-2k)+(2j-u)w)\right.$$

$$\sqrt{\left(-(d-f+i(m-2k)p+s(2j-u)+2(b-c+ai(m-2k)+(2j-u)w)z)^2\Big/\right.}$$

$$\left.(b-c+ai(m-2k)+(2j-u)w)\right)+\Bigg(e^{-\frac{(d+f+i(m-2k)p+s(2j-u))^2}{4(b+c+ai(m-2k)+(2j-u)w)}+e+g+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$

$$(d+f+i(m-2k)p+s(2j-u)+2(b+c+ai(m-2k)+(2j-u)w)z)$$

$$\Gamma\left(\frac{1}{2},-(d+f+i(m-2k)p+s(2j-u)+2(b+c+ai(m-2k)+(2j-u)w)z)^2\Big/\right.$$

$$\left.(4(b+c+ai(m-2k)+(2j-u)w))\right)\Big/\left((b+c+ai(m-2k)+(2j-u)w)\right.$$

$$\sqrt{\left(-(d+f+i(m-2k)p+s(2j-u)+2(b+c+ai(m-2k)+(2j-u)w)z)^2\Big/\right.}$$

$$\left.(b+c+ai(m-2k)+(2j-u)w)\right)+\Bigg(e^{-\frac{(d-f+i(2k-m)p+s(u-2j))^2}{4(b-c+ai(2k-m)+(u-2j)w)}+e-g+i(2k-m)q+t(u-2j)-\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$(d-f+i(2k-m)p+s(u-2j)+2(b-c+ai(2k-m)+(u-2j)w)z)$$

$$\Gamma\left(\frac{1}{2}, -(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w))\right)\Big/\left((b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w\right.$$
$$\sqrt{\left(-(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/\right.}$$
$$\left.(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\right)+\left(e^{-\frac{(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2}{4\,(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)}+e+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\right.$$
$$(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)$$
$$\Gamma\left(\frac{1}{2}, -(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w))\right)\Big/\left((b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w\right.$$
$$\sqrt{\left(-(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/\right.}$$
$$\left.(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\right)+\left(e^{-\frac{(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2}{4\,(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)}+e-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\right.$$
$$(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)$$
$$\Gamma\left(\frac{1}{2}, -(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w))\right)\Big/\left((b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w\right.$$
$$\sqrt{\left(-(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/\right.}$$
$$\left.(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\right)+\left(e^{-\frac{(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2}{4\,(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)}+e+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\right.$$
$$(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)$$
$$\Gamma\left(\frac{1}{2}, -(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w))\right)\Big/\left((b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w\right.$$
$$\sqrt{\left(-(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/\right.}$$
$$\left.\left.(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

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$$\int e^{\sqrt{z}\,b+d\,z+e}\sin^m\left(\sqrt{z}\,a+p\,z+q\right)\sinh^u\left(w\,\sqrt{z}+s\,z+t\right)\cosh\left(\sqrt{z}\,c+f\,z+g\right)dz ==$$
$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(\left(e^{-\frac{(b-c)^2}{4\,(d-f)}+e-g}\left(2\,e^{\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}}\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\;(d-f)+(b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\right.\right.$$
$$\left.\left.\Gamma\left(\frac{1}{2}, -\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)\right)\right)\Big/\left((d-f)^2\sqrt{-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}}\right)+$$

$$\left(e^{-\frac{(b+c)^2}{4(d+f)}+e+g}\left(2\,e^{\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}}\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)+(b+c)\left(b+c+2(d+f)\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right/\left((d+f)^2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\right)$$

$$(1-m \bmod 2)(1-u \bmod 2)+i^u\,2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\left(e^{-\frac{(b-c+a\,i\,(2k-m))^2}{4(d-f+i\,(2k-m)\,p)}+e-g+i\,(2k-m)\,q+\frac{i\,m\,\pi}{2}}\left((b-c+a\,i\,(2k-m))\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)\right.\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}\right)+2\,e^{\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}}$$

$$\left.\left.(d-f+i\,(2k-m)\,p)\sqrt{-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}}\right)\right)\Big/$$

$$\left((d-f+i\,(2k-m)\,p)^2\sqrt{-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(b+c+a\,i\,(2k-m))^2}{4(d+f+i\,(2k-m)\,p)}+e+g+i\,(2k-m)\,q+\frac{i\,m\,\pi}{2}}\left((b+c+a\,i\,(2k-m))\left(b+c+a\,i\,(2k-m)+2(d+f+i\,(2k-m)\,p)\sqrt{z}\right)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(b+c+a\,i\,(2k-m)+2(d+f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d+f+i\,(2k-m)\,p)}\right)+2\,e^{\frac{\left(b+c+a\,i\,(2k-m)+2(d+f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d+f+i\,(2k-m)\,p)}}$$

$$\left.\left.(d+f+i\,(2k-m)\,p)\sqrt{-\frac{\left(b+c+a\,i\,(2k-m)+2(d+f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d+f+i\,(2k-m)\,p}}\right)\right)\Big/$$

$$\left((d+f+i\,(2\,k-m)\,p)^2\sqrt{-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(b-c+a\,i\,(m-2\,k))^2}{4\,(d-f+i\,(m-2\,k)\,p)}+e-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\left((b-c+a\,i\,(m-2\,k))\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)+2\,e^{\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}}$$

$$\left.\left.(d-f+i\,(m-2\,k)\,p)\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\right)\right)\Big/$$

$$\left((d-f+i\,(m-2\,k)\,p)^2\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\right)+$$

$$\left(e^{-\frac{(b+c+a\,i\,(m-2\,k))^2}{4\,(d+f+i\,(m-2\,k)\,p)}+e+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\left((b+c+a\,i\,(m-2\,k))\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)+2\,e^{\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}}$$

$$\left.\left.(d+f+i\,(m-2\,k)\,p)\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\right)\right)\Big/$$

$$\left.\left((d+f+i\,(m-2\,k)\,p)^2\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\right)\right)+$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{(b-c+(2\,k-u)\,w)^2}{4\,(d-f+s\,(2\,k-u))}+e-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\right.\right.$$

$$\left(2\,e^{\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}}\sqrt{-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}}\,(d-f+s(2k-u))+\right.$$

$$(b-c+(2k-u)w)\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}\right)\right)\Big/$$

$$\left((d-f+s(2k-u))^2\sqrt{-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}}\right)+\left(e^{-\frac{(b+c+(2k-u)w)^2}{4(d+f+s(2k-u))}+e+g+t(2k-u)+\frac{i\pi u}{2}}\right.$$

$$\left(2\,e^{\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}}\sqrt{-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}}\,(d+f+s(2k-u))+\right.$$

$$(b+c+(2k-u)w)\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}\right)\right)\Big/$$

$$\left((d+f+s(2k-u))^2\sqrt{-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}}\right)+$$

$$\left(e^{-\frac{(b-c+(u-2k)w)^2}{4(d-f+s(u-2k))}+e-g+t(u-2k)-\frac{i\pi u}{2}}\right.\left((b-c+(u-2k)w)\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}\right)+2\,e^{\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}}\right.$$

$$\left.\left.(d-f+s(u-2k))\sqrt{-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}}\right)\right)\Big/$$

$$\left((d-f+s(u-2k))^2\sqrt{-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}}\right)+$$

$$\left(e^{-\frac{(b+c+(u-2k)w)^2}{4(d+f+s(u-2k))}+e+g+t(u-2k)-\frac{i\pi u}{2}}\left((b+c+(u-2k)w)\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}\right)+2e^{\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}}$$

$$\left.\left.(d+f+s(u-2k))\sqrt{-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}}\right)\right)\Big/$$

$$\left.\left((d+f+s(u-2k))^2\sqrt{-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}}\right)\right)+i^u\,2^{-m-u-2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(b-c+a\,i\,(2k-m)+(2j-u)w)^2}{4(d-f+i\,(2k-m)p+s(2j-u))}+e-g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{i\,m\pi}{2}}\left((b-c+a\,i\,(2k-m)+(2j-u)w)\right.\right.\right.$$

$$\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d-f+i\,(2k-m)p+s(2j-u)))\right)+2e^{\frac{\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)p+s(2j-u))}}$$

$$(d-f+i\,(2k-m)p+s(2j-u))\sqrt{\left(-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+\right.\right.$$

$$\left.\left.\left.i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(d-f+i\,(2k-m)p+s(2j-u))\right)\right)\Big/$$

$$\left((d-f+i\,(2k-m)p+s(2j-u))^2\sqrt{\left(-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+\right.\right.\right.$$

$$\left.\left.\left.i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(d-f+i\,(2k-m)p+s(2j-u))\right)\right)+$$

$$\left(e^{-\frac{(b+c+a\,i\,(2k-m)+(2j-u)w)^2}{4(d+f+i\,(2k-m)p+s(2j-u))}+e+g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{i\,m\pi}{2}}\left((b+c+a\,i\,(2k-m)+(2j-u)w)\right.\right.$$

$$\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\Big)+2\,e^{\frac{\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))}}$$

$$(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\Bigg)\Bigg/$$

$$\Big((d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))^2\,\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\Big)+$$

$$\Bigg(e^{-\frac{(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e-g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\Bigg((b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$

$$\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,e^{\frac{\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}$$

$$(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+\right.\right.}$$

$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Bigg)\Bigg/$$

$$\Big((d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\,\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+\right.\right.}$$

$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+$$

$$\Bigg(e^{-\frac{(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\Bigg((b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$

$$\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,e^{\frac{\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}$$

$$(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Bigg)\Bigg/$$

$$\Big((d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\,\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+$$

$$\left(e^{-\frac{(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\left((b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\right.\right.$$
$$\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$
$$(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+\right.\right.}$$
$$\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Bigg)\Bigg/$$
$$\left((d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+\right.\right.\right.}$$
$$\left.\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\right)+$$
$$\left(e^{-\frac{(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\left((b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\right.\right.$$
$$\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$
$$(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+\right.\right.}$$
$$\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Bigg)\Bigg/$$
$$\left((d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+\right.\right.\right.}$$
$$\left.\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\right)+$$
$$\left(e^{-\frac{(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\left((b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\right.\right.$$
$$\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}$$
$$(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+\right.\right.}$$
$$\left.\left.i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\Bigg)\Bigg/$$

$$\left((d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+\right.\right.\right.$$
$$\left.\left.\left.i\,(m-2\,k)\,p+s\,(u-2\,j))\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)+$$
$$\left(e^{-\frac{(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\left((b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\right.\right.$$
$$\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2$$
$$e^{\frac{\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))$$
$$\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Big/\left((d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\right.$$
$$\left.\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\sqrt{z}\right)^2\Big/\right.}\right.$$
$$\left.\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Big/;\ m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+$$

Involving rational functions of sin, sinh and exp

Involving $\frac{e^{p\,z}\sinh(e\,z)\cosh(d\,z)}{a+b\sin(c\,z)}$

01.20.21.1983.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(d z)}{a + b \sin(c z)} dz ==$$

$$\frac{1}{4}\left(\left(i e^{(-d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right) {}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left. {}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right) \Big/ \left(b\sqrt{a^2-b^2}\,(-d-e+i c+p)\right)+$$
$$\left(i e^{(d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right) {}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left. {}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right) \Big/ \left(b\sqrt{a^2-b^2}\,(d-e+i c+p)\right)-$$
$$\left(i e^{(-d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right) {}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left. {}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right) \Big/ \left(b\sqrt{a^2-b^2}\,(-d+e+i c+p)\right)-$$
$$\left(i e^{(d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right) {}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left. {}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right) \Big/ \left(b\sqrt{a^2-b^2}\,(d+e+i c+p)\right)\Bigg)$$

Involving $e^{p z} \sinh(e z) \cosh(d z) (a + b \sin(c z))^{-n}$

01.20.21.1984.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(d z)}{(a + b \sin(c z))^2} dz ==$$

$$\frac{1}{4}\left(\left(i e^{(-d+e+i c+p) z}\left(-a\left(a+\sqrt{a^2-b^2}\right) {}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$a\left(a-\sqrt{a^2-b^2}\right) {}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left.\left.\left.\left(a^2+\sqrt{a^2-b^2}\,a-b^2\right) {}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 2; 2-\frac{i(-d+e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$

$$\left(-a^2+\sqrt{a^2-b^2}\ a+b^2\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c\,+p)\right)+\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c\,+p)}$$

$$\left(i\,e^{(d+e+i\,c\,+p)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\ a-b^2\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\ a+b^2\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$

$$\left(i\,e^{(-d-e+i\,c\,+p)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d-e+p)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\ a-b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\ a+b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Bigg/$$

$$\left(b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c\,+p)\right)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c\,+p)}$$

$$\left(i\,e^{(d-e+i\,c\,+p)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\ a-b^2\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+$$

$$\left(\right.\right.\right.\right.\right.$$

Involving $\frac{e^{p z}\sinh(e z)\cosh(d z)}{a+b\sin^2(c z)}$

01.20.21.1985.01

$$\int \frac{e^{p z}\sinh(e z)\cosh(d z)}{a+b\sin^2(c z)}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-d-e-2ic+p)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i(-d-e+p)}{2c}+1,1;\frac{i(-d-e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i(-d-e+p)}{2c}+1,1;\frac{i(-d-e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(-d-e-2ic+p)\right)+\left(e^{(d-e-2ic+p)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i(d-e+p)}{2c}+1,1;\frac{i(d-e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i(d-e+p)}{2c}+1,1;\frac{i(d-e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(d-e-2ic+p)\right)-\left(e^{(-d+e-2ic+p)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i(-d+e+p)}{2c}+1,1;\frac{i(-d+e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i(-d+e+p)}{2c}+1,1;\frac{i(-d+e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(-d+e-2ic+p)\right)-\left(e^{(d+e-2ic+p)z}\left(\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i(d+e+p)}{2c}+1,1;\frac{i(d+e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i(d+e+p)}{2c}+1,1;\frac{i(d+e+p)}{2c}+2;-\frac{b e^{-2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(d+e-2ic+p)\right)\right)$$

Involving $e^{p z}\sinh(e z)\cosh(d z)\left(a+b\sin^2(c z)\right)^{-n}$

01.20.21.1986.01

$$\int \frac{e^{p z}\sinh(e z)\cosh(d z)}{\left(a+b\sin^2(c z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-d-e+2ic+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$

$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}\ -b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},2;2-\frac{i(-d-e+p)}{2c};\right.\right.$$
$$\left.-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}\ -b\sqrt{a+b}\right)$$
$$\left.{}_2F_1\left(1-\frac{i(-d-e+p)}{2c},2;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)\right)\Big/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(-d-e+2ic+p)\right)+\left(e^{(d-e+2ic+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(d-e+p)}{2c},1;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+(2a+b)$$
$$\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},1;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}\ -b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},2;2-\frac{i(d-e+p)}{2c};\right.\right.$$
$$\left.-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}\ -b\sqrt{a+b}\right)$$
$$\left.{}_2F_1\left(1-\frac{i(d-e+p)}{2c},2;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)\right)\Big/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(d-e+2ic+p)\right)-\left(e^{(-d+e+2ic+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(-d+e+p)}{2c},1;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+(2a+b)$$
$$\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right){}_2F_1\left(1-\frac{i(-d+e+p)}{2c},1;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}\ -b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d+e+p)}{2c},2;2-\frac{i(-d+e+p)}{2c};\right.\right.$$
$$\left.-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}\ -b\sqrt{a+b}\right)$$
$$\left.{}_2F_1\left(1-\frac{i(-d+e+p)}{2c},2;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)\right)\Big/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(-d+e+2ic+p)\right)-\left(e^{(d+e+2ic+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{i(d+e+p)}{2c},1;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+(2a+b)$$
$$\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},1;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}\ -b}\right)+$$

$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\;a-2b\sqrt{a}\;-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},2;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\;\sqrt{a}\;-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\;a+2b\sqrt{a}\;-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},2;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\;\sqrt{a}\;-b}\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d+e+2ic+p)\right)$$

Involving algebraic functions of sin, sinh and exp

Involving $e^{pz}\sinh(ez)\cosh(dz)(a+b\sin(cz))^{\beta}$

01.20.21.1987.01

$$\int e^{pz}\sinh(ez)\cosh(dz)(a+b\sin(cz))^{\beta}\,dz == \frac{1}{4}\left(1+\frac{ib e^{icz}}{\sqrt{a^2-b^2}\;-a}\right)^{-\beta}\left(1-\frac{ib e^{icz}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}(a+b\sin(cz))^{\beta}\left(\frac{e^{-(d+e-p)z}}{d+e-p+ic\beta}F_1\left(\frac{i(d+e-p+ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c+i(d+e-p)}{c};\frac{ib e^{icz}}{a+\sqrt{a^2-b^2}},\frac{ib e^{icz}}{a-\sqrt{a^2-b^2}}\right)-\frac{e^{(d-e+p)z}}{d-e+p-ic\beta}F_1\left(-\frac{i(d-e+p)}{c}-\beta;-\beta,-\beta;-\frac{i(d-e+p)}{c}-\beta+1;\frac{ib e^{icz}}{a+\sqrt{a^2-b^2}},\frac{ib e^{icz}}{a-\sqrt{a^2-b^2}}\right)+\frac{e^{(-d+e+p)z}}{-d+e+p-ic\beta}F_1\left(-\frac{i(-d+e+p)}{c}-\beta;-\beta,-\beta;-\frac{i(-d+e+p)}{c}-\beta+1;\frac{ib e^{icz}}{a+\sqrt{a^2-b^2}},\frac{ib e^{icz}}{a-\sqrt{a^2-b^2}}\right)+\frac{e^{(d+e+p)z}}{d+e+p-ic\beta}F_1\left(-\frac{i(d+e+p)}{c}-\beta;-\beta,-\beta;-\frac{i(d+e+p)}{c}-\beta+1;\frac{ib e^{icz}}{a+\sqrt{a^2-b^2}},\frac{ib e^{icz}}{a-\sqrt{a^2-b^2}}\right)\right)$$

Involving $e^{pz}\sinh(ez)\cosh(dz)\left(a+b\sin^2(cz)\right)^{\beta}$

01.20.21.1988.01

$$\int e^{p z} \sinh(e z) \cosh(d z) \left(a + b \sin^2(c z)\right)^{\beta} dz ==$$

$$\frac{1}{4}\left(1 - \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)^{-\beta}\left(1 - \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}\right)^{-\beta}\left(a - \frac{1}{4} b e^{-2 i c z}\left(-1 + e^{2 i c z}\right)^2\right)^{\beta}$$
$$\left(\frac{e^{-(d+e-p) z}}{d + e - p + 2 i c \beta} F_1\left(\frac{i (d + e - p + 2 i c \beta)}{2 c}; -\beta, -\beta; \frac{i (d + e - p)}{2 c} - \beta + 1; \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \right.\right.$$
$$\left.\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{(d+e+p) z}}{d + e + p - 2 i c \beta} F_1\left(-\frac{i (d + e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d + e + p)}{2 c} - \beta + 1; \right.$$
$$\left.\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) - \frac{e^{(-d+e+p) z}}{d - e - p + 2 i c \beta} F_1\left(-\frac{i (-d + e + p)}{2 c} - \beta; -\beta, \right.$$
$$\left.-\beta; -\frac{i (-d + e + p)}{2 c} - \beta + 1; \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) - \frac{e^{(d-e+p) z}}{d - e + p - 2 i c \beta}$$
$$\left.F_1\left(-\frac{i (d - e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d - e + p)}{2 c} - \beta + 1; \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right)$$

Involving rational functions of sinh, sin and exp

Involving $\frac{e^{p z} \sin(e z) \cosh(d z)}{a + b \sinh(c z)}$

01.20.21.1989.01

$$\int \frac{e^{p z} \sin(e z) \cosh(d z)}{a + b \sinh(c z)} dz ==$$
$$\frac{1}{4} i \left(\frac{1}{b \sqrt{a^2+b^2}\ (c-d+i e+p)} \left(e^{(c-d+i e+p) z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2+b^2}\ - a} \right) + \right. \right. \right.$$
$$\left. \left. \left. \left(\sqrt{a^2+b^2}\ - a \right) {}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) +$$
$$\frac{1}{b \sqrt{a^2+b^2}\ (c+d+i e+p)} \left(e^{(c+d+i e+p) z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{c+d+i e+p}{c}, 1; \frac{d+i e+p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2+b^2}\ - a} \right) + \right. \right.$$
$$\left. \left. \left(\sqrt{a^2+b^2}\ - a \right) {}_2F_1\left(\frac{c+d+i e+p}{c}, 1; \frac{d+i e+p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) -$$
$$\frac{1}{b \sqrt{a^2+b^2}\ (c-d-i e+p)} \left(e^{(c-d-i e+p) z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{c-d-i e+p}{c}, 1; \frac{-d-i e+p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2+b^2}\ - a} \right) + \right. \right.$$
$$\left. \left. \left(\sqrt{a^2+b^2}\ - a \right) {}_2F_1\left(\frac{c-d-i e+p}{c}, 1; \frac{-d-i e+p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) -$$
$$\frac{1}{b \sqrt{a^2+b^2}\ (c+d-i e+p)} \left(e^{(c+d-i e+p) z} \left(\left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{c+d-i e+p}{c}, 1; \frac{d-i e+p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2+b^2}\ - a} \right) + \right. \right.$$
$$\left. \left. \left(\sqrt{a^2+b^2}\ - a \right) {}_2F_1\left(\frac{c+d-i e+p}{c}, 1; \frac{d-i e+p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2+b^2}} \right) \right) \right) \right)$$

Involving $e^{p z} \sin(e z) \cosh(d z) (a + b \sinh(c z))^{-n}$

01.20.21.1990.01

$$\int \frac{e^{p z} \sin(e z) \cosh(d z)}{(a + b \sinh(c z))^2} dz == \frac{1}{4} i$$
$$\left(\frac{1}{b \left(a^2+b^2\right)^{3/2} (c-d-i e+p)} \left(e^{(c-d-i e+p) z} \left(-a \left(a + \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{c-d-i e+p}{c}, 1; \frac{-d-i e+p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2+b^2}\ - a} \right) + \right. \right. \right.$$
$$\left. \left. \left. a \left(a - \sqrt{a^2+b^2} \right) {}_2F_1\left(\frac{c-d-i e+p}{c}, 1; \frac{-d-i e+p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2+b^2}} \right) + \right. \right. \right.$$
$$\left. \left. \left. \left(a^2 + \sqrt{a^2+b^2}\ a + b^2 \right) {}_2F_1\left(\frac{c-d-i e+p}{c}, 2; \frac{-d-i e+p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2+b^2}\ - a} \right) + \left(-a^2 + \sqrt{a^2+b^2}\ a - b^2 \right) \right. \right. \right.$$

$$ {}_2F_1\left(\frac{c-d-i\,e+p}{c},\,2;\,\frac{-d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-i\,e+p)}$$

$$\left(e^{(c+d-i\,e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right)$$

$$\left.\left.{}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d+i\,e+p)}$$

$$\left(e^{(c-d+i\,e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e+p}{c},\,1;\,\frac{-d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i\,e+p}{c},\,1;\,\frac{-d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d+i\,e+p}{c},\,2;\,\frac{-d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right)$$

$$\left.\left.{}_2F_1\left(\frac{c-d+i\,e+p}{c},\,2;\,\frac{-d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+i\,e+p)}$$

$$\left(e^{(c+d+i\,e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,1;\,\frac{d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,1;\,\frac{d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,2;\,\frac{d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left.\left.\left.\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,2;\,\frac{d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)\right)$$

Involving $\frac{e^{p z} \sin(e z) \cosh(d z)}{a+b \sinh^2(c z)}$

01.20.21.1991.01

$$\int \frac{e^{p z} \sin(e z) \cosh(d z)}{a + b \sinh^2(c z)} dz ==$$
$$\frac{1}{4} i \left(\left(e^{(-2c-d-ie+p)z} \left(\left(2a + 2\sqrt{a-b}\ \sqrt{a} - b \right) {}_2F_1\left(1 - \frac{-d-ie+p}{2c}, 1; 2 - \frac{-d-ie+p}{2c}; \frac{b e^{-2cz}}{-2a + 2\sqrt{a-b}\ \sqrt{a} + b} \right) + \right. \right. \right.$$
$$\left. \left. \left. \left(-2a + 2\sqrt{a-b}\ \sqrt{a} + b \right) {}_2F_1\left(1 - \frac{-d-ie+p}{2c}, 1; 2 - \frac{-d-ie+p}{2c}; \frac{b e^{-2cz}}{-2a - 2\sqrt{a-b}\ \sqrt{a} + b} \right) \right) \right) \Big/$$
$$\left(\sqrt{a}\ \sqrt{a-b}\ b(-2c-d-ie+p) \right) + \left(e^{(-2c+d-ie+p)z} \left(\left(2a + 2\sqrt{a-b}\ \sqrt{a} - b \right) \right. \right.$$
$${}_2F_1\left(1 - \frac{d-ie+p}{2c}, 1; 2 - \frac{d-ie+p}{2c}; \frac{b e^{-2cz}}{-2a + 2\sqrt{a-b}\ \sqrt{a} + b} \right) + \left(-2a + 2\sqrt{a-b}\ \sqrt{a} + b \right) {}_2F_1$$
$$\left. \left. \left(1 - \frac{d-ie+p}{2c}, 1; 2 - \frac{d-ie+p}{2c}; \frac{b e^{-2cz}}{-2a - 2\sqrt{a-b}\ \sqrt{a} + b} \right) \right) \right) \Big/ \left(\sqrt{a}\ \sqrt{a-b}\ b(-2c+d-ie+p) \right) -$$
$$\left(e^{(-2c-d+ie+p)z} \left(\left(2a + 2\sqrt{a-b}\ \sqrt{a} - b \right) {}_2F_1\left(1 - \frac{-d+ie+p}{2c}, 1; 2 - \frac{-d+ie+p}{2c}; \frac{b e^{-2cz}}{-2a + 2\sqrt{a-b}\ \sqrt{a} + b} \right) + \right. \right.$$
$$\left. \left. \left(-2a + 2\sqrt{a-b}\ \sqrt{a} + b \right) {}_2F_1\left(1 - \frac{-d+ie+p}{2c}, 1; 2 - \frac{-d+ie+p}{2c}; \frac{b e^{-2cz}}{-2a - 2\sqrt{a-b}\ \sqrt{a} + b} \right) \right) \right) \Big/$$
$$\left(\sqrt{a}\ \sqrt{a-b}\ b(-2c-d+ie+p) \right) - \left(e^{(-2c+d+ie+p)z} \left(\left(2a + 2\sqrt{a-b}\ \sqrt{a} - b \right) \right. \right.$$
$${}_2F_1\left(1 - \frac{d+ie+p}{2c}, 1; 2 - \frac{d+ie+p}{2c}; \frac{b e^{-2cz}}{-2a + 2\sqrt{a-b}\ \sqrt{a} + b} \right) + \left(-2a + 2\sqrt{a-b}\ \sqrt{a} + b \right) {}_2F_1$$
$$\left. \left. \left. \left(1 - \frac{d+ie+p}{2c}, 1; 2 - \frac{d+ie+p}{2c}; \frac{b e^{-2cz}}{-2a - 2\sqrt{a-b}\ \sqrt{a} + b} \right) \right) \right) \Big/ \left(\sqrt{a}\ \sqrt{a-b}\ b(-2c+d+ie+p) \right) \right)$$

Involving $e^{p z} \sin(e z) \cosh(d z) \left(a + b \sinh^2(c z)\right)^{-n}$

01.20.21.1992.01

$$\int \frac{e^{p z} \sin(e z) \cosh(d z)}{\left(a + b \sinh^2(c z)\right)^2} dz == \frac{1}{4} i$$
$$\left(\left(e^{(2c-d-ie+p)z} \left((2a-b) \left(2a + 2\sqrt{a-b}\ \sqrt{a} - b \right) {}_2F_1\left(\frac{-d-ie+p}{2c} + 1, 1; \frac{-d-ie+p}{2c} + 2; \frac{b e^{2cz}}{-2a + 2\sqrt{a-b}\ \sqrt{a} + b} \right) + \right. \right. \right.$$
$$(2a-b) \left(-2a + 2\sqrt{a-b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{-d-ie+p}{2c} + 1, 1; \frac{-d-ie+p}{2c} + 2; \frac{b e^{2cz}}{-2a - 2\sqrt{a-b}\ \sqrt{a} + b} \right) +$$
$$2\sqrt{a} \left(\left(-2a^{3/2} - 2\sqrt{a-b}\ a + 2b\sqrt{a} + \sqrt{a-b}\ b \right) {}_2F_1\left(\frac{-d-ie+p}{2c} + 1, 2; \frac{-d-ie+p}{2c} + 2; \right. \right.$$

$$\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+\left(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\Bigg(\frac{-d-ie+p}{2c}+$$

$$1,\,2;\,\frac{-d-ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2a^{3/2}(a-b)^{3/2}b\,(2c-d-ie+p)\right)+$$

$$\Bigg(e^{(2c+d-ie+p)z}\Bigg((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\Bigg(\frac{d-ie+p}{2c}+1,\,1;\,\frac{d-ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+$$

$$(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\Bigg(\frac{d-ie+p}{2c}+1,\,1;\,\frac{d-ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+$$

$$2\sqrt{a}\,\Bigg(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\Bigg(\frac{d-ie+p}{2c}+1,\,2;\,\frac{d-ie+p}{2c}+$$

$$2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+\left(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\right)$$

$${}_2F_1\Bigg(\frac{d-ie+p}{2c}+1,\,2;\,\frac{d-ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/$$

$$\left(2a^{3/2}(a-b)^{3/2}b\,(2c+d-ie+p)\right)-\Bigg(e^{(2c-d+ie+p)z}\Bigg((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right)$$

$${}_2F_1\Bigg(\frac{-d+ie+p}{2c}+1,\,1;\,\frac{-d+ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+$$

$$(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\Bigg(\frac{-d+ie+p}{2c}+1,\,1;\,\frac{-d+ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+$$

$$2\sqrt{a}\,\Bigg(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\Bigg(\frac{-d+ie+p}{2c}+1,\,2;\,\frac{-d+ie+p}{2c}+$$

$$2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+\left(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\right)$$

$${}_2F_1\Bigg(\frac{-d+ie+p}{2c}+1,\,2;\,\frac{-d+ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/$$

$$\left(2a^{3/2}(a-b)^{3/2}b\,(2c-d+ie+p)\right)-\Bigg(e^{(2c+d+ie+p)z}\Bigg((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right)$$

$${}_2F_1\Bigg(\frac{d+ie+p}{2c}+1,\,1;\,\frac{d+ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+$$

$$(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\Bigg(\frac{d+ie+p}{2c}+1,\,1;\,\frac{d+ie+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+$$

$$2\sqrt{a}\,\Bigg(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\Bigg(\frac{d+ie+p}{2c}+1,\,2;\,\frac{d+ie+p}{2c}+2;$$

$$\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Bigg)+\left(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\Bigg(\frac{d+ie+p}{2c}+$$

$$d+ie+p\qquad\qquad b\,e^{2cz}\qquad\qquad\Big)\Big)\Big)\Big/\qquad\qquad\qquad\qquad\Big)$$

Involving algebraic functions of sinh, sin and exp

Involving $e^{p z} \sin(e z) \cosh(d z) (a + b \sinh(c z))^{\beta}$

01.20.21.1993.01

$$\int e^{p z} \sin(e z) \cosh(d z) (a + b \sinh(c z))^{\beta} dz == \frac{1}{4} i \left(\frac{e^{c z} b}{a - \sqrt{a^2 + b^2}} + 1\right)^{-\beta} \left(\frac{e^{c z} b}{a + \sqrt{a^2 + b^2}} + 1\right)^{-\beta} (a + b \sinh(c z))^{\beta}$$
$$\left(\frac{e^{(-d+i e+p) z}}{d - i e - p + c \beta} F_1\left(\frac{-d + i e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - d + i e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right) - \right.$$
$$\frac{e^{(d+i e+p) z}}{d + i e + p - c \beta} F_1\left(\frac{d + i e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d + i e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right) +$$
$$\frac{e^{(d-i e+p) z}}{d - i e + p - c \beta} F_1\left(\frac{d - i e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d - i e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right) -$$
$$\left.\frac{e^{(-d-i e+p) z}}{d + i e - p + c \beta} F_1\left(-\frac{d + i e - p + c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - d - i e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right)\right)$$

Involving $e^{p z} \sin(e z) \cosh(d z) \left(a + b \sinh^2(c z)\right)^{\beta}$

01.20.21.1994.01

$$\int e^{p z} \sin(e z) \cosh(d z) \left(a + b \sinh^2(c z)\right)^{\beta} dz ==$$
$$\frac{1}{4} i \left(\frac{e^{2 c z} b}{2 a - b + 2 \sqrt{a (a - b)}} + 1\right)^{-\beta} \left(1 - \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(-1 + e^{2 c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(-d+i e+p) z}}{d - i e - p + 2 c \beta} F_1\left(\frac{-d + i e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{-d + i e + p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}}, \right.\right.$$
$$\left.\frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right) + \frac{e^{(d-i e+p) z}}{d - i e + p - 2 c \beta} F_1\left(\frac{d - i e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{d - i e + p}{2 c} - \beta + 1; \right.$$
$$\left.\frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}}, \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right) - \frac{e^{(-d-i e+p) z}}{d + i e - p + 2 c \beta} F_1\left(-\frac{d + i e - p + 2 c \beta}{2 c}; -\beta, \right.$$
$$-\beta; -\frac{d + i e - p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}}, \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\Big) - \frac{e^{(d+i e+p) z}}{d + i e + p - 2 c \beta}$$
$$\left.\left.F_1\left(\frac{d + i e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{d + i e + p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}}, \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right)\right)\right)$$

Involving cos, sinh and exp

Involving $e^{b z^r+e} \cos(a z^r+q) \sinh(w z^r+t) \cosh(c z^r+g)$

01.20.21.1995.01

$$\int e^{b z^r+e} \cos(a z^r+q) \sinh(w z^r+t) \cosh(c z^r+g)\, dz ==$$

$$\frac{1}{8 r}\left(z\left(-e^{e+g+i q+t}\,\Gamma\left(\frac{1}{r}, (-b-c-i a-w) z^r\right)((-b-c-i a-w) z^r)^{-1/r} - e^{e+g-i q+t}((-b-c+i a-w) z^r)^{-1/r}\right.\right.$$
$$\Gamma\left(\frac{1}{r}, (-b-c+i a-w) z^r\right) - e^{e-g+i q+t}((-b+c-i a-w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (-b+c-i a-w) z^r\right) -$$
$$e^{e-g-i q+t}((-b+c+i a-w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (-b+c+i a-w) z^r\right) +$$
$$e^{e+g+i q-t}((-b-c-i a+w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (-b-c-i a+w) z^r\right) +$$
$$e^{e+g-i q-t}((-b-c+i a+w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (-b-c+i a+w) z^r\right) + e^{e-g+i q-t}((-b+c-i a+w) z^r)^{-1/r}$$
$$\left.\left.\Gamma\left(\frac{1}{r}, (-b+c-i a+w) z^r\right) + e^{e-g-i q-t}((-b+c+i a+w) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (-b+c+i a+w) z^r\right)\right)\right)$$

Involving $e^{b z^r+d z+e} \cos(a z^r+p z+q) \sinh(w z^r+s z+t) \cosh(c z^r+f z+g)$

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$$\int e^{b z^2+d z+e} \cos(a z^2+p z+q) \sinh(w z^2+s z+t) \cosh(c z^2+f z+g)\, dz ==$$

$$\frac{1}{16}\left(\left(e^{-\frac{(d-f-i p-s)^2}{4(b-c-i a-w)}+e-g-i q-t}(d-f-i p-s+2(b-c-i a-w) z)\,\Gamma\left(\frac{1}{2}, -\frac{(d-f-i p-s+2(b-c-i a-w) z)^2}{4(b-c-i a-w)}\right)\right)\Big/\right.$$
$$\left((b-c-i a-w)\sqrt{-\frac{(d-f-i p-s+2(b-c-i a-w) z)^2}{b-c-i a-w}}\right) +$$
$$\left(e^{-\frac{(d-f+i p-s)^2}{4(b-c+i a-w)}+e-g+i q-t}(d-f+i p-s+2(b-c+i a-w) z)\,\Gamma\left(\frac{1}{2}, -\frac{(d-f+i p-s+2(b-c+i a-w) z)^2}{4(b-c+i a-w)}\right)\right)\Big/$$
$$\left((b-c+i a-w)\sqrt{-\frac{(d-f+i p-s+2(b-c+i a-w) z)^2}{b-c+i a-w}}\right) +$$
$$\left(e^{-\frac{(d+f-i p-s)^2}{4(b+c-i a-w)}+e+g-i q-t}(d+f-i p-s+2(b+c-i a-w) z)\,\Gamma\left(\frac{1}{2}, -\frac{(d+f-i p-s+2(b+c-i a-w) z)^2}{4(b+c-i a-w)}\right)\right)\Big/$$
$$\left.\left((b+c-i a-w)\sqrt{-\frac{(d+f-i p-s+2(b+c-i a-w) z)^2}{b+c-i a-w}}\right) +\right.$$

$$\left(e^{-\frac{(d+f+i\,p-s)^2}{4\,(b+c+i\,a\,-w)}+e+g+i\,q-t}\,(d+f+i\,p-s+2\,(b+c+i\,a\,-w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+i\,p-s+2\,(b+c+i\,a\,-w)\,z)^2}{4\,(b+c+i\,a\,-w)}\right)\right)\Big/$$

$$\left((b+c+i\,a\,-w)\sqrt{-\frac{(d+f+i\,p-s+2\,(b+c+i\,a\,-w)\,z)^2}{b+c+i\,a\,-w}}\right)-$$

$$\left(e^{-\frac{(d-f-i\,p+s)^2}{4\,(b-c-i\,a\,+w)}+e-g-i\,q+t}\,(d-f-i\,p+s+2\,(b-c-i\,a\,+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f-i\,p+s+2\,(b-c-i\,a\,+w)\,z)^2}{4\,(b-c-i\,a\,+w)}\right)\right)\Big/$$

$$\left((b-c-i\,a\,+w)\sqrt{-\frac{(d-f-i\,p+s+2\,(b-c-i\,a\,+w)\,z)^2}{b-c-i\,a\,+w}}\right)-$$

$$\left(e^{-\frac{(d-f+i\,p+s)^2}{4\,(b-c+i\,a\,+w)}+e-g+i\,q+t}\,(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)^2}{4\,(b-c+i\,a\,+w)}\right)\right)\Big/$$

$$\left((b-c+i\,a\,+w)\sqrt{-\frac{(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)^2}{b-c+i\,a\,+w}}\right)-$$

$$\left(e^{-\frac{(d+f-i\,p+s)^2}{4\,(b+c-i\,a\,+w)}+e+g-i\,q+t}\,(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)^2}{4\,(b+c-i\,a\,+w)}\right)\right)\Big/$$

$$\left((b+c-i\,a\,+w)\sqrt{-\frac{(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)^2}{b+c-i\,a\,+w}}\right)-$$

$$\left(e^{-\frac{(d+f+i\,p+s)^2}{4\,(b+c+i\,a\,+w)}+e+g+i\,q+t}\,(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)^2}{4\,(b+c+i\,a\,+w)}\right)\right)\Big/$$

$$\left((b+c+i\,a\,+w)\sqrt{-\frac{(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)^2}{b+c+i\,a\,+w}}\right)\Bigg)$$

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$$\int e^{\sqrt{z}\,b+e+d\,z}\cos\left(\sqrt{z}\,a+q+p\,z\right)\sinh\left(t+s\,z+w\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz == -\frac{1}{16}$$

$$\left(\left(\left(e^{-\frac{(b-c+i\,a\,-w)^2}{4\,(d-f+i\,p-s)}+e-g+i\,q-t}\left(2\,e^{\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}}\sqrt{-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{d-f+i\,p-s}}\,(d-f+i\,p-s)+(b-c+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.i\,a\,-w)\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}\right)\right)\right)\right)\Big/$$

$$\left((d-f+i\,p-s)^2\sqrt{-\frac{\left(b-c+i\,a-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{d-f+i\,p-s}}\right)+\left(e^{-\frac{(b+c+i\,a-w)^2}{4\,(d+f+i\,p-s)}+e+g+i\,q-t}\right.$$

$$\left(2\,e^{\frac{\left(b+c+i\,a-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}}\sqrt{-\frac{\left(b+c+i\,a-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}}\;(d+f+i\,p-s)+(b+c+i\,a-w)\right.$$

$$\left.\left.\left(b+c+i\,a-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c+i\,a-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d+f+i\,p-s)^2\sqrt{-\frac{\left(b+c+i\,a-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}}\right)+\left(e^{-\frac{(b-c-i\,a-w)^2}{4\,(d-f-i\,p-s)}+e-g-i\,q-t}\right.$$

$$\left(2\,e^{\frac{\left(b-c-i\,a-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}}\sqrt{-\frac{\left(b-c-i\,a-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}}\;(d-f-i\,p-s)+(b-c-i\,a-w)\right.$$

$$\left.\left.\left(b-c-i\,a-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c-i\,a-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d-f-i\,p-s)^2\sqrt{-\frac{\left(b-c-i\,a-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}}\right)+\left(e^{-\frac{(b+c-i\,a-w)^2}{4\,(d+f-i\,p-s)}+e+g-i\,q-t}\right.$$

$$\left(2\,e^{\frac{\left(b+c-i\,a-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}}\sqrt{-\frac{\left(b+c-i\,a-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}}\;(d+f-i\,p-s)+(b+c-i\,a-w)\right.$$

$$\left.\left.\left(b+c-i\,a-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c-i\,a-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d+f-i\,p-s)^2\sqrt{-\frac{\left(b+c-i\,a-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}}\right)-\left(e^{-\frac{(b-c+i\,a+w)^2}{4\,(d-f+i\,p+s)}+e-g+i\,q+t}\right.$$

$$\left(2\, e^{\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}}\sqrt{-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}}\,(d-f+i\,p+s)+(b-c+i\,a\,+w)\right.$$

$$\left.\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}\right)\right)\Big/$$

$$\left((d-f+i\,p+s)^2\sqrt{-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}}\right)-\left(e^{-\frac{(b+c+i\,a\,+w)^2}{4\,(d+f+i\,p+s)}+e+g+i\,q+t}\right.$$

$$\left(2\, e^{\frac{\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p+s)}}\sqrt{-\frac{\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{d+f+i\,p+s}}\,(d+f+i\,p+s)+(b+c+i\,a\,+w)\right.$$

$$\left.\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p+s)}\right)\right)\Big/$$

$$\left((d+f+i\,p+s)^2\sqrt{-\frac{\left(b+c+i\,a\,+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{d+f+i\,p+s}}\right)-\left(e^{-\frac{(b-c-i\,a\,+w)^2}{4\,(d-f-i\,p+s)}+e-g-i\,q+t}\right.$$

$$\left(2\, e^{\frac{\left(b-c-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p+s)}}\sqrt{-\frac{\left(b-c-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{d-f-i\,p+s}}\,(d-f-i\,p+s)+(b-c-i\,a\,+w)\right.$$

$$\left.\left(b-c-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p+s)}\right)\right)\Big/$$

$$\left((d-f-i\,p+s)^2\sqrt{-\frac{\left(b-c-i\,a\,+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{d-f-i\,p+s}}\right)-\left(e^{-\frac{(b+c-i\,a\,+w)^2}{4\,(d+f-i\,p+s)}+e+g-i\,q+t}\right.$$

$$\left(2\, e^{\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}}\sqrt{-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}}\,(d+f-i\,p+s)+(b+c-i\,a+w)\right.$$

$$\left.\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}\right)\right)\Big/$$

$$\left((d+f-i\,p+s)^2\sqrt{-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}}\right)$$

Involving powers of cos, powers of sinh and exp

Involving $e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)$

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$$\int e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)\,dz==$$

$$-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(e^{e+g}\,\Gamma\left(\frac{1}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}+e^{e-g}\,((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)\,z^r\right)\right)\right.$$

$$\left.(1-m \bmod 2)\,(1-u \bmod 2)\right)-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z\right)\binom{u}{\frac{u}{2}}(1-u \bmod 2)\right.$$

$$\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{e+g+2\,i\,j\,q-i\,m\,q}\,\Gamma\left(\frac{1}{r},(-b-c-2\,i\,a\,j+i\,a\,m)\,z^r\right)((-b-c-2\,i\,a\,j+i\,a\,m)\,z^r)^{-1/r}+\right.$$

$$e^{e-g+2\,i\,j\,q-i\,m\,q}\,((-b+c-2\,i\,a\,j+i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-2\,i\,a\,j+i\,a\,m)\,z^r\right)+$$

$$e^{e+g-2\,i\,j\,q+i\,m\,q}\,((-b-c+2\,i\,a\,j-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+2\,i\,a\,j-i\,a\,m)\,z^r\right)+$$

$$\left.e^{e-g-2\,i\,j\,q+i\,m\,q}\,((-b+c+2\,i\,a\,j-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c+2\,i\,a\,j-i\,a\,m)\,z^r\right)\right)-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z\right)\binom{m}{\frac{m}{2}}\right.$$

$$(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{e+g+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{1}{r},(-b-c-2\,k\,w+u\,w)\,z^r\right)((-b-c-2\,k\,w+u\,w)\,z^r)^{-1/r}+\right.$$

$$e^{e-g+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,((-b+c-2\,k\,w+u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+c-2\,k\,w+u\,w)\,z^r\right)+$$

$$e^{e+g-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((-b-c+2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-c+2\,k\,w-u\,w)\,z^r\right)+$$

$$e^{e-g-2kt+tu-\frac{i\pi u}{2}}\left((-b+c+2kw-uw)z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(-b+c+2kw-uw)z^r\right)\Bigg)\Bigg)-$$

$$\frac{1}{r}\Bigg(\left(i^u 2^{-m-u-1}z\right)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{e+g+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}\Gamma\left(\frac{1}{r},(-b-c-2iaj+iam-2kw+uw)z^r\right)$$
$$\left((-b-c-2iaj+iam-2kw+uw)z^r\right)^{-1/r}+e^{e-g+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}$$
$$\left((-b+c-2iaj+iam-2kw+uw)z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(-b+c-2iaj+iam-2kw+uw)z^r\right)+$$
$$e^{e+g-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}\left((-b-c+2iaj-iam-2kw+uw)z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b-c+2iaj-iam-2kw+uw)z^r\right)+e^{e-g-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}$$
$$\left((-b+c+2iaj-iam-2kw+uw)z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(-b+c+2iaj-iam-2kw+uw)z^r\right)+$$
$$e^{e+g+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}\left((-b-c-2iaj+iam+2kw-uw)z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b-c-2iaj+iam+2kw-uw)z^r\right)+e^{e-g+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}$$
$$\left((-b+c-2iaj+iam+2kw-uw)z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(-b+c-2iaj+iam+2kw-uw)z^r\right)+$$
$$e^{e+g-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}\left((-b-c+2iaj-iam+2kw-uw)z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(-b-c+2iaj-\right.$$
$$\left.iam+2kw-uw)z^r\right)+e^{e-g-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}\left((-b+c+2iaj-iam+2kw-uw)z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b+c+2iaj-iam+2kw-uw)z^r\right)\Bigg)\Bigg)\Bigg)\Big/;\ m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0$$

Involving $e^{b z^r+d z+e}\cos^m(a z^r+p z+q)\sinh^u(w z^r+s z+t)\cosh(c z^r+f z+g)$

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$$\int e^{b z^2+d z+e}\cos^m\left(a z^2+p z+q\right)\sinh^u\left(w z^2+s z+t\right)\cosh\left(c z^2+f z+g\right)dz==$$

$$-i^u 2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\Bigg(\frac{e^{-\frac{(d-f)^2}{4(b-c)}+e-g}(d-f+2(b-c)z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f+2(b-c)z)^2}{4(b-c)}\right)}{(b-c)\sqrt{-\frac{(d-f+2(b-c)z)^2}{b-c}}}+$$

$$\frac{e^{-\frac{(d+f)^2}{4(b+c)}+e+g}(d+f+2(b+c)z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)}{(b+c)\sqrt{-\frac{(d+f+2(b+c)z)^2}{b+c}}}\Bigg)(1-m\bmod 2)(1-u\bmod 2)-$$

$$i^u\, 2^{-m-u-2} \binom{u}{\frac{u}{2}} (1-u \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\left(e^{-\frac{(d-f+i\,(2\,k-m)\,p)^2}{4\,(b-c+a\,i\,(2\,k-m))}+e-g+i\,(2\,k-m)\,q} (d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z) \right.\right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}, -\frac{(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)^2}{4\,(b-c+a\,i\,(2\,k-m))}\right)\right) \Big/$$

$$\left((b-c+a\,i\,(2\,k-m)) \sqrt{-\frac{(d-f+i\,(2\,k-m)\,p+2\,(b-c+a\,i\,(2\,k-m))\,z)^2}{b-c+a\,i\,(2\,k-m)}} \right) +$$

$$\left(e^{-\frac{(d+f+i\,(2\,k-m)\,p)^2}{4\,(b+c+a\,i\,(2\,k-m))}+e+g+i\,(2\,k-m)\,q} (d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z) \right.$$

$$\left. \Gamma\left(\frac{1}{2}, -\frac{(d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z)^2}{4\,(b+c+a\,i\,(2\,k-m))}\right)\right) \Big/$$

$$\left((b+c+a\,i\,(2\,k-m)) \sqrt{-\frac{(d+f+i\,(2\,k-m)\,p+2\,(b+c+a\,i\,(2\,k-m))\,z)^2}{b+c+a\,i\,(2\,k-m)}} \right) +$$

$$\left(e^{-\frac{(d-f+i\,(m-2\,k)\,p)^2}{4\,(b-c+a\,i\,(m-2\,k))}+e-g+i\,(m-2\,k)\,q} (d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z) \right.$$

$$\left. \Gamma\left(\frac{1}{2}, -\frac{(d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z)^2}{4\,(b-c+a\,i\,(m-2\,k))}\right)\right) \Big/$$

$$\left((b-c+a\,i\,(m-2\,k)) \sqrt{-\frac{(d-f+i\,(m-2\,k)\,p+2\,(b-c+a\,i\,(m-2\,k))\,z)^2}{b-c+a\,i\,(m-2\,k)}} \right) +$$

$$\left(e^{-\frac{(d+f+i\,(m-2\,k)\,p)^2}{4\,(b+c+a\,i\,(m-2\,k))}+e+g+i\,(m-2\,k)\,q} (d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z) \right.$$

$$\left. \Gamma\left(\frac{1}{2}, -\frac{(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)^2}{4\,(b+c+a\,i\,(m-2\,k))}\right)\right) \Big/$$

$$\left. \left((b+c+a\,i\,(m-2\,k)) \sqrt{-\frac{(d+f+i\,(m-2\,k)\,p+2\,(b+c+a\,i\,(m-2\,k))\,z)^2}{b+c+a\,i\,(m-2\,k)}} \right) \right) -$$

$$i^u\, 2^{-m-u-2} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{i=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^i \binom{u}{i} \left(\left(e^{-\frac{(d-f+s\,(2\,i-u))^2}{4\,(b-c+(2\,i-u)\,w)}+e-g+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}} (d-f+s\,(2\,i-u)+2\,(b-c+(2\,i-u)\,w)\,z) \right.\right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}, -\frac{(d-f+s\,(2\,i-u)+2\,(b-c+(2\,i-u)\,w)\,z)^2}{4\,(b-c+(2\,i-u)\,w)}\right)\right) \Big/$$

$$\left((b-c+(2\,i-u)\,w)\sqrt{-\frac{(d-f+s\,(2\,i-u)+2\,(b-c+(2\,i-u)\,w)\,z)^2}{b-c+(2\,i-u)\,w}}\right)+\left(e^{-\frac{(d+f+s\,(2\,i-u))^2}{4\,(b+c+(2\,i-u)\,w)}+e+g+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$\left.(d+f+s\,(2\,i-u)+2\,(b+c+(2\,i-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+s\,(2\,i-u)+2\,(b+c+(2\,i-u)\,w)\,z)^2}{4\,(b+c+(2\,i-u)\,w)}\right)\right)\Big/$$

$$\left((b+c+(2\,i-u)\,w)\sqrt{-\frac{(d+f+s\,(2\,i-u)+2\,(b+c+(2\,i-u)\,w)\,z)^2}{b+c+(2\,i-u)\,w}}\right)+\left(e^{-\frac{(d-f+s\,(u-2\,i))^2}{4\,(b-c+(u-2\,i)\,w)}+e-g+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\right.$$

$$\left.(d-f+s\,(u-2\,i)+2\,(b-c+(u-2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d-f+s\,(u-2\,i)+2\,(b-c+(u-2\,i)\,w)\,z)^2}{4\,(b-c+(u-2\,i)\,w)}\right)\right)\Big/$$

$$\left((b-c+(u-2\,i)\,w)\sqrt{-\frac{(d-f+s\,(u-2\,i)+2\,(b-c+(u-2\,i)\,w)\,z)^2}{b-c+(u-2\,i)\,w}}\right)+\left(e^{-\frac{(d+f+s\,(u-2\,i))^2}{4\,(b+c+(u-2\,i)\,w)}+e+g+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\right.$$

$$\left.(d+f+s\,(u-2\,i)+2\,(b+c+(u-2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f+s\,(u-2\,i)+2\,(b+c+(u-2\,i)\,w)\,z)^2}{4\,(b+c+(u-2\,i)\,w)}\right)\right)\Big/$$

$$\left.\left((b+c+(u-2\,i)\,w)\sqrt{-\frac{(d+f+s\,(u-2\,i)+2\,(b+c+(u-2\,i)\,w)\,z)^2}{b+c+(u-2\,i)\,w}}\right)\right)-$$

$$i^u\,2^{-m-u-2}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(\left(e^{-\frac{(d-f+i\,(2\,j-m)\,p+s\,(2\,i-u))^2}{4\,(b-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)}+e-g+i\,(2\,j-m)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\right.\right.$$

$$(d-f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)$$

$$\Gamma\left(\frac{1}{2},-(d-f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/\right.$$

$$\left.\left.(4\,(b-c+a\,i\,(2\,j-m)+(2\,i-u)\,w))\right)\right)\Big/\left((b-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\right.$$

$$\sqrt{\left.\left(-(d-f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/\right.\right.}$$

$$\left.\left.(b-c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\right)\right)+\left(e^{-\frac{(d+f+i\,(2\,j-m)\,p+s\,(2\,i-u))^2}{4\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)}+e+g+i\,(2\,j-m)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$(d+f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)$$

$$\Gamma\left(\frac{1}{2},-(d+f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/\right.$$

$$\left.\left.(4\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w))\right)\right)\Big/\left((b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\right.$$

$$\sqrt{\left.\left(-(d+f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/\right.\right.}$$

$$\left.\left.(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\right)\right)+\left(e^{-\frac{(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+e-g+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)$$

$$\Gamma\left(\frac{1}{2},-(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/\right.$$

$$(4\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\Big)\Big/\big((b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)$$

$$\sqrt{\big(-(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\big/}$$

$$(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\big)\big)+\Bigg(e^{-\frac{(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+e+g+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}$$

$$(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/$$

$$(4\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\Big)\Big/\big((b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)$$

$$\sqrt{\big(-(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\big/}$$

$$(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\big)\big)+\Bigg(e^{-\frac{(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+e-g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}$$

$$(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\Big)\Big/\big((b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)$$

$$\sqrt{\big(-(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\big/}$$

$$(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\big)\big)+\Bigg(e^{-\frac{(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+e+g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}$$

$$(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\Big)\Big/\big((b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)$$

$$\sqrt{\big(-(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\big/}$$

$$(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\big)\big)+\Bigg(e^{-\frac{(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+e-g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}$$

$$(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\Big)\Big/\big((b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)$$

$$\sqrt{\big(-(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\big/}$$

$$(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\big)\big)+\Bigg(e^{-\frac{(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+e+g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}$$

$$(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\Big)\Big/\big((b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)$$

$$\sqrt{\big(-(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\big/}$$

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$$\int e^{\sqrt{z}\,b+e+d\,z}\cos^m\left(\sqrt{z}\,a+q+p\,z\right)\sinh^u\left(t+s\,z+w\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(\left(e^{-\frac{(b-c)^2}{4(d-f)}+e-g}\left(2\,e^{\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}}\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)+\right.\right.\right.$$

$$\left.\left.\left.(b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)\right)\Big/$$

$$\left(\left(d-f\right)^2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\right)+\left(e^{-\frac{(b+c)^2}{4(d+f)}+e+g}\left(2\,e^{\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}}\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)+\right.\right.$$

$$\left.\left.(b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\Big/$$

$$\left.\left(\left(d+f\right)^2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\right)\right)(1-m \bmod 2)\,(1-u \bmod 2)+i^u\,2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\left(e^{-\frac{(b-c+a\,i\,(2k-m))^2}{4(d-f+i\,(2k-m)\,p)}+e-g+i\,(2k-m)\,q}\left((b-c+a\,i\,(2k-m))\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)\right.\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}\right)+2\,e^{\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}}\right.$$

$$\left.\left.(d-f+i\,(2k-m)\,p)\sqrt{-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}}\right)\right)\Big/$$

$$\left(\left(d-f+i\,(2k-m)\,p\right)^2\sqrt{-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(b+c+a\,i\,(2\,k-m))^2}{4\,(d+f+i\,(2\,k-m)\,p)}+e+g+i\,(2\,k-m)\,q}\left((b+c+a\,i\,(2\,k-m))\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}\right)+2\,e^{\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}}$$

$$\left.\left.(d+f+i\,(2\,k-m)\,p)\,\sqrt{-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}}\right)\right)\Big/$$

$$\left((d+f+i\,(2\,k-m)\,p)^2\,\sqrt{-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(b-c+a\,i\,(m-2\,k))^2}{4\,(d-f+i\,(m-2\,k)\,p)}+e-g+i\,(m-2\,k)\,q}\left((b-c+a\,i\,(m-2\,k))\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)+2\,e^{\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}}$$

$$\left.\left.(d-f+i\,(m-2\,k)\,p)\,\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\right)\right)\Big/$$

$$\left((d-f+i\,(m-2\,k)\,p)^2\,\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\right)+$$

$$\left(e^{-\frac{(b+c+a\,i\,(m-2\,k))^2}{4\,(d+f+i\,(m-2\,k)\,p)}+e+g+i\,(m-2\,k)\,q}\left((b+c+a\,i\,(m-2\,k))\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)+2\,e^{\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}}$$

$$(d+f+i\,(m-2\,k)\,p)\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\Bigg)\Bigg)\Bigg/$$

$$\left((d+f+i\,(m-2\,k)\,p)^2\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\right)+$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(\Bigg(e^{-\frac{(b-c+(2k-u)w)^2}{4(d-f+s(2k-u))}+e-g+t(2k-u)+\frac{i\pi u}{2}}$$

$$\left(2\,e^{\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}}\sqrt{-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}}\;(d-f+s(2k-u))+\right.$$

$$(b-c+(2k-u)w)\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}\right)\right)\Bigg)\Bigg/$$

$$\left((d-f+s(2k-u))^2\sqrt{-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}}\right)+\Bigg(e^{-\frac{(b+c+(2k-u)w)^2}{4(d+f+s(2k-u))}+e+g+t(2k-u)+\frac{i\pi u}{2}}$$

$$\left(2\,e^{\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}}\sqrt{-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}}\;(d+f+s(2k-u))+\right.$$

$$(b+c+(2k-u)w)\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}\right)\right)\Bigg)\Bigg/$$

$$\left((d+f+s(2k-u))^2\sqrt{-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}}\right)+$$

$$\left(e^{-\frac{(b-c+(u-2k)w)^2}{4(d-f+s(u-2k))}+e-g+t(u-2k)-\frac{i\pi u}{2}}\left((b-c+(u-2k)w)\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}\right)+2e^{\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}}$$

$$\left.\left.(d-f+s(u-2k))\sqrt{-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}}\right)\right)\Big/$$

$$\left((d-f+s(u-2k))^2\sqrt{-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}}\right)+$$

$$\left(e^{-\frac{(b+c+(u-2k)w)^2}{4(d+f+s(u-2k))}+e+g+t(u-2k)-\frac{i\pi u}{2}}\left((b+c+(u-2k)w)\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}\right)+2e^{\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}}$$

$$\left.\left.(d+f+s(u-2k))\sqrt{-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}}\right)\right)\Big/$$

$$\left.\left((d+f+s(u-2k))^2\sqrt{-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}}\right)\right)+$$

$$i^u\,2^{-m-u-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(b-c+a\,i\,(2k-m)+(2j-u)w)^2}{4(d-f+i\,(2k-m)p+s(2j-u))}+e-g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}\left((b-c+a\,i\,(2k-m)+(2j-u)w)\right.\right.\right.$$

$$\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.(4(d-f+i\,(2k-m)p+s(2j-u)))\right)+2e^{\frac{\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)p+s(2j-u))}}\right.$$

$$(d-f+i\,(2k-m)p+s(2j-u))\sqrt{\left(-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+\right.\right.}$$

$$i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\Big)\Big)\Big/$$

$$\Big((d-f+i\,(2\,k-m)\,p+s\,(2\,j-u))^2\,\sqrt{\Big(-\big(b-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d-f+$$

$$i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\Big)\Big)+$$

$$\Bigg(e^{-\frac{(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))}+e+g+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\Bigg((b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)$$

$$\big(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2},-\big(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\Big)+2\,e^{\frac{\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))}}$$

$$(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{\Big(-\big(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+$$

$$i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\Big)\Big)\Big/$$

$$\Big((d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))^2\,\sqrt{\Big(-\big(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+$$

$$i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\Big)\Big)+$$

$$\Bigg(e^{-\frac{(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e-g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\Bigg((b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$

$$\big(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2},-\big(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,e^{\frac{\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}$$

$$(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{\Big(-\big(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+$$

$$i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)\Big/$$

$$\Big((d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\,\sqrt{\Big(-\big(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+$$

$$i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)+$$

$$\Bigg(e^{-\frac{(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\Bigg((b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$

$$\big(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2},-\big(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,e^{\frac{\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))}}$$

$$(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Bigg)\Bigg/$$

$$\Big((d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\,\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+$$

$$\Bigg(e^{-\frac{(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\Bigg((b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$

$$\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$

$$(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+\right.\right.}$$

$$\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Bigg)\Bigg/$$

$$\Big((d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+\right.\right.}$$

$$\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Big)+$$

$$\Bigg(e^{-\frac{(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\Bigg((b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$

$$\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$

$$(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Bigg)\Bigg/$$

$$\Big((d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+\right.\right.}$$

$$\left.\left.i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Big)+$$

$$\left(e^{-\frac{(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\left((b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\right.\right.$$
$$\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}$$
$$(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+\right.\right.}$$
$$\left.\left.i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\Bigg)\Bigg/$$
$$\left((d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+\right.\right.\right.}$$
$$\left.\left.\left.i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)+$$
$$\left(e^{-\frac{(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\left((b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\right.\right.$$
$$\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2$$
$$e^{\frac{\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))}}\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))$$
$$\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Bigg)\Bigg/\left((d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\right.$$
$$\left.\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}\right.$$
$$\left.\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Bigg/;\,m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

Involving rational functions of cos, sinh and exp

Involving $\frac{e^{p\,z}\sinh(e\,z)\cosh(d\,z)}{a+b\cos(c\,z)}$

01.20.21.2001.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(d z)}{a + b \cos(c z)} dz ==$$

$$\frac{1}{4}\left(\left(e^{(-d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}\,(-d+e+i c+p)\right)+\frac{1}{b\sqrt{a^2-b^2}\,(d+e+i c+p)}\left(e^{(d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\left(e^{(-d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}\,(-d-e+i c+p)\right)-\frac{1}{b\sqrt{a^2-b^2}\,(d-e+i c+p)}\left(e^{(d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

Involving $e^{p z} \sinh(e z) \cosh(d z) (a + b \cos(c z))^{-n}$

01.20.21.2002.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(d z)}{(a + b \cos(c z))^2} dz ==$$

$$\frac{1}{4}\left(\left(e^{(-d+e+i c+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg/$$

$$\left(b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c\,+p)\right)+\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c\,+p)}$$

$$\left(e^{(d+e+i\,c\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$

$$\left(e^{(-d-e+i\,c\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$
$$\left.{}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\,\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$
$$\left.\left.{}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/$$
$$\left(b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c\,+p)\right)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c\,+p)}$$
$$\left(e^{(d-e+i\,c\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$
$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$
$$\left.{}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\,\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$
$$\left.\left.\left.{}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\frac{e^{p\,z}\sinh(e\,z)\cosh(d\,z)}{a+b\cos^2(c\,z)}$

01.20.21.2003.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(d z)}{b \cos^2(c z) + a} dz ==$$
$$\frac{1}{4}\left(\left(e^{(-d-e+2 i c+p) z}\left(\left(2 a-2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(1-\frac{i (-d-e+p)}{2 c}, 1; 2-\frac{i (-d-e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a+2 \sqrt{a+b}\ \sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2 a-2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(1-\frac{i (-d-e+p)}{2 c}, 1; 2-\frac{i (-d-e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a-2 \sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right) \Big/$$
$$\left(\sqrt{a}\ b \sqrt{a+b}\ (-d-e+2 i c+p)\right)+\left(e^{(d-e+2 i c+p) z}\left(\left(2 a-2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(1-\frac{i (d-e+p)}{2 c},\right.\right.\right.$$
$$\left.\left.\left.1; 2-\frac{i (d-e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a+2 \sqrt{a+b}\ \sqrt{a}+b}\right)+\left(-2 a-2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(1-\frac{i (d-e+p)}{2 c},\right.\right.\right.$$
$$\left.\left.\left.1; 2-\frac{i (d-e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a-2 \sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (d-e+2 i c+p)\right)-$$
$$\left(e^{(-d+e+2 i c+p) z}\left(\left(2 a-2 \sqrt{a+b}\ \sqrt{a}+b\right) {}_2F_1\left(1-\frac{i (-d+e+p)}{2 c}, 1; 2-\frac{i (-d+e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a+2 \sqrt{a+b}\ \sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2 a-2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(1-\frac{i (-d+e+p)}{2 c}, 1; 2-\frac{i (-d+e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a-2 \sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right) \Big/$$
$$\left(\sqrt{a}\ b \sqrt{a+b}\ (-d+e+2 i c+p)\right)-\left(e^{(d+e+2 i c+p) z}\left(\left(2 a-2 \sqrt{a+b}\ \sqrt{a}+b\right)\right.\right.$$
$$ {}_2F_1\left(1-\frac{i (d+e+p)}{2 c}, 1; 2-\frac{i (d+e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a+2 \sqrt{a+b}\ \sqrt{a}+b}\right)+\left(-2 a-2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1$$
$$\left.\left.\left(1-\frac{i (d+e+p)}{2 c}, 1; 2-\frac{i (d+e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a-2 \sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (d+e+2 i c+p)\right)\Bigg)$$

Involving $e^{p z} \sinh(e z) \cosh(d z) \left(a + b \cos^2(c z)\right)^{-n}$

01.20.21.2004.01

$$\int \frac{e^{p z} \sinh(e z) \cosh(d z)}{\left(b \cos^2(c z) + a\right)^2} dz ==$$
$$\frac{1}{4}\left(\left(e^{(-d-e+2 i c+p) z}\left(-(2 a+b)\left(-2 a+2 \sqrt{a+b}\ \sqrt{a}-b\right) {}_2F_1\left(1-\frac{i (-d-e+p)}{2 c}, 1; 2-\frac{i (-d-e+p)}{2 c};\right.\right.\right.$$
$$\left.\left.\left.-\frac{b e^{2 i c z}}{2 a+2 \sqrt{a+b}\ \sqrt{a}+b}\right)+(-2 a-b)\left(2 a+2 \sqrt{a+b}\ \sqrt{a}+b\right)\right.$$
$$ {}_2F_1\left(1-\frac{i (-d-e+p)}{2 c}, 1; 2-\frac{i (-d-e+p)}{2 c}; -\frac{b e^{2 i c z}}{2 a-2 \sqrt{a+b}\ \sqrt{a}+b}\right)+$$
$$2 \sqrt{a}\left(\left(-2 a^{3/2}+2 \sqrt{a+b}\ a-2 b \sqrt{a}+b \sqrt{a+b}\right) {}_2F_1\left(1-\frac{i (-d-e+p)}{2 c}, 2; 2-\frac{i (-d-e+p)}{2 c};\right.\right.$$

$$-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(-d-e+p)}{2\,c},\,2;\,2-\frac{i\,(-d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-d-e+2\,i\,c+p)\right)+\Bigg(e^{(d-e+2\,i\,c+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(d-e+p)}{2\,c},\,1;\,2-\frac{i\,(d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\Bigg(1-\frac{i\,(d-e+p)}{2\,c},\,1;\,2-\frac{i\,(d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\Bigg(1-\frac{i\,(d-e+p)}{2\,c},\,2;\,2-\frac{i\,(d-e+p)}{2\,c};$$

$$-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(d-e+p)}{2\,c},\,2;\,2-\frac{i\,(d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(d-e+2\,i\,c+p)\right)-\Bigg(e^{(-d+e+2\,i\,c+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(-d+e+p)}{2\,c},\,1;\,2-\frac{i\,(-d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+(-2\,a-b)$$

$$\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\Bigg(1-\frac{i\,(-d+e+p)}{2\,c},\,1;\,2-\frac{i\,(-d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\Bigg(1-\frac{i\,(-d+e+p)}{2\,c},\,2;\,2-\frac{i\,(-d+e+p)}{2\,c};$$

$$-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(-d+e+p)}{2\,c},\,2;\,2-\frac{i\,(-d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-d+e+2\,i\,c+p)\right)-\Bigg(e^{(d+e+2\,i\,c+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$${}_2F_1\Bigg(1-\frac{i\,(d+e+p)}{2\,c},\,1;\,2-\frac{i\,(d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\Bigg(1-\frac{i\,(d+e+p)}{2\,c},\,1;\,2-\frac{i\,(d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$

$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},2;2-\frac{i(d+e+p)}{2c};\right.\right.$$
$$\left.-\frac{b e^{2icz}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\;a+2b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},\right.$$
$$\left.\left.\left.2;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d+e+2ic\;+p)\right)\Bigg)$$

Involving algebraic functions of cos, sinh and exp

Involving $e^{pz}\sinh(ez)\cosh(dz)(a+b\cos(cz))^{\beta}$

01.20.21.2005.01

$$\int e^{pz}\sinh(ez)\cosh(dz)(a+b\cos(cz))^{\beta}\,dz==\frac{1}{4}\left(\frac{e^{icz}b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{icz}b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}be^{-icz}\left(1+e^{2icz}\right)\right)^{\beta}$$
$$\left(\frac{e^{-(d+e-p)z}}{d+e-p+ic\beta}F_1\left(\frac{i(d+e-p+ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c+i(d+e-p)}{c};-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\frac{e^{(d-e+p)z}}{d-e+p-ic\beta}F_1\left(-\frac{i(d-e+p-ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c-i(d-e+p)}{c};-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\frac{e^{(-d+e+p)z}}{d-e-p+ic\beta}F_1\left(-\frac{i(-d+e+p-ic\beta)}{c};-\beta,-\beta;\frac{i(d-e-p)}{c}-\beta+1;-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)+$$
$$\left.\frac{e^{(d+e+p)z}}{d+e+p-ic\beta}F_1\left(-\frac{i(d+e+p-ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c-i(d+e+p)}{c};-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $e^{pz}\sinh(ez)\cosh(dz)\left(a+b\cos^2(cz)\right)^{\beta}$

01.20.21.2006.01

$$\int e^{p z} \sinh(e z) \cosh(d z) \left(a + b \cos^2(c z)\right)^{\beta} dz ==$$

$$\frac{1}{4}\left(\frac{e^{2 i c z} b}{2 a + b - 2\sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{e^{2 i c z} b}{2 a + b + 2\sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{1}{4} b e^{-2 i c z} \left(1 + e^{2 i c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{-(d+e-p) z}}{d + e - p + 2 i c \beta} F_1\left(\frac{i (d + e - p + 2 i c \beta)}{2 c}; -\beta, -\beta; \frac{i (d + e - p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{(-d+e+p) z}}{-d + e + p - 2 i c \beta} F_1\left(-\frac{i (-d + e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (-d + e + p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{(d+e+p) z}}{d + e + p - 2 i c \beta} F_1\left(-\frac{i (d + e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d + e + p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) - \frac{e^{(d-e+p) z}}{d - e + p - 2 i c \beta}$$
$$F_1\left(-\frac{i (d - e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d - e + p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\Bigg)$$

Involving rational functions of sinh, cos and exp

Involving $\frac{e^{p z} \cos(e z) \cosh(d z)}{a + b \sinh(c z)}$

01.20.21.2007.01

$$\int \frac{e^{p z} \cos(e z) \cosh(d z)}{a + b \sinh(c z)} dz ==$$

$$\frac{1}{4}\left(-\frac{1}{b\sqrt{a^2+b^2}\,(c-d+i e+p)}\left(e^{(c-d+i e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d+i e+p)}\left(e^{(c+d+i e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i e+p}{c}, 1; \frac{d+i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d+i e+p}{c}, 1; \frac{d+i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c-d-i e+p)}\left(e^{(c-d-i e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i e+p}{c}, 1; \frac{-d-i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d-i e+p}{c}, 1; \frac{-d-i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d-i e+p)}\left(e^{(c+d-i e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i e+p}{c}, 1; \frac{d-i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d-i e+p}{c}, 1; \frac{d-i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \cos(e z) \cosh(d z) (a + b \sinh(c z))^{-n}$

01.20.21.2008.01

$$\int \frac{e^{p z} \cos(e z) \cosh(d z)}{(a + b \sinh(c z))^2} dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d+i e+p)}\left(e^{(c-d+i e+p)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c}+2;\right.\right.\right.\right.$$
$$\left.\left.\left.\frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)+\right.\right.$$
$$\left.\left.\left(a^2+\sqrt{a^2+b^2}\,a+b^2\right){}_2F_1\left(\frac{c-d+i e+p}{c}, 2; \frac{-d+i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\left(-a^2+\sqrt{a^2+b^2}\,a-b^2\right)\right.\right.$$

$$ {}_2F_1\left(\frac{c-d+i\,e\,+p}{c},\,2;\,\frac{-d+i\,e\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+i\,e\,+p)}$$

$$\left(e^{(c+d+i\,e\,+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e\,+p}{c},\,1;\,\frac{d+i\,e\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\,-a}\right)+\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+i\,e\,+p}{c},\,1;\,\frac{d+i\,e\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d+i\,e\,+p}{c},\,2;\,\frac{d+i\,e\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\,-a}\right)+\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right)$$

$${}_2F_1\left(\frac{c+d+i\,e\,+p}{c},\,2;\,\frac{d+i\,e\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d-i\,e+p)}$$

$$\left(e^{(c-d-i\,e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},\,1;\,\frac{-d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\,-a}\right)+\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},\,1;\,\frac{-d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},\,2;\,\frac{-d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\,-a}\right)+\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right)$$

$${}_2F_1\left(\frac{c-d-i\,e+p}{c},\,2;\,\frac{-d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-i\,e+p)}$$

$$\left(e^{(c+d-i\,e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\,-a}\right)+\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\,-a}\right)+$$

$$\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\Bigg)\Bigg)$$

Involving $\frac{e^{p z}\cos(e z)\cosh(d z)}{a+b\sinh^2(c z)}$

01.20.21.2009.01

$$\int \frac{e^{p z}\cos(e z)\cosh(d z)}{a+b\sinh^2(c z)}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-2c-d+ie+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-d+ie+p}{2c},1;2-\frac{-d+ie+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-d+ie+p}{2c},1;2-\frac{-d+ie+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d+ie+p)\right)+\left(e^{(-2c+d+ie+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d+ie+p}{2c},1;2-\frac{d+ie+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d+ie+p}{2c},1;2-\frac{d+ie+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d+ie+p)\right)+\left(e^{(-2c-d-ie+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-d-ie+p}{2c},1;2-\frac{-d-ie+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-d-ie+p}{2c},1;2-\frac{-d-ie+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d-ie+p)\right)+\left(e^{(-2c+d-ie+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d-ie+p}{2c},1;2-\frac{d-ie+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d-ie+p}{2c},1;2-\frac{d-ie+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d-ie+p)\right)\right)$$

Involving $e^{p z}\cos(e z)\cosh(d z)\left(a+b\sinh^2(c z)\right)^{-n}$

01.20.21.2010.01

$$\int \frac{e^{p z}\cos(e z)\cosh(d z)}{\left(a+b\sinh^2(c z)\right)^2}\,dz == \frac{1}{4}\left(\left(e^{(2c-d+ie+p)z}\left((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,1;\frac{-d+ie+p}{2c}+2;\frac{b e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,1;\frac{-d+ie+p}{2c}+2;\frac{b e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,2;\frac{-d+ie+p}{2c}+\right.\right.\right.\right.$$

$$2;\ \frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\ a-2b\sqrt{a}\ +\sqrt{a-b}\ b\Big)$$

$${}_2F_1\Big(\frac{-d+ie+p}{2c}+1,\ 2;\ \frac{-d+ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\Big(2a^{3/2}(a-b)^{3/2}b\,(2c-d+ie+p)\Big)+\Big(e^{(2c+d+ie+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\ \sqrt{a}\ -b\Big)$$

$${}_2F_1\Big(\frac{d+ie+p}{2c}+1,\ 1;\ \frac{d+ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+$$

$$(2a-b)\Big(-2a+2\sqrt{a-b}\ \sqrt{a}\ +b\Big){}_2F_1\Big(\frac{d+ie+p}{2c}+1,\ 1;\ \frac{d+ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+$$

$$2\sqrt{a}\ \Big(\Big(-2a^{3/2}-2\sqrt{a-b}\ a+2b\sqrt{a}\ +\sqrt{a-b}\ b\Big){}_2F_1\Big(\frac{d+ie+p}{2c}+1,\ 2;\ \frac{d+ie+p}{2c}+$$

$$2;\ \frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\ a-2b\sqrt{a}\ +\sqrt{a-b}\ b\Big)$$

$${}_2F_1\Big(\frac{d+ie+p}{2c}+1,\ 2;\ \frac{d+ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\Big(2a^{3/2}(a-b)^{3/2}b\,(2c+d+ie+p)\Big)+\Big(e^{(2c-d-ie+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\ \sqrt{a}\ -b\Big)$$

$${}_2F_1\Big(\frac{-d-ie+p}{2c}+1,\ 1;\ \frac{-d-ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+$$

$$(2a-b)\Big(-2a+2\sqrt{a-b}\ \sqrt{a}\ +b\Big){}_2F_1\Big(\frac{-d-ie+p}{2c}+1,\ 1;\ \frac{-d-ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+$$

$$2\sqrt{a}\ \Big(\Big(-2a^{3/2}-2\sqrt{a-b}\ a+2b\sqrt{a}\ +\sqrt{a-b}\ b\Big){}_2F_1\Big(\frac{-d-ie+p}{2c}+1,\ 2;\ \frac{-d-ie+p}{2c}+$$

$$2;\ \frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\ a-2b\sqrt{a}\ +\sqrt{a-b}\ b\Big)$$

$${}_2F_1\Big(\frac{-d-ie+p}{2c}+1,\ 2;\ \frac{-d-ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)\Big)\Big)\Big)\Big)\Big/$$

$$\Big(2a^{3/2}(a-b)^{3/2}b\,(2c-d-ie+p)\Big)+\Big(e^{(2c+d-ie+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\ \sqrt{a}\ -b\Big)$$

$${}_2F_1\Big(\frac{d-ie+p}{2c}+1,\ 1;\ \frac{d-ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+$$

$$(2a-b)\Big(-2a+2\sqrt{a-b}\ \sqrt{a}\ +b\Big){}_2F_1\Big(\frac{d-ie+p}{2c}+1,\ 1;\ \frac{d-ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\ \sqrt{a}\ +b}\Big)+$$

$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a-b}\ a+2b\sqrt{a}+\sqrt{a-b}\ b\right){}_2F_1\left(\frac{d-ie+p}{2c}+1,\ 2;\ \frac{d-ie+p}{2c}+2;\right.\right.$$
$$\left.\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\ \sqrt{a}+b}\right)+\left(2a^{3/2}-2\sqrt{a-b}\ a-2b\sqrt{a}+\sqrt{a-b}\ b\right){}_2F_1\left(\frac{d-ie+p}{2c}+\right.$$
$$\left.\left.\left.\left.1,\ 2;\ \frac{d-ie+p}{2c}+2;\ \frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\ \sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}(a-b)^{3/2}b(2c+d-ie+p)\right)\Bigg)$$

Involving algebraic functions of sinh, cos and exp

Involving $e^{pz}\cos(ez)\cosh(dz)(a+b\sinh(cz))^{\beta}$

01.20.21.2011.01

$$\int e^{pz}\cos(ez)\cosh(dz)(a+b\sinh(cz))^{\beta}\,dz==\frac{1}{4}\left(\frac{e^{cz}b}{a-\sqrt{a^2+b^2}}+1\right)^{-\beta}\left(\frac{e^{cz}b}{a+\sqrt{a^2+b^2}}+1\right)^{-\beta}(a+b\sinh(cz))^{\beta}$$
$$\left(\frac{e^{(-d+ie+p)z}}{-d+ie+p-c\beta}F_1\left(\frac{-d+ie+p-c\beta}{c};-\beta,-\beta;\frac{-\beta c+c-d+ie+p}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)+\right.$$
$$\frac{e^{(d+ie+p)z}}{d+ie+p-c\beta}F_1\left(\frac{d+ie+p-c\beta}{c};-\beta,-\beta;\frac{-\beta c+c+d+ie+p}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)+$$
$$\frac{e^{(d-ie+p)z}}{d-ie+p-c\beta}F_1\left(\frac{d-ie+p-c\beta}{c};-\beta,-\beta;\frac{-\beta c+c+d-ie+p}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)-$$
$$\left.\frac{e^{(-d-ie+p)z}}{d+ie-p+c\beta}F_1\left(-\frac{d+ie-p+c\beta}{c};-\beta,-\beta;\frac{-\beta c+c-d-ie+p}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)\right)$$

Involving $e^{pz}\cos(ez)\cosh(dz)\left(a+b\sinh^2(cz)\right)^{\beta}$

01.20.21.2012.01

$$\int e^{p z} \cos(e z) \cosh(d z) \left(a + b \sinh^2(c z)\right)^{\beta} dz ==$$

$$\frac{1}{4}\left(\frac{e^{2 c z} b}{2 a - b + 2\sqrt{a (a-b)}} + 1\right)^{-\beta} \left(1 - \frac{b e^{2 c z}}{-2 a + b + 2\sqrt{a (a-b)}}\right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(-1 + e^{2 c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(-d+i e+p) z}}{-d + i e + p - 2 c \beta} F_1\left(\frac{-d + i e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{-d + i e + p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2\sqrt{a (a-b)}}, \right.\right.$$
$$\left.\frac{b e^{2 c z}}{-2 a + b + 2\sqrt{a (a-b)}}\right) + \frac{e^{(d+i e+p) z}}{d + i e + p - 2 c \beta} F_1\left(\frac{d + i e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{d + i e + p}{2 c} - \beta + 1; \right.$$
$$\left.\frac{b e^{2 c z}}{-2 a + b - 2\sqrt{a (a-b)}}, \frac{b e^{2 c z}}{-2 a + b + 2\sqrt{a (a-b)}}\right) + \frac{e^{(d-i e+p) z}}{d - i e + p - 2 c \beta} F_1\left(\frac{d - i e + p - 2 c \beta}{2 c}; -\beta, \right.$$
$$\left.-\beta; \frac{d - i e + p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2\sqrt{a (a-b)}}, \frac{b e^{2 c z}}{-2 a + b + 2\sqrt{a (a-b)}}\right) - \frac{e^{(-d-i e+p) z}}{d + i e - p + 2 c \beta}$$
$$\left.F_1\left(-\frac{d + i e - p + 2 c \beta}{2 c}; -\beta, -\beta; -\frac{d + i e - p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2\sqrt{a (a-b)}}, \frac{b e^{2 c z}}{-2 a + b + 2\sqrt{a (a-b)}}\right)\right)$$

Involving hyperbolic, trigonometric and a power functions

Involving sin, sinh and power

Involving $z^{\alpha-1} \sin(a z^r + q) \sinh(w z^r + t) \cosh(c z^r + g)$

01.20.21.2013.01

$$\int z^{\alpha-1} \sin(a z^r + q) \sinh(w z^r + t) \cosh(c z^r + g) dz ==$$
$$-\frac{i z^{\alpha}}{8 r}\left(-e^{g+i q+t} \Gamma\left(\frac{\alpha}{r}, (-c - i a - w) z^r\right) ((-c - i a - w) z^r)^{-\frac{\alpha}{r}} + e^{g-i q+t} ((-c + i a - w) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-c + i a - w) z^r\right) - \right.$$
$$e^{-g+i q+t} ((c - i a - w) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c - i a - w) z^r\right) + e^{-g-i q+t} ((c + i a - w) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c + i a - w) z^r\right) +$$
$$e^{g+i q-t} ((-c - i a + w) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-c - i a + w) z^r\right) - e^{g-i q-t} ((-c + i a + w) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-c + i a + w) z^r\right) +$$
$$\left.e^{-g+i q-t} ((c - i a + w) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c - i a + w) z^r\right) - e^{-g-i q-t} ((c + i a + w) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (c + i a + w) z^r\right)\right)$$

Involving $z^n \sin(a z^r + p z + q) \sinh(w z^r + s z + t) \cosh(c z^r + f z + g)$

01.20.21.2014.01

$$\int z^n \sin(a z^2 + p z + q) \sinh(w z^2 + s z + t) \cosh(c z^2 + f z + g) dz ==$$
$$-\frac{1}{16} i \left(-e^{-\frac{(-f-i p-s)^2}{4(-c-i a-w)} - g - i q - t} \left(\sum_{i=0}^{n} 2^{i-n} (f + i p + s)^{n-i} (-f - i p - s + 2 (-c - i a - w) z)^{i+1}\right.\right.$$

$$\left(-\frac{(-f-i\,p-s+2\,(-c-i\,a\,-w)\,z)^2}{-c-i\,a\,-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f-i\,p-s+2\,(-c-i\,a\,-w)\,z)^2}{4\,(-c-i\,a\,-w)}\right)\Bigg)$$

$$(-c-i\,a\,-w)^{-n-1}+e^{-\frac{(-f+i\,p-s)^2}{4\,(-c+i\,a\,-w)}-g+i\,q-t}\,(-c+i\,a\,-w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(f-i\,p+s)^{n-i}\,(-f+i\,p-s+2\,(-c+i\,a\,-w)\,z)^{i+1}$$

$$\left(-\frac{(-f+i\,p-s+2\,(-c+i\,a\,-w)\,z)^2}{-c+i\,a\,-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f+i\,p-s+2\,(-c+i\,a\,-w)\,z)^2}{4\,(-c+i\,a\,-w)}\right)-$$

$$e^{-\frac{(f-i\,p-s)^2}{4\,(c-i\,a\,-w)}+g-i\,q-t}\,(c-i\,a\,-w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-f+i\,p+s)^{n-i}\,(f-i\,p-s+2\,(c-i\,a\,-w)\,z)^{i+1}$$

$$\left(-\frac{(f-i\,p-s+2\,(c-i\,a\,-w)\,z)^2}{c-i\,a\,-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f-i\,p-s+2\,(c-i\,a\,-w)\,z)^2}{4\,(c-i\,a\,-w)}\right)+$$

$$e^{-\frac{(f+i\,p-s)^2}{4\,(c+i\,a\,-w)}+g+i\,q-t}\,(c+i\,a\,-w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-f-i\,p+s)^{n-i}\,(f+i\,p-s+2\,(c+i\,a\,-w)\,z)^{i+1}$$

$$\left(-\frac{(f+i\,p-s+2\,(c+i\,a\,-w)\,z)^2}{c+i\,a\,-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f+i\,p-s+2\,(c+i\,a\,-w)\,z)^2}{4\,(c+i\,a\,-w)}\right)+$$

$$e^{-\frac{(-f-i\,p+s)^2}{4\,(-c-i\,a+w)}-g-i\,q+t}\,(-c-i\,a\,+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(f+i\,p-s)^{n-i}\,(-f-i\,p+s+2\,(-c-i\,a\,+w)\,z)^{i+1}$$

$$\left(-\frac{(-f-i\,p+s+2\,(-c-i\,a\,+w)\,z)^2}{-c-i\,a\,+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f-i\,p+s+2\,(-c-i\,a\,+w)\,z)^2}{4\,(-c-i\,a\,+w)}\right)-$$

$$e^{-\frac{(-f+i\,p+s)^2}{4\,(-c+i\,a+w)}-g+i\,q+t}\,(-c+i\,a\,+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(f-i\,p-s)^{n-i}\,(-f+i\,p+s+2\,(-c+i\,a\,+w)\,z)^{i+1}$$

$$\left(-\frac{(-f+i\,p+s+2\,(-c+i\,a\,+w)\,z)^2}{-c+i\,a\,+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f+i\,p+s+2\,(-c+i\,a\,+w)\,z)^2}{4\,(-c+i\,a\,+w)}\right)+$$

$$e^{-\frac{(f-i\,p+s)^2}{4\,(c-i\,a+w)}+g-i\,q+t}\,(c-i\,a\,+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-f+i\,p-s)^{n-i}\,(f-i\,p+s+2\,(c-i\,a\,+w)\,z)^{i+1}$$

$$\left(-\frac{(f-i\,p+s+2\,(c-i\,a\,+w)\,z)^2}{c-i\,a\,+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f-i\,p+s+2\,(c-i\,a\,+w)\,z)^2}{4\,(c-i\,a\,+w)}\right)-$$

$$e^{-\frac{(f+i\,p+s)^2}{4\,(c+i\,a+w)}+g+i\,q+t}\,(c+i\,a\,+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-f-i\,p-s)^{n-i}\,(f+i\,p+s+2\,(c+i\,a\,+w)\,z)^{i+1}$$

$$\left(-\frac{(f+i\,p+s+2\,(c+i\,a\,+w)\,z)^2}{c+i\,a\,+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f+i\,p+s+2\,(c+i\,a\,+w)\,z)^2}{4\,(c+i\,a\,+w)}\right)\Bigg)\Big/;\,n\in\mathbb{N}$$

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$$\int z^n \sin\left(\sqrt{z}\ a+q+p\,z\right)\sinh\left(t+s\,z+w\sqrt{z}\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$i\,2^{-2n-4}\left(e^{-\frac{(-c+i\,a-w)^2}{4(-f+i\,p-s)}-g+i\,q-t}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+i\,a-w)^{-i-l+2n}\right.\right.$$

$$\left(-c+i\,a-w+2(-f+i\,p-s)\sqrt{z}\right)^{i+l}\left(-\frac{\left(-c+i\,a-w+2(-f+i\,p-s)\sqrt{z}\right)^2}{-f+i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((-c+i\,a-w)\left(-c+i\,a-w+2(-f+i\,p-s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(-c+i\,a-w+2(-f+i\,p-s)\sqrt{z}\right)^2}{4(-f+i\,p-s)}\right)+2\sqrt{-\frac{\left(-c+i\,a-w+2(-f+i\,p-s)\sqrt{z}\right)^2}{-f+i\,p-s}}$$

$$\left.\left.(-f+i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-c+i\,a-w+2(-f+i\,p-s)\sqrt{z}\right)^2}{4(-f+i\,p-s)}\right)\right)\right)(-f+i\,p-s)^{-2n-2}+$$

$$e^{-\frac{(c+i\,a-w)^2}{4(f+i\,p-s)}+g+i\,q-t}(f+i\,p-s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+i\,a-w)^{-i-l+2n}\left(c+i\,a-w+2(f+i\,p-s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c+i\,a-w+2(f+i\,p-s)\sqrt{z}\right)^2}{f+i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+i\,a-w)\left(c+i\,a-w+2(f+i\,p-s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c+i\,a-w+2(f+i\,p-s)\sqrt{z}\right)^2}{4(f+i\,p-s)}\right)+2\sqrt{-\frac{\left(c+i\,a-w+2(f+i\,p-s)\sqrt{z}\right)^2}{f+i\,p-s}}$$

$$\left.(f+i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c+i\,a-w+2(f+i\,p-s)\sqrt{z}\right)^2}{4(f+i\,p-s)}\right)\right)-$$

$$e^{-\frac{(-c-i\,a-w)^2}{4(-f-i\,p-s)}-g-i\,q-t}(-f-i\,p-s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c-i\,a-w)^{-i-l+2n}\left(-c-i\,a-w+2(-f-i\,p-s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c-i\,a\,-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{-f-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\left((-c-i\,a\,-w)\left(-c-i\,a\,-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-c-i\,a\,-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(-f-i\,p-s)}\right)+2\sqrt{-\frac{\left(-c-i\,a\,-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{-f-i\,p-s}}$$

$$\left.(-f-i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-c-i\,a\,-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(-f-i\,p-s)}\right)\right)-$$

$$e^{-\frac{(c-i\,a-w)^2}{4\,(f-i\,p-s)}+g-i\,q-t}\,(f-i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c-i\,a\,-w)^{-i-l+2\,n}\left(c-i\,a\,-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c-i\,a\,-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{f-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c-i\,a\,-w)\left(c-i\,a\,-w+2\,(f-i\,p-s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(c-i\,a\,-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(f-i\,p-s)}\right)+2\sqrt{-\frac{\left(c-i\,a\,-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{f-i\,p-s}}$$

$$\left.(f-i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(c-i\,a\,-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(f-i\,p-s)}\right)\right)-$$

$$e^{-\frac{(-c+i\,a+w)^2}{4\,(-f+i\,p+s)}-g+i\,q+t}\,(-f+i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+i\,a\,+w)^{-i-l+2\,n}\left(-c+i\,a\,+w+2\,(-f+i\,p+s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c+i\,a\,+w+2\,(-f+i\,p+s)\,\sqrt{z}\right)^2}{-f+i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\left((-c+i\,a\,+w)\left(-c+i\,a\,+w+2\,(-f+i\,p+s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-c+i a+w+2(-f+i p+s)\sqrt{z}\right)^2}{4(-f+i p+s)}\right)+2\sqrt{-\frac{\left(-c+i a+w+2(-f+i p+s)\sqrt{z}\right)^2}{-f+i p+s}}$$

$$(-f+i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-c+i a+w+2(-f+i p+s)\sqrt{z}\right)^2}{4(-f+i p+s)}\right)\Bigg)-$$

$$e^{-\frac{(c+i a+w)^2}{4(f+i p+s)}+g+i q+t}(f+i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(c+i a+w)^{-i-l+2n}\left(c+i a+w+2(f+i p+s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c+i a+w+2(f+i p+s)\sqrt{z}\right)^2}{f+i p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((c+i a+w)\left(c+i a+w+2(f+i p+s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c+i a+w+2(f+i p+s)\sqrt{z}\right)^2}{4(f+i p+s)}\right)+2\sqrt{-\frac{\left(c+i a+w+2(f+i p+s)\sqrt{z}\right)^2}{f+i p+s}}$$

$$(f+i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c+i a+w+2(f+i p+s)\sqrt{z}\right)^2}{4(f+i p+s)}\right)\Bigg)+$$

$$e^{-\frac{(-c-i a+w)^2}{4(-f-i p+s)}-g-i q+t}(-f-i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(-c-i a+w)^{-i-l+2n}\left(-c-i a+w+2(-f-i p+s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c-i a+w+2(-f-i p+s)\sqrt{z}\right)^2}{-f-i p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Bigg((-c-i a+w)\left(-c-i a+w+2(-f-i p+s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-c-i a+w+2(-f-i p+s)\sqrt{z}\right)^2}{4(-f-i p+s)}\right)+2\sqrt{-\frac{\left(-c-i a+w+2(-f-i p+s)\sqrt{z}\right)^2}{-f-i p+s}}$$

$$(-f-i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-c-i a+w+2(-f-i p+s)\sqrt{z}\right)^2}{4(-f-i p+s)}\right)\Bigg)+$$

$$e^{-\frac{(c-i a+w)^2}{4(f-i p+s)}+g-i q+t}(f-i p+s)^{-2 n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c-i a+w)^{-i-l+2 n}\left(c-i a+w+2(f-i p+s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c-i a+w+2(f-i p+s)\sqrt{z}\right)^2}{f-i p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((c-i a+w)\left(c-i a+w+2(f-i p+s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c-i a+w+2(f-i p+s)\sqrt{z}\right)^2}{4(f-i p+s)}\right)+2\sqrt{-\frac{\left(c-i a+w+2(f-i p+s)\sqrt{z}\right)^2}{f-i p+s}}$$

$$(f-i p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c-i a+w+2(f-i p+s)\sqrt{z}\right)^2}{4(f-i p+s)}\right)\Bigg)\Bigg);\ n\in\mathbb{N}$$

Involving powers of sin, powers of sinh and power

Involving $z^{\alpha-1}\ \sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)$

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$$\int z^{\alpha-1}\sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)\,dz==$$

$$-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(e^g\,\Gamma\left(\frac{\alpha}{r},-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+e^{-g}\,(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},c\,z^r\right)\right)(1-m\bmod 2)\,(1-u\bmod 2)\right)-$$

$$\frac{1}{r}\Bigg(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{u}{\frac{u}{2}}(1-u\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{g+2 i k q-i m q+\frac{i m\pi}{2}}\,\Gamma\left(\frac{\alpha}{r},(-c-2 i a k+i a m)\,z^r\right)((-c-2 i a k+i a m)\,z^r)^{-\frac{\alpha}{r}}+e^{-g+2 i k q-i m q+\frac{i m\pi}{2}}\right.$$

$$((c-2 i a k+i a m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2 i a k+i a m)\,z^r\right)+e^{g-2 i k q+i m q-\frac{i m\pi}{2}}((-c+2 i a k-i a m)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},(-c+2 i a k-i a m)\,z^r\right)+e^{-g-2 i k q+i m q-\frac{i m\pi}{2}}((c+2 i a k-i a m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2 i a k-i a m)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\Bigg(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{g+2 k t-t u+\frac{i\pi u}{2}}\,\Gamma\left(\frac{\alpha}{r},(-c-2 k w+u w)\,z^r\right)((-c-2 k w+u w)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-g+2 k t-t u+\frac{i\pi u}{2}}((c-2 k w+u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2 k w+u w)\,z^r\right)+e^{g-2 k t+t u-\frac{i\pi u}{2}}((-c+2 k w-u w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r}, (-c+2kw-uw)z^r\right)+e^{-g-2kt+tu-\frac{i\pi u}{2}}((c+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (c+2kw-uw)z^r\right)\Bigg)\Bigg)-$$

$$\frac{1}{r}\Bigg(\left(i^u 2^{-m-u-1}z^\alpha\right)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{g+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+\frac{im\pi}{2}}\Gamma\left(\frac{\alpha}{r}, (-c-2iak+iam-2jw+uw)z^r\right)$$

$$((-c-2iak+iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}+e^{-g+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$((c-2iak+iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (c-2iak+iam-2jw+uw)z^r\right)+$$

$$e^{g-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-\frac{im\pi}{2}}((-c+2iak-iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r}, (-c+2iak-iam-2jw+uw)z^r\right)+e^{-g-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$

$$((c+2iak-iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (c+2iak-iam-2jw+uw)z^r\right)+$$

$$e^{g+2ikq-imq-2jt+tu-\frac{i\pi u}{2}+\frac{im\pi}{2}}((-c-2iak+iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r}, (-c-2iak+iam+2jw-uw)z^r\right)+e^{-g+2ikq-imq-2jt+tu-\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$((c-2iak+iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (c-2iak+iam+2jw-uw)z^r\right)+$$

$$e^{g-2ikq+imq-2jt+tu-\frac{i\pi u}{2}-\frac{im\pi}{2}}((-c+2iak-iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\Bigg(\frac{\alpha}{r}, (-c+2iak-iam+$$

$$2jw-uw)z^r\Bigg)+e^{-g-2ikq+imq-2jt+tu-\frac{i\pi u}{2}-\frac{im\pi}{2}}((c+2iak-iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r}, (c+2iak-iam+2jw-uw)z^r\right)\Bigg)\Bigg)\Bigg/;\ m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0$$

Involving $z^n \sin^m(a z^r + p z + q) \sinh^u(w z^r + s z + t) \cosh(c z^r + f z + g)$

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$$\int z^n \sin^m(a z^2+p z+q)\sinh^u(w z^2+s z+t)\cosh(c z^2+f z+g)\,dz == -i^u 2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)(1-u \bmod 2)$$

$$\Bigg(e^{\frac{f^2}{4c}-g}\Bigg(\sum_{i=0}^{n}2^{i-n}f^{n-i}(-f-2cz)^{i+1}\left(\frac{(-f-2cz)^2}{c}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2}, \frac{(-f-2cz)^2}{4c}\right)\Bigg)(-c)^{-n-1}+$$

$$c^{-n-1}e^{g-\frac{f^2}{4c}}\sum_{i=0}^{n}2^{i-n}(-f)^{n-i}(f+2cz)^{i+1}\left(-\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2}, -\frac{(f+2cz)^2}{4c}\right)\Bigg)-$$

$$i^u 2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{(i(2k-m)p-f)^2}{4(ia(2k-m)-c)}-g+i(2k-m)q+\frac{im\pi}{2}}\Bigg(\sum_{i=0}^{n}2^{i-n}(f-i(2k-m)p)^{n-i}$$

$$(-f+i\,(2\,k-m)\,p+2\,(i\,a\,(2\,k-m)-c)\,z)^{i+1}\left(-\frac{(-f+i\,(2\,k-m)\,p+2\,(i\,a\,(2\,k-m)-c)\,z)^2}{i\,a\,(2\,k-m)-c}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f+i\,(2\,k-m)\,p+2\,(i\,a\,(2\,k-m)-c)\,z)^2}{4\,(i\,a\,(2\,k-m)-c)}\right)\Bigg)(i\,a\,(2\,k-m)-c)^{-n-1}+$$

$$e^{-\frac{(f+i\,(2\,k-m)\,p)^2}{4\,(c+a\,i\,(2\,k-m))}+g+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}(c+a\,i\,(2\,k-m))^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-f-i\,(2\,k-m)\,p)^{n-i}$$

$$(f+i\,(2\,k-m)\,p+2\,(c+a\,i\,(2\,k-m))\,z)^{i+1}\left(-\frac{(f+i\,(2\,k-m)\,p+2\,(c+a\,i\,(2\,k-m))\,z)^2}{c+a\,i\,(2\,k-m)}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f+i\,(2\,k-m)\,p+2\,(c+a\,i\,(2\,k-m))\,z)^2}{4\,(c+a\,i\,(2\,k-m))}\right)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p-f)^2}{4\,(i\,a\,(m-2\,k)-c)}-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}(i\,a\,(m-2\,k)-c)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(f-i\,(m-2\,k)\,p)^{n-i}$$

$$(-f+i\,(m-2\,k)\,p+2\,(i\,a\,(m-2\,k)-c)\,z)^{i+1}\left(-\frac{(-f+i\,(m-2\,k)\,p+2\,(i\,a\,(m-2\,k)-c)\,z)^2}{i\,a\,(m-2\,k)-c}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f+i\,(m-2\,k)\,p+2\,(i\,a\,(m-2\,k)-c)\,z)^2}{4\,(i\,a\,(m-2\,k)-c)}\right)+$$

$$e^{-\frac{(f+i\,(m-2\,k)\,p)^2}{4\,(c+a\,i\,(m-2\,k))}+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}(c+a\,i\,(m-2\,k))^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-f-i\,(m-2\,k)\,p)^{n-i}$$

$$(f+i\,(m-2\,k)\,p+2\,(c+a\,i\,(m-2\,k))\,z)^{i+1}\left(-\frac{(f+i\,(m-2\,k)\,p+2\,(c+a\,i\,(m-2\,k))\,z)^2}{c+a\,i\,(m-2\,k)}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f+i\,(m-2\,k)\,p+2\,(c+a\,i\,(m-2\,k))\,z)^2}{4\,(c+a\,i\,(m-2\,k))}\right)\Bigg)-$$

$$i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{(s\,(2\,k-u)-f)^2}{4\,((2\,k-u)\,w-c)}-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\left(\sum_{i=0}^{n}2^{i-n}\,(f-s\,(2\,k-u))^{n-i}\right.$$

$$(-f+s\,(2\,k-u)+2\,((2\,k-u)\,w-c)\,z)^{i+1}\left(-\frac{(-f+s\,(2\,k-u)+2\,((2\,k-u)\,w-c)\,z)^2}{(2\,k-u)\,w-c}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f+s\,(2\,k-u)+2\,((2\,k-u)\,w-c)\,z)^2}{4\,((2\,k-u)\,w-c)}\right)\Bigg)((2\,k-u)\,w-c)^{-n-1}+$$

$$e^{-\frac{(f+s\,(2\,k-u))^2}{4\,(c+(2\,k-u)\,w)}+g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}(c+(2\,k-u)\,w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-f-s\,(2\,k-u))^{n-i}\,(f+s\,(2\,k-u)+2\,(c+(2\,k-u)\,w)\,z)^{i+1}$$

$$\left(-\frac{(f+s(2k-u)+2(c+(2k-u)w)z)^2}{c+(2k-u)w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f+s(2k-u)+2(c+(2k-u)w)z)^2}{4(c+(2k-u)w)}\right)+$$

$$e^{-\frac{(s(u-2k)-f)^2}{4((u-2k)w-c)}-g+t(u-2k)-\frac{i\pi u}{2}}((u-2k)w-c)^{-n-1}\sum_{i=0}^{n}2^{i-n}(f-s(u-2k))^{n-i}$$

$$(-f+s(u-2k)+2((u-2k)w-c)z)^{i+1}\left(-\frac{(-f+s(u-2k)+2((u-2k)w-c)z)^2}{(u-2k)w-c}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-f+s(u-2k)+2((u-2k)w-c)z)^2}{4((u-2k)w-c)}\right)+$$

$$e^{-\frac{(f+s(u-2k))^2}{4(c+(u-2k)w)}+g+t(u-2k)-\frac{i\pi u}{2}}(c+(u-2k)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}(-f-s(u-2k))^{n-i}(f+s(u-2k)+2(c+(u-2k)w)z)^{i+1}$$

$$\left(-\frac{(f+s(u-2k)+2(c+(u-2k)w)z)^2}{c+(u-2k)w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(f+s(u-2k)+2(c+(u-2k)w)z)^2}{4(c+(u-2k)w)}\right)-$$

$$i^u 2^{-m-u-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(-f+i(2k-m)p+s(2j-u))^2}{4(-c+ai(2k-m)+(2j-u)w)}-g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}\right.$$

$$\left(\sum_{i=0}^{n}2^{i-n}(f-i(2k-m)p-s(2j-u))^{n-i}(-f+i(2k-m)p+s(2j-u)+2(-c+ai(2k-m)+(2j-u)w)z)^{i+1}\right.$$

$$\left(-(-f+i(2k-m)p+s(2j-u)+2(-c+ai(2k-m)+(2j-u)w)z)^2\Big/(-c+ai(2k-m)+(2j-u)w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(-f+i(2k-m)p+s(2j-u)+2(-c+ai(2k-m)+(2j-u)w)z)^2\Big/(4(-c+ai(2k-m)+(2j-u)w))\right)\Bigg)$$

$$(-c+ai(2k-m)+(2j-u)w)^{-n-1}+e^{-\frac{(f+i(2k-m)p+s(2j-u))^2}{4(c+ai(2k-m)+(2j-u)w)}+g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$(c+ai(2k-m)+(2j-u)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}(-f-i(2k-m)p-s(2j-u))^{n-i}$$

$$(f+i(2k-m)p+s(2j-u)+2(c+ai(2k-m)+(2j-u)w)z)^{i+1}\left(-(f+i(2k-m)p+s(2j-u)+2(c+ai(2k-m)+(2j-u)w)z)^2\Big/(c+ai(2k-m)+(2j-u)w)\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(f+i(2k-m)p+s(2j-u)+2(c+ai(2k-m)+(2j-u)w)z)^2\Big/(4(c+ai(2k-m)+(2j-u)w))\right)+e^{-\frac{(-f+i(m-2k)p+s(2j-u))^2}{4(-c+ai(m-2k)+(2j-u)w)}-g+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$

$$(-c+ai(m-2k)+(2j-u)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}(f-i(m-2k)p-s(2j-u))^{n-i}$$

$$(-f+i(m-2k)p+s(2j-u)+2(-c+ai(m-2k)+(2j-u)w)z)^{i+1}$$

$$\left(-(-f+i(m-2k)p+s(2j-u)+2(-c+ai(m-2k)+(2j-u)w)z)^2\Big/\right.$$

$$(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},\,-(-f+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$

$$2\,(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/(4\,(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w))\Big)+$$

$$e^{-\frac{(f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2}{4\,(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)}+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-n-1}\sum_{i=0}^{n}2^{i-n}$$

$$(-f-i\,(m-2\,k)\,p-s\,(2\,j-u))^{n-i}(f+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^{i+1}$$
$$\Big(-(f+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/$$

$$(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},\,-(f+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$

$$2\,(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/(4\,(c+a\,i\,(m-2\,k)+(2\,j-u)\,w))\Big)+$$

$$e^{-\frac{(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2}{4\,(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)}-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(f-i\,(2\,k-m)\,p-s\,(u-2\,j))^{n-i}(-f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(-c+a\,i\,(2\,k-m)+(u-2\,j)$$

$$w)\,z)^{i+1}\Big(-(-f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},\,-(-f+i\,(2\,k-m)\,p+$$

$$s\,(u-2\,j)+2\,(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/(4\,(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w))\Big)+$$

$$e^{-\frac{(f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2}{4\,(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)}+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-n-1}\sum_{i=0}^{n}2^{i-n}$$

$$(-f-i\,(2\,k-m)\,p-s\,(u-2\,j))^{n-i}(f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\Big(-(f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},\,-(f+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$

$$2\,(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/(4\,(c+a\,i\,(2\,k-m)+(u-2\,j)\,w))\Big)+$$

$$e^{-\frac{(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2}{4\,(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)}-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(f-i\,(m-2\,k)\,p-s\,(u-2\,j))^{n-i}$$

$$(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\Big(-(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},\,-(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)+$$

$$2\,(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/(4\,(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w))\Big)+$$

$$e^{-\frac{(f+i\,(m-2\,k)\,p+s\,(u-2\,j))^2}{4\,(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)}+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-n-1}\sum_{i=0}^{n}2^{i-n}$$

$$(-f-i\,(m-2\,k)\,p-s\,(u-2\,j))^{n-i}(f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\Big(-(f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(c+a\,i\,(m-2\,k)+(u-2\,j)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},\,-(f+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/\right.$$

$$\left.(4\,(c+a\,i\,(m-2\,k)+(u-2\,j)\,w))\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\;a+p\,z+q\right)\sinh^u\left(w\,\sqrt{z}\;+s\,z+t\right)\cosh\left(\sqrt{z}\;c+f\,z+g\right)dz==$$

$$i^u\,2^{-m-2\,n-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,f^{-2\,n-2}$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c)^{-i-l+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{i+l}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\right.$$

$$\left.-c\left(-c-2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\,\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(i+l+2),\,\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{g-\frac{c^2}{4\,f}}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,c^{-i-l+2\,n}\left(c+2\,f\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(c\left(c+2\,f\,\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(i+l+1),\,-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)+$$

$$i^u\,2^{-m-2\,n-u-2}\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(i\,a\,(2\,k-m)-c)^2}{4\,(i\,(2\,k-m)\,p-f)}-g+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(i\,(2\,k-m)\,p-f)^{-2\,n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a\,(2\,k-m)-c)^{-i-l+2\,n}\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a\,(2\,k-m)-c)\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)\Gamma\right($$

$$\frac{1}{2}(i+l+1),-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p-f)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p-f}}\;(i\,(2\,k-m)\,p-f)\,\Gamma\Bigg(\frac{1}{2}(i+l+2),$$

$$-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p-f)}\Bigg)\Bigg)+e^{-\frac{(c+a\,i\,(2\,k-m))^2}{4\,(f+i\,(2\,k-m)\,p)}+g+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}$$

$$(f+i\,(2\,k-m)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(2\,k-m))^{-i-l+2\,n}\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{f+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((c+a\,i\,(2\,k-m))\left(c+a\,i\,(2\,k-m)+\right.$$

$$\left.2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p)}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{f+i\,(2\,k-m)\,p}}\;(f+i\,(2\,k-m)\,p)\,\Gamma\Bigg($$

$$\frac{1}{2}(i+l+2),-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p)}\Bigg)\Bigg)+$$

$$e^{-\frac{(i\,a\,(m-2\,k)-c)^2}{4\,(i\,(m-2\,k)\,p-f)}-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(i\,(m-2\,k)\,p-f)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a\,(m-2\,k)-c)^{-i-l+2\,n}$$

$$\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((i\,a\,(m-2\,k)-c)\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p-f)}\Bigg)+$$

$$2\,(i\,(m-2\,k)\,p-f)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p-f)}\right)$$

$$\sqrt{-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p-f}}\Bigg)+$$

$$e^{-\frac{(c+a\,i\,(m-2\,k))^2}{4\,(f+i\,(m-2\,k)\,p)}+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(m-2\,k))^{-i-l+2\,n}$$

$$\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((c+a\,i\,(m-2\,k))\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p)}\Bigg)+$$

$$2\sqrt{-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{f+i\,(m-2\,k)\,p}}\;(f+i\,(m-2\,k)\,p)\,\Gamma\Bigg($$

$$\frac{1}{2}(i+l+2),-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p)}\Bigg)\Bigg)\Bigg)+$$

$$i^u\,2^{-m-2\,n-u-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{((2\,k-u)\,w-c)^2}{4\,(s\,(2\,k-u)-f)}-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\,(s\,(2\,k-u)-f)^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,((2\,k-u)\,w-c)^{-i-l+2\,n}\left(-c+(2\,k-u)\,w+2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{s(2k-u)-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(((2k-u)w-c)\left(-c+(2k-u)w+\right.\right.$$

$$\left.2(s(2k-u)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{4(s(2k-u)-f)}\right)+$$

$$2\sqrt{-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{s(2k-u)-f}}\,(s(2k-u)-f)\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$

$$\left.\left.-\frac{\left(-c+(2k-u)w+2(s(2k-u)-f)\sqrt{z}\right)^2}{4(s(2k-u)-f)}\right)\right)+$$

$$e^{-\frac{(c+(2k-u)w)^2}{4(f+s(2k-u))}+g+t(2k-u)+\frac{i\pi u}{2}}(f+s(2k-u))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(c+(2k-u)w)^{-i-l+2n}$$

$$\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{f+s(2k-u)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((c+(2k-u)w)\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{4(f+s(2k-u))}\right)+2\sqrt{-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{f+s(2k-u)}}$$

$$\left.(f+s(2k-u))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c+(2k-u)w+2(f+s(2k-u))\sqrt{z}\right)^2}{4(f+s(2k-u))}\right)\right)+$$

$$e^{-\frac{((u-2k)w-c)^2}{4(s(u-2k)-f)}-g+t(u-2k)-\frac{i\pi u}{2}}(s(u-2k)-f)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i((u-2k)w-c)^{-i-l+2n}$$

$$\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^{i+l}\left(-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((u-2k)w-c\right)\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}\right)+$$

$$2\sqrt{-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}}\,(s(u-2k)-f)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}\right)+$$

$$e^{-\frac{(c+(u-2k)w)^2}{4(f+s(u-2k))}+g+t(u-2k)-\frac{i\pi u}{2}}(f+s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(c+(u-2k)w)^{-i-l+2n}$$

$$\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((c+(u-2k)w)\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}\right)+2\sqrt{-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}}\,(f+s(u-2k))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}\right)\right)+$$

$$i^u 2^{-m-2n-u-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(-c+a\,i\,(2k-m)+(2j-u)w)^2}{4(-f+i\,(2k-m)p+s(2j-u))}-g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(-c+a\,i\,(2k-m)+(2j-u)w)^{-i-l+2n}\right.$$

$$\left.\left(-c+a\,i\,(2k-m)+(2j-u)w+2(-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^{i+l}\right.$$

$$\left(-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((-c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\right.$$
$$\left.\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$
$$-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$\left.(4\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.\left.2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\right)$$

$$(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}+e^{-\frac{(c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^2}{4\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))}+g+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}$$
$$(f+i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\right.$$
$$\left.\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.\left.2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\right)+$$

$$e^{-\frac{(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}-g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$
$$\Big(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),$$
$$-\Big(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)\sqrt{\Big(-\Big(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+$$
$$2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)+$$

$$e^{-\frac{(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\Big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^{i+l}$$
$$\Big(-\Big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$
$$\Big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)\sqrt{\Big(-\Big(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+$$
$$2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)+$$

$$e^{-\frac{(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\Big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^{i+l}$$
$$\Big(-\Big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$
$$(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$
$$\Big(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),\ -\left(-c+a\,i\,(2k-m)+(u-2j)\,w+2\,(-f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(2k-m)\,p+s\,(u-2j)))\right)+2\,(-f+i\,(2k-m)\,p+s\,(u-2j))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$
$$\left.-\left(-c+a\,i\,(2k-m)+(u-2j)\,w+2\,(-f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(2k-m)\,p+s\,(u-2j)))\right)\sqrt{\left(-\left(-c+a\,i\,(2k-m)+(u-2j)\,w+\right.\right.}$$
$$\left.\left.2\,(-f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/(-f+i\,(2k-m)\,p+s\,(u-2j))\right)\Big)+$$

$$e^{-\frac{(c+a\,i\,(2k-m)+(u-2j)\,w)^2}{4\,(f+i\,(2k-m)\,p+s\,(u-2j))}+g+i\,(2k-m)\,q+t\,(u-2j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(f+i\,(2k-m)\,p+s\,(u-2j))^{-2n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(2k-m)+(u-2j)\,w)^{-i-l+2n}$$
$$\left(c+a\,i\,(2k-m)+(u-2j)\,w+2\,(f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(c+a\,i\,(2k-m)+(u-2j)\,w+2\,(f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(f+i\,(2k-m)\,p+s\,(u-2j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+a\,i\,(2k-m)+(u-2j)\,w)\right.$$
$$\left.\left(c+a\,i\,(2k-m)+(u-2j)\,w+2\,(f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\ -\left(c+a\,i\,(2k-m)+(u-2j)\,w+2\,(f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(2k-m)\,p+s\,(u-2j)))\right)+2\,(f+i\,(2k-m)\,p+s\,(u-2j))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\ -\left(c+a\,i\,(2k-m)+(u-2j)\,w+2\,(f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(2k-m)\,p+s\,(u-2j)))\right)\sqrt{\left(-\left(c+a\,i\,(2k-m)+(u-2j)\,w+\right.\right.}$$
$$\left.\left.2\,(f+i\,(2k-m)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/(f+i\,(2k-m)\,p+s\,(u-2j))\right)\Big)+$$

$$e^{-\frac{(-c+a\,i\,(m-2k)+(u-2j)\,w)^2}{4\,(-f+i\,(m-2k)\,p+s\,(u-2j))}-g+i\,(m-2k)\,q+t\,(u-2j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(-f+i\,(m-2k)\,p+s\,(u-2j))^{-2n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+a\,i\,(m-2k)+(u-2j)\,w)^{-i-l+2n}$$
$$\left(-c+a\,i\,(m-2k)+(u-2j)\,w+2\,(-f+i\,(m-2k)\,p+s\,(u-2j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(-c+a\,i\,(m-2k)+(u-2j)\,w+2\,(-f+i\,(m-2k)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(-f+i\,(m-2k)\,p+s\,(u-2j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((-c+a\,i\,(m-2k)+(u-2j)\,w)\right.$$
$$\left.\left(-c+a\,i\,(m-2k)+(u-2j)\,w+2\,(-f+i\,(m-2k)\,p+s\,(u-2j))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\ -\left(-c+a\,i\,(m-2k)+(u-2j)\,w+2\,(-f+i\,(m-2k)\,p+s\,(u-2j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(m-2k)\,p+s\,(u-2j)))\right)+2\,(-f+i\,(m-2k)\,p+s\,(u-2j))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$

$$-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)\sqrt{\left(-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+\right.\right.}$$

$$\left.\left.2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\Big)+$$

$$e^{-\frac{(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((c+a\,i\,(m-2\,k)+(u-2\,j)\,w)$$

$$\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)$$

$$\sqrt{\left(-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

Involving cos, sinh and power

Involving $z^{\alpha-1}\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh(c\,z^r+g)$

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$$\int z^{\alpha-1}\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh(c\,z^r+g)\,dz==$$

$$\frac{1}{8\,r}\left(z^{\alpha}\left(-e^{g+i\,q+t}\,\Gamma\left(\frac{\alpha}{r},\,(-c-i\,a\,-w)\,z^r\right)((-c-i\,a\,-w)\,z^r)^{-\frac{\alpha}{r}}-e^{g-i\,q+t}\,((-c+i\,a\,-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-c+i\,a\,-w)\,z^r\right)-\right.\right.$$

$$e^{-g+i\,q+t}\,((c-i\,a\,-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(c-i\,a\,-w)\,z^r\right)-e^{-g-i\,q+t}\,((c+i\,a\,-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(c+i\,a\,-w)\,z^r\right)+$$

$$e^{g+i\,q-t}\,((-c-i\,a\,+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-c-i\,a\,+w)\,z^r\right)+e^{g-i\,q-t}\,((-c+i\,a\,+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-c+i\,a\,+w)\,z^r\right)+$$

$$\left.\left.e^{-g+i\,q-t}\,((c-i\,a\,+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(c-i\,a\,+w)\,z^r\right)+e^{-g-i\,q-t}\,((c+i\,a\,+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(c+i\,a\,+w)\,z^r\right)\right)\right)$$

Involving $z^n \cos(a z^r + p z + q) \sinh(w z^r + s z + t) \cosh(c z^r + f z + g)$

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$$\int z^n \cos(a z^2 + p z + q) \sinh(w z^2 + s z + t) \cosh(c z^2 + f z + g)\, dz ==$$

$$\frac{1}{16}\left(e^{-\frac{(-f-i p-s)^2}{4(-c-i a-w)}-g-i q-t}\left(\sum_{l=0}^{n} 2^{l-n}(f+i p+s)^{n-l}(-f-i p-s+2(-c-i a-w)z)^{l+1}\right.\right.$$

$$\left.\left(-\frac{(-f-i p-s+2(-c-i a-w)z)^2}{-c-i a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f-i p-s+2(-c-i a-w)z)^2}{4(-c-i a-w)}\right)\right)$$

$$(-c-i a-w)^{-n-1}+e^{-\frac{(-f+i p-s)^2}{4(-c+i a-w)}-g+i q-t}(-c+i a-w)^{-n-1}\sum_{l=0}^{n} 2^{l-n}(f-i p+s)^{n-l}(-f+i p-s+2(-c+i a-w)z)^{l+1}$$

$$\left(-\frac{(-f+i p-s+2(-c+i a-w)z)^2}{-c+i a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f+i p-s+2(-c+i a-w)z)^2}{4(-c+i a-w)}\right)+$$

$$e^{-\frac{(f-i p-s)^2}{4(c-i a-w)}+g-i q-t}(c-i a-w)^{-n-1}\sum_{l=0}^{n} 2^{l-n}(-f+i p+s)^{n-l}(f-i p-s+2(c-i a-w)z)^{l+1}$$

$$\left(-\frac{(f-i p-s+2(c-i a-w)z)^2}{c-i a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f-i p-s+2(c-i a-w)z)^2}{4(c-i a-w)}\right)+$$

$$e^{-\frac{(f+i p-s)^2}{4(c+i a-w)}+g+i q-t}(c+i a-w)^{-n-1}\sum_{l=0}^{n} 2^{l-n}(-f-i p+s)^{n-l}(f+i p-s+2(c+i a-w)z)^{l+1}$$

$$\left(-\frac{(f+i p-s+2(c+i a-w)z)^2}{c+i a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f+i p-s+2(c+i a-w)z)^2}{4(c+i a-w)}\right)-$$

$$e^{-\frac{(-f-i p+s)^2}{4(-c-i a+w)}-g-i q+t}(-c-i a+w)^{-n-1}\sum_{l=0}^{n} 2^{l-n}(f+i p-s)^{n-l}(-f-i p+s+2(-c-i a+w)z)^{l+1}$$

$$\left(-\frac{(-f-i p+s+2(-c-i a+w)z)^2}{-c-i a+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f-i p+s+2(-c-i a+w)z)^2}{4(-c-i a+w)}\right)-$$

$$e^{-\frac{(-f+i p+s)^2}{4(-c+i a+w)}-g+i q+t}(-c+i a+w)^{-n-1}\sum_{l=0}^{n} 2^{l-n}(f-i p-s)^{n-l}(-f+i p+s+2(-c+i a+w)z)^{l+1}$$

$$\left(-\frac{(-f+i p+s+2(-c+i a+w)z)^2}{-c+i a+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f+i p+s+2(-c+i a+w)z)^2}{4(-c+i a+w)}\right)-$$

$$e^{-\frac{(f-i p+s)^2}{4(c-i a+w)}+g-i q+t}(c-i a+w)^{-n-1}\sum_{l=0}^{n} 2^{l-n}(-f+i p-s)^{n-l}(f-i p+s+2(c-i a+w)z)^{l+1}$$

$$\left(-\frac{(f-i\,p+s+2\,(c-i\,a\,+w)\,z)^2}{c-i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f-i\,p+s+2\,(c-i\,a\,+w)\,z)^2}{4\,(c-i\,a\,+w)}\right)-$$

$$e^{-\frac{(f+i\,p+s)^2}{4\,(c+i\,a\,+w)}+g+i\,q+t}\,(c+i\,a\,+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-f-i\,p-s)^{n-l}\,(f+i\,p+s+2\,(c+i\,a\,+w)\,z)^{l+1}$$

$$\left(-\frac{(f+i\,p+s+2\,(c+i\,a\,+w)\,z)^2}{c+i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f+i\,p+s+2\,(c+i\,a\,+w)\,z)^2}{4\,(c+i\,a\,+w)}\right)\Bigg)\Big/;\,n\in\mathbb{N}$$

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$$\int z^n\cos\left(\sqrt{z}\;a+q+p\,z\right)\sinh\left(t+s\,z+w\,\sqrt{z}\;\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$-2^{-2\,n-4}\left(e^{-\frac{(-c+i\,a-w)^2}{4\,(-f+i\,p-s)}-g+i\,q-t}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+i\,a\,-w)^{-i-l+2\,n}\right.\right.$$

$$\left(-c+i\,a\,-w+2\,(-f+i\,p-s)\,\sqrt{z}\;\right)^{i+l}\left(-\frac{\left(-c+i\,a\,-w+2\,(-f+i\,p-s)\,\sqrt{z}\;\right)^2}{-f+i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((-c+i\,a\,-w)\left(-c+i\,a\,-w+2\,(-f+i\,p-s)\,\sqrt{z}\;\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(-c+i\,a\,-w+2\,(-f+i\,p-s)\,\sqrt{z}\;\right)^2}{4\,(-f+i\,p-s)}\right)+2\sqrt{-\frac{\left(-c+i\,a\,-w+2\,(-f+i\,p-s)\,\sqrt{z}\;\right)^2}{-f+i\,p-s}}$$

$$\left.\left.(-f+i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),-\frac{\left(-c+i\,a\,-w+2\,(-f+i\,p-s)\,\sqrt{z}\;\right)^2}{4\,(-f+i\,p-s)}\right)\right)\right)(-f+i\,p-s)^{-2\,n-2}+$$

$$e^{-\frac{(c+i\,a-w)^2}{4\,(f+i\,p-s)}+g+i\,q-t}\,(f+i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+i\,a\,-w)^{-i-l+2\,n}\left(c+i\,a\,-w+2\,(f+i\,p-s)\,\sqrt{z}\;\right)^{i+l}$$

$$\left(-\frac{\left(c+i\,a\,-w+2\,(f+i\,p-s)\,\sqrt{z}\;\right)^2}{f+i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+i\,a\,-w)\left(c+i\,a\,-w+2\,(f+i\,p-s)\,\sqrt{z}\;\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}\,(i+l+1),-\frac{\left(c+i\,a\,-w+2\,(f+i\,p-s)\,\sqrt{z}\;\right)^2}{4\,(f+i\,p-s)}\right)+2\sqrt{-\frac{\left(c+i\,a\,-w+2\,(f+i\,p-s)\,\sqrt{z}\;\right)^2}{f+i\,p-s}}\right.$$

$$(f+i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c+i\,a-w+2\,(f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(f+i\,p-s)}\right)+$$

$$e^{-\frac{(-c-i\,a-w)^2}{4\,(-f-i\,p-s)}-g-i\,q-t}\,(-f-i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c-i\,a-w)^{-i-l+2\,n}\left(-c-i\,a-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c-i\,a-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{-f-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\left((-c-i\,a-w)\left(-c-i\,a-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-c-i\,a-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(-f-i\,p-s)}\right)+2\sqrt{-\frac{\left(-c-i\,a-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{-f-i\,p-s}}\right.$$

$$\left.(-f-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-c-i\,a-w+2\,(-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(-f-i\,p-s)}\right)\right)+$$

$$e^{-\frac{(c-i\,a-w)^2}{4\,(f-i\,p-s)}+g-i\,q-t}\,(f-i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c-i\,a-w)^{-i-l+2\,n}\left(c-i\,a-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c-i\,a-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{f-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c-i\,a-w)\left(c-i\,a-w+2\,(f-i\,p-s)\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c-i\,a-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(f-i\,p-s)}\right)+2\sqrt{-\frac{\left(c-i\,a-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{f-i\,p-s}}\right.$$

$$\left.(f-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c-i\,a-w+2\,(f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(f-i\,p-s)}\right)\right)-$$

$$e^{-\frac{(-c+i\,a+w)^2}{4\,(-f+i\,p+s)}-g+i\,q+t}\,(-f+i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+i\,a+w)^{-i-l+2\,n}\left(-c+i\,a+w+2\,(-f+i\,p+s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c+i a+w+2 (-f+i p+s) \sqrt{z}\right)^2}{-f+i p+s}\right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l}$$

$$\binom{n}{i}\left((-c+i a+w)\left(-c+i a+w+2 (-f+i p+s) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1), -\frac{\left(-c+i a+w+2 (-f+i p+s) \sqrt{z}\right)^2}{4 (-f+i p+s)}\right)+2 \sqrt{-\frac{\left(-c+i a+w+2 (-f+i p+s) \sqrt{z}\right)^2}{-f+i p+s}}$$

$$\left.(-f+i p+s) \Gamma\left(\frac{1}{2}(i+l+2), -\frac{\left(-c+i a+w+2 (-f+i p+s) \sqrt{z}\right)^2}{4 (-f+i p+s)}\right)\right)-$$

$$e^{-\frac{(c+i a+w)^2}{4 (f+i p+s)}+g+i q+t} (f+i p+s)^{-2 n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l} 4^i (c+i a+w)^{-i-l+2 n} \left(c+i a+w+2 (f+i p+s) \sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c+i a+w+2 (f+i p+s) \sqrt{z}\right)^2}{f+i p+s}\right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l}\binom{n}{i}\left((c+i a+w)\left(c+i a+w+2 (f+i p+s) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1), -\frac{\left(c+i a+w+2 (f+i p+s) \sqrt{z}\right)^2}{4 (f+i p+s)}\right)+2 \sqrt{-\frac{\left(c+i a+w+2 (f+i p+s) \sqrt{z}\right)^2}{f+i p+s}}$$

$$\left.(f+i p+s) \Gamma\left(\frac{1}{2}(i+l+2), -\frac{\left(c+i a+w+2 (f+i p+s) \sqrt{z}\right)^2}{4 (f+i p+s)}\right)\right)-$$

$$e^{-\frac{(-c-i a+w)^2}{4 (-f-i p+s)}-g-i q+t} (-f-i p+s)^{-2 n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l} 4^i (-c-i a+w)^{-i-l+2 n} \left(-c-i a+w+2 (-f-i p+s) \sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c-i a+w+2 (-f-i p+s) \sqrt{z}\right)^2}{-f-i p+s}\right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l}$$

$$\binom{n}{i}\left((-c-i a+w)\left(-c-i a+w+2 (-f-i p+s) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-c-i\,a+w+2\,(-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(-f-i\,p+s)}\right)+2\sqrt{-\frac{\left(-c-i\,a+w+2\,(-f-i\,p+s)\,\sqrt{z}\right)^2}{-f-i\,p+s}}$$

$$(-f-i\,p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-c-i\,a+w+2\,(-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(-f-i\,p+s)}\right)\Bigg)-$$

$$e^{-\frac{(c-i\,a+w)^2}{4\,(f-i\,p+s)}+g-i\,q+t}\,(f-i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c-i\,a+w)^{-i-l+2\,n}\left(c-i\,a+w+2\,(f-i\,p+s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c-i\,a+w+2\,(f-i\,p+s)\,\sqrt{z}\right)^2}{f-i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((c-i\,a+w)\left(c-i\,a+w+2\,(f-i\,p+s)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c-i\,a+w+2\,(f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(f-i\,p+s)}\right)+2\sqrt{-\frac{\left(c-i\,a+w+2\,(f-i\,p+s)\,\sqrt{z}\right)^2}{f-i\,p+s}}$$

$$(f-i\,p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c-i\,a+w+2\,(f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(f-i\,p+s)}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving powers of cos, powers of sinh and power

Involving $z^{\alpha-1}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)$

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$$\int z^{\alpha-1}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)\,dz==$$

$$-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(e^g\,\Gamma\left(\frac{\alpha}{r},-c\,z^r\right)(-c\,z^r)^{-\frac{\alpha}{r}}+e^{-g}\,(c\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},c\,z^r\right)\right)(1-m\bmod 2)\,(1-u\bmod 2)\right)-$$

$$\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{g+2\,i\,j\,q-i\,m\,q}\,\Gamma\left(\frac{\alpha}{r},(-c-2\,i\,a\,j+i\,a\,m)\,z^r\right)((-c-2\,i\,a\,j+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$e^{-g+2\,i\,j\,q-i\,m\,q}\,((c-2\,i\,a\,j+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2\,i\,a\,j+i\,a\,m)\,z^r\right)+e^{g-2\,i\,j\,q+i\,m\,q}\,((-c+2\,i\,a\,j-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},(-c+2\,i\,a\,j-i\,a\,m)\,z^r\right)+e^{-g-2\,i\,j\,q+i\,m\,q}\,((c+2\,i\,a\,j-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2\,i\,a\,j-i\,a\,m)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{g+2kt-tu+\frac{i\pi u}{2}}\,\Gamma\left(\frac{\alpha}{r},(-c-2kw+uw)\,z^r\right)((-c-2kw+uw)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$
$$e^{-g+2kt-tu+\frac{i\pi u}{2}}\,((c-2kw+uw)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2kw+uw)\,z^r\right)+e^{g-2kt+tu-\frac{i\pi u}{2}}\,((-c+2kw-uw)\,z^r)^{-\frac{\alpha}{r}}$$
$$\left.\left.\Gamma\left(\frac{\alpha}{r},(-c+2kw-uw)\,z^r\right)+e^{-g-2kt+tu-\frac{i\pi u}{2}}\,((c+2kw-uw)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2kw-uw)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{g+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}\,\Gamma\left(\frac{\alpha}{r},(-c-2iaj+iam-2kw+uw)\,z^r\right)\right.\right.$$
$$((-c-2iaj+iam-2kw+uw)\,z^r)^{-\frac{\alpha}{r}}+e^{-g+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}\,((c-2iaj+iam-2kw+uw)$$
$$z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2iaj+iam-2kw+uw)\,z^r\right)+e^{g-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}$$
$$((-c+2iaj-iam-2kw+uw)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-c+2iaj-iam-2kw+uw)\,z^r\right)+$$
$$e^{-g-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}\,((c+2iaj-iam-2kw+uw)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c+2iaj-iam-2kw+uw)\right.$$
$$z^r\Big)+e^{g+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}\,((-c-2iaj+iam+2kw-uw)\,z^r)^{-\frac{\alpha}{r}}$$
$$\Gamma\left(\frac{\alpha}{r},(-c-2iaj+iam+2kw-uw)\,z^r\right)+e^{-g+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}$$
$$((c-2iaj+iam+2kw-uw)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-2iaj+iam+2kw-uw)\,z^r\right)+$$
$$e^{g-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}\,((-c+2iaj-iam+2kw-uw)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-c+2iaj-iam+2kw-uw)\right.$$
$$z^r\Big)+e^{-g-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}\,((c+2iaj-iam+2kw-uw)\,z^r)^{-\frac{\alpha}{r}}$$
$$\left.\left.\Gamma\left(\frac{\alpha}{r},(c+2iaj-iam+2kw-uw)\,z^r\right)\right)\right)/;\, m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0$$

Involving $z^n\cos^m(a\,z^r+p\,z+q)\sinh^u(w\,z^r+s\,z+t)\cosh(c\,z^r+f\,z+g)$

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$$\int z^n\cos^m(a\,z^2+p\,z+q)\sinh^u(w\,z^2+s\,z+t)\cosh(c\,z^2+f\,z+g)\,dz==-i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)$$
$$(1-u \bmod 2)\left((-c)^{-n-1}\,e^{\frac{f^2}{4c}-g}\sum_{l=0}^{n}2^{l-n}\,f^{n-l}\,(-f-2cz)^{l+1}\left(\frac{(-f-2cz)^2}{c}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\frac{(-f-2cz)^2}{4c}\right)+\right.$$
$$\left.c^{-n-1}\,e^{g-\frac{f^2}{4c}}\sum_{l=0}^{n}2^{l-n}\,(-f)^{n-l}\,(f+2cz)^{l+1}\left(-\frac{(f+2cz)^2}{c}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f+2cz)^2}{4c}\right)\right)-$$

$$i^u\, 2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(i(2k-m)p-f)^2}{4(ia(2k-m)-c)}-g+i(2k-m)q}(ia(2k-m)-c)^{-n-1}\sum_{l=0}^{n}2^{l-n}(f-i(2k-m)p)^{n-l}\right.$$

$$(-f+i(2k-m)p+2(ia(2k-m)-c)z)^{l+1}\left(-\frac{(-f+i(2k-m)p+2(ia(2k-m)-c)z)^2}{ia(2k-m)-c}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f+i(2k-m)p+2(ia(2k-m)-c)z)^2}{4(ia(2k-m)-c)}\right)+$$

$$e^{-\frac{(f+i(2k-m)p)^2}{4(c+ai(2k-m))}+g+i(2k-m)q}(c+ai(2k-m))^{-n-1}\sum_{l=0}^{n}2^{l-n}(-f-i(2k-m)p)^{n-l}$$

$$(f+i(2k-m)p+2(c+ai(2k-m))z)^{l+1}\left(-\frac{(f+i(2k-m)p+2(c+ai(2k-m))z)^2}{c+ai(2k-m)}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f+i(2k-m)p+2(c+ai(2k-m))z)^2}{4(c+ai(2k-m))}\right)+$$

$$e^{-\frac{(i(m-2k)p-f)^2}{4(ia(m-2k)-c)}-g+i(m-2k)q}(ia(m-2k)-c)^{-n-1}\sum_{l=0}^{n}2^{l-n}(f-i(m-2k)p)^{n-l}$$

$$(-f+i(m-2k)p+2(ia(m-2k)-c)z)^{l+1}\left(-\frac{(-f+i(m-2k)p+2(ia(m-2k)-c)z)^2}{ia(m-2k)-c}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f+i(m-2k)p+2(ia(m-2k)-c)z)^2}{4(ia(m-2k)-c)}\right)+$$

$$e^{-\frac{(f+i(m-2k)p)^2}{4(c+ai(m-2k))}+g+i(m-2k)q}(c+ai(m-2k))^{-n-1}\sum_{l=0}^{n}2^{l-n}(-f-i(m-2k)p)^{n-l}$$

$$(f+i(m-2k)p+2(c+ai(m-2k))z)^{l+1}\left(-\frac{(f+i(m-2k)p+2(c+ai(m-2k))z)^2}{c+ai(m-2k)}\right)^{\frac{1}{2}(-l-1)}$$

$$\left.\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f+i(m-2k)p+2(c+ai(m-2k))z)^2}{4(c+ai(m-2k))}\right)\right)-$$

$$i^u\, 2^{-m-u-2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(e^{-\frac{(s(2i-u)-f)^2}{4((2i-u)w-c)}-g+t(2i-u)+\frac{i\pi u}{2}}((2i-u)w-c)^{-n-1}\sum_{l=0}^{n}2^{l-n}(f-s(2i-u))^{n-l}\right.$$

$$(-f+s(2i-u)+2((2i-u)w-c)z)^{l+1}\left(-\frac{(-f+s(2i-u)+2((2i-u)w-c)z)^2}{(2i-u)w-c}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f+s(2i-u)+2((2i-u)w-c)z)^2}{4((2i-u)w-c)}\right)+$$

$$e^{-\frac{(f+s(2i-u))^2}{4(c+(2i-u)w)}+g+t(2i-u)+\frac{i\pi u}{2}}(c+(2i-u)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-f-s(2i-u))^{n-l}(f+s(2i-u)+2(c+(2i-u)w)z)^{l+1}$$

$$\left(-\frac{(f+s(2i-u)+2(c+(2i-u)w)z)^2}{c+(2i-u)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f+s(2i-u)+2(c+(2i-u)w)z)^2}{4(c+(2i-u)w)}\right)+$$

$$e^{-\frac{(s(u-2i)-f)^2}{4((u-2i)w-c)}-g+t(u-2i)-\frac{i\pi u}{2}}((u-2i)w-c)^{-n-1}\sum_{l=0}^{n}2^{l-n}(f-s(u-2i))^{n-l}$$

$$(-f+s(u-2i)+2((u-2i)w-c)z)^{l+1}\left(-\frac{(-f+s(u-2i)+2((u-2i)w-c)z)^2}{(u-2i)w-c}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-f+s(u-2i)+2((u-2i)w-c)z)^2}{4((u-2i)w-c)}\right)+$$

$$e^{-\frac{(f+s(u-2i))^2}{4(c+(u-2i)w)}+g+t(u-2i)-\frac{i\pi u}{2}}(c+(u-2i)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-f-s(u-2i))^{n-l}(f+s(u-2i)+2(c+(u-2i)w)z)^{l+1}$$

$$\left(-\frac{(f+s(u-2i)+2(c+(u-2i)w)z)^2}{c+(u-2i)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(f+s(u-2i)+2(c+(u-2i)w)z)^2}{4(c+(u-2i)w)}\right)\Bigg)-$$

$$i^u 2^{-m-u-2}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\Bigg(e^{-\frac{(-f+i(2j-m)p+s(2i-u))^2}{4(-c+ai(2j-m)+(2i-u)w)}-g+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}}(-c+ai(2j-m)+(2i-u)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(f-i(2j-m)p-s(2i-u))^{n-l}(-f+i(2j-m)p+s(2i-u)+2(-c+ai(2j-m)+(2i-u)w)z)^{l+1}$$

$$\Big(-(-f+i(2j-m)p+s(2i-u)+2(-c+ai(2j-m)+(2i-u)w)z)^2\Big/$$

$$(-c+ai(2j-m)+(2i-u)w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Bigg(\frac{l+1}{2},-(-f+i(2j-m)p+s(2i-u)+$$

$$2(-c+ai(2j-m)+(2i-u)w)z)^2\Big/(4(-c+ai(2j-m)+(2i-u)w))\Bigg)+$$

$$e^{-\frac{(f+i(2j-m)p+s(2i-u))^2}{4(c+ai(2j-m)+(2i-u)w)}+g+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}}(c+ai(2j-m)+(2i-u)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-f-i(2j-m)p-s(2i-u))^{n-l}(f+i(2j-m)p+s(2i-u)+2(c+ai(2j-m)+(2i-u)w)z)^{l+1}$$

$$\Big(-(f+i(2j-m)p+s(2i-u)+2(c+ai(2j-m)+(2i-u)w)z)^2\Big/$$

$$(c+ai(2j-m)+(2i-u)w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Bigg(\frac{l+1}{2},-(f+i(2j-m)p+s(2i-u)+$$

$$2(c+ai(2j-m)+(2i-u)w)z)^2\Big/(4(c+ai(2j-m)+(2i-u)w))\Bigg)+$$

$$e^{-\frac{(-f+i(m-2j)p+s(2i-u))^2}{4(-c+ai(m-2j)+(2i-u)w)}-g+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}}(-c+ai(m-2j)+(2i-u)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(f-i(m-2j)p-s(2i-u))^{n-l}(-f+i(m-2j)p+s(2i-u)+2(-c+ai(m-2j)+(2i-u)w)z)^{l+1}$$

$$\Big(-(-f+i(m-2j)p+s(2i-u)+2(-c+ai(m-2j)+(2i-u)w)z)^2\Big/$$

$$(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},\,-(-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+$$

$$2\,(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/(4\,(-c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\Big)+$$

$$e^{-\frac{(f+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+g+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-f-i\,(m-2\,j)\,p-s\,(2\,i-u))^{n-l}\,(f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^{l+1}$$
$$\Big(-(f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/$$

$$(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},\,-(f+i\,(m-2\,j)\,p+s\,(2\,i-u)+$$

$$2\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/(4\,(c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\Big)+$$

$$e^{-\frac{(-f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}-g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(f-i\,(2\,j-m)\,p-s\,(u-2\,i))^{n-l}\,(-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},\,-(-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+$$

$$2\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/(4\,(-c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-f-i\,(2\,j-m)\,p-s\,(u-2\,i))^{n-l}\,(f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},\,-(f+i\,(2\,j-m)\,p+s\,(u-2\,i)+$$

$$2\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/(4\,(c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(-f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}-g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(f-i\,(m-2\,j)\,p-s\,(u-2\,i))^{n-l}\,(-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},\,-(-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+$$

$$2\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/(4\,(-c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-f-i\,(m-2\,j)\,p-s\,(u-2\,i))^{n-l}\,(f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(c+a\,i\,(m-2\,j)+(u-2\,i)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},\,-(f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/\right.$$

$$\left.(4\,(c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\right)\Big/;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\;a+q+p\,z\right)\sinh^u\left(t+s\,z+w\,\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$2^{-m-2\,n-u-2}\,i^u\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)$$

$$\left(e^{\frac{c^2}{4\,f}-g}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c)^{-i-l+2\,n}\left(-c-2\,f\,\sqrt{z}\right)^{i+l}\left(\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\right.\left(-c\left(-c-2\,f\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}\,(i+l+1),\,\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\,\sqrt{\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(i+l+2),\,\frac{\left(-c-2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{g-\frac{c^2}{4\,f}}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,c^{-i-l+2\,n}\left(c+2\,f\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(c\left(c+2\,f\,\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\,\sqrt{-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)$$

$$f^{-2\,n-2}+2^{-m-2\,n-u-2}\,i^u\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(i\,a\,(2\,k-m)-c)^2}{4\,(i\,(2\,k-m)\,p-f)}-g+i\,(2\,k-m)\,q}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a\,(2\,k-m)-c)^{-i-l+2\,n}\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^{i+l}\right.$$

$$\left.\left.\left(-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\right)\right)$$

$$\left((i\,a\,(2\,k-m)-c)\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p-f)}\right)+2$$

$$\sqrt{-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p-f}}\;(i\,(2\,k-m)\,p-f)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-c+a\,i\,(2\,k-m)+2\,(i\,(2\,k-m)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p-f)}\right)\right)\right)$$

$$(i\,(2\,k-m)\,p-f)^{-2\,n-2}+e^{-\frac{(c+a\,i\,(2\,k-m))^2}{4\,(f+i\,(2\,k-m)\,p)}+g+i\,(2\,k-m)\,q}\,(f+i\,(2\,k-m)\,p)^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(2\,k-m))^{-i-l+2\,n}\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{f+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+a\,i\,(2\,k-m))\left(c+a\,i\,(2\,k-m)+\right.\right.$$

$$\left.2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p)}\right)+$$

$$2\sqrt{-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{f+i\,(2\,k-m)\,p}}\;(f+i\,(2\,k-m)\,p)\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\,(i+l+2),\,-\frac{\left(c+a\,i\,(2\,k-m)+2\,(f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(2\,k-m)\,p)}\right)\right)+$$

$$e^{-\frac{(i\,a\,(m-2\,k)-c)^2}{4\,(i\,(m-2\,k)\,p-f)}-g+i\,(m-2\,k)\,q}\,(i\,(m-2\,k)\,p-f)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a\,(m-2\,k)-c)^{-i-l+2\,n}$$

$$\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a\,(m-2\,k)-c)\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p-f)}\right)+2\,(i\,(m-2\,k)\,p-f)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p-f)}\right)\sqrt{-\frac{\left(-c+a\,i\,(m-2\,k)+2\,(i\,(m-2\,k)\,p-f)\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p-f}}\right)+$$

$$e^{-\frac{(c+a\,i\,(m-2\,k))^2}{4\,(f+i\,(m-2\,k)\,p)}+g+i\,(m-2\,k)\,q}\,(f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(m-2\,k))^{-i-l+2\,n}$$

$$\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((c+a\,i\,(m-2\,k))\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p)}\right)+2\sqrt{-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{f+i\,(m-2\,k)\,p}}\,(f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(c+a\,i\,(m-2\,k)+2\,(f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(f+i\,(m-2\,k)\,p)}\right)\right)+$$

$$2^{-m-2\,n-u-2}\,i^u\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{-\frac{((2\,k-u)\,w-c)^2}{4\,(s\,(2\,k-u)-f)}-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,((2\,k-u)\,w-c)^{-i-l+2\,n}\left(-c+(2\,k-u)\,w+2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)^{i+l}\right.$$

$$\left(-\frac{\left(-c+(2\,k-u)\,w+2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)^{2}}{s\,(2\,k-u)-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(((2\,k-u)\,w-c)\left(-c+(2\,k-u)\,w+\right.\right.$$

$$\left.2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-c+(2\,k-u)\,w+2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)^{2}}{4\,(s\,(2\,k-u)-f)}\right)+2$$

$$\sqrt{-\frac{\left(-c+(2\,k-u)\,w+2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)^{2}}{s\,(2\,k-u)-f}}\;(s\,(2\,k-u)-f)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-c+(2\,k-u)\,w+2\,(s\,(2\,k-u)-f)\,\sqrt{z}\right)^{2}}{4\,(s\,(2\,k-u)-f)}\right)\right)\right)(s\,(2\,k-u)-f)^{-2\,n-2}+$$

$$e^{-\frac{(c+(2\,k-u)\,w)^{2}}{4\,(f+s\,(2\,k-u))}+g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\,(f+s\,(2\,k-u))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(c+(2\,k-u)\,w)^{-i-l+2\,n}$$

$$\left(c+(2\,k-u)\,w+2\,(f+s\,(2\,k-u))\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+(2\,k-u)\,w+2\,(f+s\,(2\,k-u))\,\sqrt{z}\right)^{2}}{f+s\,(2\,k-u)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((c+(2\,k-u)\,w)\left(c+(2\,k-u)\,w+2\,(f+s\,(2\,k-u))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(c+(2\,k-u)\,w+2\,(f+s\,(2\,k-u))\,\sqrt{z}\right)^{2}}{4\,(f+s\,(2\,k-u))}\right)+2\sqrt{-\frac{\left(c+(2\,k-u)\,w+2\,(f+s\,(2\,k-u))\,\sqrt{z}\right)^{2}}{f+s\,(2\,k-u)}}$$

$$\left.(f+s\,(2\,k-u))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(c+(2\,k-u)\,w+2\,(f+s\,(2\,k-u))\,\sqrt{z}\right)^{2}}{4\,(f+s\,(2\,k-u))}\right)\right)+$$

$$e^{-\frac{((u-2\,k)\,w-c)^{2}}{4\,(s\,(u-2\,k)-f)}-g+t\,(u-2\,k)-\frac{i\,\pi\,u}{2}}\,(s\,(u-2\,k)-f)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,((u-2\,k)\,w-c)^{-i-l+2\,n}$$

$$\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^{i+l}\left(-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left(((u-2k)w-c)\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(i+l+1),-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}\right)+$$

$$2\sqrt{-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{s(u-2k)-f}}\ (s(u-2k)-f)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(i+l+2),-\frac{\left(-c+(u-2k)w+2(s(u-2k)-f)\sqrt{z}\right)^2}{4(s(u-2k)-f)}\right)\right)+$$

$$e^{-\frac{(c+(u-2k)w)^2}{4(f+s(u-2k))}+g+t(u-2k)-\frac{i\pi u}{2}}(f+s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(c+(u-2k)w)^{-i-l+2n}$$

$$\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^{i+l}\left(-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((c+(u-2k)w)\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}\right)+2\sqrt{-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{f+s(u-2k)}}$$

$$\left.\left.(f+s(u-2k))\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c+(u-2k)w+2(f+s(u-2k))\sqrt{z}\right)^2}{4(f+s(u-2k))}\right)\right)\right)+$$

$$2^{-m-2n-u-2}i^u\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(-c+a\,i(2k-m)+(2j-u)w)^2}{4(-f+i(2k-m)p+s(2j-u))}-g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-i-l+2\,n}\right.$$
$$\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((-c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\right.$$
$$\left.\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.(4\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$
$$-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/$$
$$\left.(4\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(-c+a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.\left.2\,(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\right)\Bigg)$$

$$(-f+i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}+e^{-\frac{(c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{2}}{4\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))}+g+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}$$
$$(f+i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\right.$$
$$\left.\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.(4\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.(4\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(c+a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.\left.2\,(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/(f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\right)+$$

$$e^{-\frac{(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{2}}{4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}-g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\right.$$
$$\left.\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$
$$\left.-\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.2\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\,(-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+$$

$$e^{-\frac{(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\right.$$
$$\left.\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(c+a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.2\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\,(f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+$$

$$e^{-\frac{(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$
$$\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),$$
$$-\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\left(-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.}$$
$$\left.2\,(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\Big(-\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$
$$(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$
$$\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\left(c+a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.}$$
$$\left.2\,(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\Big(-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$
$$(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)$$
$$\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),\ -\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$
$$\left.-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)\sqrt{\left(-\left(-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+\right.\right.}$$
$$\left.\left.2\,(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\Big)+$$
$$e^{-\frac{(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((c+a\,i\,(m-2\,k)+(u-2\,j)\,w)\right.$$
$$\left.\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\ -\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\ -\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)$$
$$\sqrt{\left(-\left(c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.(f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

Involving hyperbolic, exponential, trigonometric and a power functions

Involving sin, sinh, exp and power

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\sin(a\,z^r+q)\sinh(w\,z^r+t)\cosh(c\,z^r+g)$

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$$\int z^{\alpha-1}\, e^{b\,z^r+e}\sin(a\,z^r+q)\sinh(w\,z^r+t)\cosh(c\,z^r+g)\,dz ==$$

$$-\frac{1}{8\,r}\left((i\,z^{\alpha})\left(-e^{e+g+i\,q+t}\,\Gamma\left(\frac{\alpha}{r},(-b-c-i\,a-w)\,z^r\right)((-b-c-i\,a-w)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$e^{e+g-i\,q+t}\,((-b-c+i\,a-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b-c+i\,a-w)\,z^r\right)-$$

$$e^{e-g+i\,q+t}\,((-b+c-i\,a-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+c-i\,a-w)\,z^r\right)+e^{e-g-i\,q+t}\,((-b+c+i\,a-w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b+c+i\,a-w)\,z^r\right)+e^{e+g+i\,q-t}\,((-b-c-i\,a+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b-c-i\,a+w)\,z^r\right)-$$

$$e^{e+g-i\,q-t}\,((-b-c+i\,a+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b-c+i\,a+w)\,z^r\right)+e^{e-g+i\,q-t}\,((-b+c-i\,a+w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},(-b+c-i\,a+w)\,z^r\right)-e^{e-g-i\,q-t}\,((-b+c+i\,a+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+c+i\,a+w)\,z^r\right)\right)\right)$$

Involving $z^n\, e^{b\,z^r+d\,z+e}\sin(a\,z^r+p\,z+q)\sinh(w\,z^r+s\,z+t)\cosh(c\,z^r+f\,z+g)$

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$$\int z^n\, e^{b\,z^2+d\,z+e}\sin(a\,z^2+p\,z+q)\sinh(w\,z^2+s\,z+t)\cosh(c\,z^2+f\,z+g)\,dz ==$$

$$-\frac{1}{16}\,i\left(-e^{-\frac{(d-f-i\,p-s)^2}{4\,(b-c-i\,a-w)}+e-g-i\,q-t}\left(\sum_{i=0}^{n}2^{i-n}\,(-d+f+i\,p+s)^{n-i}\,(d-f-i\,p-s+2\,(b-c-i\,a-w)\,z)^{i+1}\right.\right.$$

$$\left.\left(-\frac{(d-f-i\,p-s+2\,(b-c-i\,a-w)\,z)^2}{b-c-i\,a-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-f-i\,p-s+2\,(b-c-i\,a-w)\,z)^2}{4\,(b-c-i\,a-w)}\right)\right)$$

$$(b-c-i\,a-w)^{-n-1}+e^{-\frac{(d-f+i\,p-s)^2}{4\,(b-c+i\,a-w)}+e-g+i\,q-t}\,(b-c+i\,a-w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-d+f-i\,p+s)^{n-i}\,(d-f+i\,p-s+2\,(b-c+i\,a-w)\,z)^{i+1}$$

$$\left(-\frac{(d-f+i\,p-s+2\,(b-c+i\,a-w)\,z)^2}{b-c+i\,a-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-f+i\,p-s+2\,(b-c+i\,a-w)\,z)^2}{4\,(b-c+i\,a-w)}\right)-$$

$$e^{-\frac{(d+f-i\,p-s)^2}{4\,(b+c-i\,a-w)}+e+g-i\,q-t}\,(b+c-i\,a-w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d-f+i\,p+s)^{n-i}\,(d+f-i\,p-s+2\,(b+c-i\,a-w)\,z)^{i+1}$$

$$\left(-\frac{(d+f-i\,p-s+2\,(b+c-i\,a-w)\,z)^2}{b+c-i\,a-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+f-i\,p-s+2\,(b+c-i\,a-w)\,z)^2}{4\,(b+c-i\,a-w)}\right)+$$

$$e^{-\frac{(d+f+i\,p-s)^2}{4\,(b+c+i\,a-w)}+e+g+i\,q-t}\,(b+c+i\,a-w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d-f-i\,p+s)^{n-i}\,(d+f+i\,p-s+2\,(b+c+i\,a-w)\,z)^{i+1}$$

$$\left(-\frac{(d+f+i\,p-s+2\,(b+c+i\,a-w)\,z)^2}{b+c+i\,a-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+f+i\,p-s+2\,(b+c+i\,a-w)\,z)^2}{4\,(b+c+i\,a-w)}\right)+$$

$$e^{-\frac{(d-f-i\,p+s)^2}{4(b-c-i\,a+w)}+e-g-i\,q+t}\,(b-c-i\,a+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d+f+i\,p-s)^{n-i}\,(d-f-i\,p+s+2\,(b-c-i\,a+w)\,z)^{i+1}$$

$$\left(-\frac{(d-f-i\,p+s+2\,(b-c-i\,a+w)\,z)^2}{b-c-i\,a+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-f-i\,p+s+2\,(b-c-i\,a+w)\,z)^2}{4\,(b-c-i\,a+w)}\right)-$$

$$e^{-\frac{(d-f+i\,p+s)^2}{4(b-c+i\,a+w)}+e-g+i\,q+t}\,(b-c+i\,a+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d+f-i\,p-s)^{n-i}\,(d-f+i\,p+s+2\,(b-c+i\,a+w)\,z)^{i+1}$$

$$\left(-\frac{(d-f+i\,p+s+2\,(b-c+i\,a+w)\,z)^2}{b-c+i\,a+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-f+i\,p+s+2\,(b-c+i\,a+w)\,z)^2}{4\,(b-c+i\,a+w)}\right)+$$

$$e^{-\frac{(d+f-i\,p+s)^2}{4(b+c-i\,a+w)}+e+g-i\,q+t}\,(b+c-i\,a+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d-f+i\,p-s)^{n-i}\,(d+f-i\,p+s+2\,(b+c-i\,a+w)\,z)^{i+1}$$

$$\left(-\frac{(d+f-i\,p+s+2\,(b+c-i\,a+w)\,z)^2}{b+c-i\,a+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+f-i\,p+s+2\,(b+c-i\,a+w)\,z)^2}{4\,(b+c-i\,a+w)}\right)-$$

$$e^{-\frac{(d+f+i\,p+s)^2}{4(b+c+i\,a+w)}+e+g+i\,q+t}\,(b+c+i\,a+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d-f-i\,p-s)^{n-i}\,(d+f+i\,p+s+2\,(b+c+i\,a+w)\,z)^{i+1}$$

$$\left(-\frac{(d+f+i\,p+s+2\,(b+c+i\,a+w)\,z)^2}{b+c+i\,a+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\left.\Gamma\left(\frac{i+1}{2},-\frac{(d+f+i\,p+s+2\,(b+c+i\,a+w)\,z)^2}{4\,(b+c+i\,a+w)}\right)\right)/;\,n\in\mathbb{N}$$

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$$\int z^n\,e^{\sqrt{z}\,b+e+d\,z}\sin\left(\sqrt{z}\,a+q+p\,z\right)\sinh\left(t+s\,z+w\,\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz==$$

$$i\,2^{-2\,n-4}\left(e^{-\frac{(b-c+i\,a-w)^2}{4\,(d-f+i\,p-s)}+e-g+i\,q-t}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+i\,a-w)^{-i-l+2\,n}\right.\right.$$

$$\left(b-c+i\,a-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c+i\,a-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{d-f+i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b-c+i\,a-w)\left(b-c+i\,a-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}\Bigg)+2\sqrt{-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{d-f+i\,p-s}}$$

$$(d-f+i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}\right)\Bigg)\Bigg)$$

$$(d-f+i\,p-s)^{-2\,n-2}+e^{-\frac{(b+c+i\,a-w)^2}{4\,(d+f+i\,p-s)}+e+g+i\,q-t}\,(d+f+i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+i\,a\,-w)^{-i-l+2\,n}$$

$$\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}\right)^{\frac{1}{2}\,(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+c+i\,a\,-w)\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$\left.-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}\right)+2\sqrt{-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}}$$

$$(d+f+i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}\right)\Bigg)-$$

$$e^{-\frac{(b-c-i\,a-w)^2}{4\,(d-f-i\,p-s)}+e-g-i\,q-t}\,(d-f-i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c-i\,a\,-w)^{-i-l+2\,n}$$

$$\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}\right)^{\frac{1}{2}\,(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b-c-i\,a\,-w)\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$\left.-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}\right)+2\sqrt{-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}}$$

$$(d-f-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}\right)\Bigg)-$$

$$e^{-\frac{(b+c-i\,a\,-w)^2}{4\,(d+f-i\,p-s)}+e+g-i\,q-t}\,(d+f-i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c-i\,a\,-w)^{-i-l+2\,n}$$

$$\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+c-i\,a\,-w)\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.$$

$$\left.-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}\right)+2\sqrt{-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}}$$

$$(d+f-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}\right)\Bigg)-$$

$$e^{-\frac{(b-c+i\,a\,+w)^2}{4\,(d-f+i\,p+s)}+e-g+i\,q+t}\,(d-f+i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+i\,a\,+w)^{-i-l+2\,n}$$

$$\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b-c+i\,a\,+w)\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.$$

$$\left.-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}\right)+2\sqrt{-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}}$$

$$(d-f+i\,p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}\right)\Bigg)-$$

$$e^{-\frac{(b+c+i\,a+w)^2}{4\,(d+f+i\,p+s)}+e+g+i\,q+t}\,(d+f+i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+i\,a+w)^{-i-l+2\,n}$$

$$\left(b+c+i\,a+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c+i\,a+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{d+f+i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b+c+i\,a+w)\left(b+c+i\,a+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+c+i\,a+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p+s)}\right)+2\sqrt{-\frac{\left(b+c+i\,a+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{d+f+i\,p+s}}$$

$$\left.(d+f+i\,p+s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+c+i\,a+w+2\,(d+f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p+s)}\right)\right)+$$

$$e^{-\frac{(b-c-i\,a+w)^2}{4\,(d-f-i\,p+s)}+e-g-i\,q+t}\,(d-f-i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c-i\,a+w)^{-i-l+2\,n}$$

$$\left(b-c-i\,a+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c-i\,a+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{d-f-i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b-c-i\,a+w)\left(b-c-i\,a+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b-c-i\,a+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p+s)}\right)+2\sqrt{-\frac{\left(b-c-i\,a+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{d-f-i\,p+s}}$$

$$\left.(d-f-i\,p+s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b-c-i\,a+w+2\,(d-f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p+s)}\right)\right)+$$

$$e^{-\frac{(b+c-i\,a+w)^2}{4\,(d+f-i\,p+s)}+e+g-i\,q+t}\,(d+f-i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c-i\,a+w)^{-i-l+2\,n}$$

$$\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b+c-i\,a+w)\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}\right)+2\sqrt{-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}}$$

$$\left.\left.(d+f-i\,p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}\right)\right)\right/;\ n\in\mathbb{N}$$

Involving powers of sin, powers of sinh, exp and power

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\,\sin^m(a\,z^r+q)\,\sinh^u(w\,z^r+t)\,\cosh(c\,z^r+g)$

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$$\int z^{\alpha-1}\,e^{b\,z^r+e}\sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)\,dz==$$

$$-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(e^{e+g}\,\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}+e^{e-g}\,((c-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)\right)\right.$$

$$\left.(1-m\bmod 2)\,(1-u\bmod 2)\right)-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{u}{\frac{u}{2}}(1-u\bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+g+2\,i\,k\,q-i\,m\,q+\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{\alpha}{r},(-b-c-2\,i\,a\,k+i\,a\,m)\,z^r\right)((-b-c-2\,i\,a\,k+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-g+2\,i\,k\,q-i\,m\,q+\frac{i\,m\,\pi}{2}}((-b+c-2\,i\,a\,k+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+c-2\,i\,a\,k+i\,a\,m)\,z^r\right)+$$

$$e^{e+g-2\,i\,k\,q+i\,m\,q-\frac{i\,m\,\pi}{2}}((-b-c+2\,i\,a\,k-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b-c+2\,i\,a\,k-i\,a\,m)\,z^r\right)+$$

$$\left.\left.e^{e-g-2\,i\,k\,q+i\,m\,q-\frac{i\,m\,\pi}{2}}((-b+c+2\,i\,a\,k-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+c+2\,i\,a\,k-i\,a\,m)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{e+g+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{\alpha}{r},(-b-c-2\,k\,w+u\,w)\,z^r\right)\right.\right.$$

$$((-b-c-2kw+uw)z^r)^{-\frac{\alpha}{r}}+e^{e-g+2kt-tu+\frac{i\pi u}{2}}((-b+c-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\right.$$

$$\left.(-b+c-2kw+uw)z^r\right)+e^{e+g-2kt+tu-\frac{i\pi u}{2}}((-b-c+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-c+2kw-uw)z^r\right)+$$

$$e^{e-g-2kt+tu-\frac{i\pi u}{2}}((-b+c+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c+2kw-uw)z^r\right)\Bigg)\Bigg)-$$

$$\frac{1}{r}\Bigg(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{e+g+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+\frac{im\pi}{2}}\Gamma\left(\frac{\alpha}{r},(-b-c-2iak+iam-\right.$$

$$\left.2jw+uw)z^r\right)((-b-c-2iak+iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}+e^{e-g+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$((-b+c-2iak+iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c-2iak+iam-2jw+uw)z^r\right)+$$

$$e^{e+g-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-\frac{im\pi}{2}}((-b-c+2iak-iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b-c+2iak-iam-2jw+uw)z^r\right)+e^{e-g-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$

$$((-b+c+2iak-iam-2jw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c+2iak-iam-2jw+uw)z^r\right)+$$

$$e^{e+g+2ikq-imq-2jt+tu-\frac{i\pi u}{2}+\frac{im\pi}{2}}((-b-c-2iak+iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b-c-2iak+iam+2jw-uw)z^r\right)+e^{e-g+2ikq-imq-2jt+tu-\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$((-b+c-2iak+iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c-2iak+iam+2jw-uw)z^r\right)+$$

$$e^{e+g-2ikq+imq-2jt+tu-\frac{i\pi u}{2}-\frac{im\pi}{2}}((-b-c+2iak-iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-c+2iak-iam+\right.$$

$$\left.2jw-uw)z^r\right)+e^{e-g-2ikq+imq-2jt+tu-\frac{i\pi u}{2}-\frac{im\pi}{2}}((-b+c+2iak-iam+2jw-uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b+c+2iak-iam+2jw-uw)z^r\right)\Bigg)\Bigg)\Bigg/;\ m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\sin^m\left(a\,z^r+p\,z+q\right)\sinh^u\left(w\,z^r+s\,z+t\right)\cosh\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\,e^{b\,z^2+d\,z+e}\sin^m\left(a\,z^2+p\,z+q\right)\sinh^u\left(w\,z^2+s\,z+t\right)\cosh\left(c\,z^2+f\,z+g\right)dz==$$

$$-i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)(1-u\bmod 2)\Bigg(e^{-\frac{(d-f)^2}{4(b-c)}+e-g}$$

$$\left(\sum_{i=0}^{n}2^{i-n}(f-d)^{n-i}(d-f+2(b-c)z)^{i+1}\left(-\frac{(d-f+2(b-c)z)^2}{b-c}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-f+2(b-c)z)^2}{4(b-c)}\right)\right)$$

$$(b-c)^{-n-1}+(b+c)^{-n-1}\,e^{-\frac{(d+f)^2}{4(b+c)}+e+g}\sum_{i=0}^{n}2^{i-n}(-d-f)^{n-i}(d+f+2(b+c)z)^{i+1}$$

$$\left(-\frac{(d+f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)\Bigg)-i^u\,2^{-m-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{(d-f+i(2k-m)p)^2}{4(b-c+a\,i(2k-m))}+e-g+i(2k-m)q+\frac{i m\pi}{2}}\Bigg(\sum_{i=0}^{n}2^{i-n}(-d+f-i(2k-m)p)^{n-i}(d-f+i(2k-m)p+$$

$$2(b-c+a\,i(2k-m))z)^{i+1}\left(-\frac{(d-f+i(2k-m)p+2(b-c+a\,i(2k-m))z)^2}{b-c+a\,i(2k-m)}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-f+i(2k-m)p+2(b-c+a\,i(2k-m))z)^2}{4(b-c+a\,i(2k-m))}\right)\Bigg)$$

$$(b-c+a\,i(2k-m))^{-n-1}+e^{-\frac{(d+f+i(2k-m)p)^2}{4(b+c+a\,i(2k-m))}+e+g+i(2k-m)q+\frac{i m\pi}{2}}(b+c+a\,i(2k-m))^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(-d-f-i(2k-m)p)^{n-i}(d+f+i(2k-m)p+2(b+c+a\,i(2k-m))z)^{i+1}$$

$$\left(-\frac{(d+f+i(2k-m)p+2(b+c+a\,i(2k-m))z)^2}{b+c+a\,i(2k-m)}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(d+f+i(2k-m)p+2(b+c+a\,i(2k-m))z)^2}{4(b+c+a\,i(2k-m))}\right)+e^{-\frac{(d-f+i(m-2k)p)^2}{4(b-c+a\,i(m-2k))}+e-g+i(m-2k)q-\frac{i m\pi}{2}}$$

$$(b-c+a\,i(m-2k))^{-n-1}\sum_{i=0}^{n}2^{i-n}(-d+f-i(m-2k)p)^{n-i}(d-f+i(m-2k)p+2(b-c+a\,i(m-2k))z)^{i+1}$$

$$\left(-\frac{(d-f+i(m-2k)p+2(b-c+a\,i(m-2k))z)^2}{b-c+a\,i(m-2k)}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(d-f+i(m-2k)p+2(b-c+a\,i(m-2k))z)^2}{4(b-c+a\,i(m-2k))}\right)+e^{-\frac{(d+f+i(m-2k)p)^2}{4(b+c+a\,i(m-2k))}+e+g+i(m-2k)q-\frac{i m\pi}{2}}$$

$$(b+c+a\,i(m-2k))^{-n-1}\sum_{i=0}^{n}2^{i-n}(-d-f-i(m-2k)p)^{n-i}(d+f+i(m-2k)p+2(b+c+a\,i(m-2k))z)^{i+1}$$

$$\left(-\frac{(d+f+i(m-2k)p+2(b+c+a\,i(m-2k))z)^2}{b+c+a\,i(m-2k)}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(d+f+i(m-2k)p+2(b+c+a\,i(m-2k))z)^2}{4(b+c+a\,i(m-2k))}\right)\Bigg)-$$

$$i^u\, 2^{-m-u-2} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^k \binom{u}{k} \left(e^{-\frac{(d-f+s(2k-u))^2}{4(b-c+(2k-u)w)}+e-g+t(2k-u)+\frac{i\pi u}{2}} \left(\sum_{i=0}^{n} 2^{i-n} (-d+f-s(2k-u))^{n-i} \right.\right.$$

$$(d-f+s(2k-u)+2(b-c+(2k-u)w)z)^{i+1} \left(-\frac{(d-f+s(2k-u)+2(b-c+(2k-u)w)z)^2}{b-c+(2k-u)w} \right)^{\frac{1}{2}(-i-1)}$$

$$\left. \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d-f+s(2k-u)+2(b-c+(2k-u)w)z)^2}{4(b-c+(2k-u)w)} \right) \right) (b-c+(2k-u)w)^{-n-1} +$$

$$e^{-\frac{(d+f+s(2k-u))^2}{4(b+c+(2k-u)w)}+e+g+t(2k-u)+\frac{i\pi u}{2}} (b+c+(2k-u)w)^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-d-f-s(2k-u))^{n-i}$$

$$(d+f+s(2k-u)+2(b+c+(2k-u)w)z)^{i+1} \left(-\frac{(d+f+s(2k-u)+2(b+c+(2k-u)w)z)^2}{b+c+(2k-u)w} \right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d+f+s(2k-u)+2(b+c+(2k-u)w)z)^2}{4(b+c+(2k-u)w)} \right) +$$

$$e^{-\frac{(d-f+s(u-2k))^2}{4(b-c+(u-2k)w)}+e-g+t(u-2k)-\frac{i\pi u}{2}} (b-c+(u-2k)w)^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-d+f-s(u-2k))^{n-i}$$

$$(d-f+s(u-2k)+2(b-c+(u-2k)w)z)^{i+1} \left(-\frac{(d-f+s(u-2k)+2(b-c+(u-2k)w)z)^2}{b-c+(u-2k)w} \right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d-f+s(u-2k)+2(b-c+(u-2k)w)z)^2}{4(b-c+(u-2k)w)} \right) +$$

$$e^{-\frac{(d+f+s(u-2k))^2}{4(b+c+(u-2k)w)}+e+g+t(u-2k)-\frac{i\pi u}{2}} (b+c+(u-2k)w)^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-d-f-s(u-2k))^{n-i}$$

$$(d+f+s(u-2k)+2(b+c+(u-2k)w)z)^{i+1} \left(-\frac{(d+f+s(u-2k)+2(b+c+(u-2k)w)z)^2}{b+c+(u-2k)w} \right)^{\frac{1}{2}(-i-1)}$$

$$\left. \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d+f+s(u-2k)+2(b+c+(u-2k)w)z)^2}{4(b+c+(u-2k)w)} \right) \right) -$$

$$i^u\, 2^{-m-u-2} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{j=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^j \binom{u}{j} \left(e^{-\frac{(d-f+i(2k-m)p+s(2j-u))^2}{4(b-c+ai(2k-m)+(2j-u)w)}+e-g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}} \right.$$

$$\left(\sum_{i=0}^{n} 2^{i-n} (-d+f-i(2k-m)p-s(2j-u))^{n-i} (d-f+i(2k-m)p+s(2j-u)+ \right.$$

$$2(b-c+ai(2k-m)+(2j-u)w)z)^{i+1} \left(-(d-f+i(2k-m)p+s(2j-u)+ \right.$$

$$\left. \left. 2(b-c+ai(2k-m)+(2j-u)w)z)^2 \Big/ (b-c+ai(2k-m)+(2j-u)w) \right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},\,-(d-f+i\,(2\,k-m)\,p+s\,(2\,j-u)+2\,(b-c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b-c+a\,i\,(2\,k-m)+(2\,j-u)\,w))\right)(b-c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-n-1}+$$

$$e^{-\frac{(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))^2}{4\,(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)}+e+g+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-f-i\,(2\,k-m)\,p-s\,(2\,j-u))^{n-i}\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u)+$$
$$2\,(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^{i+1}\left(-(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.$$
$$\left.2\,(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^2\Big/(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\right)^{\frac{1}{2}(-i-1)}$$
$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},\,-(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u)+2\,(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w))\right)+e^{-\frac{(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2}{4\,(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)}+e-g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}$$
$$(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d+f-i\,(m-2\,k)\,p-s\,(2\,j-u))^{n-i}$$
$$(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^{i+1}$$
$$\left(-(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/\right.$$
$$\left.(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\,-(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.2\,(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/(4\,(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w))\right)+$$

$$e^{-\frac{(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))^2}{4\,(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)}+e+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-f-i\,(m-2\,k)\,p-s\,(2\,j-u))^{n-i}$$
$$(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^{i+1}$$
$$\left(-(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/\right.$$
$$\left.(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\,-(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.2\,(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/(4\,(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w))\right)+$$

$$e^{-\frac{(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^2}{4\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)}+e-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d+f-i\,(2\,k-m)\,p-s\,(u-2\,j))^{n-i}$$
$$(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\left(-(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$\left.(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\,-(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.2\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/(4\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w))\right)+$$

$$e^{-\frac{(d+f+i(2k-m)p+s(u-2j))^2}{4(b+c+ai(2k-m)+(u-2j)w)}+e+g+i(2k-m)q+t(u-2j)-\frac{i\pi u}{2}+\frac{im\pi}{2}}(b+c+ai(2k-m)+(u-2j)w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(-d-f-i(2k-m)p-s(u-2j))^{n-i}$$

$$(d+f+i(2k-m)p+s(u-2j)+2(b+c+ai(2k-m)+(u-2j)w)z)^{i+1}$$

$$\left(-(d+f+i(2k-m)p+s(u-2j)+2(b+c+ai(2k-m)+(u-2j)w)z)^2\Big/\right.$$

$$\left.(b+c+ai(2k-m)+(u-2j)w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(d+f+i(2k-m)p+s(u-2j)+\right.$$

$$\left.2(b+c+ai(2k-m)+(u-2j)w)z)^2\Big/(4(b+c+ai(2k-m)+(u-2j)w))\right)+$$

$$e^{-\frac{(d-f+i(m-2k)p+s(u-2j))^2}{4(b-c+ai(m-2k)+(u-2j)w)}+e-g+i(m-2k)q+t(u-2j)-\frac{i\pi u}{2}-\frac{im\pi}{2}}(b-c+ai(m-2k)+(u-2j)w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(-d+f-i(m-2k)p-s(u-2j))^{n-i}$$

$$(d-f+i(m-2k)p+s(u-2j)+2(b-c+ai(m-2k)+(u-2j)w)z)^{i+1}$$

$$\left(-(d-f+i(m-2k)p+s(u-2j)+2(b-c+ai(m-2k)+(u-2j)w)z)^2\Big/\right.$$

$$\left.(b-c+ai(m-2k)+(u-2j)w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(d-f+i(m-2k)p+s(u-2j)+\right.$$

$$\left.2(b-c+ai(m-2k)+(u-2j)w)z)^2\Big/(4(b-c+ai(m-2k)+(u-2j)w))\right)+$$

$$e^{-\frac{(d+f+i(m-2k)p+s(u-2j))^2}{4(b+c+ai(m-2k)+(u-2j)w)}+e+g+i(m-2k)q+t(u-2j)-\frac{i\pi u}{2}-\frac{im\pi}{2}}(b+c+ai(m-2k)+(u-2j)w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(-d-f-i(m-2k)p-s(u-2j))^{n-i}$$

$$(d+f+i(m-2k)p+s(u-2j)+2(b+c+ai(m-2k)+(u-2j)w)z)^{i+1}$$

$$\left(-(d+f+i(m-2k)p+s(u-2j)+2(b+c+ai(m-2k)+(u-2j)w)z)^2\Big/\right.$$

$$\left.(b+c+ai(m-2k)+(u-2j)w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\left.\Gamma\left(\frac{i+1}{2},-(d+f+i(m-2k)p+s(u-2j)+2(b+c+ai(m-2k)+(u-2j)w)z)^2\Big/\right.\right.$$

$$\left.\left.(4(b+c+ai(m-2k)+(u-2j)w))\right)\right)/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

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$$\int z^n e^{\sqrt{z}\,b+dz+e}\sin^m\left(\sqrt{z}\,a+pz+q\right)\sinh^u\left(w\sqrt{z}+sz+t\right)\cosh\left(\sqrt{z}\,c+fz+g\right)dz=$$

$$i^u 2^{-m-2n-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)(1-u\bmod 2)$$

$$\left(e^{-\frac{(b-c)^2}{4(d-f)}+e-g}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-c)^{-i-l+2n}\left(b-c+2(d-f)\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\right.\right.$$

$$\binom{n}{i}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)(d-f)^{-2n-2}+$$

$$e^{-\frac{(b+c)^2}{4(d+f)}+e+g}(d+f)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c)^{-i-l+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)+$$

$$i^u\,2^{-m-2n-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(b-c+a\,i\,(2k-m))^2}{4(d-f+i\,(2k-m)\,p)}+e-g+i\,(2k-m)\,q+\frac{i\,m\,\pi}{2}}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(2k-m))^{-i-l+2n}\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^{i+l}\right.$$

$$\left.\left(-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\right.$$

$$\left((b-c+a\,i\,(2k-m))\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}\right)+2\right.$$

$$(d-f+i\,(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b-c+a\,i\,(2\,k-m)+2\,(d-f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(2\,k-m)\,p)}\right)$$

$$\sqrt{-\frac{\left(b-c+a\,i\,(2\,k-m)+2\,(d-f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(2\,k-m)\,p}}\Bigg)\Bigg)$$

$$(d-f+i\,(2\,k-m)\,p)^{-2\,n-2}+e^{-\frac{(b+c+a\,i\,(2\,k-m))^2}{4\,(d+f+i\,(2\,k-m)\,p)}+e+g+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(d+f+i\,(2\,k-m)\,p)^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(2\,k-m))^{-i-l+2\,n}\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+c+a\,i\,(2\,k-m))\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(i+l+1),\,-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}\Bigg)+$$

$$2\,(d+f+i\,(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}}\Bigg)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k))^2}{4\,(d-f+i\,(m-2\,k)\,p)}+e-g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d-f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(m-2\,k))^{-i-l+2\,n}$$

$$\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b-c+a\,i\,(m-2\,k))\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\Bigg)+$$

$$2\,(d-f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\Bigg)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k))^2}{4\,(d+f+i\,(m-2\,k)\,p)}+e+g+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d+f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(m-2\,k))^{-i-l+2\,n}$$

$$\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+c+a\,i\,(m-2\,k))\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\Bigg)+$$

$$2\,(d+f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\Bigg)\Bigg)+$$

$$i^u\,2^{-m-2\,n-u-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{(b-c+(2\,k-u)\,w)^2}{4\,(d-f+s\,(2\,k-u))}+e-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+(2\,k-u)\,w)^{-i-l+2\,n}\left(b-c+(2\,k-u)\,w+2\,(d-f+s\,(2\,k-u))\,\sqrt{z}\right)^{i+l}\right.$$

$$\left(-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-c+(2k-u)w)\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}\right)+2$$

$$\sqrt{-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}}\ (d-f+s(2k-u))$$

$$\left.\left.\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}\right)\right)\right)$$

$$(d-f+s(2k-u))^{-2n-2}+e^{-\frac{(b+c+(2k-u)w)^2}{4(d+f+s(2k-u))}+e+g+t(2k-u)+\frac{i\pi u}{2}}(d+f+s(2k-u))^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+c+(2k-u)w)^{-i-l+2n}\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+c+(2k-u)w)\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(i+l+1),-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}\right)+$$

$$2\sqrt{-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}}\ (d+f+s(2k-u))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(i+l+2),-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}\right)\right)+$$

$$e^{-\frac{(b-c+(u-2k)w)^2}{4(d-f+s(u-2k))}+e-g+t(u-2k)-\frac{i\pi u}{2}}(d-f+s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-c+(u-2k)w)^{-i-l+2n}$$

$$\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-c+(u-2k)w)\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}\right)+\right.$$

$$\left.2(d-f+s(u-2k))\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}\right)\sqrt{-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}}\right)+$$

$$e^{-\frac{(b+c+(u-2k)w)^2}{4(d+f+s(u-2k))}+e+g+t(u-2k)-\frac{i\pi u}{2}}(d+f+s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+c+(u-2k)w)^{-i-l+2n}$$

$$\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+c+(u-2k)w)\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}\right)+\right.$$

$$\left.2(d+f+s(u-2k))\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}\right)\right)$$

$$\sqrt{-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}}\Bigg)\Bigg)+$$

$$i^u\,2^{-m-2n-u-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-\frac{(b-c+a\,i\,(2k-m)+(2j-u)w)^2}{4(d-f+i\,(2k-m)p+s(2j-u))}+e-g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(2k-m)+(2j-u)w)^{-i-l+2n}$$

$$\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d-f+i\,(2k-m)p+s(2j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b-c+a\,i\,(2k-m)+(2j-u)w)$$

$$\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),$$

$$-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(4(d-f+i\,(2k-m)p+s(2j-u)))\Bigg)+2(d-f+i\,(2k-m)p+s(2j-u))$$

$$\Gamma\Bigg(\frac{1}{2}(i+l+2),-\Big(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+$$

$$s(2j-u))\sqrt{z}\Big)^2\Big/(4(d-f+i\,(2k-m)p+s(2j-u)))\Bigg)$$

$$\sqrt{\left(-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.(d-f+i\,(2k-m)p+s(2j-u))\right)\right)\Bigg)(d-f+i\,(2k-m)p+s(2j-u))^{-2n-2}+$$

$$e^{-\frac{(b+c+a\,i\,(2k-m)+(2j-u)w)^2}{4(d+f+i\,(2k-m)p+s(2j-u))}+e+g+i\,(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}(d+f+i\,(2k-m)p+s(2j-u))^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(2k-m)+(2j-u)w)^{-i-l+2n}$$

$$\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+f+i\,(2k-m)p+s(2j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b+c+a\,i\,(2k-m)+(2j-u)w)$$

$$\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),$$

$$-\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(4(d+f+i\,(2k-m)p+s(2j-u)))\Bigg)+2(d+f+i\,(2k-m)p+s(2j-u))\,\Gamma\Bigg(\frac{1}{2}(i+l+$$

$$2),\ -\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\Big)\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$
$$\left.\left.i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\Big)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e-g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$
$$\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$
$$-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$
$$2),\ -\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+\right.\right.}$$
$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$
$$\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$
$$-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$
$$2),\ -\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)+$$

$$e^{-\frac{(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$

$$\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$

$$2),\,-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+$$

$$i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$

$$\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$

$$2),\,-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+$$

$$i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)$$

$$\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(i+l+1),$$

$$-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/$$

$$\left.(4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\Gamma\Bigg(\frac{1}{2}\,(i+l+$$

$$2),\,-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/$$

$$\left.(4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+\right.\right.}$$

$$\left.\left.i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\Bigg)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{2}}{4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)$$

$$\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(i+l+1),$$

$$-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/$$

$$\left.(4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))$$

$$\Gamma\Bigg(\frac{1}{2}\,(i+l+2),\,-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+\right.$$

$$\left.s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/(4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Bigg)$$

$$\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\right.}$$

$$\left.\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}\bigwedge u\in\mathbb{N}^{+}$$

Involving cos, sinh, exp and power

Involving $z^{\alpha-1}\, e^{b\, z^r+e} \cos(a\, z^r+q) \sinh(w\, z^r+t) \cosh(c\, z^r+g)$

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$$\int z^{\alpha-1}\, e^{b\, z^r+e} \cos(a\, z^r+q) \sinh(w\, z^r+t) \cosh(c\, z^r+g)\, dz ==$$

$$\frac{1}{8\, r}\left(z^{\alpha}\left(-e^{e+g+i\, q+t}\, \Gamma\left(\frac{\alpha}{r}, (-b-c-i\, a-w)\, z^r\right)((-b-c-i\, a-w)\, z^r)^{-\frac{\alpha}{r}} - e^{e+g-i\, q+t}\, ((-b-c+i\, a-w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-c+i\, a-w)\, z^r\right) - e^{e-g+i\, q+t}\, ((-b+c-i\, a-w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+c-i\, a-w)\, z^r\right) - e^{e-g-i\, q+t}\, ((-b+c+i\, a-w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+c+i\, a-w)\, z^r\right) + e^{e+g+i\, q-t}\, ((-b-c-i\, a+w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-c-i\, a+w)\, z^r\right) + e^{e+g-i\, q-t}\, ((-b-c+i\, a+w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-c+i\, a+w)\, z^r\right) + e^{e-g+i\, q-t}\, ((-b+c-i\, a+w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+c-i\, a+w)\, z^r\right) + e^{e-g-i\, q-t}\, ((-b+c+i\, a+w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+c+i\, a+w)\, z^r\right)\right)\right)$$

Involving $z^n\, e^{b\, z^r+d\, z+e} \cos(a\, z^r+p\, z+q) \sinh(w\, z^r+s\, z+t) \cosh(c\, z^r+f\, z+g)$

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$$\int z^n\, e^{b\, z^2+d\, z+e} \cos(a\, z^2+p\, z+q) \sinh(w\, z^2+s\, z+t) \cosh(c\, z^2+f\, z+g)\, dz ==$$

$$\frac{1}{16}\left(e^{-\frac{(d-f-i\, p-s)^2}{4\,(b-c-i\, a-w)}+e-g-i\, q-t}\left(\sum_{l=0}^{n} 2^{l-n}\, (-d+f+i\, p+s)^{n-l}\, (d-f-i\, p-s+2\,(b-c-i\, a-w)\, z)^{l+1}\left(-\frac{(d-f-i\, p-s+2\,(b-c-i\, a-w)\, z)^2}{b-c-i\, a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2}, -\frac{(d-f-i\, p-s+2\,(b-c-i\, a-w)\, z)^2}{4\,(b-c-i\, a-w)}\right)\right)\right.$$

$$(b-c-i\, a-w)^{-n-1} + e^{-\frac{(d-f+i\, p-s)^2}{4\,(b-c+i\, a-w)}+e-g+i\, q-t}\, (b-c+i\, a-w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n}\, (-d+f-i\, p+s)^{n-l}\, (d-f+i\, p-s+2\,(b-c+i\, a-w)\, z)^{l+1}\left(-\frac{(d-f+i\, p-s+2\,(b-c+i\, a-w)\, z)^2}{b-c+i\, a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2}, -\frac{(d-f+i\, p-s+2\,(b-c+i\, a-w)\, z)^2}{4\,(b-c+i\, a-w)}\right) +$$

$$e^{-\frac{(d+f-i\, p-s)^2}{4\,(b+c-i\, a-w)}+e+g-i\, q-t}\, (b+c-i\, a-w)^{-n-1} \sum_{l=0}^{n} 2^{l-n}\, (-d-f+i\, p+s)^{n-l}\, (d+f-i\, p-s+2\,(b+c-i\, a-w)\, z)^{l+1}$$

$$\left.\left(-\frac{(d+f-i\, p-s+2\,(b+c-i\, a-w)\, z)^2}{b+c-i\, a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2}, -\frac{(d+f-i\, p-s+2\,(b+c-i\, a-w)\, z)^2}{4\,(b+c-i\, a-w)}\right) +\right.$$

$$\left. e^{-\frac{(d+f+i\, p-s)^2}{4\,(b+c+i\, a-w)}+e+g+i\, q-t}\, (b+c+i\, a-w)^{-n-1} \sum_{l=0}^{n} 2^{l-n}\, (-d-f-i\, p+s)^{n-l}\, (d+f+i\, p-s+2\,(b+c+i\, a-w)\, z)^{l+1}\right)$$

$$\left(-\frac{(d+f+i\,p-s+2\,(b+c+i\,a\,-w)\,z)^2}{b+c+i\,a\,-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+f+i\,p-s+2\,(b+c+i\,a\,-w)\,z)^2}{4\,(b+c+i\,a\,-w)}\right)-$$

$$e^{-\frac{(d-f-i\,p+s)^2}{4\,(b-c-i\,a\,+w)}+e-g-i\,q+t}\,(b-c-i\,a\,+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d+f+i\,p-s)^{n-l}\,(d-f-i\,p+s+2\,(b-c-i\,a\,+w)\,z)^{l+1}$$

$$\left(-\frac{(d-f-i\,p+s+2\,(b-c-i\,a\,+w)\,z)^2}{b-c-i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-f-i\,p+s+2\,(b-c-i\,a\,+w)\,z)^2}{4\,(b-c-i\,a\,+w)}\right)-$$

$$e^{-\frac{(d-f+i\,p+s)^2}{4\,(b-c+i\,a\,+w)}+e-g+i\,q+t}\,(b-c+i\,a\,+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d+f-i\,p-s)^{n-l}\,(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)^{l+1}$$

$$\left(-\frac{(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)^2}{b-c+i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-f+i\,p+s+2\,(b-c+i\,a\,+w)\,z)^2}{4\,(b-c+i\,a\,+w)}\right)-$$

$$e^{-\frac{(d+f-i\,p+s)^2}{4\,(b+c-i\,a\,+w)}+e+g-i\,q+t}\,(b+c-i\,a\,+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-f+i\,p-s)^{n-l}\,(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)^{l+1}$$

$$\left(-\frac{(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)^2}{b+c-i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+f-i\,p+s+2\,(b+c-i\,a\,+w)\,z)^2}{4\,(b+c-i\,a\,+w)}\right)-$$

$$e^{-\frac{(d+f+i\,p+s)^2}{4\,(b+c+i\,a\,+w)}+e+g+i\,q+t}\,(b+c+i\,a\,+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-f-i\,p-s)^{n-l}\,(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)^{l+1}$$

$$\left(-\frac{(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)^2}{b+c+i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\left.\Gamma\left(\frac{l+1}{2},-\frac{(d+f+i\,p+s+2\,(b+c+i\,a\,+w)\,z)^2}{4\,(b+c+i\,a\,+w)}\right)\right)/;\,n\in\mathbb{N}$$

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$$\int z^n\,e^{\sqrt{z}\;b+e+d\,z}\cos\left(\sqrt{z}\;a+q+p\,z\right)\sinh\left(t+s\,z+w\,\sqrt{z}\;\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$-2^{-2\,n-4}\left(e^{-\frac{(b-c+i\,a\,-w)^2}{4\,(d-f+i\,p-s)}+e-g+i\,q-t}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+i\,a\,-w)^{-i-l+2\,n}\right.\right.$$

$$\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\;\right)^{i+l}\left(-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\;\right)^2}{d-f+i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b-c+i\,a\,-w)\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\;\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}\Bigg)+2\sqrt{-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{d-f+i\,p-s}}$$

$$(d-f+i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b-c+i\,a\,-w+2\,(d-f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p-s)}\right)\Bigg)\Bigg)$$

$$(d-f+i\,p-s)^{-2\,n-2}+e^{-\frac{(b+c+i\,a-w)^2}{4\,(d+f+i\,p-s)}+e+g+i\,q-t}\,(d+f+i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+i\,a\,-w)^{-i-l+2\,n}$$

$$\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}\right)^{\frac{1}{2}\,(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+c+i\,a\,-w)\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$\left.-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}\right)+2\sqrt{-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{d+f+i\,p-s}}$$

$$(d+f+i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+c+i\,a\,-w+2\,(d+f+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f+i\,p-s)}\right)\Bigg)+$$

$$e^{-\frac{(b-c-i\,a-w)^2}{4\,(d-f-i\,p-s)}+e-g-i\,q-t}\,(d-f-i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c-i\,a\,-w)^{-i-l+2\,n}$$

$$\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}\right)^{\frac{1}{2}\,(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b-c-i\,a\,-w)\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$\left.-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}\right)+2\sqrt{-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{d-f-i\,p-s}}$$

$$(d-f-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(b-c-i\,a\,-w+2\,(d-f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-f-i\,p-s)}\right)\Bigg)+$$

$$e^{-\frac{(b+c-i\,a\,-w)^2}{4\,(d+f-i\,p-s)}+e+g-i\,q-t}\,(d+f-i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c-i\,a\,-w)^{-i-l+2\,n}$$

$$\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+c-i\,a\,-w)\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.$$

$$\left.-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}\right)+2\sqrt{-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{d+f-i\,p-s}}$$

$$(d+f-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(b+c-i\,a\,-w+2\,(d+f-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p-s)}\right)\Bigg)-$$

$$e^{-\frac{(b-c+i\,a\,+w)^2}{4\,(d-f+i\,p+s)}+e-g+i\,q+t}\,(d-f+i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+i\,a\,+w)^{-i-l+2\,n}$$

$$\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b-c+i\,a\,+w)\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.$$

$$\left.-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}\right)+2\sqrt{-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{d-f+i\,p+s}}$$

$$(d-f+i\,p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(b-c+i\,a\,+w+2\,(d-f+i\,p+s)\,\sqrt{z}\right)^2}{4\,(d-f+i\,p+s)}\right)\Bigg)-$$

$$e^{-\frac{(b+c+i a+w)^2}{4(d+f+i p+s)}+e+g+i q+t}(d+f+i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+c+i a+w)^{-i-l+2n}$$

$$\left(b+c+i a+w+2(d+f+i p+s)\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c+i a+w+2(d+f+i p+s)\sqrt{z}\right)^2}{d+f+i p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b+c+i a+w)\left(b+c+i a+w+2(d+f+i p+s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+c+i a+w+2(d+f+i p+s)\sqrt{z}\right)^2}{4(d+f+i p+s)}\right)+2\sqrt{-\frac{\left(b+c+i a+w+2(d+f+i p+s)\sqrt{z}\right)^2}{d+f+i p+s}}$$

$$\left.(d+f+i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c+i a+w+2(d+f+i p+s)\sqrt{z}\right)^2}{4(d+f+i p+s)}\right)\right)-$$

$$e^{-\frac{(b-c-i a+w)^2}{4(d-f-i p+s)}+e-g-i q+t}(d-f-i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-c-i a+w)^{-i-l+2n}$$

$$\left(b-c-i a+w+2(d-f-i p+s)\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c-i a+w+2(d-f-i p+s)\sqrt{z}\right)^2}{d-f-i p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b-c-i a+w)\left(b-c-i a+w+2(d-f-i p+s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b-c-i a+w+2(d-f-i p+s)\sqrt{z}\right)^2}{4(d-f-i p+s)}\right)+2\sqrt{-\frac{\left(b-c-i a+w+2(d-f-i p+s)\sqrt{z}\right)^2}{d-f-i p+s}}$$

$$\left.(d-f-i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c-i a+w+2(d-f-i p+s)\sqrt{z}\right)^2}{4(d-f-i p+s)}\right)\right)-$$

$$e^{-\frac{(b+c-i a+w)^2}{4(d+f-i p+s)}+e+g-i q+t}(d+f-i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+c-i a+w)^{-i-l+2n}$$

$$\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b+c-i\,a+w)\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}\right)+2\sqrt{-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{d+f-i\,p+s}}$$

$$\left.(d+f-i\,p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c-i\,a+w+2\,(d+f-i\,p+s)\,\sqrt{z}\right)^2}{4\,(d+f-i\,p+s)}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving powers of cos, powers of sinh, exp and power

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)$

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$$\int z^{\alpha-1}\,e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh(c\,z^r+g)\,dz==$$

$$-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\left(e^{e+g}\,\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)\left((-b-c)\,z^r\right)^{-\frac{\alpha}{r}}+e^{e-g}\left((c-b)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)\right)\right.$$

$$\left.(1-m\bmod 2)\,(1-u\bmod 2)\right)-\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{u}{\frac{u}{2}}(1-u\bmod 2)\right.$$

$$\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{e+g+2\,i\,j\,q-i\,m\,q}\,\Gamma\left(\frac{\alpha}{r},(-b-c-2\,i\,a\,j+i\,a\,m)\,z^r\right)\left((-b-c-2\,i\,a\,j+i\,a\,m)\,z^r\right)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-g+2\,i\,j\,q-i\,m\,q}\left((-b+c-2\,i\,a\,j+i\,a\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c-2\,i\,a\,j+i\,a\,m)\,z^r\right)+$$

$$e^{e+g-2\,i\,j\,q+i\,m\,q}\left((-b-c+2\,i\,a\,j-i\,a\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-c+2\,i\,a\,j-i\,a\,m)\,z^r\right)+$$

$$\left.\left.e^{e-g-2\,i\,j\,q+i\,m\,q}\left((-b+c+2\,i\,a\,j-i\,a\,m)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c+2\,i\,a\,j-i\,a\,m)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{e+g+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{\alpha}{r},(-b-c-2\,k\,w+u\,w)\,z^r\right)\right.\right.$$

$$((-b-c-2kw+uw)z^r)^{-\frac{\alpha}{r}}+e^{e-g+2kt-tu+\frac{i\pi u}{2}}((-b+c-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\right.$$

$$\left.(-b+c-2kw+uw)z^r\right)+e^{e+g-2kt+tu-\frac{i\pi u}{2}}((-b-c+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-c+2kw-uw)z^r\right)+$$

$$\left.e^{e-g-2kt+tu-\frac{i\pi u}{2}}((-b+c+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c+2kw-uw)z^r\right)\right)\Bigg)-$$

$$\frac{1}{r}\Bigg(\left(i^u\,2^{-m-u-1}\,z^\alpha\right)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{e+g+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}\Gamma\left(\frac{\alpha}{r},(-b-c-2iaj+iam-2kw+uw)z^r\right)$$

$$((-b-c-2iaj+iam-2kw+uw)z^r)^{-\frac{\alpha}{r}}+e^{e-g+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}$$

$$((-b+c-2iaj+iam-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c-2iaj+iam-2kw+uw)z^r\right)+$$

$$e^{e+g-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}((-b-c+2iaj-iam-2kw+uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b-c+2iaj-iam-2kw+uw)z^r\right)+e^{e-g-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}$$

$$((-b+c+2iaj-iam-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c+2iaj-iam-2kw+uw)z^r\right)+$$

$$e^{e+g+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}((-b-c-2iaj+iam+2kw-uw)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b-c-2iaj+iam+2kw-uw)z^r\right)+e^{e-g+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}$$

$$((-b+c-2iaj+iam+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+c-2iaj+iam+2kw-uw)z^r\right)+$$

$$e^{e+g-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}((-b-c+2iaj-iam+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-c+2iaj-\right.$$

$$\left.iam+2kw-uw)z^r\right)+e^{e-g-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}((-b+c+2iaj-iam+2kw-uw)z^r)^{-\frac{\alpha}{r}}$$

$$\left.\Gamma\left(\frac{\alpha}{r},(-b+c+2iaj-iam+2kw-uw)z^r\right)\right)\Bigg)/;m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cos^m(a\,z^r+p\,z+q)\sinh^u(w\,z^r+s\,z+t)\cosh(c\,z^r+f\,z+g)$

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$$\int z^n\,e^{b\,z^2+d\,z+e}\cos^m(a\,z^2+p\,z+q)\sinh^u(w\,z^2+s\,z+t)\cosh(c\,z^2+f\,z+g)\,dz==$$

$$-i^u\,2^{-m-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)(1-u\bmod 2)\left(e^{-\frac{(d-f)^2}{4(b-c)}+e-g}\left(\sum_{l=0}^{n}2^{l-n}(f-d)^{n-l}(d-f+2(b-c)z)^{l+1}\right.\right.$$

$$\left.\left(-\frac{(d-f+2(b-c)z)^2}{b-c}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-f+2(b-c)z)^2}{4(b-c)}\right)\right)(b-c)^{-n-1}+(b+c)^{-n-1}\,e^{-\frac{(d+f)^2}{4(b+c)}+e+g}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d-f)^{n-l} (d+f+2(b+c)z)^{l+1} \left(-\frac{(d+f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\left(\frac{l+1}{2}, -\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)\Bigg) -$$

$$i^u 2^{-m-u-2} \binom{u}{\frac{u}{2}} (1-u \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \Bigg(e^{-\frac{(d-f+i(2k-m)p)^2}{4(b-c+ai(2k-m))}+e-g+i(2k-m)q} (b-c+ai(2k-m))^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d+f-i(2k-m)p)^{n-l} (d-f+i(2k-m)p+2(b-c+ai(2k-m))z)^{l+1}$$

$$\left(-\frac{(d-f+i(2k-m)p+2(b-c+ai(2k-m))z)^2}{b-c+ai(2k-m)}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d-f+i(2k-m)p+2(b-c+ai(2k-m))z)^2}{4(b-c+ai(2k-m))}\right) + e^{-\frac{(d+f+i(2k-m)p)^2}{4(b+c+ai(2k-m))}+e+g+i(2k-m)q}$$

$$(b+c+ai(2k-m))^{-n-1} \sum_{l=0}^{n} 2^{l-n} (-d-f-i(2k-m)p)^{n-l} (d+f+i(2k-m)p+2(b+c+ai(2k-m))z)^{l+1}$$

$$\left(-\frac{(d+f+i(2k-m)p+2(b+c+ai(2k-m))z)^2}{b+c+ai(2k-m)}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d+f+i(2k-m)p+2(b+c+ai(2k-m))z)^2}{4(b+c+ai(2k-m))}\right) + e^{-\frac{(d-f+i(m-2k)p)^2}{4(b-c+ai(m-2k))}+e-g+i(m-2k)q}$$

$$(b-c+ai(m-2k))^{-n-1} \sum_{l=0}^{n} 2^{l-n} (-d+f-i(m-2k)p)^{n-l} (d-f+i(m-2k)p+2(b-c+ai(m-2k))z)^{l+1}$$

$$\left(-\frac{(d-f+i(m-2k)p+2(b-c+ai(m-2k))z)^2}{b-c+ai(m-2k)}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d-f+i(m-2k)p+2(b-c+ai(m-2k))z)^2}{4(b-c+ai(m-2k))}\right) + e^{-\frac{(d+f+i(m-2k)p)^2}{4(b+c+ai(m-2k))}+e+g+i(m-2k)q}$$

$$(b+c+ai(m-2k))^{-n-1} \sum_{l=0}^{n} 2^{l-n} (-d-f-i(m-2k)p)^{n-l} (d+f+i(m-2k)p+2(b+c+ai(m-2k))z)^{l+1}$$

$$\left(-\frac{(d+f+i(m-2k)p+2(b+c+ai(m-2k))z)^2}{b+c+ai(m-2k)}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d+f+i(m-2k)p+2(b+c+ai(m-2k))z)^2}{4(b+c+ai(m-2k))}\right)\Bigg) - i^u 2^{-m-u-2} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{i=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^i \binom{u}{i} \Bigg(e^{-\frac{(d-f+s(2i-u))^2}{4(b-c+(2i-u)w)}+e-g+t(2i-u)+\frac{i\pi u}{2}} (b-c+(2i-u)w)^{-n-1} \sum_{l=0}^{n} 2^{l-n} (-d+f-s(2i-u))^{n-l}$$

$$(d-f+s(2i-u)+2(b-c+(2i-u)w)z)^{l+1}\left(-\frac{(d-f+s(2i-u)+2(b-c+(2i-u)w)z)^2}{b-c+(2i-u)w}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-f+s(2i-u)+2(b-c+(2i-u)w)z)^2}{4(b-c+(2i-u)w)}\right)+$$

$$e^{-\frac{(d+f+s(2i-u))^2}{4(b+c+(2i-u)w)}+e+g+t(2i-u)+\frac{i\pi u}{2}}(b+c+(2i-u)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-d-f-s(2i-u))^{n-l}$$

$$(d+f+s(2i-u)+2(b+c+(2i-u)w)z)^{l+1}\left(-\frac{(d+f+s(2i-u)+2(b+c+(2i-u)w)z)^2}{b+c+(2i-u)w}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+f+s(2i-u)+2(b+c+(2i-u)w)z)^2}{4(b+c+(2i-u)w)}\right)+$$

$$e^{-\frac{(d-f+s(u-2i))^2}{4(b-c+(u-2i)w)}+e-g+t(u-2i)-\frac{i\pi u}{2}}(b-c+(u-2i)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-d+f-s(u-2i))^{n-l}$$

$$(d-f+s(u-2i)+2(b-c+(u-2i)w)z)^{l+1}\left(-\frac{(d-f+s(u-2i)+2(b-c+(u-2i)w)z)^2}{b-c+(u-2i)w}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-f+s(u-2i)+2(b-c+(u-2i)w)z)^2}{4(b-c+(u-2i)w)}\right)+$$

$$e^{-\frac{(d+f+s(u-2i))^2}{4(b+c+(u-2i)w)}+e+g+t(u-2i)-\frac{i\pi u}{2}}(b+c+(u-2i)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-d-f-s(u-2i))^{n-l}$$

$$(d+f+s(u-2i)+2(b+c+(u-2i)w)z)^{l+1}\left(-\frac{(d+f+s(u-2i)+2(b+c+(u-2i)w)z)^2}{b+c+(u-2i)w}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+f+s(u-2i)+2(b+c+(u-2i)w)z)^2}{4(b+c+(u-2i)w)}\right)\Bigg)-$$

$$i^u\,2^{-m-u-2}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\Bigg(e^{-\frac{(d-f+i(2j-m)p+s(2i-u))^2}{4(b-c+a\,i(2j-m)+(2i-u)w)}+e-g+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}}$$

$$(b-c+a\,i(2j-m)+(2i-u)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-d+f-i(2j-m)p-s(2i-u))^{n-l}$$

$$(d-f+i(2j-m)p+s(2i-u)+2(b-c+a\,i(2j-m)+(2i-u)w)z)^{l+1}$$

$$\Big(-(d-f+i(2j-m)p+s(2i-u)+2(b-c+a\,i(2j-m)+(2i-u)w)z)^2\Big/$$

$$(b-c+a\,i(2j-m)+(2i-u)w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Bigg(\frac{l+1}{2},-(d-f+i(2j-m)p+s(2i-u)+$$

$$2(b-c+a\,i(2j-m)+(2i-u)w)z)^2\Big/(4(b-c+a\,i(2j-m)+(2i-u)w))\Bigg)+$$

$$e^{-\frac{(d+f+i(2j-m)p+s(2i-u))^2}{4(b+c+a\,i(2j-m)+(2i-u)w)}+e+g+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}}(b+c+a\,i(2j-m)+(2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} \left(-d-f-i\,(2\,j-m)\,p-s\,(2\,i-u)\right)^{n-l} \left(d+f+i\,(2\,j-m)\,p+s\,(2\,i-u)+\right.$$
$$\left.2\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z\right)^{l+1} \left(-(d+f+i\,(2\,j-m)\,p+s\,(2\,i-u)+\right.$$
$$\left.2\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z\right)^2 \Big/ (b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$
$$\Gamma\left(\frac{l+1}{2}, -(d+f+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2 \Big/\right.$$
$$\left.(4\,(b+c+a\,i\,(2\,j-m)+(2\,i-u)\,w))\right)+e^{-\frac{(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+e-g+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}$$
$$(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)^{-n-1} \sum_{l=0}^{n} 2^{l-n} \left(-d+f-i\,(m-2\,j)\,p-s\,(2\,i-u)\right)^{n-l}$$
$$(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^{l+1}$$
$$\left(-(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2 \Big/\right.$$
$$\left.(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\right)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\left(\frac{l+1}{2}, -(d-f+i\,(m-2\,j)\,p+s\,(2\,i-u)+\right.$$
$$\left.2\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2 \Big/ (4\,(b-c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\right)+$$
$$e^{-\frac{(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+e+g+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}} (b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)^{-n-1}$$
$$\sum_{l=0}^{n} 2^{l-n} \left(-d-f-i\,(m-2\,j)\,p-s\,(2\,i-u)\right)^{n-l} \left(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u)+\right.$$
$$\left.2\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z\right)^{l+1} \left(-(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u)+\right.$$
$$\left.2\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z\right)^2 \Big/ (b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$
$$\Gamma\left(\frac{l+1}{2}, -(d+f+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2 \Big/\right.$$
$$\left.(4\,(b+c+a\,i\,(m-2\,j)+(2\,i-u)\,w))\right)+e^{-\frac{(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+e-g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}$$
$$(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)^{-n-1} \sum_{l=0}^{n} 2^{l-n} \left(-d+f-i\,(2\,j-m)\,p-s\,(u-2\,i)\right)^{n-l}$$
$$(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\left(-(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2 \Big/\right.$$
$$\left.(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\right)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\left(\frac{l+1}{2}, -(d-f+i\,(2\,j-m)\,p+s\,(u-2\,i)+\right.$$
$$\left.2\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2 \Big/ (4\,(b-c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\right)+$$
$$e^{-\frac{(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+e+g+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}} (b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)^{-n-1}$$
$$\sum_{l=0}^{n} 2^{l-n} \left(-d-f-i\,(2\,j-m)\,p-s\,(u-2\,i)\right)^{n-l}$$
$$(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\left(-(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/\right.$$
$$(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d+f+i\,(2\,j-m)\,p+s\,(u-2\,i)+\right.$$
$$\left.\left.2\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/(4\,(b+c+a\,i\,(2\,j-m)+(u-2\,i)\,w))\right)+$$
$$e^{-\frac{(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+e-g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)^{-n-1}$$
$$\sum_{l=0}^{n}2^{l-n}\,(-d+f-i\,(m-2\,j)\,p-s\,(u-2\,i))^{n-l}$$
$$(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\left(-(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/\right.$$
$$(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d-f+i\,(m-2\,j)\,p+s\,(u-2\,i)+\right.$$
$$\left.\left.2\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/(4\,(b-c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\right)+$$
$$e^{-\frac{(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+e+g+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)^{-n-1}$$
$$\sum_{l=0}^{n}2^{l-n}\,(-d-f-i\,(m-2\,j)\,p-s\,(u-2\,i))^{n-l}$$
$$(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\left(-(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/\right.$$
$$(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$
$$\left.\Gamma\left(\frac{l+1}{2},\,-(d+f+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(b+c+a\,i\,(m-2\,j)+(u-2\,i)\,w))\right)\right]/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+$$

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$$\int z^n\,e^{\sqrt{z}\,b+e+d\,z}\cos^m\left(\sqrt{z}\,a+q+p\,z\right)\sinh^u\left(t+s\,z+w\,\sqrt{z}\right)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz=$$
$$i^u\,2^{-m-2\,n-u-2}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)$$
$$\left(e^{-\frac{(b-c)^2}{4\,(d-f)}+e-g}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c)^{-i-l+2\,n}\left(b-c+2\,(d-f)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\right.\right.$$
$$\left.\left.\binom{n}{i}\left((b-c)\left(b-c+2\,(d-f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(b-c+2\,(d-f)\,\sqrt{z}\right)^2}{4\,(d-f)}\right)+\right.\right.$$

$$2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\Bigg)\Bigg)(d-f)^{-2n-2}+$$

$$e^{-\frac{(b+c)^2}{4(d+f)}+e+g}(d+f)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c)^{-i-l+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+$$

$$2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\Bigg)\Bigg)+$$

$$i^u\,2^{-m-2n-u-2}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{-\frac{(b-c+a\,i\,(2k-m))^2}{4(d-f+i\,(2k-m)\,p)}+e-g+i\,(2k-m)\,q}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(2k-m))^{-i-l+2n}\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{d-f+i\,(2k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b-c+a\,i\,(2k-m))\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}\right)+2$$

$$(d-f+i\,(2k-m)\,p)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+a\,i\,(2k-m)+2(d-f+i\,(2k-m)\,p)\sqrt{z}\right)^2}{4(d-f+i\,(2k-m)\,p)}\right)$$

$$\sqrt{-\frac{\left(b-c+a\,i\,(2\,k-m)+2\,(d-f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(2\,k-m)\,p}}\Bigg)\Bigg)$$

$$(d-f+i\,(2\,k-m)\,p)^{-2\,n-2}+e^{-\frac{(b+c+a\,i\,(2\,k-m))^2}{4\,(d+f+i\,(2\,k-m)\,p)}+e+g+i\,(2\,k-m)\,q}\,(d+f+i\,(2\,k-m)\,p)^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(2\,k-m))^{-i-l+2\,n}\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+c+a\,i\,(2\,k-m))\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}\Bigg)+$$

$$2\,(d+f+i\,(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(2\,k-m)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+c+a\,i\,(2\,k-m)+2\,(d+f+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(2\,k-m)\,p}}\Bigg)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k))^2}{4\,(d-f+i\,(m-2\,k)\,p)}+e-g+i\,(m-2\,k)\,q}\,(d-f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(m-2\,k))^{-i-l+2\,n}$$

$$\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b-c+a\,i\,(m-2\,k))\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\Bigg)+$$

$$2\,(d-f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d-f+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b-c+a\,i\,(m-2\,k)+2\,(d-f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d-f+i\,(m-2\,k)\,p}}\Bigg)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k))^2}{4\,(d+f+i\,(m-2\,k)\,p)}+e+g+i\,(m-2\,k)\,q}\,(d+f+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(m-2\,k))^{-i-l+2\,n}$$

$$\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+c+a\,i\,(m-2\,k))\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(i+l+1),\,-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\Bigg)+$$

$$2\,(d+f+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+f+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+c+a\,i\,(m-2\,k)+2\,(d+f+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+f+i\,(m-2\,k)\,p}}\Bigg)\Bigg)+$$

$$i^u\,2^{-m-2\,n-u-2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{(b-c+(2\,k-u)\,w)^2}{4\,(d-f+s\,(2\,k-u))}+e-g+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+(2\,k-u)\,w)^{-i-l+2\,n}\left(b-c+(2\,k-u)\,w+2\,(d-f+s\,(2\,k-u))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-c+(2k-u)w)\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}\right)+2$$

$$\sqrt{-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{d-f+s(2k-u)}}\ (d-f+s(2k-u))$$

$$\left.\left.\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+(2k-u)w+2(d-f+s(2k-u))\sqrt{z}\right)^2}{4(d-f+s(2k-u))}\right)\right)\right)$$

$$(d-f+s(2k-u))^{-2n-2}+e^{-\frac{(b+c+(2k-u)w)^2}{4(d+f+s(2k-u))}+e+g+t(2k-u)+\frac{i\pi u}{2}}(d+f+s(2k-u))^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+c+(2k-u)w)^{-i-l+2n}\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+c+(2k-u)w)\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(i+l+1),-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}\right)+$$

$$2\sqrt{-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{d+f+s(2k-u)}}\ (d+f+s(2k-u))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(i+l+2),-\frac{\left(b+c+(2k-u)w+2(d+f+s(2k-u))\sqrt{z}\right)^2}{4(d+f+s(2k-u))}\right)\right)+$$

$$e^{-\frac{(b-c+(u-2k)w)^2}{4(d-f+s(u-2k))}+e-g+t(u-2k)-\frac{i\pi u}{2}}(d-f+s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-c+(u-2k)w)^{-i-l+2n}$$

$$\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-c+(u-2k)w)\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(i+l+1),-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}\right)+$$

$$2(d-f+s(u-2k))\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{4(d-f+s(u-2k))}\right)$$

$$\left.\sqrt{-\frac{\left(b-c+(u-2k)w+2(d-f+s(u-2k))\sqrt{z}\right)^2}{d-f+s(u-2k)}}\right)+$$

$$e^{-\frac{(b+c+(u-2k)w)^2}{4(d+f+s(u-2k))}+e+g+t(u-2k)-\frac{i\pi u}{2}}(d+f+s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+c+(u-2k)w)^{-i-l+2n}$$

$$\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+c+(u-2k)w)\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(i+l+1),-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}\right)+$$

$$2(d+f+s(u-2k))\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{4(d+f+s(u-2k))}\right)$$

$$\sqrt{-\frac{\left(b+c+(u-2k)w+2(d+f+s(u-2k))\sqrt{z}\right)^2}{d+f+s(u-2k)}}\Bigg)\Bigg)+$$

$$i^u\,2^{-m-2n-u-2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-\frac{(b-c+a\,i\,(2k-m)+(2j-u)w)^2}{4(d-f+i(2k-m)p+s(2j-u))}+e-g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(2k-m)+(2j-u)w)^{-i-l+2n}$$

$$\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^{i+l}$$

$$\Bigg(-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(d-f+i\,(2k-m)p+s(2j-u))\Bigg)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b-c+a\,i\,(2k-m)+(2j-u)w)$$

$$\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),$$

$$-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(4(d-f+i\,(2k-m)p+s(2j-u)))\Bigg)+2(d-f+i\,(2k-m)p+s(2j-u))$$

$$\Gamma\Bigg(\frac{1}{2}(i+l+2),\,-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+\right.$$

$$\left.s(2j-u))\sqrt{z}\right)^2\Big/(4(d-f+i\,(2k-m)p+s(2j-u)))\Bigg)$$

$$\sqrt{\Bigg(-\left(b-c+a\,i\,(2k-m)+(2j-u)w+2(d-f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(d-f+i\,(2k-m)p+s(2j-u))\Bigg)}\Bigg)\Bigg)(d-f+i\,(2k-m)p+s(2j-u))^{-2n-2}+$$

$$e^{-\frac{(b+c+a\,i\,(2k-m)+(2j-u)w)^2}{4(d+f+i(2k-m)p+s(2j-u))}+e+g+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}(d+f+i\,(2k-m)p+s(2j-u))^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(2k-m)+(2j-u)w)^{-i-l+2n}$$

$$\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^{i+l}$$

$$\Bigg(-\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(d+f+i\,(2k-m)p+s(2j-u))\Bigg)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b+c+a\,i\,(2k-m)+(2j-u)w)$$

$$\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),$$

$$-\left(b+c+a\,i\,(2k-m)+(2j-u)w+2(d+f+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/$$

$$(4(d+f+i\,(2k-m)p+s(2j-u)))\Bigg)+2(d+f+i\,(2k-m)p+s(2j-u))\,\Gamma\Bigg(\frac{1}{2}(i+l+$$

$$2),\ -\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u)))\Big)\sqrt{\left(-\left(b+c+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$
$$\left.\left.i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+f+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\Big)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e-g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$
$$\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$
$$-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$
$$2),\ -\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)\sqrt{\left(-\left(b-c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d-f+\right.\right.}$$
$$\left.\left.i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d-f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Big)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e+g+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w)$$
$$\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$
$$-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$
$$2),\ -\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$
$$(4\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u)))\Big)\sqrt{\left(-\left(b+c+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+f+\right.\right.}$$

$$i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\Big)^2\Big/\,(d+f+i\,(m-2\,k)\,p+s\,(2\,j-u))\Big)\Big)+$$

$$e^{-\frac{(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e-g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$

$$\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$

$$2),\,-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\Big(b-c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d-f+$$

$$i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d-f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e+g+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w)$$

$$\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$

$$2),\,-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\Big(b+c+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+f+$$

$$i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+f+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e-g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w)$$

$$\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/$$

$$(4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\Gamma\Big(\frac{1}{2}\,(i+l+$$

$$2),\,-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/$$

$$(4\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\left(b-c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d-f+\right.}$$

$$\left.i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\,(d-f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{2}}{4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+g+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w)$$

$$\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/$$

$$(4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+\right.$$

$$\left.s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\,(4\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)$$

$$\sqrt{\Big(-\left(b+c+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/}$$

$$\left.(d+f+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}\bigwedge u\in\mathbb{N}^{+}$$

Involving functions of the direct function

Involving powers of the direct function

Involving powers of cosh

Involving $\cosh^{\nu}(a\,z)$

01.20.21.2037.01

$$\int \cosh^{\nu}(a\,z)\,dz == \frac{\cosh^{\nu+1}(a\,z)\,\operatorname{csch}(a\,z)\,\sqrt{-\sinh^2(a\,z)}}{a\,(\nu+1)}\,{}_2F_1\left(\frac{\nu+1}{2},\,\frac{1}{2};\,\frac{\nu+3}{2};\,\cosh^2(a\,z)\right)$$

01.20.21.2038.01

$$\int \cosh^2(a\,z)\,dz == \frac{2\,a\,z+\sinh(2\,a\,z)}{4\,a}$$

01.20.21.2039.01

$$\int \cosh^3(a\,z)\,dz == \frac{9\sinh(a\,z)+\sinh(3\,a\,z)}{12\,a}$$

01.20.21.2040.01

$$\int \cosh^4(a\,z)\,dz == \frac{12\,a\,z+8\sinh(2\,a\,z)+\sinh(4\,a\,z)}{32\,a}$$

01.20.21.2041.01

$$\int \cosh^5(a\,z)\,dz == \frac{150\sinh(a\,z)+25\sinh(3\,a\,z)+3\sinh(5\,a\,z)}{240\,a}$$

01.20.21.2042.01

$$\int \cosh^6(a\,z)\,dz == \frac{60\,a\,z+45\sinh(2\,a\,z)+9\sinh(4\,a\,z)+\sinh(6\,a\,z)}{192\,a}$$

01.20.21.2043.01

$$\int \cosh^7(a\,z)\,dz == \frac{1225\sinh(a\,z)+245\sinh(3\,a\,z)+49\sinh(5\,a\,z)+5\sinh(7\,a\,z)}{2240\,a}$$

01.20.21.2044.01

$$\int \cosh^8(a\,z)\,dz == \frac{1}{3072\,a}\,(840\,a\,z+672\sinh(2\,a\,z)+168\sinh(4\,a\,z)+32\sinh(6\,a\,z)+3\sinh(8\,a\,z))$$

01.20.21.4946.01

$$\int \cosh^{2n}(a\,z)\,dz = \frac{\left(\frac{1}{2}\right)_n}{2\,a\,n!}\left(2\,a\,z+\tanh(a\,z)\sum_{k=1}^{n}\frac{(k-1)!\cosh^{2k}(a\,z)}{\left(\frac{1}{2}\right)_k}\right)/;\,n\in\mathbb{N}$$

01.20.21.4947.01

$$\int \cosh^{2n+1}(a\,z)\,dz = \frac{n!\sinh^{2n+1}(a\,z)}{a}\sum_{k=0}^{n}\frac{(-1)^{n-k}\coth^{2k}(a\,z)}{\left(\frac{3}{2}\right)_{n-k}\,k!}\,/;\,n\in\mathbb{N}$$

01.20.21.4948.01

$$\int \cosh^{2n}(a\,z)\,dz == \frac{\left(\frac{1}{2}\right)_n\sin^{-1}(\cosh(a\,z))\sinh(a\,z)}{a\,n!\,\sqrt{-\sinh^2(a\,z)}}-\frac{\cosh^{2n+1}(a\,z)\sinh(a\,z)}{a\,(2\,n+1)}\,{}_2F_1\left(1,\,n+1;\,n+\frac{3}{2};\,\cosh^2(a\,z)\right)+\frac{z\left(\frac{1}{2}\right)_n}{n!}\,/;\,n\in\mathbb{N}$$

01.20.21.4949.01

$$\int \cosh^{2n+1}(a\,z)\,dz = \frac{\cosh^{2n+2}(a\,z)\,\operatorname{csch}(a\,z)}{2\,a\,(n+1)}\,{}_2F_1\left(\frac{1}{2},\,1;\,n+2;\,\coth^2(a\,z)\right) + \frac{n!\,\sqrt{-\operatorname{csch}^2(a\,z)}\,\sinh(a\,z)}{a\left(\frac{3}{2}\right)_n} /;\, n \in \mathbb{N}$$

01.20.21.2045.01

$$\int \cosh^{\frac{3}{2}}(a\,z)\,dz == \frac{2\left(\cosh^{\frac{1}{2}}(a\,z)\sinh(a\,z) - i\,F\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)\right)}{3\,a}$$

01.20.21.2046.01

$$\int \cosh^{\frac{1}{2}}(a\,z)\,dz == -\frac{2\,i}{a}\,E\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)$$

01.20.21.2047.01

$$\int \frac{1}{\cosh^{\frac{1}{2}}(a\,z)}\,dz == -\frac{2\,i}{a}\,F\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)$$

01.20.21.2048.01

$$\int \frac{1}{\cosh^{\frac{3}{2}}(a\,z)}\,dz == \frac{1}{a}\left(2\,i\,E\left(\frac{i\,a\,z}{2}\,\middle|\,2\right) + \frac{2\sinh(a\,z)}{\cosh^{\frac{1}{2}}(a\,z)}\right)$$

01.20.21.2049.01

$$\int \frac{1}{\sqrt{\cosh^3(a\,z)}}\,dz == \frac{2\cosh(a\,z)}{a\sqrt{\cosh^3(a\,z)}}\left(i\cosh^{\frac{1}{2}}(a\,z)\,E\left(\frac{i\,a\,z}{2}\,\middle|\,2\right) + \sinh(a\,z)\right)$$

01.20.21.2050.01

$$\int \frac{1}{\cosh^{\frac{5}{2}}(a\,z)}\,dz == \frac{2}{3\,a}\left(\frac{\sinh(a\,z)}{\cosh^{\frac{3}{2}}(a\,z)} - i\,F\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)\right)$$

01.20.21.2051.01

$$\int \frac{1}{\sqrt{\cosh^5(a\,z)}}\,dz == \frac{2\cosh(a\,z)}{3\,a\sqrt{\cosh^5(a\,z)}}\left(\sinh(a\,z) - i\cosh^{\frac{3}{2}}(a\,z)\,F\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)\right)$$

Involving $\cosh^{\nu}(a\,z+b)$

01.20.21.2052.01

$$\int \cosh^{\nu}(b+a\,z)\,dz == \frac{\cosh^{\nu+1}(b+a\,z)\,\operatorname{csch}(b+a\,z)\,\sqrt{-\sinh^2(b+a\,z)}}{a\,(\nu+1)}\,{}_2F_1\left(\frac{\nu+1}{2},\,\frac{1}{2};\,\frac{\nu+3}{2};\,\cosh^2(b+a\,z)\right)$$

Involving $\cosh^{\nu}\left(a\,z^2+\frac{b}{z^2}\right)$

01.20.21.2053.01

$$\int \cosh^{\nu}\left(a\,z^2+\frac{b}{z^2}\right)dz ==$$

$$2^{-\nu}\,z\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-a\,(2\,k-\nu)}}e^{-2\sqrt{-a\,(2\,k-\nu)}\ \sqrt{-b\,(2\,k-\nu)}}\left(e^{4\sqrt{-a\,(2\,k-\nu)}\ \sqrt{-b\,(2\,k-\nu)}}\right.\right.$$
$$\left.\left(\operatorname{erf}\left(\sqrt{-a\,(2\,k-\nu)}\ z+\frac{\sqrt{-b\,(2\,k-\nu)}}{z}\right)-1\right)-\operatorname{erf}\left(\frac{\sqrt{-b\,(2\,k-\nu)}}{z}-\sqrt{-a\,(2\,k-\nu)}\ z\right)+1\right)+$$
$$\frac{1}{\sqrt{a\,(2\,k-\nu)}}e^{-2\sqrt{a\,(2\,k-\nu)}\ \sqrt{b\,(2\,k-\nu)}}\left(e^{4\sqrt{a\,(2\,k-\nu)}\ \sqrt{b\,(2\,k-\nu)}}\left(\operatorname{erf}\left(\sqrt{a\,(2\,k-\nu)}\ z+\frac{\sqrt{b\,(2\,k-\nu)}}{z}\right)-1\right)-\right.$$
$$\left.\left.\operatorname{erf}\left(\frac{\sqrt{b\,(2\,k-\nu)}}{z}-\sqrt{a\,(2\,k-\nu)}\ z\right)+1\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh^{\nu}\left(a\,z^2+\frac{b}{z^2}+c\right)$

01.20.21.2054.01

$$\int \cosh^{\nu}\left(a\,z^2+c+\frac{b}{z^2}\right)dz ==$$

$$2^{-\nu}\,z\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-c\,(\nu-2\,k)}\binom{\nu}{k}\left(\frac{1}{\sqrt{-a\,(2\,k-\nu)}}\left(e^{-2\sqrt{-a\,(2\,k-\nu)}\ \sqrt{-b\,(2\,k-\nu)}}\left(e^{4\sqrt{-a\,(2\,k-\nu)}\ \sqrt{-b\,(2\,k-\nu)}}\right.\right.\right.$$
$$\left.\left.\left(\operatorname{erf}\left(\sqrt{-a\,(2\,k-\nu)}\ z+\frac{\sqrt{-b\,(2\,k-\nu)}}{z}\right)-1\right)-\operatorname{erf}\left(\frac{\sqrt{-b\,(2\,k-\nu)}}{z}-\sqrt{-a\,(2\,k-\nu)}\ z\right)+1\right)\right)+$$
$$\frac{1}{\sqrt{a\,(2\,k-\nu)}}\left(e^{2\,c\,(\nu-2\,k)-2\sqrt{a\,(2\,k-\nu)}\ \sqrt{b\,(2\,k-\nu)}}\left(e^{4\sqrt{a\,(2\,k-\nu)}\ \sqrt{b\,(2\,k-\nu)}}\left(\operatorname{erf}\left(\sqrt{a\,(2\,k-\nu)}\ z+\frac{\sqrt{b\,(2\,k-\nu)}}{z}\right)-1\right)-\right.\right.$$
$$\left.\left.\left.\operatorname{erf}\left(\frac{\sqrt{b\,(2\,k-\nu)}}{z}-\sqrt{a\,(2\,k-\nu)}\ z\right)+1\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh^{\nu}\left(a\,z^r\right)$

01.20.21.2055.01

$$\int \cosh^{\nu}(a\,z^r)\,dz == 2^{-\nu}\,z\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)-$$
$$\frac{2^{-\nu}\,z}{r}\sum_{i=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{i}\left((-a\,(\nu-2\,i)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-a\,(\nu-2\,i)\,z^r\right)+(a\,(\nu-2\,i)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},a\,(\nu-2\,i)\,z^r\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2056.01

$$\int \cosh^{\nu}\left(a\,z^2\right)dz == 2^{-\nu}\,z\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+2^{\frac{1}{2}-\nu}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,a\,(\nu-2\,k)}}\binom{\nu}{k}C\left(\sqrt{\frac{2}{\pi}}\ \sqrt{i\,a\,(\nu-2\,k)}\ z\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2057.01

$$\int \cosh^{\nu}\left(a\sqrt{z}\right) dz ==$$

$$2^{-\nu} z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) - \frac{2^{2-\nu}}{a^2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{\binom{\nu}{k} \left(\cosh\left(a(\nu-2k)\sqrt{z}\right) - a(\nu-2k)\sqrt{z}\,\sinh\left(a(\nu-2k)\sqrt{z}\right)\right)}{(\nu-2k)^2} /; \nu \in \mathbb{N}^+$$

Involving $\cosh^{\nu}\left(a\,(z^r)^p\right)$

01.20.21.2058.01

$$\int \cosh^{\nu}(a\,(z^r)^p)\,dz == 2^{-\nu} z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) - \frac{1}{p\,r} 2^{-\nu} z$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\Gamma\left(\frac{1}{p\,r}, -a(\nu-2k)(z^r)^p\right)(-a(\nu-2k)(z^r)^p)^{-\frac{1}{p\,r}} + (a(\nu-2k)(z^r)^p)^{-\frac{1}{p\,r}} \Gamma\left(\frac{1}{p\,r}, a(\nu-2k)(z^r)^p\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.2059.01

$$\int \cosh^{\nu}\left(a\,(z^r)^{1/r}\right) dz == 2^{-\nu} z \left(\binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) + \frac{2\,(z^r)^{-1/r}}{a} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{\binom{\nu}{k} \sinh\left(a(2k-\nu)(z^r)^{1/r}\right)}{2k-\nu}\right) /; \nu \in \mathbb{N}^+$$

01.20.21.2060.01

$$\int \cosh^{\nu}\left(a\sqrt{z^2}\right) dz == 2^{-\nu} z \left(\binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) + \frac{2}{a\sqrt{z^2}} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{\binom{\nu}{k} \sinh\left(a(2k-\nu)\sqrt{z^2}\right)}{2k-\nu}\right) /; \nu \in \mathbb{N}^+$$

Involving $\cosh^{\nu}\left(a\,z^r + b\right)$

01.20.21.2061.01

$$\int \cosh^{\nu}(a\,z^r + b)\,dz == 2^{-\nu} z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) - \frac{1}{r} 2^{-\nu} z$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{b(\nu-2k)} \Gamma\left(\frac{1}{r}, -a(\nu-2k)z^r\right)(-a(\nu-2k)z^r)^{-1/r} + e^{-b(\nu-2k)} (a(\nu-2k)z^r)^{-1/r} \Gamma\left(\frac{1}{r}, a(\nu-2k)z^r\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.2062.01

$$\int \cosh^{\nu}\left(a\,z^2 + b\right) dz == 2^{-\nu} z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) + \frac{1}{\sqrt{i\,a}} 2^{\frac{1}{2}-\nu} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{\sqrt{\nu-2k}} \binom{\nu}{k}$$

$$\left(\cosh(2\,b\,k - b\,\nu)\, C\left(\sqrt{i\,a}\,\sqrt{\frac{2}{\pi}}\,\sqrt{\nu-2k}\,z\right) + i\,S\left(\sqrt{i\,a}\,\sqrt{\frac{2}{\pi}}\,\sqrt{\nu-2k}\,z\right)\sinh(2\,b\,k - b\,\nu)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.2063.01

$$\int \cosh^{\nu}\left(\sqrt{z}\ a+b\right) dz == 2^{-\nu}\, z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) - \frac{1}{a^2}\, 2^{2-\nu}$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{(\nu-2k)^2} \left(\binom{\nu}{k} \left(\cosh\left(2bk - b\nu + a(2k-\nu)\sqrt{z}\right) - a(2k-\nu)\sqrt{z}\ \sinh\left(2bk - b\nu + a(2k-\nu)\sqrt{z}\right) \right) \right) /;\ \nu \in \mathbb{N}^+$$

Involving $\cosh^{\nu}(a\, z^r + b\, z)$

01.20.21.2064.01

$$\int \cosh^{\nu}\left(a z^2 + b z\right) dz == 2^{-\nu}\, z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$\frac{2^{\frac{1}{2}-\nu}\sqrt{\pi}}{\sqrt{i\,a}} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{\binom{\nu}{k} \left(\cosh\left(\frac{b^2(\nu-2k)}{4a}\right) C\left(\frac{\sqrt{\nu-2k}\ (i\,b+2\,i\,a\,z)}{\sqrt{i\,a}\ \sqrt{2\pi}} \right) + i\, S\left(\frac{\sqrt{\nu-2k}\ (i\,b+2\,i\,a\,z)}{\sqrt{i\,a}\ \sqrt{2\pi}} \right) \sinh\left(\frac{b^2(\nu-2k)}{4a}\right) \right)}{\sqrt{\nu-2k}} /;\ \nu \in \mathbb{N}^+$$

01.20.21.2065.01

$$\int \cosh^{\nu}\left(\sqrt{z}\ a + b\, z\right) dz == 2^{-\nu}\, z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$\frac{1}{(i\,b)^{3/2}} \left(2^{-\nu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{(\nu-2k)^{3/2}} \left(\binom{\nu}{k} \left(a\, i \sqrt{2\pi}\ (2k-\nu) \cosh\left(\frac{a^2(\nu-2k)}{4b}\right) C\left(\frac{\sqrt{\nu-2k}\ \left(i\,a+2\,i\,b\sqrt{z}\right)}{\sqrt{i\,b}\ \sqrt{2\pi}} \right) - \right.\right.\right.$$

$$\left.\left.\left. a\sqrt{2\pi}\ (2k-\nu)\, S\left(\frac{\sqrt{\nu-2k}\ \left(i\,a+2\,i\,b\sqrt{z}\right)}{\sqrt{i\,b}\ \sqrt{2\pi}} \right) \sinh\left(\frac{a^2(\nu-2k)}{4b}\right) - \right.\right.\right.$$

$$\left.\left.\left. 2\,i\sqrt{i\,b}\ \sqrt{\nu-2k}\ \sinh\left((2k-\nu)\left(a+b\sqrt{z}\right)\sqrt{z}\right) \right) \right) \right) /;\ \nu \in \mathbb{N}^+$$

Involving $\cosh^{\nu}(a\, z^r + b\, z + c)$

01.20.21.2066.01

$$\int \cosh^{\nu}\left(a z^2 + b z + c\right) dz == 2^{-\nu}\, z \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$\frac{1}{\sqrt{i\,a}} \left(2^{\frac{1}{2}-\nu}\sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{\sqrt{\nu-2k}} \left(\binom{\nu}{k} \left(\cosh\left(\frac{1}{4}\left(\frac{(\nu-2k)\,b^2}{a} + 8ck - 4c\nu \right) \right) C\left(\frac{\sqrt{\nu-2k}\ (i\,b+2\,i\,a\,z)}{\sqrt{i\,a}\ \sqrt{2\pi}} \right) + \right.\right.\right.\right.$$

$$\left.\left.\left.\left. i\, S\left(\frac{\sqrt{\nu-2k}\ (i\,b+2\,i\,a\,z)}{\sqrt{i\,a}\ \sqrt{2\pi}} \right) \sinh\left(\frac{1}{4}\left(\frac{(\nu-2k)\,b^2}{a} + 8ck - 4c\nu \right) \right) \right) \right) \right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.2067.01

$$\int \cosh^{\nu}\left(\sqrt{z}\ a+c+b\,z\right)dz == 2^{-\nu}\,z\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$
$$\frac{1}{(i\,b)^{3/2}}\left(2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{(\nu-2\,k)^{3/2}}\left(\binom{\nu}{k}\left(a\,i\,\sqrt{2\,\pi}\ (2\,k-\nu)\cosh\left(\frac{1}{4}\left(\frac{(\nu-2\,k)\,a^2}{b}+8\,c\,k-4\,c\,\nu\right)\right)C\left(\frac{\sqrt{\nu-2\,k}\ \left(i\,a+2\,i\,b\,\sqrt{z}\right)}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)-\right.\right.\right.$$
$$\left.\left.a\,\sqrt{2\,\pi}\ (2\,k-\nu)\,S\left(\frac{\sqrt{\nu-2\,k}\ \left(i\,a+2\,i\,b\,\sqrt{z}\right)}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{1}{4}\left(\frac{(\nu-2\,k)\,a^2}{b}+8\,c\,k-4\,c\,\nu\right)\right)-\right.$$
$$\left.\left.2\,i\,\sqrt{i\,b}\ \sqrt{\nu-2\,k}\ \sinh\left(c\,(2\,k-\nu)+\left(a+b\,\sqrt{z}\right)\sqrt{z}\ (2\,k-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving products of the direct function

Involving products of two direct functions

Involving $\cosh(c\,z)\cosh(a\,z)$

01.20.21.2068.01

$$\int \cosh(a\,z)\cosh(c\,z)\,dz == \frac{a\cosh(c\,z)\sinh(a\,z)-c\cosh(a\,z)\sinh(c\,z)}{a^2-c^2}$$

Involving $\cosh(c\,z)\cosh(a\,z+b)$

01.20.21.2069.01

$$\int \cosh(c\,z)\cosh(b+a\,z)\,dz == \frac{(a-c)\sinh(b+(a+c)\,z)+(a+c)\sinh(b+a\,z-c\,z)}{2\,(a-c)\,(a+c)}$$

Involving $\cosh(c\,z+d)\cosh(a\,z+b)$

01.20.21.2070.01

$$\int \cosh(d+c\,z)\cosh(b+a\,z)\,dz == \frac{(a-c)\sinh(b+d+(a+c)\,z)+(a+c)\sinh(b-d+a\,z-c\,z)}{2\,(a-c)\,(a+c)}$$

Involving $\cosh(b\,z)\cosh\left(c\,z^r\right)$

01.20.21.2071.01

$$\int \cosh(b\,z)\cosh\left(c\,z^2\right)dz ==$$
$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{S\left(\frac{b+2\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}\right)-i\cosh\left(\frac{b^2}{4\,c}\right)C\left(\frac{b+2\,c\,z}{\sqrt{-i\,c}\ \sqrt{2\,\pi}}\right)}{\sqrt{-i\,c}}+\frac{i\cosh\left(\frac{b^2}{4\,c}\right)C\left(\frac{2\,c\,z-b}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{2\,c\,z-b}{\sqrt{i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,c}\right)}{\sqrt{i\,c}}\right)$$

01.20.21.2072.01

$$\int \cosh(b\,z)\cosh\left(c\,\sqrt{z}\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,b)^{3/2}}\left(c\,\sqrt{2\,\pi}\,\cosh\left(\frac{c^2}{4\,b}\right)C\left(\frac{c-2\,b\,\sqrt{z}}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\,S\left(\frac{c-2\,b\,\sqrt{z}}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,b}\right)-2\,i\,\sqrt{-i\,b}\,\sinh\left(b\,z-c\,\sqrt{z}\right)\right)+\right.$$
$$\left.\frac{1}{(-i\,b)^{3/2}}\left(c\,\sqrt{2\,\pi}\,\cosh\left(\frac{c^2}{4\,b}\right)C\left(\frac{c+2\,b\,\sqrt{z}}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\,S\left(\frac{c+2\,b\,\sqrt{z}}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,b}\right)-2\,i\,\sqrt{-i\,b}\,\sinh\left(\sqrt{z}\,c+b\,z\right)\right)\right)$$

Involving $\cosh(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.2073.01

$$\int \cosh(e+d\,z)\cosh\left(c\,z^2\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}$$
$$\left(\frac{i\cosh\left(\frac{d^2}{4\,c}-e\right)C\left(\frac{-d-2\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)-S\left(\frac{-d-2\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,c}-e\right)}{\sqrt{-i\,c}}+\frac{i\cosh\left(\frac{d^2}{4\,c}+e\right)C\left(\frac{2\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,c\,z-d}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,c}+e\right)}{\sqrt{i\,c}}\right)$$

01.20.21.2074.01

$$\int \cosh(e+d\,z)\cosh\left(\sqrt{z}\;c\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,d)^{3/2}}\left(-c\,\sqrt{2\,\pi}\,\cosh\left(\frac{c^2}{4\,d}-e\right)C\left(\frac{-c-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\,\sqrt{2\,\pi}}\right)-i\,c\,\sqrt{2\,\pi}\,S\left(\frac{-c-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,d}-e\right)-\right.\right.$$
$$\left.2\,i\,\sqrt{-i\,d}\,\sinh\left(\sqrt{z}\,c+e+d\,z\right)\right)+\frac{1}{(-i\,d)^{3/2}}\left(c\,\sqrt{2\,\pi}\,\cosh\left(\frac{c^2}{4\,d}-e\right)C\left(\frac{c-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\,\sqrt{2\,\pi}}\right)+$$
$$\left.\left.c\,i\,\sqrt{2\,\pi}\,S\left(\frac{c-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,d}-e\right)-2\,i\,\sqrt{-i\,d}\,\sinh\left(-\sqrt{z}\,c+e+d\,z\right)\right)\right)$$

Involving $\cosh\left(a\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.2075.01

$$\int \cosh(b\,z^r)\cosh(c\,z^r)\,dz ==$$
$$-\frac{1}{4\,r}\left(z\left(\Gamma\left(\frac{1}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}+((b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-c)\,z^r\right)+((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)\,z^r\right)+\right.\right.$$
$$\left.\left.((b+c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.2076.01

$$\int \cosh\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{C\left(\sqrt{-i\,b+i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{-i\,b+i\,c}}+\frac{C\left(\sqrt{-i\,b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.2077.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\ c\right)dz ==$$
$$-\frac{\cosh\left(\sqrt{z}\ (c-b)\right)-(c-b)\sqrt{z}\ \sinh\left(\sqrt{z}\ (c-b)\right)}{(c-b)^2}-\frac{\cosh\left(\sqrt{z}\ (b+c)\right)+(-b-c)\sqrt{z}\ \sinh\left(\sqrt{z}\ (b+c)\right)}{(b+c)^2}$$

Involving $\cosh(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.2078.01

$$\int \cosh(d\,z)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}$$
$$\left(\frac{i\cosh\left(\frac{d^2}{4c}-g\right)C\left(\frac{-d-2cz}{\sqrt{-ic}\ \sqrt{2\pi}}\right)-S\left(\frac{-d-2cz}{\sqrt{-ic}\ \sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4c}-g\right)}{\sqrt{-ic}}+\frac{i\cosh\left(\frac{d^2}{4c}-g\right)C\left(\frac{2cz-d}{\sqrt{ic}\ \sqrt{2\pi}}\right)+S\left(\frac{2cz-d}{\sqrt{ic}\ \sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4c}-g\right)}{\sqrt{ic}}\right)$$

01.20.21.2079.01

$$\int \cosh(d\,z)\cosh\left(\sqrt{z}\ c+g\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-id)^{3/2}}\left(-c\sqrt{2\pi}\ \cosh\left(\frac{c^2}{4d}-g\right)C\left(\frac{-c-2d\sqrt{z}}{\sqrt{-id}\ \sqrt{2\pi}}\right)-ic\sqrt{2\pi}\ S\left(\frac{-c-2d\sqrt{z}}{\sqrt{-id}\ \sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4d}-g\right)-\right.\right.$$
$$\left.2i\sqrt{-id}\ \sinh\left(\sqrt{z}\ c+g+dz\right)\right)+\frac{1}{(-id)^{3/2}}\left(c\sqrt{2\pi}\ \cosh\left(\frac{c^2}{4d}+g\right)C\left(\frac{c-2d\sqrt{z}}{\sqrt{-id}\ \sqrt{2\pi}}\right)+$$
$$\left.\left.ci\sqrt{2\pi}\ S\left(\frac{c-2d\sqrt{z}}{\sqrt{-id}\ \sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4d}+g\right)-2i\sqrt{-id}\ \sinh\left(-\sqrt{z}\ c-g+dz\right)\right)\right)$$

Involving $\cosh(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.2080.01

$$\int \cosh(e+d\,z)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{d^2}{4c}-e-g\right)C\left(\frac{-d-2cz}{\sqrt{-ic}\ \sqrt{2\pi}}\right)-S\left(\frac{-d-2cz}{\sqrt{-ic}\ \sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4c}-e-g\right)}{\sqrt{-ic}}+\right.$$
$$\left.\frac{i\cosh\left(\frac{d^2}{4c}+e-g\right)C\left(\frac{2cz-d}{\sqrt{ic}\ \sqrt{2\pi}}\right)+S\left(\frac{2cz-d}{\sqrt{ic}\ \sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4c}+e-g\right)}{\sqrt{ic}}\right)$$

01.20.21.2081.01

$$\int \cosh(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz == \frac{1}{4}\left(\frac{1}{(-i\,d)^{3/2}}\left(-c\sqrt{2\pi}\;\cosh\left(\frac{c^2}{4\,d}-e-g\right)C\left(\frac{-c-2\,d\sqrt{z}}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)-i\,c\sqrt{2\pi}\;S\left(\frac{-c-2\,d\sqrt{z}}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4\,d}-e-g\right)-2\,i\sqrt{-i\,d}\;\sinh\left(\sqrt{z}\;c+e+g+d\,z\right)\right)+\frac{1}{(-i\,d)^{3/2}}\left(c\sqrt{2\pi}\;\cosh\left(\frac{c^2}{4\,d}-e+g\right)C\left(\frac{c-2\,d\sqrt{z}}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)+c\,i\sqrt{2\pi}\;S\left(\frac{c-2\,d\sqrt{z}}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)\sinh\left(\frac{c^2}{4\,d}-e+g\right)-2\,i\sqrt{-i\,d}\;\sinh\left(-\sqrt{z}\;c+e-g+d\,z\right)\right)\right)$$

Involving $\cosh\left(a\,z^r\right)\cosh\left(c\,z^r+g\right)$

01.20.21.2082.01

$$\int \cosh(b\,z^r)\cosh(c\,z^r+g)\,dz == -\frac{1}{4\,r}\left(z\left(e^g\,\Gamma\left(\frac{1}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}+e^g\,((b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-c)\,z^r\right)+e^{-g}\,((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(c-b)\,z^r\right)+e^{-g}\,((b+c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.2083.01

$$\int \cosh\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh(g)\,C\left(\sqrt{-i\,b+i\,c}\;\sqrt{\frac{2}{\pi}}\;z\right)-i\,S\left(\sqrt{-i\,b+i\,c}\;\sqrt{\frac{2}{\pi}}\;z\right)\sinh(g)}{\sqrt{-i\,b+i\,c}}+\frac{\cosh(g)\,C\left(\sqrt{-i\,b-i\,c}\;\sqrt{\frac{2}{\pi}}\;z\right)+i\,S\left(\sqrt{-i\,b-i\,c}\;\sqrt{\frac{2}{\pi}}\;z\right)\sinh(g)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.2084.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g\right)dz == -\frac{\cosh\left(\sqrt{z}\;(c-b)+g\right)-(c-b)\sqrt{z}\;\sinh\left(\sqrt{z}\;(c-b)+g\right)}{(c-b)^2}-\frac{\cosh\left(\sqrt{z}\;(b+c)+g\right)+(-b-c)\sqrt{z}\;\sinh\left(\sqrt{z}\;(b+c)+g\right)}{(-b-c)^2}$$

Involving $\cosh\left(a\,z^r+e\right)\cosh\left(c\,z^r+g\right)$

01.20.21.2085.01

$$\int \cosh(b\,z^r+e)\cosh(c\,z^r+g)\,dz == -\frac{1}{4\,r}\left(z\left(e^{e+g}\,\Gamma\left(\frac{1}{r},\,(-b-c)\,z^r\right)((-b-c)\,z^r)^{-1/r}+e^{g-e}\,((b-c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(b-c)\,z^r\right)+e^{e-g}\,((c-b)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(c-b)\,z^r\right)+e^{-e-g}\,((b+c)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(b+c)\,z^r\right)\right)\right)$$

01.20.21.2086.01

$$\int \cosh\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{\cosh(e-g)\,C\left(\sqrt{-i\,b+i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)+i\,S\left(\sqrt{-i\,b+i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh(e-g)}{\sqrt{-i\,b+i\,c}}+\frac{\cosh(e+g)\,C\left(\sqrt{-i\,b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)+i\,S\left(\sqrt{-i\,b-i\,c}\,\sqrt{\frac{2}{\pi}}\,z\right)\sinh(e+g)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.2087.01

$$\int \cosh\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+g\right)dz == -\frac{\cosh\left(-\sqrt{z}\,(-b-c)+e+g\right)+(-b-c)\,\sqrt{z}\,\sinh\left(-\sqrt{z}\,(-b-c)+e+g\right)}{(-b-c)^2}-\frac{\cosh\left(-\sqrt{z}\,(c-b)+e-g\right)+(c-b)\,\sqrt{z}\,\sinh\left(-\sqrt{z}\,(c-b)+e-g\right)}{(c-b)^2}$$

Involving $\cosh(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.2088.01

$$\int \cosh(d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(f-d)^2}{4\,c}\right)C\left(\frac{-d+f+2\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{-d+f+2\,c\,z}{\sqrt{i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(f-d)^2}{4\,c}\right)}{\sqrt{i\,c}}+\frac{i\cosh\left(\frac{(-d-f)^2}{4\,c}\right)C\left(\frac{-d-f-2\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)-S\left(\frac{-d-f-2\,c\,z}{\sqrt{-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(-d-f)^2}{4\,c}\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.2089.01

$$\int \cosh(d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,d-i\,f)^{3/2}}\left(-c\sqrt{2\,\pi}\;\cosh\left(\frac{c^2}{-4\,d-4\,f}\right)C\left(\frac{2\,(-d-f)\sqrt{z}\;-c}{\sqrt{i\,(-d-f)}\;\sqrt{2\,\pi}}\right)+c\,i\sqrt{2\,\pi}\;S\left(\frac{2\,(-d-f)\sqrt{z}\;-c}{\sqrt{i\,(-d-f)}\;\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sinh\left(\frac{c^2}{-4\,d-4\,f}\right)-2\,i\sqrt{-i\,d-i\,f}\;\sinh\left(\sqrt{z}\;c+d\,z+f\,z\right)\right)+\frac{1}{(-i\,d+i\,f)^{3/2}}$$
$$\left(c\sqrt{2\,\pi}\;\cosh\left(\frac{c^2}{4\,d-4\,f}\right)C\left(\frac{c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\;\sqrt{2\,\pi}}\right)+c\,i\sqrt{2\,\pi}\;S\left(\frac{c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{4\,d-4\,f}\right)-\right.$$
$$\left.\left.2\,i\sqrt{-i\,d+i\,f}\;\sinh\left(-\sqrt{z}\;c+d\,z-f\,z\right)\right)\right)$$

Involving $\cosh(d\,z+e)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.2090.01

$$\int \cosh(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(f-d)^2}{4\,c}+e\right)C\left(\frac{-d+f+2\,c\,z}{\sqrt{i\,c}\;\sqrt{2\,\pi}}\right)+S\left(\frac{-d+f+2\,c\,z}{\sqrt{i\,c}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(f-d)^2}{4\,c}+e\right)}{\sqrt{i\,c}}+\right.$$
$$\left.\frac{i\cosh\left(-\frac{(-d-f)^2}{4\,c}+e\right)C\left(\frac{-d-f-2\,c\,z}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)+S\left(\frac{-d-f-2\,c\,z}{\sqrt{-i\,c}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(-d-f)^2}{4\,c}+e\right)}{\sqrt{-i\,c}}\right)$$

01.20.21.2091.01

$$\int \cosh(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,d-i\,f)^{3/2}}\left(-c\sqrt{2\,\pi}\;\cosh\left(\frac{c^2}{-4\,d-4\,f}+e\right)C\left(\frac{2\,(-d-f)\sqrt{z}\;-c}{\sqrt{i\,(-d-f)}\;\sqrt{2\,\pi}}\right)+c\,i\sqrt{2\,\pi}\;S\left(\frac{2\,(-d-f)\sqrt{z}\;-c}{\sqrt{i\,(-d-f)}\;\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sinh\left(\frac{c^2}{-4\,d-4\,f}+e\right)-2\,i\sqrt{-i\,d-i\,f}\;\sinh\left(\sqrt{z}\;c+e+d\,z+f\,z\right)\right)+\frac{1}{(-i\,d+i\,f)^{3/2}}$$
$$\left(c\sqrt{2\,\pi}\;\cosh\left(-\frac{c^2}{4\,d-4\,f}+e\right)C\left(\frac{c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\;\sqrt{2\,\pi}}\right)-i\,c\sqrt{2\,\pi}\;S\left(\frac{c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{c^2}{4\,d-4\,f}+e\right)-\right.$$
$$\left.\left.2\,i\sqrt{-i\,d+i\,f}\;\sinh\left(-\sqrt{z}\;c+e+d\,z-f\,z\right)\right)\right)$$

Involving $\cosh(b\,z^r)\cosh(c\,z^r+f\,z)$

01.20.21.2092.01

$$\int \cosh(b\,z^2)\cosh(c\,z^2+f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{f^2}{-4\,b-4\,c}\right)C\left(\frac{2(-b-c)z-f}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2(-b-c)z-f}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{-4\,b-4\,c}\right)}{\sqrt{-i\,b-i\,c}}+\right.$$

$$\left.\frac{i\cosh\left(\frac{f^2}{4\,b-4\,c}\right)C\left(\frac{f+2(c-b)z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)-S\left(\frac{f+2(c-b)z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,b-4\,c}\right)}{\sqrt{-i\,b+i\,c}}\right)$$

01.20.21.2093.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left((-b-c)\sqrt{2\,\pi}\;\cosh\left(\frac{(b+c)^2}{4\,f}\right)C\left(\frac{-b-c-2\,f\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)-i\,(b+c)\sqrt{2\,\pi}\;S\left(\frac{-b-c-2\,f\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+c)^2}{4\,f}\right)-\right.\right.$$

$$\left.2\,i\sqrt{-i\,f}\;\sinh\left(\sqrt{z}\;b+f\,z+c\sqrt{z}\right)\right)+\frac{1}{(i\,f)^{3/2}}\left((c-b)\sqrt{2\,\pi}\;\cosh\left(\frac{(c-b)^2}{4\,f}\right)C\left(\frac{-b+c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,(c-b)\sqrt{2\,\pi}\;S\left(\frac{-b+c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(c-b)^2}{4\,f}\right)-2\,i\sqrt{i\,f}\;\sinh\left(\sqrt{z}\;b-f\,z-c\sqrt{z}\right)\right)\right)$$

Involving $\cosh(b\,z^r+e)\cosh(c\,z^r+f\,z)$

01.20.21.2094.01

$$\int \cosh(b\,z^2+e)\cosh(c\,z^2+f\,z)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(-\frac{f^2}{4\,b-4\,c}+e\right)C\left(\frac{f+2(c-b)z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{f+2(c-b)z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{f^2}{4\,b-4\,c}+e\right)}{\sqrt{-i\,b+i\,c}}+\right.$$

$$\left.\frac{i\cosh\left(\frac{f^2}{-4\,b-4\,c}+e\right)C\left(\frac{2(-b-c)z-f}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2(-b-c)z-f}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{-4\,b-4\,c}+e\right)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.2095.01

$$\int \cosh\left(\sqrt{z}\, b+e\right)\cosh\left(\sqrt{z}\, c+f z\right) dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i f)^{3/2}}\left((-b-c)\sqrt{2\pi}\,\cosh\left(-\frac{(b+c)^2}{4f}+e\right)C\left(\frac{-b-c-2f\sqrt{z}}{\sqrt{-if}\,\sqrt{2\pi}}\right)-i(-b-c)\sqrt{2\pi}\right.\right.$$
$$\left.S\left(\frac{-b-c-2f\sqrt{z}}{\sqrt{-if}\,\sqrt{2\pi}}\right)\sinh\left(-\frac{(b+c)^2}{4f}+e\right)-2i\sqrt{-if}\,\sinh\left(\sqrt{z}\, b+e+f z+c\sqrt{z}\right)\right)+\frac{1}{(if)^{3/2}}$$
$$\left((c-b)\sqrt{2\pi}\,\cosh\left(\frac{(c-b)^2}{4f}+e\right)C\left(\frac{-b+c+2f\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)-i(c-b)\sqrt{2\pi}\,S\left(\frac{-b+c+2f\sqrt{z}}{\sqrt{if}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(c-b)^2}{4f}+e\right)-\right.$$
$$\left.\left.2i\sqrt{if}\,\sinh\left(\sqrt{z}\, b+e-f z-c\sqrt{z}\right)\right)\right)$$

Involving $\cosh\left(b z^r+d z\right)\cosh\left(c z^r+f z\right)$

01.20.21.2096.01

$$\int \cosh\left(b z^2+d z\right)\cosh\left(c z^2+f z\right) dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(-d-f)^2}{4(-b-c)}\right)C\left(\frac{-d-f+2(-b-c)z}{\sqrt{-ib-ic}\,\sqrt{2\pi}}\right)+S\left(\frac{-d-f+2(-b-c)z}{\sqrt{-ib-ic}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(-d-f)^2}{4(-b-c)}\right)}{\sqrt{-ib-ic}}+\right.$$
$$\left.\frac{i\cosh\left(\frac{(f-d)^2}{4(c-b)}\right)C\left(\frac{-d+f+2(c-b)z}{\sqrt{-ib+ic}\,\sqrt{2\pi}}\right)+S\left(\frac{-d+f+2(c-b)z}{\sqrt{-ib+ic}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(f-d)^2}{4(c-b)}\right)}{\sqrt{-ib+ic}}\right)$$

01.20.21.2097.01

$$\int \cosh\left(\sqrt{z}\, b+d z\right)\cosh\left(\sqrt{z}\, c+f z\right) dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-id-if)^{3/2}}\left((-b-c)\sqrt{2\pi}\,\cosh\left(\frac{(b+c)^2}{-4d-4f}\right)C\left(\frac{-b-c+2(-d-f)\sqrt{z}}{\sqrt{-id-if}\,\sqrt{2\pi}}\right)-i(-b-c)\sqrt{2\pi}\right.\right.$$
$$\left.S\left(\frac{-b-c+2(-d-f)\sqrt{z}}{\sqrt{-id-if}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(b+c)^2}{-4d-4f}\right)-2i\sqrt{-id-if}\,\sinh\left(\sqrt{z}\, b-(-d-f)z+c\sqrt{z}\right)\right)+$$
$$\frac{1}{(-id+if)^{3/2}}\left((c-b)\sqrt{2\pi}\,\cosh\left(\frac{(c-b)^2}{4f-4d}\right)C\left(\frac{-b+c+2(f-d)\sqrt{z}}{\sqrt{-id+if}\,\sqrt{2\pi}}\right)-\right.$$
$$\left.\left.i(c-b)\sqrt{2\pi}\,S\left(\frac{-b+c+2(f-d)\sqrt{z}}{\sqrt{-id+if}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(c-b)^2}{4f-4d}\right)-2i\sqrt{-id+if}\,\sinh\left(\sqrt{z}\, b-(f-d)z-c\sqrt{z}\right)\right)\right)$$

Involving $\cosh(d\,z)\cosh(c\,z^r + f\,z + g)$

01.20.21.2098.01

$$\int \cosh(d\,z)\cosh\left(c\,z^2 + f\,z + g\right) dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(f-d)^2}{4c} - g\right) C\left(\frac{-d+f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right) + S\left(\frac{-d+f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(f-d)^2}{4c} - g\right)}{\sqrt{ic}} + \right.$$

$$\left.\frac{i\cosh\left(-\frac{(-d-f)^2}{4c} + g\right) C\left(\frac{-d-f-2cz}{\sqrt{-ic}\,\sqrt{2\pi}}\right) + S\left(\frac{-d-f-2cz}{\sqrt{-ic}\,\sqrt{2\pi}}\right)\sinh\left(-\frac{(-d-f)^2}{4c} + g\right)}{\sqrt{-ic}}\right)$$

01.20.21.2099.01

$$\int \cosh(d\,z)\cosh\left(\sqrt{z}\,c + g + f\,z\right) dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-i\,d - i\,f)^{3/2}}\left(-c\sqrt{2\pi}\,\cosh\left(\frac{c^2}{-4\,d-4\,f} + g\right) C\left(\frac{2(-d-f)\sqrt{z} - c}{\sqrt{i(-d-f)}\,\sqrt{2\pi}}\right) + c\,i\sqrt{2\pi}\,S\left(\frac{2(-d-f)\sqrt{z} - c}{\sqrt{i(-d-f)}\,\sqrt{2\pi}}\right)\right.\right.$$

$$\left.\sinh\left(\frac{c^2}{-4\,d-4\,f} + g\right) - 2\,i\sqrt{-i\,d - i\,f}\,\sinh\left(\sqrt{z}\,c + g + d\,z + f\,z\right)\right) +$$

$$\frac{1}{(-i\,d + i\,f)^{3/2}}\left(c\sqrt{2\pi}\,\cosh\left(\frac{c^2}{4\,d-4\,f} + g\right) C\left(\frac{c + 2(f-d)\sqrt{z}}{\sqrt{i(f-d)}\,\sqrt{2\pi}}\right) + c\,i\sqrt{2\pi}\,S\left(\frac{c + 2(f-d)\sqrt{z}}{\sqrt{i(f-d)}\,\sqrt{2\pi}}\right)\right.$$

$$\left.\left.\sinh\left(\frac{c^2}{4\,d-4\,f} + g\right) - 2\,i\sqrt{-i\,d + i\,f}\,\sinh\left(-\sqrt{z}\,c - g + d\,z - f\,z\right)\right)\right)$$

Involving $\cosh(d\,z + e)\cosh(c\,z^r + f\,z + g)$

01.20.21.2100.01

$$\int \cosh(e + d\,z)\cosh\left(c\,z^2 + f\,z + g\right) dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(f-d)^2}{4c} + e - g\right) C\left(\frac{-d+f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right) + S\left(\frac{-d+f+2cz}{\sqrt{ic}\,\sqrt{2\pi}}\right)\sinh\left(\frac{(f-d)^2}{4c} + e - g\right)}{\sqrt{ic}} + \right.$$

$$\left.\frac{i\cosh\left(-\frac{(-d-f)^2}{4c} + e + g\right) C\left(\frac{-d-f-2cz}{\sqrt{-ic}\,\sqrt{2\pi}}\right) + S\left(\frac{-d-f-2cz}{\sqrt{-ic}\,\sqrt{2\pi}}\right)\sinh\left(-\frac{(-d-f)^2}{4c} + e + g\right)}{\sqrt{-ic}}\right)$$

01.20.21.2101.01

$$\int \cosh(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,d-i\,f)^{3/2}}\left(-c\sqrt{2\,\pi}\;\cosh\left(\frac{c^2}{-4\,d-4\,f}+e+g\right)C\left(\frac{2\,(-d-f)\sqrt{z}\;-c}{\sqrt{i\,(-d-f)}\;\sqrt{2\,\pi}}\right)+c\,i\sqrt{2\,\pi}\right.\right.$$
$$\left.S\left(\frac{2\,(-d-f)\sqrt{z}\;-c}{\sqrt{i\,(-d-f)}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{c^2}{-4\,d-4\,f}+e+g\right)-2\,i\sqrt{-i\,d-i\,f}\;\sinh\left(\sqrt{z}\;c+e+g+d\,z+f\,z\right)\right)+$$
$$\frac{1}{(-i\,d+i\,f)^{3/2}}\left(c\sqrt{2\,\pi}\;\cosh\left(-\frac{c^2}{4\,d-4\,f}+e-g\right)C\left(\frac{c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\;\sqrt{2\,\pi}}\right)-\right.$$
$$\left.\left.i\,c\sqrt{2\,\pi}\;S\left(\frac{c+2\,(f-d)\sqrt{z}}{\sqrt{i\,(f-d)}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{c^2}{4\,d-4\,f}+e-g\right)-2\,i\sqrt{-i\,d+i\,f}\;\sinh\left(-\sqrt{z}\;c+e-g+d\,z-f\,z\right)\right)\right)$$

Involving $\cosh\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.2102.01

$$\int \cosh\left(b\,z^2\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{f^2}{-4\,b-4\,c}+g\right)C\left(\frac{2\,(-b-c)\,z-f}{\sqrt{-i\,b-i\,c}\;\sqrt{2\,\pi}}\right)+S\left(\frac{2\,(-b-c)\,z-f}{\sqrt{-i\,b-i\,c}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{-4\,b-4\,c}+g\right)}{\sqrt{-i\,b-i\,c}}+\right.$$
$$\left.\frac{i\cosh\left(\frac{f^2}{4\,b-4\,c}+g\right)C\left(\frac{f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\;\sqrt{2\,\pi}}\right)-S\left(\frac{f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{4\,b-4\,c}+g\right)}{\sqrt{-i\,b+i\,c}}\right)$$

01.20.21.2103.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left((-b-c)\sqrt{2\,\pi}\;\cosh\left(g-\frac{(b+c)^2}{4\,f}\right)C\left(\frac{-b-c-2\,f\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)-i\,(-b-c)\sqrt{2\,\pi}\right.\right.$$
$$\left.S\left(\frac{-b-c-2\,f\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(g-\frac{(b+c)^2}{4\,f}\right)-2\,i\sqrt{-i\,f}\;\sinh\left(\sqrt{z}\;b+g+f\,z+c\sqrt{z}\right)\right)+$$
$$\frac{1}{(i\,f)^{3/2}}\left((c-b)\sqrt{2\,\pi}\;\cosh\left(\frac{(c-b)^2}{4\,f}-g\right)C\left(\frac{-b+c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)-i\,(c-b)\sqrt{2\,\pi}\;S\left(\frac{-b+c+2\,f\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)\right.$$
$$\left.\left.\sinh\left(\frac{(c-b)^2}{4\,f}-g\right)-2\,i\sqrt{i\,f}\;\sinh\left(\sqrt{z}\;b-g-f\,z-c\sqrt{z}\right)\right)\right)$$

Involving $\cosh(b\,z^r+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.2104.01

$$\int \cosh(b\,z^2+e)\cosh(c\,z^2+f\,z+g)\,dz ==$$
$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(-\frac{f^2}{4\,b-4\,c}+e-g\right)C\left(\frac{f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{f^2}{4\,b-4\,c}+e-g\right)}{\sqrt{-i\,b+i\,c}}+\right.$$
$$\left.\frac{i\cosh\left(\frac{f^2}{-4\,b-4\,c}+e+g\right)C\left(\frac{2\,(-b-c)\,z-f}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,(-b-c)\,z-f}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{f^2}{-4\,b-4\,c}+e+g\right)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.2105.01

$$\int \cosh\left(\sqrt{z}\;b+e\right)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$
$$\frac{1}{4}\left(\frac{1}{(-i\,f)^{3/2}}\left((-b-c)\,\sqrt{2\,\pi}\;\cosh\left(-\frac{(b+c)^2}{4\,f}+e+g\right)C\left(\frac{-b-c-2\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)-i\,(-b-c)\,\sqrt{2\,\pi}\right.\right.$$
$$\left.S\left(\frac{-b-c-2\,f\,\sqrt{z}}{\sqrt{-i\,f}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(b+c)^2}{4\,f}+e+g\right)-2\,i\,\sqrt{-i\,f}\;\sinh\left(\sqrt{z}\;b+e+g+f\,z+c\,\sqrt{z}\right)\right)+$$
$$\frac{1}{(i\,f)^{3/2}}\left((c-b)\,\sqrt{2\,\pi}\;\cosh\left(\frac{(c-b)^2}{4\,f}+e-g\right)C\left(\frac{-b+c+2\,f\,\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)-i\,(c-b)\,\sqrt{2\,\pi}\;S\left(\frac{-b+c+2\,f\,\sqrt{z}}{\sqrt{i\,f}\;\sqrt{2\,\pi}}\right)\right.$$
$$\left.\left.\sinh\left(\frac{(c-b)^2}{4\,f}+e-g\right)-2\,i\,\sqrt{i\,f}\;\sinh\left(\sqrt{z}\;b+e-g-f\,z-c\,\sqrt{z}\right)\right)\right)$$

Involving $\cosh(b\,z^r+d\,z)\cosh(c\,z^r+f\,z+g)$

01.20.21.2106.01

$$\int \cosh(b\,z^2+d\,z)\cosh(c\,z^2+f\,z+g)\,dz == \frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(f-d)^2}{4\,(c-b)}-g\right)C\left(\frac{-d+f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{-d+f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(f-d)^2}{4\,(c-b)}-g\right)}{\sqrt{-i\,b+i\,c}}+\right.$$
$$\left.\frac{i\cosh\left(\frac{(-d-f)^2}{4\,(-b-c)}+g\right)C\left(\frac{-d-f+2\,(-b-c)\,z}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)+S\left(\frac{-d-f+2\,(-b-c)\,z}{\sqrt{-i\,b-i\,c}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(-d-f)^2}{4\,(-b-c)}+g\right)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.2107.01

$$\int \cosh\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-i\,d-i\,f)^{3/2}}\left((-b-c)\sqrt{2\,\pi}\ \cosh\left(\frac{(b+c)^2}{-4\,d-4\,f}+g\right)C\left(\frac{-b-c+2\,(-d-f)\sqrt{z}}{\sqrt{-i\,d-i\,f}\ \sqrt{2\,\pi}}\right)-i\,(-b-c)\sqrt{2\,\pi}\right.\right.$$

$$\left.S\left(\frac{-b-c+2\,(-d-f)\sqrt{z}}{\sqrt{-i\,d-i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+c)^2}{-4\,d-4\,f}+g\right)-2\,i\,\sqrt{-i\,d-i\,f}\ \sinh\left(\sqrt{z}\ b+g-(-d-f)\,z+c\,\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d+i\,f)^{3/2}}\left((c-b)\sqrt{2\,\pi}\ \cosh\left(\frac{(c-b)^2}{4\,f-4\,d}-g\right)C\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{\sqrt{-i\,d+i\,f}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.i\,(c-b)\sqrt{2\,\pi}\ S\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{\sqrt{-i\,d+i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(c-b)^2}{4\,f-4\,d}-g\right)-2\,i\,\sqrt{-i\,d+i\,f}\ \sinh\left(\sqrt{z}\ b-g-(f-d)\,z-c\,\sqrt{z}\right)\right)\right)$$

Involving $\cosh\left(b\,z^r+d\,z+e\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.2108.01

$$\int \cosh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{2}\sqrt{\frac{\pi}{2}}\left(\frac{i\cosh\left(\frac{(f-d)^2}{4\,(c-b)}+e-g\right)C\left(\frac{-d+f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{-d+f+2\,(c-b)\,z}{\sqrt{-i\,b+i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(f-d)^2}{4\,(c-b)}+e-g\right)}{\sqrt{-i\,b+i\,c}}+\right.$$

$$\left.\frac{i\cosh\left(\frac{(-d-f)^2}{4\,(-b-c)}+e+g\right)C\left(\frac{-d-f+2\,(-b-c)\,z}{\sqrt{-i\,b-i\,c}\ \sqrt{2\,\pi}}\right)+S\left(\frac{-d-f+2\,(-b-c)\,z}{\sqrt{-i\,b-i\,c}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(-d-f)^2}{4\,(-b-c)}+e+g\right)}{\sqrt{-i\,b-i\,c}}\right)$$

01.20.21.2109.01

$$\int \cosh\left(b\,z^2+d\,z+e\right)\cosh\left(c\,z^2+f\,z+g\right)dz == \frac{1}{8}\sqrt{\pi}\left(\frac{e^{\frac{(d-f)^2}{4\,(b-c)}-e+g}\ \mathrm{erf}\left(\frac{d-f+2\,b\,z-2\,c\,z}{2\,\sqrt{b-c}}\right)}{\sqrt{b-c}}+\right.$$

$$\left.\frac{e^{\frac{d^2+2\,f\,d+f^2-4\,c\,e-4\,c\,g-4\,b\,(e+g)}{4\,(b+c)}}\ \mathrm{erf}\left(\frac{d+f+2\,(b+c)\,z}{2\,\sqrt{b+c}}\right)}{\sqrt{b+c}}+\frac{e^{-\frac{(d-f)^2}{4\,(b-c)}+e-g}\ \mathrm{erfi}\left(\frac{d-f+2\,b\,z-2\,c\,z}{2\,\sqrt{b-c}}\right)}{\sqrt{b-c}}+\frac{e^{-\frac{(d+f)^2}{4\,(b+c)}+e+g}\ \mathrm{erfi}\left(\frac{d+f+2\,(b+c)\,z}{2\,\sqrt{b+c}}\right)}{\sqrt{b+c}}\right)$$

01.20.21.2110.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{4}\left(\frac{1}{(-i\,d-i\,f)^{3/2}}\left((-b-c)\sqrt{2\,\pi}\ \cosh\left(\frac{(b+c)^2}{-4\,d-4\,f}+e+g\right)C\left(\frac{-b-c+2\,(-d-f)\sqrt{z}}{\sqrt{-i\,d-i\,f}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\,(-b-c)\sqrt{2\,\pi}\ S\left(\frac{-b-c+2\,(-d-f)\sqrt{z}}{\sqrt{-i\,d-i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+c)^2}{-4\,d-4\,f}+e+g\right)-$$

$$\left.2\,i\,\sqrt{-i\,d-i\,f}\ \sinh\left(\sqrt{z}\ b+e+g-(-d-f)\,z+c\,\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d+i\,f)^{3/2}}\left((c-b)\sqrt{2\,\pi}\ \cosh\left(\frac{(c-b)^2}{4\,f-4\,d}+e-g\right)C\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{\sqrt{-i\,d+i\,f}\ \sqrt{2\,\pi}}\right)-i\,(c-b)\sqrt{2\,\pi}\right.$$

$$\left.\left.S\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{\sqrt{-i\,d+i\,f}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(c-b)^2}{4\,f-4\,d}+e-g\right)-2\,i\,\sqrt{-i\,d+i\,f}\ \sinh\left(\sqrt{z}\ b+e-g-(f-d)\,z-c\,\sqrt{z}\right)\right)\right)$$

01.20.21.2111.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{8}\left(2\,e^{-e-g}\left(\frac{e^{\sqrt{z}\ (b-c)+2\,e+(d-f)\,z}}{d-f}+\frac{e^{\sqrt{z}\ (c-b)+2\,g+(f-d)\,z}}{f-d}+\frac{e^{\sqrt{z}\ (b+c)+2\,e+2\,g+(d+f)\,z}}{d+f}+\frac{e^{\sqrt{z}\ (-b-c)+(-d-f)\,z}}{-d-f}\right)-\right.$$

$$\frac{(-b-c)\,e^{-\frac{(-b-c)^2}{4\,(-d-f)}-e-g}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b-c+2\,(-d-f)\sqrt{z}}{2\sqrt{-d-f}}\right)}{(-d-f)^{3/2}}-\frac{(b-c)\,e^{-\frac{(b-c)^2}{4\,(d-f)}+e-g}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-c+2\,(d-f)\sqrt{z}}{2\sqrt{d-f}}\right)}{(d-f)^{3/2}}-$$

$$\left.\frac{(c-b)\,e^{-\frac{(c-b)^2}{4\,(f-d)}-e+g}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+c+2\,(f-d)\sqrt{z}}{2\sqrt{f-d}}\right)}{(f-d)^{3/2}}-\frac{(b+c)\,e^{-\frac{(b+c)^2}{4\,(d+f)}+e+g}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+c+2\,(d+f)\sqrt{z}}{2\sqrt{d+f}}\right)}{(d+f)^{3/2}}\right)$$

Involving products of several direct functions

Involving $\cosh(a\,z+\alpha)\cosh(b\,z+\beta)\cosh(c\,z+\gamma)$

01.20.21.2112.01

$$\int \cosh(a\,z)\cosh(b\,z)\cosh(c\,z)\,dz == \frac{1}{4}\left(\frac{\sinh((a-b-c)\,z)}{a-b-c}+\frac{\sinh((a+b-c)\,z)}{a+b-c}+\frac{\sinh((a-b+c)\,z)}{a-b+c}+\frac{\sinh((a+b+c)\,z)}{a+b+c}\right)$$

01.20.21.2113.01

$$\int \cosh(a\,z+\alpha)\cosh(b\,z+\beta)\cosh(c\,z+\gamma)\,dz ==$$
$$\frac{1}{4}\left(\frac{\cosh(\alpha-\beta-\gamma)\sinh((a-b-c)\,z)}{a-b-c}+\frac{\cosh(\alpha+\beta-\gamma)\sinh((a+b-c)\,z)}{a+b-c}+\frac{\cosh(\alpha-\beta+\gamma)\sinh((a-b+c)\,z)}{a-b+c}+\right.$$
$$\frac{\cosh(\alpha+\beta+\gamma)\sinh((a+b+c)\,z)}{a+b+c}+\frac{\cosh((a-b-c)\,z)\sinh(\alpha-\beta-\gamma)}{a-b-c}+$$
$$\left.\frac{\cosh((a+b-c)\,z)\sinh(\alpha+\beta-\gamma)}{a+b-c}+\frac{\cosh((a-b+c)\,z)\sinh(\alpha-\beta+\gamma)}{a-b+c}+\frac{\cosh((a+b+c)\,z)\sinh(\alpha+\beta+\gamma)}{a+b+c}\right)$$

01.20.21.2114.01

$$\int \cosh(z)\cosh(a+z)\cosh(b+z)\,dz == \frac{1}{12}\left(-3\sinh(a-b-z)+3\sinh(a-b+z)+3\sinh(a+b+z)+\sinh(a+b+3\,z)\right)$$

Involving $\prod_{k=1}^{n}\cosh(a_k\,z)$

01.20.21.2115.01

$$\int\prod_{k=1}^{n}\cosh(a_k\,z)\,dz == 2^{-n}\sum_{\substack{k_1=-1\\ \Delta k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta k_n=2}}^{1}\frac{\sinh\left(z\sum_{j=1}^{n}k_j\,a_j\right)}{\sum_{j=1}^{n}k_j\,a_j}$$

Involving products of powers of the direct function

Involving product of power of the direct function and the direct function

Involving $\cosh(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.2116.01

$$\int \cosh(c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{(a\,\nu-c)\,(c+a\,\nu)}\,2^{-\nu-1}\,e^{-c\,z}\,(e^{-a\,z}+e^{a\,z})^{\nu}\left(1+e^{2\,a\,z}\right)^{-\nu}$$
$$\left(e^{2\,c\,z}\,(-c-a\,\nu)\,{}_2F_1\left(-\frac{a\,\nu-c}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c}{a}-\nu+2\right);\,-e^{2\,a\,z}\right)-(a\,\nu-c)\,{}_2F_1\left(-\frac{c+a\,\nu}{2\,a},\,-\nu;\,-\frac{c+a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)\right)$$

01.20.21.2117.01

$$\int \cosh(c\,z)\cosh^{\nu}(a\,z)\,dz ==$$
$$2^{-\nu-1}\left(2\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left((c+a\,(\nu-2\,s))\sinh(c\,z+a\,(2\,s-\nu)\,z)+(c+2\,a\,s-a\,\nu)\sinh(c\,z+a\,(\nu-2\,s)\,z)\right)/\left((c+2\,a\,s-a\,\nu)\right.\right.$$
$$\left.\left.(c+a\,(\nu-2\,s))\right)-\binom{\nu}{\frac{\nu}{2}}\frac{2\,(\nu\bmod 2-1)\sinh(c\,z)}{c}\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.2118.01

$$\int \cosh(c\,z)\cosh^{\frac{1}{2}}(a\,z)\,dz == -\left(e^{-c\,z}\sqrt{e^{-a\,z}+e^{a\,z}}\left((a-2\,c)\,{}_2F_1\left(-\frac{a+2\,c}{4\,a},-\frac{1}{2};\frac{3}{4}-\frac{c}{2\,a};-e^{2\,a\,z}\right)+(a+2\,c)\,e^{2\,c\,z}\,{}_2F_1\left(\frac{c}{2\,a}-\frac{1}{4},-\frac{1}{2};\frac{c}{2\,a}+\frac{3}{4};-e^{2\,a\,z}\right)\right)\right)\Big/\left(\sqrt{2}\,\left(a^2-4\,c^2\right)\sqrt{1+e^{2\,a\,z}}\right)$$

01.20.21.2119.01

$$\int \frac{\cosh(c\,z)}{\cosh^{\frac{1}{2}}(a\,z)}\,dz == \frac{1}{\left(a^2-4\,c^2\right)\sqrt{e^{-a\,z}+e^{a\,z}}}\left(\sqrt{2}\;e^{-\frac{a\,z}{2}}\sqrt{1+e^{2\,a\,z}}\left((a-2\,c)\,e^{\frac{1}{2}(a+2\,c)\,z}\,{}_2F_1\left(\frac{a+2\,c}{4\,a},\frac{1}{2};\frac{c}{2\,a}+\frac{5}{4};-e^{2\,a\,z}\right)+(a+2\,c)\,e^{\frac{1}{2}(a-2\,c)\,z}\,{}_2F_1\left(\frac{a-2\,c}{4\,a},\frac{1}{2};\frac{5}{4}-\frac{c}{2\,a};-e^{2\,a\,z}\right)\right)\right)$$

01.20.21.2120.01

$$\int \cosh((\nu+2)\,z)\cosh^{\nu}(z)\,dz == \frac{\cosh^{\nu+1}(z)\sinh(z\,(\nu+1))}{\nu+1}$$

01.20.21.2121.01

$$\int \cosh(a\,z)\cosh^{\frac{1}{2}}(2\,a\,z)\,dz == \frac{\sqrt{2}\,\sinh^{-1}\left(\sqrt{2}\,\sinh(a\,z)\right)+2\cosh^{\frac{1}{2}}(2\,a\,z)\sinh(a\,z)}{4\,a}$$

01.20.21.2122.01

$$\int \frac{\cosh(a\,z)}{\cosh^{\frac{1}{2}}(2\,a\,z)}\,dz == \frac{\sinh^{-1}\left(\sqrt{2}\,\sinh(a\,z)\right)}{\sqrt{2}\,a}$$

01.20.21.2123.01

$$\int \cosh(2\,a\,z)\cosh^{\nu}(a\,z)\,dz == -\frac{1}{a\,(\nu-2)\,(\nu+2)}\left(2^{-\nu-1}\,e^{-2\,a\,z}\,(e^{-a\,z}+e^{a\,z})^{\nu}\left(1+e^{2\,a\,z}\right)^{-\nu}\left((\nu-2)\,{}_2F_1\left(-\frac{\nu}{2}-1,-\nu;-\frac{\nu}{2};-e^{2\,a\,z}\right)+e^{4\,a\,z}\,(\nu+2)\,{}_2F_1\left(1-\frac{\nu}{2},-\nu;2-\frac{\nu}{2};-e^{2\,a\,z}\right)\right)\right)$$

Involving $\cosh(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.2124.01

$$\int \cosh(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{2\,((c-a\,\nu)\,(c+a\,\nu))}\left(e^{-d-c\,z}\cosh^{\nu}(a\,z)\left(1+e^{2\,a\,z}\right)^{-\nu}\left(e^{2\,(d+c\,z)}\,(c+a\,\nu)\,{}_2F_1\left(\frac{c-a\,\nu}{2\,a},-\nu;\frac{1}{2}\left(\frac{c}{a}-\nu+2\right);-e^{2\,a\,z}\right)+(a\,\nu-c)\,{}_2F_1\left(-\frac{c+a\,\nu}{2\,a},-\nu;-\frac{c+a\,(\nu-2)}{2\,a};-e^{2\,a\,z}\right)\right)\right)$$

01.20.21.2125.01

$$\int \cosh(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(d+c\,z)}{c}+2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}((c-a\,(\nu-2\,s))\sinh(d+c\,z+a\,(\nu-2\,s)\,z)+(c+a\,(\nu-2\,s))\sinh(d+c\,z-a\,(\nu-2\,s)\,z))\right)\Big/((c-a\,(\nu-2\,s))\,(c+a\,(\nu-2\,s)))\;/;\;\nu\in\mathbb{N}^+$$

Involving $\cosh(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.2126.01

$$\int \cosh(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{(c-a\,\nu)(c+a\,\nu)}\,2^{-1}\,e^{-c\,z}\cosh(b+a\,z)^{\nu}\left(1+e^{2(b+a\,z)}\right)^{-\nu}$$
$$\left(e^{2\,c\,z}(c+a\,\nu)\,{}_2F_1\left(\frac{c-a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c}{a}-\nu+2\right);\,-e^{2(b+a\,z)}\right)+(a\,\nu-c)\,{}_2F_1\left(-\frac{c+a\,\nu}{2\,a},\,-\nu;\,-\frac{c+a\,(\nu-2)}{2\,a};\,-e^{2(b+a\,z)}\right)\right)$$

01.20.21.2127.01

$$\int \cosh(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{2^{-\nu}\,(1-\nu \bmod 2)\sinh(c\,z)}{c}\binom{\nu}{\frac{\nu}{2}}+$$
$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}\left((c-a\,(\nu-2\,s))\sinh(b\,(\nu-2\,s)+c\,z+a\,(\nu-2\,s)\,z)+(c+a\,(\nu-2\,s))\sinh(-b\,(\nu-2\,s)+c\,z-a\,(\nu-2\,s)\,z)\right)\Big/$$
$$((c-a\,(\nu-2\,s))(c+a\,(\nu-2\,s)))\;/;\;\nu\in\mathbb{N}^{+}$$

Involving $\cosh(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.2128.01

$$\int \cosh(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{(c-a\,\nu)(c+a\,\nu)}\,2^{-1}\,e^{-d-c\,z}\cosh(b+a\,z)^{\nu}\left(1+e^{2(b+a\,z)}\right)^{-\nu}$$
$$\left(e^{2(d+c\,z)}(c+a\,\nu)\,{}_2F_1\left(\frac{c-a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c}{a}-\nu+2\right);\,-e^{2(b+a\,z)}\right)+(a\,\nu-c)\,{}_2F_1\left(-\frac{c+a\,\nu}{2\,a},\,-\nu;\,-\frac{c+a\,(\nu-2)}{2\,a};\,-e^{2(b+a\,z)}\right)\right)$$

01.20.21.2129.01

$$\int \cosh(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$
$$\frac{2^{-\nu}\,(1-\nu \bmod 2)\sinh(d+c\,z)}{c}\binom{\nu}{\frac{\nu}{2}}+2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}\left((c-a\,(\nu-2\,s))\sinh(d+b\,(\nu-2\,s)+c\,z+a\,(\nu-2\,s)\,z)+\right.\right.$$
$$\left.\left.(c+a\,(\nu-2\,s))\sinh(d-b\,(\nu-2\,s)+c\,z-a\,(\nu-2\,s)\,z)\right)\Big/((c-a\,(\nu-2\,s))(c+a\,(\nu-2\,s)))\;/;\;\nu\in\mathbb{N}^{+}\right)$$

Involving $\cosh\left(b\,z^{r}\right)\cosh^{\nu}(c\,z)$

01.20.21.2130.01

$$\int \cosh\left(b\,z^2\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\,i\,\sqrt{\pi}\;(1-\nu \bmod 2)}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}C\left(\frac{b\sqrt{\frac{2}{\pi}}\;z}{\sqrt{i\,b}}\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{i\cosh\left(\frac{(2\,c\,k-c\,\nu)^2}{4\,b}\right)C\left(\frac{2\,c\,k-c\,\nu-2\,b\,z}{\sqrt{-i\,b}\;\sqrt{2\,\pi}}\right)-S\left(\frac{2\,c\,k-c\,\nu-2\,b\,z}{\sqrt{-i\,b}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,c\,k-c\,\nu)^2}{4\,b}\right)}{\sqrt{-i\,b}}+\right.$$

$$\left.\frac{i\cosh\left(\frac{(2\,c\,k-c\,\nu)^2}{4\,b}\right)C\left(\frac{2\,c\,k-c\,\nu+2\,b\,z}{\sqrt{i\,b}\;\sqrt{2\,\pi}}\right)+S\left(\frac{2\,c\,k-c\,\nu+2\,b\,z}{\sqrt{i\,b}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,c\,k-c\,\nu)^2}{4\,b}\right)}{\sqrt{i\,b}}\right)/;\;\nu\in\mathbb{N}^+$$

01.20.21.2131.01

$$\int \cosh\left(\sqrt{z}\;b\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\;\cosh\left(-\frac{b^2}{4\,(2\,c\,k-c\,\nu)}\right)C\left(\frac{b+2\,(2\,c\,k-c\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)+b\,i\sqrt{2\,\pi}\right.\right.$$

$$\left.S\left(\frac{b+2\,(2\,c\,k-c\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)\sinh\left(-\frac{b^2}{4\,(2\,c\,k-c\,\nu)}\right)+2\,i\sqrt{2\,i\,c\,k-i\,c\,\nu}\;\sinh\left(\sqrt{z}\;b+(2\,c\,k-c\,\nu)\,z\right)\right)+$$

$$\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(-b\sqrt{2\,\pi}\;\cosh\left(\frac{b^2}{4\,(2\,c\,k-c\,\nu)}\right)C\left(\frac{2\,(2\,c\,k-c\,\nu)\,\sqrt{z}\;-b}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)+b\,i\sqrt{2\,\pi}\right.$$

$$\left.\left.S\left(\frac{2\,(2\,c\,k-c\,\nu)\,\sqrt{z}\;-b}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)\sinh\left(\frac{b^2}{4\,(2\,c\,k-c\,\nu)}\right)-2\,i\sqrt{2\,i\,c\,k-i\,c\,\nu}\;\sinh\left(\sqrt{z}\;b-(2\,c\,k-c\,\nu)\,z\right)\right)\right)-$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(\sqrt{z}\;b\right)-b\sqrt{z}\;\sinh\left(\sqrt{z}\;b\right)\right)}{b^2}\;/;\;\nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+e\right)\cosh^{\nu}(c\,z)$

01.20.21.2132.01

$$\int \cosh\left(b\,z^2+e\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)-S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)\sinh(e)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{i\cosh\left(-\frac{(2\,c\,k-c\,\nu)^2}{4\,b}+e\right)C\left(\frac{2\,c\,k-c\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,c\,k-c\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(2\,c\,k-c\,\nu)^2}{4\,b}+e\right)}{\sqrt{i\,b}}+\frac{1}{\sqrt{-i\,b}}\right.$$

$$\left.\left(i\cosh\left(-\frac{(2\,c\,k-c\,\nu)^2}{4\,b}+e\right)C\left(\frac{2\,c\,k-c\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,c\,k-c\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(2\,c\,k-c\,\nu)^2}{4\,b}+e\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.2133.01

$$\int \cosh\left(\sqrt{z}\;b+e\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\,\cosh\left(-\frac{b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)C\left(\frac{b+2\,(2\,c\,k-c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)+\right.\right.$$

$$b\,i\sqrt{2\,\pi}\,S\left(\frac{b+2\,(2\,c\,k-c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)\sinh\left(-\frac{b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)+$$

$$\left.2\,i\sqrt{2\,i\,c\,k-i\,c\,\nu}\,\sinh\left(\sqrt{z}\;b+e+(2\,c\,k-c\,\nu)\,z\right)\right)+\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}$$

$$\left(-b\sqrt{2\,\pi}\,\cosh\left(\frac{b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)C\left(\frac{2\,(2\,c\,k-c\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)+b\,i\sqrt{2\,\pi}\,S\left(\frac{2\,(2\,c\,k-c\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-i\,c\,\nu}}\right)\right.$$

$$\left.\left.\sinh\left(\frac{b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)-2\,i\sqrt{2\,i\,c\,k-i\,c\,\nu}\,\sinh\left(\sqrt{z}\;b+e-(2\,c\,k-c\,\nu)\,z\right)\right)\right)-$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(\sqrt{z}\;b+e\right)-b\sqrt{z}\,\sinh\left(\sqrt{z}\;b+e\right)\right)}{b^2}\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+d\,z\right)\cosh^{\nu}(c\,z)$

01.20.21.2134.01

$$\int \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4\,b}\right)C\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,b}\right)\right)}{\sqrt{i\,b}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-i\,b}}\left(i\cosh\left(\frac{(-d+2\,c\,k-c\,\nu)^2}{4\,b}\right)C\left(\frac{-d+2\,c\,k-c\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-d+2\,c\,k-c\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(-d+2\,c\,k-c\,\nu)^2}{4\,b}\right)\right)+$$

$$\left.\frac{i\cosh\left(\frac{(d+2\,c\,k-c\,\nu)^2}{4\,b}\right)C\left(\frac{d+2\,c\,k-c\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,c\,k-c\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(d+2\,c\,k-c\,\nu)^2}{4\,b}\right)}{\sqrt{i\,b}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2135.01

$$\int \cosh\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}(c\,z)\,dz == \frac{1}{(i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\,\sqrt{2\,\pi}}\right)-i\,b\sqrt{2\,\pi}\ S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}\right)+2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+d\,z\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(i\,d+2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{-4\,d-8\,c\,k+4\,c\,\nu}\right)C\left(\frac{b+2\,(d+2\,c\,k-c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(d+2\,c\,k-c\,\nu)}}\right)+\right.\right.$$

$$b\,i\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d+2\,c\,k-c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(d+2\,c\,k-c\,\nu)}}\right)\sinh\left(\frac{b^2}{-4\,d-8\,c\,k+4\,c\,\nu}\right)+$$

$$\left.2\,i\sqrt{i\,d+2\,i\,c\,k-i\,c\,\nu}\ \sinh\left(\sqrt{z}\ b+d\,z+2\,c\,k\,z-c\,\nu\,z\right)\right)+$$

$$\frac{1}{(-i\,d+2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(-b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{-4\,d+8\,c\,k-4\,c\,\nu}\right)C\left(\frac{2\,(-d+2\,c\,k-c\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,c\,k-c\,\nu)}}\right)+\right.$$

$$b\,i\sqrt{2\,\pi}\ S\left(\frac{2\,(-d+2\,c\,k-c\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,c\,k-c\,\nu)}}\right)\sinh\left(\frac{b^2}{-4\,d+8\,c\,k-4\,c\,\nu}\right)+$$

$$\left.\left.2\,i\sqrt{-i\,d+2\,i\,c\,k-i\,c\,\nu}\ \sinh\left(-\sqrt{z}\ b-d\,z+2\,c\,k\,z-c\,\nu\,z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+d\,z+e\right)\cosh^{\nu}(c\,z)$

01.20.21.2136.01

$$\int \cosh\left(b z^2+d z+e\right)\cosh^{\nu}(c z)\,dz ==$$

$$\frac{1}{\sqrt{i b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4b}-e\right)C\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4b}-e\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-ib}}\left(i\cosh\left(-\frac{(-d+2ck-c\nu)^2}{4b}+e\right)C\left(\frac{-d+2ck-c\nu-2bz}{\sqrt{-ib}\sqrt{2\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{-d+2ck-c\nu-2bz}{\sqrt{-ib}\sqrt{2\pi}}\right)\sinh\left(-\frac{(-d+2ck-c\nu)^2}{4b}+e\right)\right)+\frac{1}{\sqrt{ib}}\left(i\cosh\left(-\frac{(d+2ck-c\nu)^2}{4b}+e\right)\right.$$

$$\left.\left.C\left(\frac{d+2ck-c\nu+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)-S\left(\frac{d+2ck-c\nu+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)\sinh\left(-\frac{(d+2ck-c\nu)^2}{4b}+e\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2137.01

$$\int \cosh\left(\sqrt{z}\,b+e+d z\right)\cosh^{\nu}(c z)\,dz ==$$

$$\frac{1}{(id)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\pi}\,\cosh\left(\frac{b^2}{4d}-e\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)-ib\sqrt{2\pi}\,S\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4d}-e\right)+\right.\right.$$

$$\left.\left.2\sqrt{id}\;i\sinh\left(\sqrt{z}\,b+e+dz\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(id+2ick-ic\nu)^{3/2}}\left(b\sqrt{2\pi}\,\cosh\left(\frac{b^2}{-4d-8ck+4c\nu}+e\right)C\left(\frac{b+2(d+2ck-c\nu)\sqrt{z}}{\sqrt{2\pi}\sqrt{i(d+2ck-c\nu)}}\right)+\right.\right.$$

$$b i\sqrt{2\pi}\,S\left(\frac{b+2(d+2ck-c\nu)\sqrt{z}}{\sqrt{2\pi}\sqrt{i(d+2ck-c\nu)}}\right)\sinh\left(\frac{b^2}{-4d-8ck+4c\nu}+e\right)+$$

$$\left.2i\sqrt{id+2ick-ic\nu}\,\sinh\left(\sqrt{z}\,b+e+dz+2ckz-c\nu z\right)\right)+$$

$$\frac{1}{(-id+2ick-ic\nu)^{3/2}}\left(-b\sqrt{2\pi}\,\cosh\left(\frac{b^2}{-4d+8ck-4c\nu}+e\right)C\left(\frac{2(-d+2ck-c\nu)\sqrt{z}-b}{\sqrt{2\pi}\sqrt{i(-d+2ck-c\nu)}}\right)+\right.$$

$$b i\sqrt{2\pi}\,S\left(\frac{2(-d+2ck-c\nu)\sqrt{z}-b}{\sqrt{2\pi}\sqrt{i(-d+2ck-c\nu)}}\right)\sinh\left(\frac{b^2}{-4d+8ck-4c\nu}+e\right)+$$

$$\left.\left.2i\sqrt{-id+2ick-ic\nu}\,\sinh\left(-\sqrt{z}\,b-e-dz+2ckz-c\nu z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b z^r\right)\cosh^{\nu}(f z+g)$

01.20.21.2138.01

$$\int \cosh\left(b\,z^2\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\,i\,\sqrt{\pi}\,(1-\nu \bmod 2)}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-i\,b}}\left(i\cosh\left(\frac{(2\,f\,k-f\,\nu)^2}{4\,b}+g\,(2\,k-\nu)\right)C\left(\frac{2\,f\,k-f\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$S\left(\frac{2\,f\,k-f\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,f\,k-f\,\nu)^2}{4\,b}+g\,(2\,k-\nu)\right)\Bigg)+\frac{1}{\sqrt{i\,b}}\left(i\cosh\left(g\,(2\,k-\nu)-\frac{(2\,f\,k-f\,\nu)^2}{4\,b}\right)\right.$$

$$\left.\left.C\left(\frac{2\,f\,k-f\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,f\,k-f\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(g\,(2\,k-\nu)-\frac{(2\,f\,k-f\,\nu)^2}{4\,b}\right)\right)\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

01.20.21.2139.01

$$\int \cosh\left(\sqrt{z}\ b\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\,\cosh\left(-\frac{b^2}{4\,(2\,f\,k-f\,\nu)}+2\,g\,k-g\,\nu\right)C\left(\frac{b+2\,(2\,f\,k-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+\right.\right.$$

$$b\,i\sqrt{2\,\pi}\,S\left(\frac{b+2\,(2\,f\,k-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sinh\left(-\frac{b^2}{4\,(2\,f\,k-f\,\nu)}+2\,g\,k-g\,\nu\right)+$$

$$\left.2\,i\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sinh\left(\sqrt{z}\ b+2\,g\,k-g\,\nu+(2\,f\,k-f\,\nu)\,z\right)\right)+\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}$$

$$\left(-b\sqrt{2\,\pi}\,\cosh\left(\frac{b^2}{4\,(2\,f\,k-f\,\nu)}-2\,g\,k+g\,\nu\right)C\left(\frac{2\,(2\,f\,k-f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+b\,i\sqrt{2\,\pi}\,S\left(\frac{2\,(2\,f\,k-f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\right.$$

$$\left.\left.\sinh\left(\frac{b^2}{4\,(2\,f\,k-f\,\nu)}-2\,g\,k+g\,\nu\right)-2\,i\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sinh\left(\sqrt{z}\ b-2\,g\,k+g\,\nu-(2\,f\,k-f\,\nu)\,z\right)\right)\right)-$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(\sqrt{z}\ b\right)-b\sqrt{z}\,\sinh\left(\sqrt{z}\ b\right)\right)}{b^2}\Bigg/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+e\right)\cosh^{\nu}(f\,z+g)$

01.20.21.2140.01

$$\int \cosh\left(b\,z^2+e\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)-S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)\sinh(e)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{i\,b}}\left(i\cosh\left(-\frac{(2\,f\,k-f\,\nu)^2}{4\,b}+e+g\,(2\,k-\nu)\right)C\left(\frac{2\,f\,k-f\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,f\,k-f\,\nu+2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sinh\left(-\frac{(2\,f\,k-f\,\nu)^2}{4\,b}+e+g\,(2\,k-\nu)\right)\right)+\frac{1}{\sqrt{-i\,b}}\left(i\cosh\left(-\frac{(2\,f\,k-f\,\nu)^2}{4\,b}+e-g\,(2\,k-\nu)\right)\right.$$
$$\left.\left.C\left(\frac{2\,f\,k-f\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,f\,k-f\,\nu-2\,b\,z}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(2\,f\,k-f\,\nu)^2}{4\,b}+e-g\,(2\,k-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.2141.01

$$\int \cosh\left(\sqrt{z}\;b+e\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\,\cosh\left(-\frac{b^2}{4\,(2\,f\,k-f\,\nu)}+e+2\,g\,k-g\,\nu\right)C\left(\frac{b+2\,(2\,f\,k-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+\right.\right.$$
$$b\,i\sqrt{2\,\pi}\,S\left(\frac{b+2\,(2\,f\,k-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sinh\left(-\frac{b^2}{4\,(2\,f\,k-f\,\nu)}+e+2\,g\,k-g\,\nu\right)+$$
$$\left.2\,i\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sinh\left(\sqrt{z}\;b+e+2\,g\,k-g\,\nu+(2\,f\,k-f\,\nu)\,z\right)\right)+$$
$$\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(-b\sqrt{2\,\pi}\,\cosh\left(\frac{b^2}{4\,(2\,f\,k-f\,\nu)}+e-2\,g\,k+g\,\nu\right)C\left(\frac{2\,(2\,f\,k-f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+\right.$$
$$b\,i\sqrt{2\,\pi}\,S\left(\frac{2\,(2\,f\,k-f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sinh\left(\frac{b^2}{4\,(2\,f\,k-f\,\nu)}+e-2\,g\,k+g\,\nu\right)-$$
$$\left.\left.2\,i\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sinh\left(\sqrt{z}\;b+e-2\,g\,k+g\,\nu-(2\,f\,k-f\,\nu)\,z\right)\right)\right)-$$
$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(\sqrt{z}\;b+e\right)-b\sqrt{z}\;\sinh\left(\sqrt{z}\;b+e\right)\right)}{b^2}\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+d\,z\right)\cosh^{\nu}(f\,z+g)$

01.20.21.2142.01

$$\int \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4b}\right)C\left(\frac{d+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4b}\right)\right)}{\sqrt{ib}}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-ib}}\left(i\cosh\left(\frac{(-d+2fk-f\nu)^2}{4b}+g(2k-\nu)\right)C\left(\frac{-d+2fk-f\nu-2bz}{\sqrt{-ib}\ \sqrt{2\pi}}\right)-S\left(\frac{-d+2fk-f\nu-2bz}{\sqrt{-ib}\ \sqrt{2\pi}}\right)\right.\right.$$
$$\left.\sinh\left(\frac{(-d+2fk-f\nu)^2}{4b}+g(2k-\nu)\right)\right)+\frac{1}{\sqrt{ib}}\left(i\cosh\left(g(2k-\nu)-\frac{(d+2fk-f\nu)^2}{4b}\right)\right.$$
$$\left.\left.C\left(\frac{d+2fk-f\nu+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)-S\left(\frac{d+2fk-f\nu+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)\sinh\left(g(2k-\nu)-\frac{(d+2fk-f\nu)^2}{4b}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2143.01

$$\int \cosh\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{1}{(id)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left.\left(b\sqrt{2\pi}\ \cosh\left(\frac{b^2}{4d}\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\ \sqrt{2\pi}}\right)-ib\sqrt{2\pi}\ S\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\ \sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4d}\right)+2\sqrt{id}\ i\sinh\left(\sqrt{z}\ b+d\,z\right)\right)+\right.$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(id+2ifk-if\nu)^{3/2}}\left(b\sqrt{2\pi}\ \cosh\left(\frac{b^2}{-4d-8fk+4f\nu}+2gk-g\nu\right)C\left(\frac{b+2(d+2fk-f\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{i(d+2fk-f\nu)}}\right)+\right.\right.$$
$$bi\sqrt{2\pi}\ S\left(\frac{b+2(d+2fk-f\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{i(d+2fk-f\nu)}}\right)\sinh\left(\frac{b^2}{-4d-8fk+4f\nu}+2gk-g\nu\right)+$$
$$\left.2i\sqrt{id+2ifk-if\nu}\ \sinh\left(\sqrt{z}\ b+2gk-g\nu+dz+2fkz-f\nu z\right)\right)+$$
$$\frac{1}{(-id+2ifk-if\nu)^{3/2}}\left(-b\sqrt{2\pi}\ \cosh\left(\frac{b^2}{-4d+8fk-4f\nu}-2gk+g\nu\right)C\left(\frac{2(-d+2fk-f\nu)\sqrt{z}-b}{\sqrt{2\pi}\ \sqrt{i(-d+2fk-f\nu)}}\right)+\right.$$
$$bi\sqrt{2\pi}\ S\left(\frac{2(-d+2fk-f\nu)\sqrt{z}-b}{\sqrt{2\pi}\ \sqrt{i(-d+2fk-f\nu)}}\right)\sinh\left(\frac{b^2}{-4d+8fk-4f\nu}-2gk+g\nu\right)+$$
$$\left.\left.2i\sqrt{-id+2ifk-if\nu}\ \sinh\left(-\sqrt{z}\ b+2gk-g\nu-dz+2fkz-f\nu z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+d\,z+e\right)\cosh^{\nu}(f\,z+g)$

01.20.21.2144.01

$$\int \cosh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$\frac{1}{\sqrt{i\,b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4\,b}-e\right)C\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,b}-e\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-i\,b}}\left(i\cosh\left(-\frac{(-d+2\,f\,k-f\,\nu)^2}{4\,b}+e-g\,(2\,k-\nu)\right)C\left(\frac{-d+2\,f\,k-f\,\nu-2\,b\,z}{\sqrt{-i\,b}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{-d+2\,f\,k-f\,\nu-2\,b\,z}{\sqrt{-i\,b}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{(-d+2\,f\,k-f\,\nu)^2}{4\,b}+e-g\,(2\,k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{i\,b}}\left(i\cosh\left(-\frac{(d+2\,f\,k-f\,\nu)^2}{4\,b}+e+g\,(2\,k-\nu)\right)C\left(\frac{d+2\,f\,k-f\,\nu+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.S\left(\frac{d+2\,f\,k-f\,\nu+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{(d+2\,f\,k-f\,\nu)^2}{4\,b}+e+g\,(2\,k-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2145.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$\frac{1}{(i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}-e\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\,b\sqrt{2\,\pi}\ S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}-e\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+e+d\,z\right)\right)\right)+2^{-\nu-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(i\,d+2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{-4\,d-8\,f\,k+4\,f\,\nu}+e+2\,g\,k-g\,\nu\right)C\left(\frac{b+2\,(d+2\,f\,k-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,(d+2\,f\,k-f\,\nu)}}\right)+\right.\right.$$

$$b\,i\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d+2\,f\,k-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,(d+2\,f\,k-f\,\nu)}}\right)\sinh\left(\frac{b^2}{-4\,d-8\,f\,k+4\,f\,\nu}+e+2\,g\,k-g\,\nu\right)+$$

$$\left.2\,i\sqrt{i\,d+2\,i\,f\,k-i\,f\,\nu}\ \sinh\left(\sqrt{z}\ b+e+2\,g\,k-g\,\nu+d\,z+2\,f\,k\,z-f\,\nu\,z\right)\right)+\frac{1}{(-i\,d+2\,i\,f\,k-i\,f\,\nu)^{3/2}}$$

$$\left(-b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{-4\,d+8\,f\,k-4\,f\,\nu}+e-2\,g\,k+g\,\nu\right)C\left(\frac{2\,(-d+2\,f\,k-f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\ \sqrt{i\,(-d+2\,f\,k-f\,\nu)}}\right)+\right.$$

$$b\,i\sqrt{2\,\pi}\ S\left(\frac{2\,(-d+2\,f\,k-f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\ \sqrt{i\,(-d+2\,f\,k-f\,\nu)}}\right)\sinh\left(\frac{b^2}{-4\,d+8\,f\,k-4\,f\,\nu}+e-2\,g\,k+g\,\nu\right)+$$

$$\left.\left.2\,i\sqrt{-i\,d+2\,i\,f\,k-i\,f\,\nu}\ \sinh\left(-\sqrt{z}\ b-e+2\,g\,k-g\,\nu-d\,z+2\,f\,k\,z-f\,\nu\,z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(b\,z)\cosh^{\nu}(c\,z^{r})$

01.20.21.2146.01

$$\int \cosh(b\,z)\cosh^{\nu}\left(c\,z^{2}\right)dz ==$$

$$\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(b\,z)}{b}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{b^{2}}{4\,(c\,\nu-2\,c\,s)}\right)C\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{b^{2}}{4\,(c\,\nu-2\,c\,s)}\right)\right)+\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}$$

$$\left.\left.\left(i\cosh\left(\frac{b^{2}}{4\,(2\,c\,s-c\,\nu)}\right)C\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+S\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{b^{2}}{4\,(2\,c\,s-c\,\nu)}\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2147.01

$$\int \cosh(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(b\,z)}{b}+$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,b)^{3/2}}\left(-\sqrt{2\,\pi}\,(2\,c\,s-c\,\nu)\cosh\left(\frac{(c\,\nu-2\,c\,s)^{2}}{4\,b}\right)C\left(\frac{-2\,\sqrt{z}\,b-2\,c\,s+c\,\nu}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)+\right.\right.$$

$$i\,\sqrt{2\,\pi}\,(c\,\nu-2\,c\,s)\,S\left(\frac{-2\,\sqrt{z}\,b-2\,c\,s+c\,\nu}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(c\,\nu-2\,c\,s)^{2}}{4\,b}\right)-2\,i\,\sqrt{-i\,b}\,\sinh\left(b\,z-(c\,\nu-2\,c\,s)\,\sqrt{z}\right)\Bigg)+$$

$$\frac{1}{(-i\,b)^{3/2}}\left(-\sqrt{2\,\pi}\,(c\,\nu-2\,c\,s)\cosh\left(\frac{(2\,c\,s-c\,\nu)^{2}}{4\,b}\right)C\left(\frac{-2\,\sqrt{z}\,b+2\,c\,s-c\,\nu}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)+i\,\sqrt{2\,\pi}\,(2\,c\,s-c\,\nu)\right.$$

$$\left.\left.S\left(\frac{-2\,\sqrt{z}\,b+2\,c\,s-c\,\nu}{\sqrt{-i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,c\,s-c\,\nu)^{2}}{4\,b}\right)-2\,i\,\sqrt{-i\,b}\,\sinh\left(b\,z-(2\,c\,s-c\,\nu)\,\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\cosh(d\,z+e)\cosh^{\nu}\left(c\,z^{r}\right)$

01.20.21.2148.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(c\,z^{2}\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(e+d\,z)}{d}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{d^{2}}{4\,(c\,\nu-2\,c\,s)}+e\right)C\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-d}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-d}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{d^{2}}{4\,(c\,\nu-2\,c\,s)}+e\right)\right)+\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{d^{2}}{4\,(2\,c\,s-c\,\nu)}+e\right)\right.$$

$$\left.\left.\left.C\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+S\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{d^{2}}{4\,(2\,c\,s-c\,\nu)}+e\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2149.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(e+d\,z)}{d} +$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d)^{3/2}}\left(-\sqrt{2\,\pi}\;(2\,c\,s-c\,\nu)\cosh\left(-\frac{(c\,\nu-2\,c\,s)^2}{4\,d}+e\right)C\left(\frac{-2\sqrt{z}\;d-2\,c\,s+c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\,\pi}}\right)-i\sqrt{2\,\pi}\;(c\,\nu-2\,c\,s)\right.\right.$$
$$\left.S\left(\frac{-2\sqrt{z}\;d-2\,c\,s+c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(c\,\nu-2\,c\,s)^2}{4\,d}+e\right)-2\,i\sqrt{-i\,d}\;\sinh\left(e+d\,z-(c\,\nu-2\,c\,s)\sqrt{z}\right)\right)+$$
$$\frac{1}{(-i\,d)^{3/2}}\left(-\sqrt{2\,\pi}\;(c\,\nu-2\,c\,s)\cosh\left(-\frac{(2\,c\,s-c\,\nu)^2}{4\,d}+e\right)C\left(\frac{-2\sqrt{z}\;d+2\,c\,s-c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\,\pi}}\right)-i\sqrt{2\,\pi}\;(2\,c\,s-c\,\nu)\right.$$
$$\left.\left.S\left(\frac{-2\sqrt{z}\;d+2\,c\,s-c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(2\,c\,s-c\,\nu)^2}{4\,d}+e\right)-2\,i\sqrt{-i\,d}\;\sinh\left(e+d\,z-(2\,c\,s-c\,\nu)\sqrt{z}\right)\right)\right)/;\;\nu\in\mathbb{N}^+$$

Involving $\cosh(a\,z^r)\cosh^{\nu}(c\,z^r)$

01.20.21.2150.01

$$\int \cosh(b\,z^r)\cosh^{\nu}(c\,z^r)\,dz == -\frac{2^{-\nu-1}\,z\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{1}{r},-b\,z^r\right)(-b\,z^r)^{-1/r}+(b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b\,z^r\right)\right)(1-\nu \bmod 2)}{r} -$$

$$\frac{1}{r}\,2^{-\nu-1}\,z\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{1}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)((-b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}+((b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+\right.$$
$$\left.((-b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)+((b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)/;\;\nu\in\mathbb{N}^+$$

01.20.21.2151.01

$$\int \cosh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2\right)dz == \frac{2^{-\nu-\frac{1}{2}}\,i\sqrt{\pi}\;(1-\nu \bmod 2)}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}C\left(\frac{b\sqrt{\frac{2}{\pi}}\;z}{\sqrt{i\,b}}\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}\;z\right)}{\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}}+\frac{C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}\;z\right)}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}}\right)/;\;\nu\in\mathbb{N}^+$$

01.20.21.2152.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == -\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(b\sqrt{z}\right)-b\sqrt{z}\,\sinh\left(b\sqrt{z}\right)\right)}{b^2} -$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\cosh\left((c(\nu-2s)-b)\sqrt{z}\right)-(c(\nu-2s)-b)\sqrt{z}\,\sinh\left((c(\nu-2s)-b)\sqrt{z}\right)}{(c(\nu-2s)-b)^2}+\right.$$

$$\left.\frac{1}{(-b-c(\nu-2s))^2}\left(\cosh\left((-b-c(\nu-2s))\sqrt{z}\right)-(-b-c(\nu-2s))\sqrt{z}\,\sinh\left((-b-c(\nu-2s))\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(a z^r+e)\cosh^{\nu}(c z^r)$

01.20.21.2153.01

$$\int \cosh(b z^r+e)\cosh^{\nu}(c z^r)\,dz == -\frac{2^{-\nu-1}z\binom{\nu}{\frac{\nu}{2}}\left(e^e\,\Gamma\left(\frac{1}{r},-b z^r\right)(-b z^r)^{-1/r}+e^{-e}(b z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b z^r\right)\right)(1-\nu \bmod 2)}{r} -$$

$$\frac{1}{r}2^{-\nu-1}z\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^e\,\Gamma\left(\frac{1}{r},(-b-2cs+c\nu)z^r\right)((-b-2cs+c\nu)z^r)^{-1/r}+\right.$$

$$e^{-e}((b-2cs+c\nu)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2cs+c\nu)z^r\right)+e^e((-b+2cs-c\nu)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2cs-c\nu)z^r\right)+$$

$$\left.e^{-e}((b+2cs-c\nu)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2cs-c\nu)z^r\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2154.01

$$\int \cosh\left(b z^2+e\right)\cosh^{\nu}\left(c z^2\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i b}}\right)-S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i b}}\right)\sinh(e)\right)+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{1}{\sqrt{-i b-2ics+ic\nu}}\left(\cosh(e)\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i b-2ics+ic\nu}\,z\right)+iS\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i b-2ics+ic\nu}\,z\right)\sinh(e)\right)+\right.$$

$$\frac{1}{\sqrt{-i b+2ics-ic\nu}}$$

$$\left.\left.\left(\cosh(e)\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i b+2ics-ic\nu}\,z\right)+iS\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i b+2ics-ic\nu}\,z\right)\sinh(e)\right)\right)/;\ \nu\in\mathbb{N}^+\right.$$

01.20.21.2155.01

$$\int \cosh\left(\sqrt{z}\ b+e\right)\cosh^{\nu}\left(\sqrt{z}\ c\right)dz ==$$

$$-\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(\sqrt{z}\ b+e\right)-b\sqrt{z}\ \sinh\left(\sqrt{z}\ b+e\right)\right)}{b^2}-2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(c(\nu-2s)-b)^2}\right.$$

$$\left(\cosh\left(e-(c(\nu-2s)-b)\sqrt{z}\right)+(c(\nu-2s)-b)\sqrt{z}\ \sinh\left(e-(c(\nu-2s)-b)\sqrt{z}\right)\right)+\frac{1}{(-b-c(\nu-2s))^2}$$

$$\left.\left(\cosh\left(e-(-b-c(\nu-2s))\sqrt{z}\right)+(-b-c(\nu-2s))\sqrt{z}\ \sinh\left(e-(-b-c(\nu-2s))\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.2156.01

$$\int \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4b}\right)C\left(\frac{d+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4b}\right)\right)}{\sqrt{ib}}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$

$$\left(\frac{1}{\sqrt{ib+2ick-icv}}\left(i\cosh\left(\frac{d^2}{-4b-8ck+4cv}\right)C\left(\frac{d+2(b+2ck-cv)z}{\sqrt{2\pi}\ \sqrt{ib+2ick-icv}}\right)-S\left(\frac{d+2(b+2ck-cv)z}{\sqrt{2\pi}\ \sqrt{ib+2ick-icv}}\right)\right.\right.$$

$$\left.\sinh\left(\frac{d^2}{-4b-8ck+4cv}\right)\right)+\frac{1}{\sqrt{-ib+2ick-icv}}\left(i\cosh\left(\frac{d^2}{-4b+8ck-4cv}\right)\right.$$

$$\left.\left.C\left(\frac{2(-b+2ck-cv)z-d}{\sqrt{2\pi}\ \sqrt{-ib+2ick-icv}}\right)+S\left(\frac{2(-b+2ck-cv)z-d}{\sqrt{2\pi}\ \sqrt{-ib+2ick-icv}}\right)\sinh\left(\frac{d^2}{-4b+8ck-4cv}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2157.01

$$\int \cosh\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}\left(c\,\sqrt{z}\ \right)dz == \frac{1}{(i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left(b\,\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}\right)C\left(\frac{b+2\,d\,\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\,b\,\sqrt{2\,\pi}\ S\left(\frac{b+2\,d\,\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}\right)+2\,\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+d\,z\right)\right)+2^{-\nu-1}$$
$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(i\,d)^{3/2}}\left(\sqrt{2\,\pi}\ (b+2\,c\,k-c\,\nu)\cosh\left(\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}\right)C\left(\frac{b+2\,c\,k-c\,\nu+2\,d\,\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\,\sqrt{2\,\pi}\ (b+2\,c\,k-c\,\nu)\right.\right.$$
$$S\left(\frac{b+2\,c\,k-c\,\nu+2\,d\,\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}\right)+2\,\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+d\,z+c\,(2\,k-\nu)\,\sqrt{z}\right)+$$
$$\frac{1}{(-i\,d)^{3/2}}\left(\sqrt{2\,\pi}\ (-b+2\,c\,k-c\,\nu)\cosh\left(\frac{(b+c\,(\nu-2\,k))^2}{4\,d}\right)C\left(\frac{-b+2\,c\,k-c\,\nu-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)+\right.$$
$$i\,\sqrt{2\,\pi}\ (-b+2\,c\,k-c\,\nu)\,S\left(\frac{-b+2\,c\,k-c\,\nu-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{(b+c\,(\nu-2\,k))^2}{4\,d}\right)-$$
$$\left.\left.\left.2\,i\,\sqrt{-i\,d}\ \sinh\left(\sqrt{z}\ b+d\,z-c\,(2\,k-\nu)\,\sqrt{z}\right)\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\cosh\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.2158.01

$$\int \cosh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$
$$\frac{1}{\sqrt{i\,b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4\,b}-e\right)C\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,b}-e\right)\right)\right)+$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{i\,b+2\,i\,c\,k-i\,c\,\nu}}\left(i\cosh\left(\frac{d^2}{-4\,b-8\,c\,k+4\,c\,\nu}+e\right)C\left(\frac{d+2\,(b+2\,c\,k-c\,\nu)\,z}{\sqrt{2\,\pi}\ \sqrt{i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)-\right.\right.$$
$$\left.S\left(\frac{d+2\,(b+2\,c\,k-c\,\nu)\,z}{\sqrt{2\,\pi}\ \sqrt{i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)\sinh\left(\frac{d^2}{-4\,b-8\,c\,k+4\,c\,\nu}+e\right)\right)+$$
$$\frac{1}{\sqrt{-i\,b+2\,i\,c\,k-i\,c\,\nu}}\left(i\cosh\left(\frac{d^2}{-4\,b+8\,c\,k-4\,c\,\nu}+e\right)C\left(\frac{2\,(-b+2\,c\,k-c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,(-b+2\,c\,k-c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)\sinh\left(\frac{d^2}{-4\,b+8\,c\,k-4\,c\,\nu}+e\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2159.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz ==$$

$$\frac{1}{(i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}-e\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\,b\sqrt{2\,\pi}\right.\right.$$

$$\left.\left.S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}-e\right)+2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+e+d\,z\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(i\,d)^{3/2}}\left(\sqrt{2\,\pi}\ (b+2\,c\,k-c\,\nu)\cosh\left(e-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}\right)C\left(\frac{b+2\,c\,k-c\,\nu+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$i\sqrt{2\,\pi}\ (b+2\,c\,k-c\,\nu)\,S\left(\frac{b+2\,c\,k-c\,\nu+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(e-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}\right)+$$

$$\left.2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+e+d\,z+c\,(2\,k-\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d)^{3/2}}\left(\sqrt{2\,\pi}\ (-b+2\,c\,k-c\,\nu)\cosh\left(e-\frac{(b+c\,(\nu-2\,k))^2}{4\,d}\right)C\left(\frac{-b+2\,c\,k-c\,\nu-2\,d\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)-\right.$$

$$i\sqrt{2\,\pi}\ (-b+2\,c\,k-c\,\nu)\,S\left(\frac{-b+2\,c\,k-c\,\nu-2\,d\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(e-\frac{(b+c\,(\nu-2\,k))^2}{4\,d}\right)-$$

$$\left.\left.2\,i\sqrt{-i\,d}\ \sinh\left(\sqrt{z}\ b+e+d\,z-c\,(2\,k-\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(d\,z)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2160.01

$$\int \cosh(d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(d\,z)}{d}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{d^2}{4\,(c\,\nu-2\,c\,s)}+g\,(2\,s-\nu)\right)C\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-d}{\sqrt{2\,\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$S\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-d}{\sqrt{2\,\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{d^2}{4\,(c\,\nu-2\,c\,s)}+g\,(2\,s-\nu)\right)\Big)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{d^2}{4\,(2\,c\,s-c\,\nu)}-g\,(2\,s-\nu)\right)C\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{d^2}{4\,(2\,c\,s-c\,\nu)}-g\,(2\,s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2161.01

$$\int \cosh(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(d\,z)}{d} +$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d)^{3/2}}\left(-\sqrt{2\pi}\;(2\,c\,s-c\,\nu)\cosh\left(-\frac{(c\,\nu-2\,c\,s)^2}{4\,d}+2\,g\,s-g\,\nu\right)C\left(\frac{-2\sqrt{z}\;d-2\,c\,s+c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)-\right.\right.$$

$$i\sqrt{2\pi}\;(c\,\nu-2\,c\,s)\,S\left(\frac{-2\sqrt{z}\;d-2\,c\,s+c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)\sinh\left(-\frac{(c\,\nu-2\,c\,s)^2}{4\,d}+2\,g\,s-g\,\nu\right)-$$

$$\left.2\,i\sqrt{-i\,d}\;\sinh\left(2\,g\,s-g\,\nu+d\,z-(c\,\nu-2\,c\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d)^{3/2}}\left(-\sqrt{2\pi}\;(c\,\nu-2\,c\,s)\cosh\left(-\frac{(2\,c\,s-c\,\nu)^2}{4\,d}-2\,g\,s+g\,\nu\right)C\left(\frac{-2\sqrt{z}\;d+2\,c\,s-c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)-\right.$$

$$i\sqrt{2\pi}\;(2\,c\,s-c\,\nu)\,S\left(\frac{-2\sqrt{z}\;d+2\,c\,s-c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)\sinh\left(-\frac{(2\,c\,s-c\,\nu)^2}{4\,d}-2\,g\,s+g\,\nu\right)-$$

$$\left.\left.2\,i\sqrt{-i\,d}\;\sinh\left(-2\,g\,s+g\,\nu+d\,z-(2\,c\,s-c\,\nu)\sqrt{z}\right)\right)\right)/;\;\nu\in\mathbb{N}^{+}$$

Involving $\cosh(d\,z+e)\cosh^{\nu}\left(c\,z^{r}+g\right)$

01.20.21.2162.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(c\,z^{2}+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(e+d\,z)}{d} +$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{d^2}{4\,(c\,\nu-2\,c\,s)}+e+g\,(2\,s-\nu)\right)C\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-d}{\sqrt{2\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,(c\,\nu-2\,c\,s)\,z-d}{\sqrt{2\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{d^2}{4\,(c\,\nu-2\,c\,s)}+e+g\,(2\,s-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{d^2}{4\,(2\,c\,s-c\,\nu)}+e-g\,(2\,s-\nu)\right)C\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-d}{\sqrt{2\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,(2\,c\,s-c\,\nu)\,z-d}{\sqrt{2\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{d^2}{4\,(2\,c\,s-c\,\nu)}+e-g\,(2\,s-\nu)\right)\right)\right)/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.2163.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(e+d\,z)}{d} +$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d)^{3/2}}\left(-\sqrt{2\pi}\;(2\,c\,s-c\,\nu)\cosh\left(-\frac{(c\,\nu-2\,c\,s)^2}{4\,d}+e+2\,g\,s-g\,\nu\right)C\left(\frac{-2\sqrt{z}\;d-2\,c\,s+c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)-\right.\right.$$

$$i\sqrt{2\pi}\;(c\,\nu-2\,c\,s)\,S\left(\frac{-2\sqrt{z}\;d-2\,c\,s+c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)\sinh\left(-\frac{(c\,\nu-2\,c\,s)^2}{4\,d}+e+2\,g\,s-g\,\nu\right)-$$

$$\left.2\,i\sqrt{-i\,d}\;\sinh\left(e+2\,g\,s-g\,\nu+d\,z-(c\,\nu-2\,c\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d)^{3/2}}\left(-\sqrt{2\pi}\;(c\,\nu-2\,c\,s)\cosh\left(-\frac{(2\,c\,s-c\,\nu)^2}{4\,d}+e-2\,g\,s+g\,\nu\right)C\left(\frac{-2\sqrt{z}\;d+2\,c\,s-c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)-\right.$$

$$i\sqrt{2\pi}\;(2\,c\,s-c\,\nu)\,S\left(\frac{-2\sqrt{z}\;d+2\,c\,s-c\,\nu}{\sqrt{-i\,d}\;\sqrt{2\pi}}\right)\sinh\left(-\frac{(2\,c\,s-c\,\nu)^2}{4\,d}+e-2\,g\,s+g\,\nu\right)-$$

$$\left.\left.2\,i\sqrt{-i\,d}\;\sinh\left(e-2\,g\,s+g\,\nu+d\,z-(2\,c\,s-c\,\nu)\sqrt{z}\right)\right)\right)/;\;\nu\in\mathbb{N}^{+}$$

Involving $\cosh(a\,z^r)\cosh^{\nu}(c\,z^r+g)$

01.20.21.2164.01

$$\int \cosh(b\,z^r)\cosh^{\nu}(c\,z^r+g)\,dz == -\frac{2^{-\nu-1}\,z\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{1}{r},-b\,z^r\right)(-b\,z^r)^{-1/r}+(b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b\,z^r\right)\right)(1-\nu \bmod 2)}{r} -$$

$$\frac{1}{r}2^{-\nu-1}\,z\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,g\,s-g\,\nu}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)((-b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}+\right.$$

$$e^{2\,g\,s-g\,\nu}\,((b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+e^{-2\,g\,s+g\,\nu}\,((-b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-2\,g\,s+g\,\nu}\,((b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.2165.01

$$\int \cosh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu-\frac{1}{2}}\,i\,\sqrt{\pi}\;(1-\nu \bmod 2)}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}C\left(\frac{b\sqrt{\frac{2}{\pi}}\;z}{\sqrt{i\,b}}\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}}\left(\cosh(g\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}\;z\right)+\right.\right.$$
$$\left.i\,S\left(\sqrt{\frac{2}{\pi}}\;\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}\;z\right)\sinh(g\,(2\,s-\nu))\right)+\frac{1}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}}\left(\cosh(g\,(2\,s-\nu))\right.$$
$$\left.\left.C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}\;z\right)-i\,S\left(\sqrt{\frac{2}{\pi}}\;\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}\;z\right)\sinh(g\,(2\,s-\nu))\right)\right)/;\;\nu\in\mathbb{N}^+$$

01.20.21.2166.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$
$$-\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(b\sqrt{z}\right)-b\sqrt{z}\;\sinh\left(b\sqrt{z}\right)\right)}{b^2}-2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(c\,(\nu-2\,s)-b)^2}\right.$$
$$\left(\cosh\left(g\,(\nu-2\,s)+(c\,(\nu-2\,s)-b)\sqrt{z}\right)-(c\,(\nu-2\,s)-b)\sqrt{z}\;\sinh\left(g\,(\nu-2\,s)+(c\,(\nu-2\,s)-b)\sqrt{z}\right)\right)+$$
$$\frac{1}{(-b-c\,(\nu-2\,s))^2}\left(\cosh\left(g\,(\nu-2\,s)-(-b-c\,(\nu-2\,s))\sqrt{z}\right)+(-b-c\,(\nu-2\,s))\right.$$
$$\left.\left.\sqrt{z}\;\sinh\left(g\,(\nu-2\,s)-(-b-c\,(\nu-2\,s))\sqrt{z}\right)\right)\right)/;\;\nu\in\mathbb{N}^+$$

Involving $\cosh\left(a\,z^r+e\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2167.01

$$\int \cosh(b\,z^r+e)\cosh^{\nu}(c\,z^r+g)\,dz == -\frac{2^{-\nu-1}\,z\binom{\nu}{\frac{\nu}{2}}\left(e^{e}\,\Gamma\left(\frac{1}{r},-b\,z^r\right)(-b\,z^r)^{-1/r}+e^{-e}\,(b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b\,z^r\right)\right)(1-\nu \bmod 2)}{r}-$$
$$\frac{1}{r}\,2^{-\nu-1}\,z\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)((-b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}+\right.$$
$$e^{-e+2\,g\,s-g\,\nu}\,((b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+e^{e-2\,g\,s+g\,\nu}\,((-b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}$$
$$\left.\Gamma\left(\frac{1}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-e-2\,g\,s+g\,\nu}\,((b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)/;\;\nu\in\mathbb{N}^+$$

01.20.21.2168.01

$$\int \cosh\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)-S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)\sinh(e)\right)+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{1}{\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}}\left(\cosh(e+g\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}\,z\right)+i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\right.\right.$$

$$\left.\sinh(e+g\,(2\,s-\nu))\right)+\frac{1}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}}\left(\cosh(e-g\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}\,z\right)+\right.$$

$$\left.\left.i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\sinh(e-g\,(2\,s-\nu))\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2169.01

$$\int \cosh\left(\sqrt{z}\,b+e\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz ==$$

$$-\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cosh\left(\sqrt{z}\,b+e\right)-b\sqrt{z}\,\sinh\left(\sqrt{z}\,b+e\right)\right)}{b^2}-2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(c\,(\nu-2\,s)-b)^2}\right.$$

$$\left(\cosh\left(e-g\,(\nu-2\,s)-(c\,(\nu-2\,s)-b)\sqrt{z}\right)+(c\,(\nu-2\,s)-b)\sqrt{z}\,\sinh\left(e-g\,(\nu-2\,s)-(c\,(\nu-2\,s)-b)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-b-c\,(\nu-2\,s))^2}\left(\cosh\left(e+g\,(\nu-2\,s)-(-b-c\,(\nu-2\,s))\sqrt{z}\right)+\right.$$

$$\left.\left.(-b-c\,(\nu-2\,s))\sqrt{z}\,\sinh\left(e+g\,(\nu-2\,s)-(-b-c\,(\nu-2\,s))\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\cosh\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2170.01

$$\int \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4b}\right)C\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4b}\right)\right)}{\sqrt{ib}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{ib+2ick-icv}}\left(i\cosh\left(\frac{d^2}{-4b-8ck+4cv}+g(2k-\nu)\right)C\left(\frac{d+2(b+2ck-cv)z}{\sqrt{2\pi}\sqrt{ib+2ick-icv}}\right)-\right.\right.$$

$$\left.S\left(\frac{d+2(b+2ck-cv)z}{\sqrt{2\pi}\sqrt{ib+2ick-icv}}\right)\sinh\left(\frac{d^2}{-4b-8ck+4cv}+g(2k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{-ib+2ick-icv}}\left(i\cosh\left(\frac{d^2}{-4b+8ck-4cv}-g(2k-\nu)\right)C\left(\frac{2(-b+2ck-cv)z-d}{\sqrt{2\pi}\sqrt{-ib+2ick-icv}}\right)+\right.$$

$$\left.\left.S\left(\frac{2(-b+2ck-cv)z-d}{\sqrt{2\pi}\sqrt{-ib+2ick-icv}}\right)\sinh\left(\frac{d^2}{-4b+8ck-4cv}-g(2k-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2171.01

$$\int \cosh\left(\sqrt{z}\,b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{1}{(id)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left.\left(b\sqrt{2\pi}\cosh\left(\frac{b^2}{4d}\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)-ib\sqrt{2\pi}\,S\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4d}\right)+2\sqrt{id}\,i\sinh\left(\sqrt{z}\,b+dz\right)\right)+\right.$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(id)^{3/2}}\left(\sqrt{2\pi}\,(b+2ck-cv)\cosh\left(-\frac{(b+2ck-cv)^2}{4d}+2gk-gv\right)C\left(\frac{b+2ck-cv+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)+\right.\right.$$

$$i\sqrt{2\pi}\,(b+2ck-cv)\,S\left(\frac{b+2ck-cv+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)\sinh\left(-\frac{(b+2ck-cv)^2}{4d}+2gk-gv\right)+$$

$$\left.2\sqrt{id}\,i\sinh\left(\sqrt{z}\,b+2gk-gv+dz+c(2k-\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-id)^{3/2}}\left(\sqrt{2\pi}\,(-b+2ck-cv)\cosh\left(-\frac{(b+c(\nu-2k))^2}{4d}-2gk+gv\right)C\left(\frac{-b+2ck-cv-2d\sqrt{z}}{\sqrt{-id}\sqrt{2\pi}}\right)-\right.$$

$$i\sqrt{2\pi}\,(-b+2ck-cv)\,S\left(\frac{-b+2ck-cv-2d\sqrt{z}}{\sqrt{-id}\sqrt{2\pi}}\right)\sinh\left(-\frac{(b+c(\nu-2k))^2}{4d}-2gk+gv\right)-$$

$$\left.\left.2i\sqrt{-id}\,\sinh\left(\sqrt{z}\,b-2gk+gv+dz-c(2k-\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2172.01

$$\int \cosh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$\frac{1}{\sqrt{i\,b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4\,b}-e\right)C\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,b}-e\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{i\,b+2\,i\,c\,k-i\,c\,\nu}}\left(i\cosh\left(\frac{d^2}{-4\,b-8\,c\,k+4\,c\,\nu}+e+g\,(2\,k-\nu)\right)C\left(\frac{d+2\,(b+2\,c\,k-c\,\nu)\,z}{\sqrt{2\,\pi}\ \sqrt{i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)-\right.\right.$$

$$\left.S\left(\frac{d+2\,(b+2\,c\,k-c\,\nu)\,z}{\sqrt{2\,\pi}\ \sqrt{i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)\sinh\left(\frac{d^2}{-4\,b-8\,c\,k+4\,c\,\nu}+e+g\,(2\,k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{-i\,b+2\,i\,c\,k-i\,c\,\nu}}\left(i\cosh\left(\frac{d^2}{-4\,b+8\,c\,k-4\,c\,\nu}+e-g\,(2\,k-\nu)\right)C\left(\frac{2\,(-b+2\,c\,k-c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,(-b+2\,c\,k-c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-i\,b+2\,i\,c\,k-i\,c\,\nu}}\right)\sinh\left(\frac{d^2}{-4\,b+8\,c\,k-4\,c\,\nu}+e-g\,(2\,k-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2173.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz ==$$

$$\frac{1}{(i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}-e\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\,b\sqrt{2\,\pi}\right.\right.$$

$$\left.S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}-e\right)+2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+e+d\,z\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(i\,d)^{3/2}}\left(\sqrt{2\,\pi}\ (b+2\,c\,k-c\,\nu)\cosh\left(-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}+e+2\,g\,k-g\,\nu\right)C\left(\frac{b+2\,c\,k-c\,\nu+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$i\sqrt{2\,\pi}\ (b+2\,c\,k-c\,\nu)\,S\left(\frac{b+2\,c\,k-c\,\nu+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}+e+2\,g\,k-g\,\nu\right)+$$

$$\left.2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+e+2\,g\,k-g\,\nu+d\,z+c\,(2\,k-\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d)^{3/2}}\left(\sqrt{2\,\pi}\ (-b+2\,c\,k-c\,\nu)\cosh\left(-\frac{(b+c\,(\nu-2\,k))^2}{4\,d}+e-2\,g\,k+g\,\nu\right)C\left(\frac{-b+2\,c\,k-c\,\nu-2\,d\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)-\right.$$

$$i\sqrt{2\,\pi}\ (-b+2\,c\,k-c\,\nu)\,S\left(\frac{-b+2\,c\,k-c\,\nu-2\,d\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(-\frac{(b+c\,(\nu-2\,k))^2}{4\,d}+e-2\,g\,k+g\,\nu\right)-$$

$$\left.\left.2\,i\sqrt{-i\,d}\ \sinh\left(\sqrt{z}\ b+e-2\,g\,k+g\,\nu+d\,z-c\,(2\,k-\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(d\,z)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.2174.01

$$\int \cosh(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu+1-1}\sinh(d\,z)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d} +$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}\right)C\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}\right)C\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2175.01

$$\int \cosh(d\,z)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(d\,z)}{d}+2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\left(-c\sqrt{2\,\pi}\,(2\,s-\nu)\cosh\left(-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}\right)\right.\right.$$

$$C\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)-c\,i\sqrt{2\,\pi}\,(2\,s-\nu)\,S\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)$$

$$\left.\sinh\left(\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}\right)-2\,i\sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}\,\sinh\left(2\,f\,z\,s+2\,c\sqrt{z}\,s+d\,z-f\,\nu\,z-c\,\nu\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(c\sqrt{2\,\pi}\,(2\,s-\nu)\cosh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}\right)C\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)-\right.$$

$$i\,c\sqrt{2\,\pi}\,(2\,s-\nu)\,S\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)\sinh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}\right)+$$

$$\left.\left.2\,i\sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}\,\sinh\left(2\,f\,z\,s+2\,c\sqrt{z}\,s-d\,z-f\,\nu\,z-c\,\nu\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(d\,z+e)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.2176.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu+1-1}\sinh(e+d\,z)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d} +$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}+e\right)C\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}+e\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}+e\right)C\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}+e\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.2177.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(e+d\,z)}{d}+2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\right.$$

$$\left(-c\sqrt{2\,\pi}\;(2\,s-\nu)\cosh\left(-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}+e\right)C\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)+\right.$$

$$c\,i\sqrt{2\,\pi}\;(2\,s-\nu)\,S\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)\sinh\left(-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}+e\right)-$$

$$\left.2\,i\sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}\;\sinh\left(e+d\,z+2\,f\,s\,z-f\,\nu\,z+2\,c\,s\sqrt{z}\;-c\,\nu\sqrt{z}\right)\right)+\frac{1}{(-i\,d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}$$

$$\left(c\sqrt{2\,\pi}\;(2\,s-\nu)\cosh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e\right)C\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)-\right.$$

$$i\,c\sqrt{2\,\pi}\;(2\,s-\nu)\,S\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)\sinh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e\right)+$$

$$\left.\left.2\,i\sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}\;\sinh\left(-e-d\,z+2\,f\,s\,z-f\,\nu\,z+2\,c\,s\sqrt{z}\;-c\,\nu\sqrt{z}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(b\,z^r)\cosh^{\nu}(c\,z^r+f\,z)$

01.20.21.2178.01

$$\int \cosh\left(b\,z^2\right)\cosh^{v}\left(c\,z^2+f\,z\right)dz == \frac{2^{-v-\frac{1}{2}}\,i\,\sqrt{\pi}\,\left(1-v \bmod 2\right)}{\sqrt{i\,b}}\binom{v}{\frac{v}{2}}C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)+$$

$$2^{-v-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(\frac{f^2\,(v-2\,s)^2}{-4\,b+8\,c\,s-4\,c\,v}\right)C\left(\frac{2\,f\,s-f\,v+2\,(-b+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,f\,s-f\,v+2\,(-b+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(\frac{f^2\,(v-2\,s)^2}{-4\,b+8\,c\,s-4\,c\,v}\right)\right)+$$
$$\frac{1}{\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\left(i\cosh\left(\frac{f^2\,(v-2\,s)^2}{4\,b+8\,c\,s-4\,c\,v}\right)C\left(\frac{-2\,f\,s+f\,v+2\,(-b-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\right)-\right.$$
$$\left.\left.S\left(\frac{-2\,f\,s+f\,v+2\,(-b-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\right)\sinh\left(\frac{f^2\,(v-2\,s)^2}{4\,b+8\,c\,s-4\,c\,v}\right)\right)\right)/;\ v\in\mathbb{N}^+$$

01.20.21.2179.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh^{v}\left(\sqrt{z}\,c+f\,z\right)dz == \frac{2^{1-v}\binom{v}{\frac{v}{2}}\left(1-v \bmod 2\right)\left(b\sqrt{z}\,\sinh\left(b\sqrt{z}\right)-\cosh\left(b\sqrt{z}\right)\right)}{b^2}+2^{-v-1}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\,\pi}\,\left(-b-2\,c\,s+c\,v\right)\cosh\left(\frac{(-b-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}\right)C\left(\frac{-b-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)-\right.\right.$$
$$i\sqrt{2\,\pi}\,\left(-b-2\,c\,s+c\,v\right)S\left(\frac{-b-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sinh\left(\frac{(-b-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}\right)-$$
$$\left.2\,i\sqrt{i\,f\,v-2\,i\,f\,s}\,\sinh\left(\sqrt{z}\,b-(f\,v-2\,f\,s)\,z-c\,(v-2\,s)\sqrt{z}\right)\right)+$$
$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\,\pi}\,\left(-b+2\,c\,s-c\,v\right)\cosh\left(\frac{(b+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}\right)C\left(\frac{-b+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)-\right.$$
$$i\sqrt{2\,\pi}\,\left(-b+2\,c\,s-c\,v\right)S\left(\frac{-b+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)\sinh\left(\frac{(b+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}\right)-$$
$$\left.\left.2\,i\sqrt{2\,i\,f\,s-i\,f\,v}\,\sinh\left(\sqrt{z}\,b-(2\,f\,s-f\,v)\,z-c\,(2\,s-v)\sqrt{z}\right)\right)\right)/;\ v\in\mathbb{N}^+$$

Involving $\cosh\left(b\,z^r+e\right)\cosh^{v}\left(c\,z^r+f\,z\right)$

01.20.21.2180.01

$$\int \cosh\left(b\,z^2+e\right)\cosh^{v}\left(c\,z^2+f\,z\right)dz == \frac{2^{-v-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,b}}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(i\cosh(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)-S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)\sinh(e)\right)+$$

$$2^{-v-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(\frac{f^2\,(v-2\,s)^2}{-4\,b+8\,c\,s-4\,c\,v}+e\right)C\left(\frac{2\,f\,s-f\,v+2\,(-b+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,f\,s-f\,v+2\,(-b+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(\frac{f^2\,(v-2\,s)^2}{-4\,b+8\,c\,s-4\,c\,v}+e\right)\right)+$$

$$\frac{1}{\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\left(i\cosh\left(-\frac{f^2\,(v-2\,s)^2}{4\,b+8\,c\,s-4\,c\,v}+e\right)C\left(\frac{-2\,f\,s+f\,v+2\,(-b-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\right)+\right.$$

$$\left.\left.S\left(\frac{-2\,f\,s+f\,v+2\,(-b-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\right)\sinh\left(-\frac{f^2\,(v-2\,s)^2}{4\,b+8\,c\,s-4\,c\,v}+e\right)\right)\right)\Big/;\ v\in\mathbb{N}^{+}$$

01.20.21.2181.01

$$\int \cosh\left(\sqrt{z}\,b+e\right)\cosh^{v}\left(\sqrt{z}\,c+f\,z\right)dz == \frac{2^{1-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(b\sqrt{z}\,\sinh\left(\sqrt{z}\,b+e\right)-\cosh\left(\sqrt{z}\,b+e\right)\right)}{b^2}+2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\,\pi}\,(-b-2\,c\,s+c\,v)\cosh\left(\frac{(-b-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}+e\right)C\left(\frac{-b-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)-\right.\right.$$

$$i\sqrt{2\,\pi}\,(-b-2\,c\,s+c\,v)\,S\left(\frac{-b-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sinh\left(\frac{(-b-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}+e\right)-$$

$$\left.2\,i\sqrt{i\,f\,v-2\,i\,f\,s}\,\sinh\left(\sqrt{z}\,b+e-(f\,v-2\,f\,s)\,z-c\,(v-2\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\,\pi}\,(-b+2\,c\,s-c\,v)\cosh\left(\frac{(b+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+e\right)C\left(\frac{-b+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)-\right.$$

$$i\sqrt{2\,\pi}\,(-b+2\,c\,s-c\,v)\,S\left(\frac{-b+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)\sinh\left(\frac{(b+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+e\right)-$$

$$\left.\left.2\,i\sqrt{2\,i\,f\,s-i\,f\,v}\,\sinh\left(\sqrt{z}\,b+e-(2\,f\,s-f\,v)\,z-c\,(2\,s-v)\sqrt{z}\right)\right)\right)\Big/;\ v\in\mathbb{N}^{+}$$

Involving $\cosh\left(b\,z^r+d\,z\right)\cosh^{v}\left(c\,z^r+f\,z\right)$

01.20.21.2182.01

$$\int \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4b}\right)C\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4b}\right)\right)}{\sqrt{ib}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-ib+2ics-icv}}\left(i\cosh\left(\frac{(d+f(\nu-2s))^2}{-4b+8cs-4cv}\right)C\left(\frac{-d+2fs-fv+2(-b+2cs-cv)z}{\sqrt{2\pi}\sqrt{-ib+2ics-icv}}\right)+\right.\right.$$

$$\left.S\left(\frac{-d+2fs-fv+2(-b+2cs-cv)z}{\sqrt{2\pi}\sqrt{-ib+2ics-icv}}\right)\sinh\left(\frac{(d+f(\nu-2s))^2}{-4b+8cs-4cv}\right)\right)+$$

$$\frac{1}{\sqrt{-ib-2ics+icv}}\left(i\cosh\left(\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)-4b}\right)C\left(\frac{-d-2fs+fv+2(-b-2cs+cv)z}{\sqrt{2\pi}\sqrt{-ib-2ics+icv}}\right)+\right.$$

$$\left.\left.S\left(\frac{-d-2fs+fv+2(-b-2cs+cv)z}{\sqrt{2\pi}\sqrt{-ib-2ics+icv}}\right)\sinh\left(\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)-4b}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.2183.01

$$\int \cosh\left(\sqrt{z}\,b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$\frac{1}{(id)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\pi}\cosh\left(\frac{b^2}{4d}\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)-ib\sqrt{2\pi}\,S\left(\frac{b+2d\sqrt{z}}{\sqrt{id}\sqrt{2\pi}}\right)\sinh\left(\frac{b^2}{4d}\right)+\right.\right.$$

$$\left.2\sqrt{id}\,i\sinh\left(\sqrt{z}\,b+dz\right)\right)\Big)+2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-id-2ifs+ifv)^{3/2}}\right.$$

$$\left(\sqrt{2\pi}\,(-b-2cs+cv)\cosh\left(\frac{(-b-2cs+cv)^2}{-4d-8fs+4fv}\right)C\left(\frac{-b-2cs+cv+2(-d-2fs+fv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-id-2ifs+ifv}}\right)-\right.$$

$$i\sqrt{2\pi}\,(-b-2cs+cv)S\left(\frac{-b-2cs+cv+2(-d-2fs+fv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-id-2ifs+ifv}}\right)\sinh\left(\frac{(-b-2cs+cv)^2}{-4d-8fs+4fv}\right)-$$

$$\left.2i\sqrt{-id-2ifs+ifv}\,\sinh\left(\sqrt{z}\,b-(-d-2fs+fv)z-c(\nu-2s)\sqrt{z}\right)\right)+\frac{1}{(-id+2ifs-ifv)^{3/2}}$$

$$\left(\sqrt{2\pi}\,(-b+2cs-cv)\cosh\left(\frac{(b+c(\nu-2s))^2}{-4d+8fs-4fv}\right)C\left(\frac{-b+2cs-cv+2(-d+2fs-fv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-id+2ifs-ifv}}\right)-\right.$$

$$i\sqrt{2\pi}\,(-b+2cs-cv)S\left(\frac{-b+2cs-cv+2(-d+2fs-fv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-id+2ifs-ifv}}\right)\sinh\left(\frac{(b+c(\nu-2s))^2}{-4d+8fs-4fv}\right)-$$

$$\left.\left.2i\sqrt{-id+2ifs-ifv}\,\sinh\left(\sqrt{z}\,b-(-d+2fs-fv)z-c(2s-\nu)\sqrt{z}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(b\,z^r + d\,z + e)\cosh^v(c\,z^r + f\,z)$

01.20.21.2184.01

$$\int \cosh(b\,z^2 + d\,z + e)\cosh^v(c\,z^2 + f\,z)\,dz ==$$

$$\frac{1}{\sqrt{i\,b}}\left(2^{-v-\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\left(i\cosh\left(\frac{d^2}{4\,b} - e\right)C\left(\frac{d + 2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right) + S\left(\frac{d + 2\,b\,z}{\sqrt{i\,b}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,b} - e\right)\right)\right) +$$

$$2^{-v-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-i\,b + 2\,i\,c\,s - i\,c\,v}}\left(i\cosh\left(\frac{(d + f\,(v - 2\,s))^2}{-4\,b + 8\,c\,s - 4\,c\,v} + e\right)C\left(\frac{-d + 2\,f\,s - f\,v + 2\,(-b + 2\,c\,s - c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b + 2\,i\,c\,s - i\,c\,v}}\right) + \right.\right.$$

$$\left.S\left(\frac{-d + 2\,f\,s - f\,v + 2\,(-b + 2\,c\,s - c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b + 2\,i\,c\,s - i\,c\,v}}\right)\sinh\left(\frac{(d + f\,(v - 2\,s))^2}{-4\,b + 8\,c\,s - 4\,c\,v} + e\right)\right) +$$

$$\frac{1}{\sqrt{-i\,b - 2\,i\,c\,s + i\,c\,v}}\left(i\cosh\left(\frac{(f\,(v - 2\,s) - d)^2}{4\,c\,(v - 2\,s) - 4\,b} + e\right)C\left(\frac{-d - 2\,f\,s + f\,v + 2\,(-b - 2\,c\,s + c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b - 2\,i\,c\,s + i\,c\,v}}\right) + \right.$$

$$\left.\left.S\left(\frac{-d - 2\,f\,s + f\,v + 2\,(-b - 2\,c\,s + c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b - 2\,i\,c\,s + i\,c\,v}}\right)\sinh\left(\frac{(f\,(v - 2\,s) - d)^2}{4\,c\,(v - 2\,s) - 4\,b} + e\right)\right)\right) /;\, v \in \mathbb{N}^+$$

01.20.21.2185.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{1}{(i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}-e\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\,b\sqrt{2\,\pi}\ S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}-e\right)+\right.\right.$$

$$\left.\left.2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+e+d\,z\right)\right)\right)+2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\ (-b-2\,c\,s+c\,\nu)\cosh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{-4\,d-8\,f\,s+4\,f\,\nu}+e\right)C\left(\frac{-b-2\,c\,s+c\,\nu+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}}\right)-\right.$$

$$i\sqrt{2\,\pi}\ (-b-2\,c\,s+c\,\nu)\,S\left(\frac{-b-2\,c\,s+c\,\nu+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}}\right)\sinh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{-4\,d-8\,f\,s+4\,f\,\nu}+e\right)-2\,i$$

$$\left.\sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}\ \sinh\left(\sqrt{z}\ b+e-(-d-2\,f\,s+f\,\nu)\,z-c\,(\nu-2\,s)\sqrt{z}\right)\right)+\frac{1}{(-i\,d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}$$

$$\left(\sqrt{2\,\pi}\ (-b+2\,c\,s-c\,\nu)\cosh\left(\frac{(b+c\,(\nu-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e\right)C\left(\frac{-b+2\,c\,s-c\,\nu+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}}\right)-\right.$$

$$i\sqrt{2\,\pi}\ (-b+2\,c\,s-c\,\nu)\,S\left(\frac{-b+2\,c\,s-c\,\nu+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}}\right)\sinh\left(\frac{(b+c\,(\nu-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e\right)-$$

$$\left.\left.2\,i\sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}\ \sinh\left(\sqrt{z}\ b+e-(-d+2\,f\,s-f\,\nu)\,z-c\,(2\,s-\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(d\,z)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.2186.01

$$\int \cosh(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == \frac{2^{-\nu+1-1}\sinh(d\,z)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}+g\,(2\,s-\nu)\right)C\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}+g\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}-g\,(2\,s-\nu)\right)C\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}-g\,(2\,s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2187.01

$$\int \cosh(d\,z)\cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(d\,z)}{d}+$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\left(-c\,\sqrt{2\,\pi}\,(2\,s-\nu)\cosh\left(-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}+2\,g\,s-g\,\nu\right)\right.\right.$$
$$C\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)+c\,i\,\sqrt{2\,\pi}\,(2\,s-\nu)\,S\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)$$
$$\sinh\left(-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}+2\,g\,s-g\,\nu\right)-2\,i\,\sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}$$
$$\left.\sinh\left(2\,g\,s+2\,f\,z\,s+2\,c\,\sqrt{z}\,s-g\,\nu+d\,z-f\,\nu\,z-c\,\nu\,\sqrt{z}\right)\right)+\frac{1}{(-i\,d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}$$
$$\left(c\,\sqrt{2\,\pi}\,(2\,s-\nu)\cosh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}-2\,g\,s+g\,\nu\right)C\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)-\right.$$
$$i\,c\,\sqrt{2\,\pi}\,(2\,s-\nu)\,S\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)\sinh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}-2\,g\,s+g\,\nu\right)+$$
$$\left.\left.2\,i\,\sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}\,\sinh\left(2\,g\,s+2\,f\,z\,s+2\,c\,\sqrt{z}\,s-g\,\nu-d\,z-f\,\nu\,z-c\,\nu\,\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(d\,z+e)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.2188.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == \frac{2^{-\nu+1-1}\sinh(e+d\,z)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d} +$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(i\cosh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}+e+g\,(2\,s-\nu)\right)C\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{-d-2\,f\,s+f\,\nu+2\,(c\,\nu-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sinh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,(c\,\nu-2\,c\,s)}+e+g\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}+e-g\,(2\,s-\nu)\right)C\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{-d+2\,f\,s-f\,\nu+2\,(2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{(-d+2\,f\,s-f\,\nu)^2}{4\,(2\,c\,s-c\,\nu)}+e-g\,(2\,s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2189.01

$$\int \cosh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sinh(e+d\,z)}{d} +$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\left(-c\,\sqrt{2\,\pi}\;(2\,s-\nu)\cosh\left(-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}+e+2\,g\,s-g\,\nu\right)\right.\right.$$
$$C\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)+c\,i\,\sqrt{2\,\pi}\;(2\,s-\nu)\,S\left(\frac{c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)$$
$$\sinh\left(-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}+e+2\,g\,s-g\,\nu\right)-2\,i\,\sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}$$
$$\left.\sinh\left(e+2\,g\,s-g\,\nu+d\,z+2\,f\,s\,z-f\,\nu\,z+2\,c\,s\,\sqrt{z}\;-c\,\nu\,\sqrt{z}\right)\right)+\frac{1}{(-i\,d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}$$
$$\left(c\,\sqrt{2\,\pi}\;(2\,s-\nu)\cosh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e-2\,g\,s+g\,\nu\right)C\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)-\right.$$
$$i\,c\,\sqrt{2\,\pi}\;(2\,s-\nu)\,S\left(\frac{c\,(2\,s-\nu)+2\,(-d+2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)\sinh\left(\frac{c^2\,(\nu-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e-2\,g\,s+g\,\nu\right)+$$
$$\left.\left.2\,i\,\sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}\;\sinh\left(-e+2\,g\,s-g\,\nu-d\,z+2\,f\,s\,z-f\,\nu\,z+2\,c\,s\,\sqrt{z}\;-c\,\nu\,\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(b\,z^r)\cosh^{\nu}(c\,z^r+f\,z+g)$

01.20.21.2190.01

$$\int \cosh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == \frac{2^{-\nu-\frac{1}{2}}\,i\,\sqrt{\pi}\,(1-\nu \bmod 2)}{\sqrt{i\,b}}\binom{\nu}{\frac{\nu}{2}}C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)+2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{f^2\,(\nu-2\,s)^2}{-4\,b+8\,c\,s-4\,c\,\nu}-g\,(2\,s-\nu)\right)C\left(\frac{2\,f\,s-f\,\nu+2\,(-b+2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,f\,s-f\,\nu+2\,(-b+2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\left(\frac{f^2\,(\nu-2\,s)^2}{-4\,b+8\,c\,s-4\,c\,\nu}-g\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}}\left(i\cosh\left(-\frac{f^2\,(\nu-2\,s)^2}{4\,b+8\,c\,s-4\,c\,\nu}-g\,(\nu-2\,s)\right)C\left(\frac{-2\,f\,s+f\,\nu+2\,(-b-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{-2\,f\,s+f\,\nu+2\,(-b-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,\nu}}\right)\sinh\left(-\frac{f^2\,(\nu-2\,s)^2}{4\,b+8\,c\,s-4\,c\,\nu}-g\,(\nu-2\,s)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2191.01

$$\int \cosh\left(b\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{z}\,\sinh\left(b\sqrt{z}\right)-\cosh\left(b\sqrt{z}\right)\right)}{b^2}+2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,f\,\nu-2\,i\,f\,s)^{3/2}}\right.$$
$$\left(\sqrt{2\,\pi}\;(-b-2\,c\,s+c\,\nu)\cosh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{4\,f\,\nu-8\,f\,s}+2\,g\,s-g\,\nu\right)C\left(\frac{-b-2\,c\,s+c\,\nu+2\,(f\,\nu-2\,f\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)-\right.$$
$$i\,\sqrt{2\,\pi}\;(-b-2\,c\,s+c\,\nu)\,S\left(\frac{-b-2\,c\,s+c\,\nu+2\,(f\,\nu-2\,f\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)\sinh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{4\,f\,\nu-8\,f\,s}+2\,g\,s-g\,\nu\right)-$$
$$\left.2\,i\,\sqrt{i\,f\,\nu-2\,i\,f\,s}\;\sinh\left(\sqrt{z}\;b+2\,g\,s-g\,\nu-(f\,\nu-2\,f\,s)\,z-c\,(\nu-2\,s)\,\sqrt{z}\right)\right)+\frac{1}{(2\,i\,f\,s-i\,f\,\nu)^{3/2}}$$
$$\left(\sqrt{2\,\pi}\;(-b+2\,c\,s-c\,\nu)\cosh\left(\frac{(b+c\,(\nu-2\,s))^2}{8\,f\,s-4\,f\,\nu}-2\,g\,s+g\,\nu\right)C\left(\frac{-b+2\,c\,s-c\,\nu+2\,(2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)-\right.$$
$$i\,\sqrt{2\,\pi}\;(-b+2\,c\,s-c\,\nu)\,S\left(\frac{-b+2\,c\,s-c\,\nu+2\,(2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)\sinh\left(\frac{(b+c\,(\nu-2\,s))^2}{8\,f\,s-4\,f\,\nu}-2\,g\,s+g\,\nu\right)-$$
$$\left.\left.2\,i\,\sqrt{2\,i\,f\,s-i\,f\,\nu}\;\sinh\left(\sqrt{z}\;b-2\,g\,s+g\,\nu-(2\,f\,s-f\,\nu)\,z-c\,(2\,s-\nu)\,\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cosh(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.2192.01

$$\int \cosh(b\,z^2+e)\cosh^v(c\,z^2+f\,z+g)\,dz ==$$

$$\frac{2^{-v-\frac{1}{2}}\sqrt{\pi}}{\sqrt{i\,b}}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(i\cosh(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)-S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b}}\right)\sinh(e)\right)+2^{-v-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(\frac{f^2(v-2s)^2}{-4\,b+8\,c\,s-4\,c\,v}+e-g(2s-v)\right)C\left(\frac{2\,f\,s-f\,v+2(-b+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,f\,s-f\,v+2(-b+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b+2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(\frac{f^2(v-2s)^2}{-4\,b+8\,c\,s-4\,c\,v}+e-g(2s-v)\right)\right)+$$
$$\frac{1}{\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\left(i\cosh\left(-\frac{f^2(v-2s)^2}{4\,b+8\,c\,s-4\,c\,v}-g(v-2s)+e\right)C\left(\frac{-2\,f\,s+f\,v+2(-b-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\right)+\right.$$
$$\left.\left.S\left(\frac{-2\,f\,s+f\,v+2(-b-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,b-2\,i\,c\,s+i\,c\,v}}\right)\sinh\left(-\frac{f^2(v-2s)^2}{4\,b+8\,c\,s-4\,c\,v}-g(v-2s)+e\right)\right)\right)/;\ v\in\mathbb{N}^+$$

01.20.21.2193.01

$$\int \cosh\left(\sqrt{z}\, b+e\right)\cosh^{v}\left(\sqrt{z}\, c+g+f z\right)dz == \frac{2^{1-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(b\sqrt{z}\,\sinh\left(\sqrt{z}\, b+e\right)-\cosh\left(\sqrt{z}\, b+e\right)\right)}{b^2}+$$

$$2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i f v-2 i f s)^{3/2}}\left(\sqrt{2\pi}\,(-b-2 c s+c v)\cosh\left(\frac{(-b-2 c s+c v)^2}{4 f v-8 f s}+e+2 g s-g v\right)\right.\right.$$

$$C\left(\frac{-b-2 c s+c v+2(f v-2 f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)-i\sqrt{2\pi}\,(-b-2 c s+c v)$$

$$S\left(\frac{-b-2 c s+c v+2(f v-2 f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)\sinh\left(\frac{(-b-2 c s+c v)^2}{4 f v-8 f s}+e+2 g s-g v\right)-$$

$$\left.2 i\sqrt{i f v-2 i f s}\,\sinh\left(\sqrt{z}\, b+e+2 g s-g v-(f v-2 f s) z-c(v-2 s)\sqrt{z}\right)\right)+\frac{1}{(2 i f s-i f v)^{3/2}}$$

$$\left(\sqrt{2\pi}\,(-b+2 c s-c v)\cosh\left(\frac{(b+c(v-2 s))^2}{8 f s-4 f v}+e-2 g s+g v\right)C\left(\frac{-b+2 c s-c v+2(2 f s-f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)-\right.$$

$$i\sqrt{2\pi}\,(-b+2 c s-c v)S\left(\frac{-b+2 c s-c v+2(2 f s-f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)\sinh\left(\frac{(b+c(v-2 s))^2}{8 f s-4 f v}+e-2 g s+g v\right)-$$

$$\left.\left.2 i\sqrt{2 i f s-i f v}\,\sinh\left(\sqrt{z}\, b+e-2 g s+g v-(2 f s-f v) z-c(2 s-v)\sqrt{z}\right)\right)\right)/;\, v\in\mathbb{N}^{+}$$

Involving $\cosh\left(b z^{r}+d z\right)\cosh^{v}\left(c z^{r}+f z+g\right)$

01.20.21.2194.01

$$\int \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4b}\right)C\left(\frac{d+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{ib}\ \sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4b}\right)\right)}{\sqrt{ib}}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-ib+2ics-icv}}\left(i\cosh\left(\frac{(d+f(\nu-2s))^2}{-4b+8cs-4cv}-g(2s-\nu)\right)C\left(\frac{-d+2fs-f\nu+2(-b+2cs-c\nu)z}{\sqrt{2\pi}\ \sqrt{-ib+2ics-icv}}\right)+\right.\right.$$
$$\left.S\left(\frac{-d+2fs-f\nu+2(-b+2cs-c\nu)z}{\sqrt{2\pi}\ \sqrt{-ib+2ics-icv}}\right)\sinh\left(\frac{(d+f(\nu-2s))^2}{-4b+8cs-4cv}-g(2s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{-ib-2ics+icv}}\left(i\cosh\left(\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)-4b}+g(2s-\nu)\right)C\left(\frac{-d-2fs+f\nu+2(-b-2cs+c\nu)z}{\sqrt{2\pi}\ \sqrt{-ib-2ics+icv}}\right)+\right.$$
$$\left.\left.S\left(\frac{-d-2fs+f\nu+2(-b-2cs+c\nu)z}{\sqrt{2\pi}\ \sqrt{-ib-2ics+icv}}\right)\sinh\left(\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)-4b}+g(2s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2195.01

$$\int \cosh\left(\sqrt{z}\ b+d\,z\right)\cosh^{v}\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{(i\,d)^{3/2}}\left(2^{-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\,b\sqrt{2\,\pi}\ S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}\right)+2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+d\,z\right)\right)+$$

$$2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(-i\,d-2\,i\,f\,s+i\,f\,v)^{3/2}}\left(\sqrt{2\,\pi}\ (-b-2\,c\,s+c\,v)\cosh\left(\frac{(-b-2\,c\,s+c\,v)^2}{-4\,d-8\,f\,s+4\,f\,v}+2\,g\,s-g\,v\right)\right.\right.$$

$$C\left(\frac{-b-2\,c\,s+c\,v+2\,(-d-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d-2\,i\,f\,s+i\,f\,v}}\right)-i\sqrt{2\,\pi}\ (-b-2\,c\,s+c\,v)$$

$$S\left(\frac{-b-2\,c\,s+c\,v+2\,(-d-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d-2\,i\,f\,s+i\,f\,v}}\right)\sinh\left(\frac{(-b-2\,c\,s+c\,v)^2}{-4\,d-8\,f\,s+4\,f\,v}+2\,g\,s-g\,v\right)-$$

$$\left.2\,i\sqrt{-i\,d-2\,i\,f\,s+i\,f\,v}\ \sinh\left(\sqrt{z}\ b+2\,g\,s-g\,v-(-d-2\,f\,s+f\,v)\,z-c\,(v-2\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d+2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\,\pi}\ (-b+2\,c\,s-c\,v)\cosh\left(\frac{(b+c\,(v-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,v}-2\,g\,s+g\,v\right)\right.$$

$$C\left(\frac{-b+2\,c\,s-c\,v+2\,(-d+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d+2\,i\,f\,s-i\,f\,v}}\right)-i\sqrt{2\,\pi}\ (-b+2\,c\,s-c\,v)$$

$$S\left(\frac{-b+2\,c\,s-c\,v+2\,(-d+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d+2\,i\,f\,s-i\,f\,v}}\right)\sinh\left(\frac{(b+c\,(v-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,v}-2\,g\,s+g\,v\right)-$$

$$\left.\left.2\,i\sqrt{-i\,d+2\,i\,f\,s-i\,f\,v}\ \sinh\left(\sqrt{z}\ b-2\,g\,s+g\,v-(-d+2\,f\,s-f\,v)\,z-c\,(2\,s-v)\sqrt{z}\right)\right)\right)/;\ v\in\mathbb{N}^{+}$$

Involving $\cosh\left(b\,z^r+d\,z+e\right)\cosh^{v}\left(c\,z^r+f\,z+g\right)$

01.20.21.2196.01

$$\int \cosh\left(b z^2+d z+e\right)\cosh^{\nu}\left(c z^2+f z+g\right)dz ==$$

$$\frac{1}{\sqrt{i b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\cosh\left(\frac{d^2}{4b}-e\right)C\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{ib}\sqrt{2\pi}}\right)\sinh\left(\frac{d^2}{4b}-e\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{1}{\sqrt{-ib+2ics-icv}}\left(i\cosh\left(\frac{(d+f(\nu-2s))^2}{-4b+8cs-4cv}+e-g(2s-\nu)\right)C\left(\frac{-d+2fs-f\nu+2(-b+2cs-c\nu)z}{\sqrt{2\pi}\sqrt{-ib+2ics-icv}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{-d+2fs-f\nu+2(-b+2cs-c\nu)z}{\sqrt{2\pi}\sqrt{-ib+2ics-icv}}\right)\sinh\left(\frac{(d+f(\nu-2s))^2}{-4b+8cs-4cv}+e-g(2s-\nu)\right)\right)+\right.$$

$$\frac{1}{\sqrt{-ib-2ics+icv}}\left(i\cosh\left(\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)-4b}+e+g(2s-\nu)\right)C\left(\frac{-d-2fs+f\nu+2(-b-2cs+c\nu)z}{\sqrt{2\pi}\sqrt{-ib-2ics+icv}}\right)+\right.$$

$$\left.\left.S\left(\frac{-d-2fs+f\nu+2(-b-2cs+c\nu)z}{\sqrt{2\pi}\sqrt{-ib-2ics+icv}}\right)\sinh\left(\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)-4b}+e+g(2s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2197.01

$$\int \cosh\left(b z^2+d z+e\right)\cosh^{\nu}\left(c z^2+f z+g\right)dz == 2^{-\nu-2}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{\frac{(d+2fk-f\nu)^2}{4b+8ck-4c\nu}-e-2gk+g\nu}\operatorname{erfi}\left(\frac{-d+f(\nu-2k)-2bz-4ckz+2c\nu z}{2\sqrt{-b-2ck+c\nu}}\right)}{\sqrt{-b-2ck+c\nu}}+\frac{e^{\frac{(d+f(\nu-2k))^2}{4(b+c(\nu-2k))}-e+2gk-g\nu}\operatorname{erfi}\left(\frac{-d+2fk-f\nu-2bz+4ckz-2c\nu z}{2\sqrt{-b+2ck-c\nu}}\right)}{\sqrt{-b+2ck-c\nu}}+\right.$$

$$\left.\frac{e^{-\frac{(d+2fk-f\nu)^2}{4b+8ck-4c\nu}+e+2gk-g\nu}\operatorname{erfi}\left(\frac{d+2fk-f\nu+2(b+2ck-c\nu)z}{2\sqrt{b+2ck-c\nu}}\right)}{\sqrt{b+2ck-c\nu}}+\frac{e^{-\frac{(d+f(\nu-2k))^2}{4(b+c(\nu-2k))}+e-2gk+g\nu}\operatorname{erfi}\left(\frac{d+f(\nu-2k)+2bz-4ckz+2c\nu z}{2\sqrt{b+c(\nu-2k)}}\right)}{\sqrt{b+c(\nu-2k)}}\right)-$$

$$\frac{2^{-\nu-2}\sqrt{\pi}}{b}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sqrt{-b}\ e^{\frac{d^2-4be}{4b}}\operatorname{erfi}\left(\frac{-d-2bz}{2\sqrt{-b}}\right)-\sqrt{b}\ e^{-\frac{d^2-4be}{4b}}\operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2198.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{1}{(i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\,\pi}\ \cosh\left(\frac{b^2}{4\,d}-e\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)-i\right.\right.$$

$$\left.\left. b\sqrt{2\,\pi}\ S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}-e\right)+2\sqrt{i\,d}\ i\sinh\left(\sqrt{z}\ b+e+d\,z\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-i\,d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\left(\sqrt{2\,\pi}\ (-b-2\,c\,s+c\,\nu)\cosh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{-4\,d-8\,f\,s+4\,f\,\nu}+e+2\,g\,s-g\,\nu\right)\right.\right.$$

$$C\left(\frac{-b-2\,c\,s+c\,\nu+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}}\right)-i\sqrt{2\,\pi}\ (-b-2\,c\,s+c\,\nu)$$

$$S\left(\frac{-b-2\,c\,s+c\,\nu+2\,(-d-2\,f\,s+f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}}\right)\sinh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{-4\,d-8\,f\,s+4\,f\,\nu}+e+2\,g\,s-g\,\nu\right)-$$

$$\left.2\,i\sqrt{-i\,d-2\,i\,f\,s+i\,f\,\nu}\ \sinh\left(\sqrt{z}\ b+e+2\,g\,s-g\,\nu-(-d-2\,f\,s+f\,\nu)\,z-c\,(\nu-2\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-i\,d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(\sqrt{2\,\pi}\ (-b+2\,c\,s-c\,\nu)\cosh\left(\frac{(b+c\,(\nu-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e-2\,g\,s+g\,\nu\right)\right.$$

$$C\left(\frac{-b+2\,c\,s-c\,\nu+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}}\right)-i\sqrt{2\,\pi}\ (-b+2\,c\,s-c\,\nu)$$

$$S\left(\frac{-b+2\,c\,s-c\,\nu+2\,(-d+2\,f\,s-f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}}\right)\sinh\left(\frac{(b+c\,(\nu-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e-2\,g\,s+g\,\nu\right)-$$

$$\left.\left.2\,i\sqrt{-i\,d+2\,i\,f\,s-i\,f\,\nu}\ \sinh\left(\sqrt{z}\ b+e-2\,g\,s+g\,\nu-(-d+2\,f\,s-f\,\nu)\,z-c\,(2\,s-\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2199.01

$$\int \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(\frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}+\frac{4\,e^{e}\sinh\left(\sqrt{z}\ b+e+d\,z\right)}{d}-\frac{b\,e^{2e-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{-e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\,e^{-e-2gk-g\nu}\left(\frac{e^{2e+2g\nu+(d-2fk+f\nu)z+(b-2ck+c\nu)\sqrt{z}}}{d-2fk+f\nu}+\frac{e^{4gk+(-d+2fk-f\nu)z+(-b+2ck-c\nu)\sqrt{z}}}{-d+2fk-f\nu}+\right.\right.$$

$$\left.\frac{e^{2e+4gk+(d+2fk-f\nu)z+(b+2ck-c\nu)\sqrt{z}}}{d+2fk-f\nu}+\frac{e^{2g\nu+(-d-2fk+f\nu)z+(-b-2ck+c\nu)\sqrt{z}}}{-d-2fk+f\nu}\right)-\left(e^{-\frac{(-b-2ck+c\nu)^2}{4(-d-2fk+f\nu)}-e-2gk+g\nu}\right.$$

$$\left.\left.\sqrt{\pi}\ (-b-2ck+c\nu)\operatorname{erfi}\left(\frac{-b-2ck+c\nu+2(-d-2fk+f\nu)\sqrt{z}}{2\sqrt{-d-2fk+f\nu}}\right)\right)\Big/(-d-2fk+f\nu)^{3/2}-\right.$$

$$\left(e^{-\frac{(-b+2ck-c\nu)^2}{4(-d+2fk-f\nu)}-e+2gk-g\nu}\sqrt{\pi}\ (-b+2ck-c\nu)\operatorname{erfi}\left(\frac{-b+2ck-c\nu+2(-d+2fk-f\nu)\sqrt{z}}{2\sqrt{-d+2fk-f\nu}}\right)\right)\Big/$$

$$(-d+2fk-f\nu)^{3/2}-\frac{e^{-\frac{(b+2ck-c\nu)^2}{4(d+2fk-f\nu)}+e+2gk-g\nu}\sqrt{\pi}\ (b+2ck-c\nu)\operatorname{erfi}\left(\frac{b+2ck-c\nu+2(d+2fk-f\nu)\sqrt{z}}{2\sqrt{d+2fk-f\nu}}\right)}{(d+2fk-f\nu)^{3/2}}-$$

$$\left.\frac{e^{-\frac{(b+c(\nu-2k))^2}{4(d+f(\nu-2k))}+e-2gk+g\nu}\sqrt{\pi}\ (b+c(\nu-2k))\operatorname{erfi}\left(\frac{b-2ck+c\nu+2(d+f(\nu-2k))\sqrt{z}}{2\sqrt{d+f(\nu-2k)}}\right)}{(d+f(\nu-2k))^{3/2}}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving product of powers of two direct functions

Involving $\cosh^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.2200.01

$$\int \cosh^{\mu}(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu-\mu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s} e^{a(2s-\nu)z}\,(e^{-cz}+e^{cz})^{\mu}\left(1+e^{2cz}\right)^{-\mu}$$
$$\left(e^{2a(\nu-2s)z}\,(2as-a\nu-c\mu)\,{}_2F_1\left(-\frac{2as-a\nu+c\mu}{2c},\,-\mu;\,\frac{1}{2}\left(\frac{a(\nu-2s)}{c}-\mu+2\right);\,-e^{2cz}\right)-(2as-a\nu+c\mu)\right.$$
$$\left.{}_2F_1\left(-\frac{a(\nu-2s)+c\mu}{2c},\,-\mu;\,-\frac{a(\nu-2s)+c(\mu-2)}{2c};\,-e^{2cz}\right)\right)\Big/\left((2as-a\nu+c\mu)(a(\nu-2s)+c\mu)\right)-$$
$$\binom{\nu}{\frac{\nu}{2}}\frac{2^{-\nu}(1-\nu \bmod 2)\cosh^{\mu+1}(c\,z)\sinh(c\,z)}{c(\mu+1)\sqrt{-\sinh^2(c\,z)}}\,{}_2F_1\left(\frac{\mu+1}{2},\,\frac{1}{2};\,\frac{\mu+3}{2};\,\cosh^2(c\,z)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.2201.01

$$\int \cosh^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz ==$$
$$2^{-m-\nu}\left(z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)(\nu \bmod 2-1)-\frac{2(\nu \bmod 2-1)}{c}\binom{\nu}{\frac{\nu}{2}}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\frac{\sinh(c(m-2s)z)}{m-2s}-\right.$$
$$\frac{2(m \bmod 2-1)}{a}\binom{m}{\frac{m}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\frac{\sinh(a(2s-\nu)z)}{2s-\nu}+2\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$
$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}((c(m-2k)+a(\nu-2s))\sinh(c(m-2k)z+a(2s-\nu)z)+(-2ck+cm+2as-a\nu)\sinh(c(m-2k)$$
$$\left.z+a(\nu-2s)z))/((-2ck+cm+2as-a\nu)(c(m-2k)+a(\nu-2s)))\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2202.01

$$\int \cosh^2(c\,z)\cosh^{\frac{1}{2}}(a\,z)\,dz == \frac{1}{4\left(a^3-16\,a\,c^2\right)\sqrt{1+e^{2az}}}\left(-4\left(a^2-16\,c^2\right)\sqrt{1+e^{2az}}\;i\,E\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)-\sqrt{2}\;a\,e^{-2cz}\right.$$
$$\left.\sqrt{e^{-az}+e^{az}}\left((a+4c)\,e^{4cz}\,{}_2F_1\left(\frac{c}{a}-\frac{1}{4},\,-\frac{1}{2};\,\frac{c}{a}+\frac{3}{4};\,-e^{2az}\right)+(a-4c)\,{}_2F_1\left(-\frac{c}{a}-\frac{1}{4},\,-\frac{1}{2};\,\frac{3}{4}-\frac{c}{a};\,-e^{2az}\right)\right)\right)$$

01.20.21.2203.01

$$\int \cosh^2(c\,z)\cosh^{\frac{1}{2}}(2\,c\,z)\,dz == -\frac{i\left(3\,E(i\,c\,z\,|\,2)+F(i\,c\,z\,|\,2)+i\cosh^{\frac{1}{2}}(2\,c\,z)\sinh(2\,c\,z)\right)}{6\,c}$$

01.20.21.2204.01

$$\int \frac{\cosh^2(c\,z)}{\cosh^{\frac{1}{2}}(a\,z)}\,dz == \left(e^{-\frac{az}{2}}\left(\sqrt{2}\;a\sqrt{1+e^{2az}}\right.\right.$$
$$\left.\left((a-4c)\,e^{\frac{1}{2}(a+4c)z}\,{}_2F_1\left(\frac{c}{a}+\frac{1}{4},\,\frac{1}{2};\,\frac{c}{a}+\frac{5}{4};\,-e^{2az}\right)+(a+4c)\,e^{\frac{1}{2}(a-4c)z}\,{}_2F_1\left(\frac{1}{4}-\frac{c}{a},\,\frac{1}{2};\,\frac{5}{4}-\frac{c}{a};\,-e^{2az}\right)\right)-\right.$$
$$\left.\left.2\,i\left(a^2-16\,c^2\right)e^{\frac{az}{2}}\sqrt{e^{-az}+e^{az}}\;F\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)\right)\right)\Big/\left(2\left(a^3-16\,a\,c^2\right)\sqrt{e^{-az}+e^{az}}\right)$$

01.20.21.2205.01

$$\int \frac{\cosh^2(c\,z)}{\cosh^{\frac{1}{2}}(2\,c\,z)}\,dz == -\frac{i\,(E(i\,c\,z\,|\,2)+F(i\,c\,z\,|\,2))}{2\,c}$$

01.20.21.2206.01

$$\int \frac{\cosh^7(c\,z)}{\sqrt{\cosh^7(2\,c\,z)}}\,dz == \left(\cosh(2\,c\,z)\left(30\sqrt{2}\,\sinh^{-1}\left(\sqrt{2}\,\sinh(c\,z)\right)\cosh^{\frac{5}{2}}(2\,c\,z)+140\sinh(c\,z)-45\sinh(3\,c\,z)+83\sinh(5\,c\,z)\right)\right)\Big/\left(480\,c\sqrt{\cosh^7(2\,c\,z)}\right)$$

Involving $\cosh^{\mu}(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.2207.01

$$\int \cosh^{\mu}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-b\,(\nu-2\,s)}\left(1+e^{-2\,c\,z}\right)^{-\mu}\binom{\nu}{s}\cosh^{\mu}(c\,z)\left(\frac{e^{2\,b\,(\nu-2\,s)+a\,z\,(\nu-2\,s)}}{a\,(\nu-2\,s)+c\,\mu}\,{}_2F_1\left(-\frac{a\,(\nu-2\,s)+c\,\mu}{2\,c},\,-\mu;\,-\frac{a\,(\nu-2\,s)+c\,(\mu-2)}{2\,c};\,-e^{-2\,c\,z}\right)-\frac{e^{-a\,(\nu-2\,s)\,z}}{a\,(\nu-2\,s)-c\,\mu}\,{}_2F_1\left(-\frac{c\,\mu-a\,(\nu-2\,s)}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,(\nu-2\,s)}{c}-\mu+2\right);\,-e^{-2\,c\,z}\right)\right)-\frac{2^{-\nu}\left(1+e^{2\,c\,z}\right)^{-\mu}\cosh^{\mu}(c\,z)\,(1-\nu \bmod 2)}{c\,\mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,\frac{2-\mu}{2};\,-e^{2\,c\,z}\right)\Big/;\,\nu\in\mathbb{N}^+$$

01.20.21.2208.01

$$\int \cosh^m(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{a\,\nu}\,2^{-m}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\left(\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{-2\,(b+a\,z)}\right)(1-m \bmod 2)+a\,\nu\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{e^{c\,(2\,k-m)\,z}}{2\,c\,k-c\,m+a\,\nu}\,{}_2F_1\left(-\frac{2\,c\,k-c\,m+a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c\,(m-2\,k)}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)+\frac{e^{c\,m\,z-2\,c\,k\,z}}{c\,(m-2\,k)+a\,\nu}\,{}_2F_1\left(-\frac{c\,(m-2\,k)+a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c\,(2\,k-m)}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)\right)\Big/;\,m\in\mathbb{N}^+$$

01.20.21.2209.01

$$\int \cosh^m(c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+$$

$$\frac{2^{-m-\nu+1}\,(1-\nu \bmod 2)}{c}\binom{\nu}{\frac{\nu}{2}}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{s}\sinh((m-2\,s)\,c\,z)}{m-2\,s}+\frac{2^{-m-\nu+1}}{a}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{s}\sinh((2\,s-\nu)\,(b+a\,z))}{2\,s-\nu}+$$

$$2^{-m-\nu+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}((c\,(m-2\,k)-a\,(\nu-2\,s))\sinh(b\,(\nu-2\,s)+a\,z\,(\nu-2\,s)+c\,(m-2\,k)\,z)+\right.$$

$$\left.(c\,(m-2\,k)+a\,(\nu-2\,s))\sinh(-b\,(\nu-2\,s)-a\,z\,(\nu-2\,s)+c\,(m-2\,k)\,z)\right)\Big/$$

$$((c\,(m-2\,k)-a\,(\nu-2\,s))\,(c\,(m-2\,k)+a\,(\nu-2\,s)))\;/;\;m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\cosh^\mu(c\,z+d)\cosh^\nu(a\,z+b)$

01.20.21.2210.01

$$\int \cosh^\mu(d+c\,z)\cosh^\nu(b+a\,z)\,dz ==$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-b\,(\nu-2\,s)}\left(1+e^{-2\,(d+c\,z)}\right)^{-\mu}\binom{\nu}{s}\cosh^\mu(d+c\,z)\left(\frac{e^{2\,b\,(\nu-2\,s)+a\,z\,(\nu-2\,s)}}{a\,(\nu-2\,s)+c\,\mu}\,{}_2F_1\left(-\frac{a\,(\nu-2\,s)+c\,\mu}{2\,c},\,-\mu;\,-\frac{a\,(\nu-2\,s)+c\,(\mu-2)}{2\,c};\right.\right.$$

$$\left.\left.-e^{-2\,(d+c\,z)}\right)-\frac{e^{-a\,(\nu-2\,s)\,z}}{a\,(\nu-2\,s)-c\,\mu}\,{}_2F_1\left(-\frac{c\,\mu-a\,(\nu-2\,s)}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,(\nu-2\,s)}{c}-\mu+2\right);\,-e^{-2\,(d+c\,z)}\right)\right)-$$

$$\frac{2^{-\nu}\left(1+e^{2\,(d+c\,z)}\right)^{-\mu}\,\cosh^\mu(d+c\,z)\,(1-\nu \bmod 2)}{c\,\mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,\frac{2-\mu}{2};\,-e^{2\,(d+c\,z)}\right)\;/;\;\nu\in\mathbb{N}^+$$

01.20.21.2211.01

$$\int \cosh^m(d+c\,z)\cosh^\nu(b+a\,z)\,dz ==$$

$$2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+\frac{2^{-m-\nu+1}\,(1-\nu \bmod 2)}{c}\binom{\nu}{\frac{\nu}{2}}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\frac{\sinh((m-2\,s)\,(d+c\,z))}{m-2\,s}+$$

$$\frac{2^{-m-\nu+1}\,(1-m \bmod 2)}{a}\binom{m}{\frac{m}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\frac{\sinh((2\,s-\nu)\,(b+a\,z))}{2\,s-\nu}+$$

$$2^{-m-\nu+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}((c\,(m-2\,k)-a\,(\nu-2\,s))\sinh(d\,(m-2\,k)+c\,z\,(m-2\,k)+b\,(\nu-2\,s)+a\,(\nu-2\,s)\,z)+\right.$$

$$\left.(c\,(m-2\,k)+a\,(\nu-2\,s))\sinh(d\,(m-2\,k)+c\,z\,(m-2\,k)-b\,(\nu-2\,s)-a\,(\nu-2\,s)\,z)\right)\Big/$$

$$((c\,(m-2\,k)-a\,(\nu-2\,s))\,(c\,(m-2\,k)+a\,(\nu-2\,s)))\;/;\;m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\cosh^m(b\,z)\cosh^\nu\left(c\,z^r\right)$

01.20.21.2212.01

$$\int \cosh^m(b\,z)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\;(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$\frac{2^{-m-v+1}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(2\,b\,k\,z-m\,b\,z)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(i\cosh\left(\frac{(2\,b\,k-b\,m)^2}{4\,(c\,v-2\,c\,s)}\right)C\left(\frac{2\,b\,k-b\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+S\left(\frac{2\,b\,k-b\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\right.\right.$$

$$\left.\sinh\left(\frac{(2\,b\,k-b\,m)^2}{4\,(c\,v-2\,c\,s)}\right)\right)+\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,c\,s-c\,v)}\right)C\left(\frac{2\,b\,k-b\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,v}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,b\,k-b\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,c\,s-c\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2213.01

$$\int \cosh^m(b\,z)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) -$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2\,k-v)\sqrt{z}\right)-c\,(2\,k-v)\sqrt{z}\,\sinh\left(c\,(2\,k-v)\sqrt{z}\right)\right)}{(v-2\,k)^2} +$$

$$\frac{2^{-m-v+1}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(b\,(m-2\,k)\,z)}{m-2\,k} + 2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,i\,b\,k-i\,b\,m)^{3/2}}\left(-\sqrt{2\,\pi}\,(2\,c\,s-c\,v)\cosh\left(\frac{(c\,v-2\,c\,s)^2}{4\,(2\,b\,k-b\,m)}\right)C\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,b\,k-i\,b\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$i\sqrt{2\,\pi}\,(c\,v-2\,c\,s)\,S\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,b\,k-i\,b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(c\,v-2\,c\,s)^2}{4\,(2\,b\,k-b\,m)}\right)+$$

$$\left.2\,i\sqrt{2\,i\,b\,k-i\,b\,m}\,\sinh\left(\sqrt{z}\,(c\,v-2\,c\,s)+(2\,b\,k-b\,m)\,z\right)\right)+$$

$$\frac{1}{(2\,i\,b\,k-i\,b\,m)^{3/2}}\left(-\sqrt{2\,\pi}\,(c\,v-2\,c\,s)\cosh\left(\frac{(2\,c\,s-c\,v)^2}{4\,(2\,b\,k-b\,m)}\right)C\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,b\,k-i\,b\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$i\sqrt{2\,\pi}\,(2\,c\,s-c\,v)\,S\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,b\,k-i\,b\,m}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,c\,s-c\,v)^2}{4\,(2\,b\,k-b\,m)}\right)+$$

$$\left.\left.2\,i\sqrt{2\,i\,b\,k-i\,b\,m}\,\sinh\left(\sqrt{z}\,(2\,c\,s-c\,v)+(2\,b\,k-b\,m)\,z\right)\right)\right)/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(d\,z+e)\cosh^v\left(c\,z^r\right)$

01.20.21.2214.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(2\,k-m)-m\,d\,z+2\,d\,k\,z)}{2\,k-m}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(i\cosh\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(c\,v-2\,c\,s)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sinh\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(c\,v-2\,c\,s)}\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,c\,s-c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$
$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,c\,s-c\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2215.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) -$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2\,k-v)\sqrt{z}\right)-c\,(2\,k-v)\sqrt{z}\,\sinh\left(c\,(2\,k-v)\sqrt{z}\right)\right)}{(v-2\,k)^2}+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}+2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,i\,d\,k-i\,d\,m)^{3/2}}\right.$$

$$\left(-\sqrt{2\,\pi}\;(2\,c\,s-c\,v)\cosh\left(-\frac{(c\,v-2\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$

$$i\sqrt{2\,\pi}\;(c\,v-2\,c\,s)\,S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(c\,v-2\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)+$$

$$\left.2\,i\sqrt{2\,i\,d\,k-i\,d\,m}\;\sinh\left(2\,e\,k-e\,m+(2\,d\,k-d\,m)\,z+(c\,v-2\,c\,s)\sqrt{z}\right)\right)+\frac{1}{(2\,i\,d\,k-i\,d\,m)^{3/2}}$$

$$\left(-\sqrt{2\,\pi}\;(c\,v-2\,c\,s)\cosh\left(-\frac{(2\,c\,s-c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$

$$i\sqrt{2\,\pi}\;(2\,c\,s-c\,v)\,S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(2\,c\,s-c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)+$$

$$\left.\left.2\,i\sqrt{2\,i\,d\,k-i\,d\,m}\;\sinh\left(2\,e\,k-e\,m+(2\,d\,k-d\,m)\,z+(2\,c\,s-c\,v)\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(a\,z^r)\cosh^v(c\,z^r)$

01.20.21.2216.01

$$\int \cosh^m(b\,z^r)\cosh^v(c\,z^r)\,dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - \frac{2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r},(b\,m-2\,b\,k)\,z^r\right)((b\,m-2\,b\,k)\,z^r)^{-1/r}+((2\,b\,k-b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,b\,k-b\,m)\,z^r\right)\right) - \frac{2^{-m-v}\,z}{r}$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{1}{r},(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,k-c\,v)\,z^r\right)\right) - \frac{2^{-m-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\right.$$

$$\Gamma\left(\frac{1}{r},(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)+((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2217.01

$$\int \cosh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) +$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)}{\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}}+\frac{C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)}{\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}}\right)/;\ m\in$$

$\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$

01.20.21.2218.01

$$\int \cosh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) -$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cosh\left(b\,(2k-m)\sqrt{z}\right)-b\,(2k-m)\sqrt{z}\,\sinh\left(b\,(2k-m)\sqrt{z}\right)\right)}{(2k-m)^2} -$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2k-v)\sqrt{z}\right)-c\,(2k-v)\sqrt{z}\,\sinh\left(c\,(2k-v)\sqrt{z}\right)\right)}{(2k-v)^2} - 2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cosh\left((b\,(2k-m)+c\,(v-2s))\sqrt{z}\right)-(b\,(2k-m)+c\,(v-2s))\sqrt{z}\,\sinh\left((b\,(2k-m)+c\,(v-2s))\sqrt{z}\right)\right)\Big/$$

$$(b\,(2k-m)+c\,(v-2s))^2+\left(\cosh\left((b\,(2k-m)-c\,(v-2s))\sqrt{z}\right)-(b\,(2k-m)-c\,(v-2s))\right.$$

$$\left.\sqrt{z}\,\sinh\left((b\,(2k-m)-c\,(v-2s))\sqrt{z}\right)\right)\Big/\left.(b\,(2k-m)-c\,(v-2s))^2\right)\,/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cosh^m(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.2219.01

$$\int \cosh^m(d\,z)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2k)}}\binom{v}{k}\left(i\cosh(g\,(v-2k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2k)\,z}{\sqrt{i\,c\,(v-2k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2k)\,z}{\sqrt{i\,c\,(v-2k)}}\right)\sinh(g\,(v-2k))\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(2\,d\,k\,z-m\,d\,z)}{2k-m}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(i\cosh\left(\frac{(2\,d\,k-d\,m)^2}{4\,(c\,v-2\,c\,s)}+g\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sinh\left(\frac{(2\,d\,k-d\,m)^2}{4\,(c\,v-2\,c\,s)}+g\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(g\,(2\,s-v)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,c\,s-c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(g\,(2\,s-v)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,c\,s-c\,v)}\right)\right)\right)\,/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2220.01

$$\int \cosh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(d\,(m-2\,k)\,z)}{m-2\,k}+2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,i\,d\,k-i\,d\,m)^{3/2}}\right.$$

$$\left(-\sqrt{2\,\pi}\;(2\,c\,s-c\,v)\cosh\left(-\frac{(c\,v-2\,c\,s)^2}{4\,(2\,d\,k-d\,m)}-2\,g\,s+g\,v\right)C\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$

$$i\,\sqrt{2\,\pi}\;(c\,v-2\,c\,s)\,S\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(c\,v-2\,c\,s)^2}{4\,(2\,d\,k-d\,m)}-2\,g\,s+g\,v\right)+$$

$$\left.2\,i\,\sqrt{2\,i\,d\,k-i\,d\,m}\;\sinh\left(-2\,g\,s+g\,v+(2\,d\,k-d\,m)\,z+(c\,v-2\,c\,s)\,\sqrt{z}\right)\right)+\frac{1}{(2\,i\,d\,k-i\,d\,m)^{3/2}}$$

$$\left(-\sqrt{2\,\pi}\;(c\,v-2\,c\,s)\cosh\left(-\frac{(2\,c\,s-c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,g\,s-g\,v\right)C\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$

$$i\,\sqrt{2\,\pi}\;(2\,c\,s-c\,v)\,S\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(2\,c\,s-c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,g\,s-g\,v\right)+$$

$$\left.\left.2\,i\,\sqrt{2\,i\,d\,k-i\,d\,m}\;\sinh\left(2\,g\,s-g\,v+(2\,d\,k-d\,m)\,z+(2\,c\,s-c\,v)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.2221.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(2\,k-m)-m\,d\,z+2\,d\,k\,z)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(c\,v-2\,c\,s)}+e\,(2\,k-m)-g\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sinh\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(c\,v-2\,c\,s)}+e\,(2\,k-m)-g\,(2\,s-v)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,c\,s-c\,v)}+e\,(2\,k-m)+g\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$
$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,c\,s-c\,v)}+e\,(2\,k-m)+g\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2222.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - \frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,i\,d\,k-i\,d\,m)^{3/2}}\left(-\sqrt{2\,\pi}\;(2\,c\,s-c\,v)\cosh\left(-\frac{(c\,v-2\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-2\,g\,s+g\,v\right)\right.\right.$$

$$C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)+i\sqrt{2\,\pi}\;(c\,v-2\,c\,s)$$

$$S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,c\,s+c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)\sinh\left(-\frac{(c\,v-2\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-2\,g\,s+g\,v\right)+$$

$$\left.2\,i\sqrt{2\,i\,d\,k-i\,d\,m}\;\sinh\left(2\,e\,k-e\,m-2\,g\,s+g\,v+(2\,d\,k-d\,m)\,z+(c\,v-2\,c\,s)\,\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,d\,k-i\,d\,m)^{3/2}}\left(-\sqrt{2\,\pi}\;(c\,v-2\,c\,s)\cosh\left(-\frac{(2\,c\,s-c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m+2\,g\,s-g\,v\right)\right.$$

$$C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)+i\sqrt{2\,\pi}\;(2\,c\,s-c\,v)\,S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,c\,s-c\,v}{\sqrt{2\,i\,d\,k-i\,d\,m}\;\sqrt{2\,\pi}}\right)$$

$$\sinh\left(-\frac{(2\,c\,s-c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m+2\,g\,s-g\,v\right)+2\,i\sqrt{2\,i\,d\,k-i\,d\,m}$$

$$\left.\left.\sinh\left(2\,e\,k-e\,m+2\,g\,s-g\,v+(2\,d\,k-d\,m)\,z+(2\,c\,s-c\,v)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cosh^m(a\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.2223.01

$$\int \cosh^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2) - \frac{2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r},(b\,m-2\,b\,k)\,z^r\right)((b\,m-2\,b\,k)\,z^r)^{-1/r}+((2\,b\,k-b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,b\,k-b\,m)\,z^r\right)\right) - \frac{2^{-m-v}\,z}{r}$$
$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{1}{r},(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+e^{g\,v-2\,g\,k}\,((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,k-c\,v)\,z^r\right)\right) -$$
$$\frac{2^{-m-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{1}{r},(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$
$$e^{2\,g\,s-g\,v}\,((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)+$$
$$e^{-2\,g\,s+g\,v}\,((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)+$$
$$\left.e^{-2\,g\,s+g\,v}\,((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2224.01

$$\int \cosh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2) + 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)\right)+$$
$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)+$$
$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cosh(g\,(2\,s-v))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)+\right.\right.$$
$$\left.i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)\sinh(g\,(2\,s-v))\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\right)+$$
$$\left(\cosh(g\,(2\,s-v))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)-i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)\right.$$
$$\left.\left.\sinh(g\,(2\,s-v))\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2225.01

$$\int \cosh^m\left(\sqrt{z}\ b\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2) - \frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(2k-v)^2}\left(\binom{v}{k}\left(\cosh\left(c(2k-v)\sqrt{z}-g(v-2k)\right)-c(2k-v)\sqrt{z}\,\sinh\left(c(2k-v)\sqrt{z}-g(v-2k)\right)\right)\right) -$$
$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cosh\left(b(2k-m)\sqrt{z}\right)-b(2k-m)\sqrt{z}\,\sinh\left(b(2k-m)\sqrt{z}\right)\right)}{(2k-m)^2} -$$
$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b(2k-m)+c(v-2s))^2}\left(\cosh\left(-g(v-2s)-(b(2k-m)+c(v-2s))\sqrt{z}\right)+\right.\right.$$
$$\left.(b(2k-m)+c(v-2s))\sqrt{z}\,\sinh\left(-g(v-2s)-(b(2k-m)+c(v-2s))\sqrt{z}\right)\right)+$$
$$\frac{1}{(b(2k-m)-c(v-2s))^2}\left(\cosh\left(g(v-2s)-(b(2k-m)-c(v-2s))\sqrt{z}\right)+\right.$$
$$\left.\left.(b(2k-m)-c(v-2s))\sqrt{z}\,\sinh\left(g(v-2s)-(b(2k-m)-c(v-2s))\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(a\,z^r+e)\cosh^v(c\,z^r+g)$

01.20.21.2226.01

$$\int \cosh^m(b\,z^r+e)\cosh^v(c\,z^r+g)\,dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2) - \frac{2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2ek-em}\,\Gamma\left(\frac{1}{r},(bm-2bk)z^r\right)((bm-2bk)z^r)^{-1/r}+e^{em-2ek}\,((2bk-bm)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2bk-bm)z^r\right)\right) -$$
$$\frac{2^{-m-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2gk-gv}\,\Gamma\left(\frac{1}{r},(cv-2ck)z^r\right)((cv-2ck)z^r)^{-1/r}+e^{gv-2gk}\,((2ck-cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2ck-cv)z^r\right)\right) -$$
$$\frac{2^{-m-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2ek-em+2gs-gv}\,\Gamma\left(\frac{1}{r},(-2bk+bm-2cs+cv)z^r\right)((-2bk+bm-2cs+cv)z^r)^{-1/r}+\right.$$
$$e^{-2ek+em+2gs-gv}\,((2bk-bm-2cs+cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2bk-bm-2cs+cv)z^r\right)+$$
$$e^{2ek-em-2gs+gv}\,((-2bk+bm+2cs-cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2bk+bm+2cs-cv)z^r\right)+$$
$$\left.e^{-2ek+em-2gs+gv}\,((2bk-bm+2cs-cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2bk-bm+2cs-cv)z^r\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2227.01

$$\int \cosh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\left(\binom{m}{k}\left(i\cosh(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)\sinh(e\,(m-2\,k))\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cosh(e\,(2\,k-m)-g\,(2\,s-v))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)-\right.\right.$$

$$\left.i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)\sinh(e\,(2\,k-m)-g\,(2\,s-v))\right)\Big/$$

$$\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cosh(e\,(2\,k-m)+g\,(2\,s-v))\right.$$

$$C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)-i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)$$

$$\left.\left.\left.\sinh(e\,(2\,k-m)+g\,(2\,s-v))\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)\Big/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2228.01

$$\int \cosh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(2k-v)^2}\left(\binom{v}{k}\left(\cosh\left(c\,(2k-v)\sqrt{z}\ -g\,(v-2k)\right)-c\,(2k-v)\sqrt{z}\ \sinh\left(c\,(2k-v)\sqrt{z}\ -g\,(v-2k)\right)\right)\right)-\frac{2^{-m-v+2}}{b^2}$$
$$\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(2k-m)^2}\left(\binom{m}{k}\left(\cosh\left(e\,(m-2k)-b\,(2k-m)\sqrt{z}\right)+b\,(2k-m)\sqrt{z}\ \sinh\left(e\,(m-2k)-b\,(2k-m)\sqrt{z}\right)\right)\right)-$$
$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b\,(2k-m)+c\,(v-2s))^2}\left(\cosh\left(e\,(m-2k)-g\,(v-2s)-(b\,(2k-m)+c\,(v-2s))\sqrt{z}\right)+\right.\right.$$
$$\left.(b\,(2k-m)+c\,(v-2s))\sqrt{z}\ \sinh\left(e\,(m-2k)-g\,(v-2s)-(b\,(2k-m)+c\,(v-2s))\sqrt{z}\right)\right)+$$
$$\frac{1}{(b\,(2k-m)-c\,(v-2s))^2}\left(\cosh\left(e\,(m-2k)+g\,(v-2s)-(b\,(2k-m)-c\,(v-2s))\sqrt{z}\right)+(b\,(2k-m)-\right.$$
$$\left.\left.c\,(v-2s))\sqrt{z}\ \sinh\left(e\,(m-2k)+g\,(v-2s)-(b\,(2k-m)-c\,(v-2s))\sqrt{z}\right)\right)\Big/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cosh^m(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2229.01

$$\int \cosh^m(d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$
$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2k)}{4c}\right)C\left(\frac{f\,(v-2k)+2c\,z\,(v-2k)}{\sqrt{2\pi}\ \sqrt{i\,c\,(v-2k)}}\right)+S\left(\frac{f\,(v-2k)+2c\,z\,(v-2k)}{\sqrt{2\pi}\ \sqrt{i\,c\,(v-2k)}}\right)\sinh\left(\frac{f^2\,(v-2k)}{4c}\right)\right)}{\sqrt{i\,c\,(v-2k)}}+$$
$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(-d\,z\,m+2\,d\,k\,z)}{2k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}\right)C\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\pi}\ \sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\pi}\ \sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sinh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$
$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sinh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2230.01

$$\int \cosh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\,\pi}\;(v-2\,k)\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{c\,(v-2\,k)+2\,f\sqrt{z}\;(v-2\,k)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)-c\,i\sqrt{2\,\pi}\;(v-2\,k)\right.\right.$$

$$\left.\left.S\left(-\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)+2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)\right)\right)+$$

$$\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(d\,(m-2\,k)\,z)}{m-2\,k}}{d}+2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(-c\sqrt{2\,\pi}\;(2\,s-v)\cosh\left(\frac{c^2\,(v-2\,s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}\right)C\left(\frac{c\,(v-2\,s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\;(2\,s-v)\,S\left(\frac{c\,(v-2\,s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)$$

$$\sinh\left(\frac{c^2\,(v-2\,s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}\right)+2\,i\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\left.\left.\sinh\left(-2\,f\,z\,s-2\,c\sqrt{z}\;s+2\,d\,k\,z-d\,m\,z+f\,v\,z+c\,v\sqrt{z}\right)\right)\Big/(2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\right.$$

$$\left(c\sqrt{2\,\pi}\;(2\,s-v)\cosh\left(\frac{c^2\,(v-2\,s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}\right)C\left(\frac{c\,(2\,s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)-\right.$$

$$i\,c\sqrt{2\,\pi}\;(2\,s-v)\,S\left(\frac{c\,(2\,s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)\sinh\left(\frac{c^2\,(v-2\,s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}\right)+$$

$$2\,i\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}\;\sinh\left(\frac{1}{2}\left(4\,f\,z\,s+4\,c\sqrt{z}\;s+4\,d\,k\,z-2\,d\,m\,z-\right.\right.\right.$$

$$\left.\left.\left.2\,f\,v\,z-2\,c\,v\sqrt{z}\right)\right)\right)\Big/(2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\Bigg)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2231.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(2\,k-m)-d\,z\,m+2\,d\,k\,z)}{2\,k-m}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\right.$$

$$\left(i\cosh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}+e\,(2\,k-m)\right)C\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sinh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}+e\,(2\,k-m)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}+e\,(2\,k-m)\right)\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\sinh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}+e\,(2\,k-m)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2232.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\,\pi}\;(v-2\,k)\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{c\,(v-2\,k)+2\,f\sqrt{z}\;(v-2\,k)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)-c\,i\sqrt{2\,\pi}\;(v-2\,k)\right.\right.$$

$$\left.\left.S\left(-\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)+2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)\right)\right)+$$

$$\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}}{d}+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(-c\sqrt{2\,\pi}\;(2\,s-v)\cosh\left(\frac{c^2\,(v-2\,s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m\right)\right.\right.$$

$$C\left(\frac{c\,(v-2\,s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)-i\,c\sqrt{2\,\pi}\;(2\,s-v)$$

$$S\left(\frac{c\,(v-2\,s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)\sinh\left(\frac{c^2\,(v-2\,s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m\right)+$$

$$2\,i\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}\;\sinh\left(2\,e\,k+2\,d\,z\,k-e\,m-d\,m\,z-2\,f\,s\,z+\right.$$

$$\left.\left.\left.f\,v\,z-2\,c\,s\sqrt{z}+c\,v\sqrt{z}\right)\right)\Big/(2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\right.$$

$$\left(c\sqrt{2\,\pi}\;(2\,s-v)\cosh\left(-\frac{c^2\,(v-2\,s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m\right)\right.$$

$$C\left(\frac{c\,(2\,s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)+c\,i\sqrt{2\,\pi}\;(2\,s-v)$$

$$S\left(\frac{c\,(2\,s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)\sinh\left(-\frac{c^2\,(v-2\,s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m\right)+$$

$$2\,i\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}\;\sinh\left(\frac{1}{2}\left(4\,e\,k+4\,d\,z\,k-2\,e\,m-2\,d\,m\,z+4\,f\,s\,z-2\,f\,v\,z+\right.\right.$$

$$\left.\left.\left.\left.4\,c\,s\sqrt{z}-2\,c\,v\sqrt{z}\right)\right)\right)\Big/(2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(b z^r)\cosh^v(c z^r + f z)$

01.20.21.2233.01

$$\int \cosh^m\left(b z^2\right)\cosh^v\left(c z^2 + f z\right) dz == 2^{-m-v} z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2) +$$

$$2^{-m-v+\frac{1}{2}}\, i \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{\sqrt{i\, b\, (m-2k)}} \binom{m}{k} C\left(\frac{b\,(m-2k)\sqrt{\frac{2}{\pi}}\, z}{\sqrt{i\, b\, (m-2k)}}\right) +$$

$$2^{-m-v+\frac{1}{2}} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{\binom{v}{k}\left(i \cosh\left(\frac{f^2 (v-2k)}{4c}\right) C\left(\frac{f\,(v-2k)+2c z\,(v-2k)}{\sqrt{2\pi}\,\sqrt{i\,c\,(v-2k)}}\right) + S\left(\frac{f\,(v-2k)+2c z\,(v-2k)}{\sqrt{2\pi}\,\sqrt{i\,c\,(v-2k)}}\right) \sinh\left(\frac{f^2 (v-2k)}{4c}\right)\right)}{\sqrt{i\,c\,(v-2k)}} +$$

$$2^{-m-v+\frac{1}{2}} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(i \cosh\left(\frac{f^2 (v-2s)^2}{-8bk+4bm+8cs-4cv}\right) C\left(\frac{-2fs+fv+2(2bk-bm-2cs+cv)z}{\sqrt{2\pi}\,\sqrt{2ibk-ibm-2ics+icv}}\right) - S\left(\frac{-2fs+fv+2(2bk-bm-2cs+cv)z}{\sqrt{2\pi}\,\sqrt{2ibk-ibm-2ics+icv}}\right) \sinh\left(\frac{f^2 (v-2s)^2}{-8bk+4bm+8cs-4cv}\right)\right) \Big/ \left(\sqrt{2ibk-ibm-2ics+icv}\right) + \left(i \cosh\left(\frac{f^2 (v-2s)^2}{8bk-4bm+8cs-4cv}\right) C\left(\frac{2fs-fv+2(2bk-bm+2cs-cv)z}{\sqrt{2\pi}\,\sqrt{2ibk-ibm+2ics-icv}}\right) + S\left(\frac{2fs-fv+2(2bk-bm+2cs-cv)z}{\sqrt{2\pi}\,\sqrt{2ibk-ibm+2ics-icv}}\right) \sinh\left(\frac{f^2 (v-2s)^2}{8bk-4bm+8cs-4cv}\right)\right) \Big/ \left(\sqrt{2ibk-ibm+2ics-icv}\right)\right) /; m \in \mathbb{N}^+ \wedge v \in \mathbb{N}^+$$

01.20.21.2234.01

$$\int \cosh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\left(b\,(2k-m)\sqrt{z}\,\sinh\left((2k-m)\,b\sqrt{z}\right)-\cosh\left((2k-m)\,b\sqrt{z}\right)\right)\binom{m}{k}}{(m-2k)^2}\right)(1-v \bmod 2)+\right.$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\,(v-2k)\cosh\left(\frac{c^2\,(v-2k)}{4\,f}\right)\right.\right.$$

$$C\left(\frac{c\,(v-2k)+2\,f\sqrt{z}\,(v-2k)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)-i\,c\sqrt{2\pi}\,(v-2k)\,S\left(\frac{c\,(v-2k)+2\,f\sqrt{z}\,(v-2k)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)$$

$$\left.\left.\sinh\left(\frac{c^2\,(v-2k)}{4\,f}\right)+2\,i\sqrt{i\,f\,(v-2k)}\,\sinh\left(f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\cosh\left(\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)-i\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,c\,s+c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sinh\left(\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}\right)+$$

$$\left.2\,i\sqrt{i\,f\,v-2\,i\,f\,s}\,\sinh\left(b\sqrt{z}\,(2k-m)+(f\,v-2\,f\,s)\,z+c\,(v-2\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\cosh\left(\frac{(b\,(m-2k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)-i\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,c\,s-c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)\sinh\left(\frac{(b\,(m-2k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}\right)+$$

$$\left.\left.2\,i\sqrt{2\,i\,f\,s-i\,f\,v}\,\sinh\left(b\sqrt{z}\,(2k-m)+(2\,f\,s-f\,v)\,z+c\,(2\,s-v)\sqrt{z}\right)\right)\right)/;\, m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cosh^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z)$

01.20.21.2235.01

$$\int \cosh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\binom{m}{k}\left(i\cosh(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)\sinh(e\,(m-2\,k))\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(i\cosh\left(\frac{f^2\,(v-2\,s)^2}{-8\,b\,k+4\,b\,m+8\,c\,s-4\,c\,v}+e\,(2\,k-m)\right)C\left(\frac{-2\,f\,s+f\,v+2\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{-2\,f\,s+f\,v+2\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sinh\left(\frac{f^2\,(v-2\,s)^2}{-8\,b\,k+4\,b\,m+8\,c\,s-4\,c\,v}+e\,(2\,k-m)\right)\right)\Big/$$

$$\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(i\cosh\left(e\,(2\,k-m)-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\right.$$

$$C\left(\frac{2\,f\,s-f\,v+2\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,f\,s-f\,v+2\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sinh\Bigg($$

$$\left.\left.e\,(2\,k-m)-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big)\,/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2236.01

$$\int \cosh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+f\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+2}\,(1-v \bmod 2)}{b^2}\binom{v}{\frac{v}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\left(b\,(2k-m)\sqrt{z}\,\sinh\left((2k-m)\left(\sqrt{z}\ b+e\right)\right)-\cosh\left((2k-m)\left(\sqrt{z}\ b+e\right)\right)\right)\binom{m}{k}}{(m-2k)^2}+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\ (v-2k)\cosh\left(\frac{c^2\,(v-2k)}{4f}\right)\right.\right.$$

$$C\left(\frac{c\,(v-2k)+2\,f\sqrt{z}\ (v-2k)}{\sqrt{2\pi}\ \sqrt{i\,f\,(v-2k)}}\right)-i\,c\sqrt{2\pi}\ (v-2k)\,S\left(\frac{c\,(v-2k)+2\,f\sqrt{z}\ (v-2k)}{\sqrt{2\pi}\ \sqrt{i\,f\,(v-2k)}}\right)$$

$$\left.\left.\sinh\left(\frac{c^2\,(v-2k)}{4f}\right)+2\,i\sqrt{i\,f\,(v-2k)}\ \sinh\left(f\,z\,(v-2k)+c\sqrt{z}\ (v-2k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\pi}\ (2\,b\,k-b\,m-2\,c\,s+c\,v)\cosh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}+\right.\right.\right.$$

$$\left.2\,e\,k-e\,m\right)C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{i\,f\,v-2\,i\,f\,s}}\right)+i\sqrt{2\pi}\ (2\,b\,k-b\,m-2\,c\,s+c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sinh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}+2\,e\,k-e\,m\right)+$$

$$\left.2\,i\sqrt{i\,f\,v-2\,i\,f\,s}\ \sinh\left(2\,e\,k-e\,m+(f\,v-2\,f\,s)\,z+b\,(2\,k-m)\sqrt{z}\ +c\,(v-2\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\pi}\ (2\,b\,k-b\,m+2\,c\,s-c\,v)\cosh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+2\,e\,k-e\,m\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,i\,f\,s-i\,f\,v}}\right)+$$

$$i\sqrt{2\pi}\ (2\,b\,k-b\,m+2\,c\,s-c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sinh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+2\,e\,k-e\,m\right)+2\,i\sqrt{2\,i\,f\,s-i\,f\,v}$$

$$\left.\left.\sinh\left(2\,e\,k-e\,m+(2\,f\,s-f\,v)\,z+b\,(2\,k-m)\sqrt{z}\ +c\,(2\,s-v)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(b z^r + d z)\cosh^v(c z^r + f z)$

01.20.21.2237.01

$$\int \cosh^m\left(b z^2 + d z\right)\cosh^v\left(c z^2 + f z\right) dz ==$$

$$2^{-m-v} z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)(1 - v \bmod 2) + 2^{-m-v+\frac{1}{2}} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{\sqrt{i\, b\, (m-2k)}} \right.$$

$$\left. \left(\binom{m}{k} \left(i \cosh\left(\frac{d^2 (m-2k)}{4b} \right) C\left(\frac{d(m-2k) + 2bz(m-2k)}{\sqrt{i\, b\, (m-2k)}\ \sqrt{2\pi}} \right) + S\left(\frac{d(m-2k) + 2bz(m-2k)}{\sqrt{i\, b\, (m-2k)}\ \sqrt{2\pi}} \right) \sinh\left(\frac{d^2 (m-2k)}{4b} \right) \right) \right) \right)$$

$$(1 - v \bmod 2) + 2^{-m-v+\frac{1}{2}} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{\binom{v}{k} \left(i \cosh\left(\frac{f^2 (v-2k)}{4c} \right) C\left(\frac{f(v-2k) + 2cz(v-2k)}{\sqrt{2\pi}\ \sqrt{i\, c\, (v-2k)}} \right) + S\left(\frac{f(v-2k) + 2cz(v-2k)}{\sqrt{2\pi}\ \sqrt{i\, c\, (v-2k)}} \right) \sinh\left(\frac{f^2 (v-2k)}{4c} \right) \right)}{\sqrt{i\, c\, (v-2k)}} + 2^{-m-v+\frac{1}{2}} \sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(i \cosh\left(\frac{(2dk - dm - 2fs + fv)^2}{8bk - 4bm - 8cs + 4cv} \right) C\left(\frac{2dk + 4bzk - dm - 2fs + fv - 2bmz - 4csz + 2cvz}{\sqrt{2\pi}\ \sqrt{i\, (2bk - bm - 2cs + cv)}} \right) + \right. \right.$$

$$\left. S\left(\frac{2dk + 4bzk - dm - 2fs + fv - 2bmz - 4csz + 2cvz}{\sqrt{2\pi}\ \sqrt{i\, (2bk - bm - 2cs + cv)}} \right) \right.$$

$$\left. \left. \sinh\left(\frac{(2dk - dm - 2fs + fv)^2}{8bk - 4bm - 8cs + 4cv} \right) \right) \Big/ \left(\sqrt{2\, i\, bk - i\, bm - 2\, i\, cs + i\, cv} \right) + \right.$$

$$\left(i \cosh\left(\frac{(d(m-2k) + f(v-2s))^2}{8bk - 4bm + 8cs - 4cv} \right) C\left(\frac{2dk + 4bzk - dm + 2fs - fv - 2bmz + 4csz - 2cvz}{\sqrt{2\pi}\ \sqrt{i\, (2bk - bm + 2cs - cv)}} \right) + \right.$$

$$\left. S\left(\frac{2dk + 4bzk - dm + 2fs - fv - 2bmz + 4csz - 2cvz}{\sqrt{2\pi}\ \sqrt{i\, (2bk - bm + 2cs - cv)}} \right) \sinh\left(\frac{(d(m-2k) + f(v-2s))^2}{8bk - 4bm + 8cs - 4cv} \right) \right) \Big/$$

$$\left. \left(\sqrt{2\, i\, bk - i\, bm + 2\, i\, cs - i\, cv} \right) \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.2238.01

$$\int \cosh^m\left(\sqrt{z}\ b + d z\right)\cosh^v\left(\sqrt{z}\ c + f z\right) dz == 2^{-m-v} z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)(1 - v \bmod 2) +$$

$$2^{-m-v} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{(i\, d\, (m-2k))^{3/2}} \left(\binom{m}{k} \left(b(m-2k)\sqrt{2\pi} \cosh\left(\frac{(m-2k) b^2}{4d} \right) C\left(\frac{b(m-2k) + 2d\sqrt{z}\ (m-2k)}{\sqrt{i\, d\, (m-2k)}\ \sqrt{2\pi}} \right) - \right. \right. \right.$$

$$\left. \left. \left. i\, b\, (m-2k)\sqrt{2\pi}\ S\left(\frac{b(m-2k) + 2d\sqrt{z}\ (m-2k)}{\sqrt{i\, d\, (m-2k)}\ \sqrt{2\pi}} \right) \sinh\left(\frac{(m-2k) b^2}{4d} \right) + \right. \right. \right.$$

$$2\,i\,\sqrt{i\,d\,(m-2\,k)}\,\sinh\left(d\,z\,(m-2\,k)+b\,\sqrt{z}\,(m-2\,k)\right)\Bigg)\Bigg)\Bigg)(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\Bigg(\binom{v}{k}\Bigg(c\,(v-2\,k)\,\sqrt{2\,\pi}\,\cosh\left(-\frac{(v-2\,k)\,c^2}{4\,f}\right)C\left(\frac{c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+$$

$$c\,i\,(v-2\,k)\,\sqrt{2\,\pi}\,S\left(\frac{c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(-\frac{(v-2\,k)\,c^2}{4\,f}\right)+$$

$$2\,i\,\sqrt{i\,f\,(v-2\,k)}\,\sinh\left(f\,z\,(v-2\,k)+c\,\sqrt{z}\,(v-2\,k)\right)\Bigg)\Bigg)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\Bigg(\sqrt{2\,\pi}\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\cosh\left(\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}\right)$$

$$C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}}\right)-$$

$$i\,\sqrt{2\,\pi}\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sinh\left(\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}\right)+2\,i\,\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\sinh\left(b\,\sqrt{z}\,(2\,k-m)+(2\,d\,k-d\,m-2\,f\,s+f\,v)\,z+c\,(v-2\,s)\,\sqrt{z}\right)\Bigg)\Bigg/$$

$$(2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\Bigg(\sqrt{2\,\pi}\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\cosh\left(\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}\right)$$

$$C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}}\right)-i\,\sqrt{2\,\pi}\,(2\,b\,k-b\,m+2\,c\,s-c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}}\right)\sinh\left(\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}\right)+$$

$$2\,i\,\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}\,\sinh\left(b\,\sqrt{z}\,(2\,k-m)+(2\,d\,k-d\,m+2\,f\,s-f\,v)\,z+\right.$$

$$\left.c\,(2\,s-v)\,\sqrt{z}\right)\Bigg)\Bigg/(2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\Bigg)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.2239.01

$$\int \cosh^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right.\right.$$

$$\left.\left.C\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(-d\,z\,m+2\,d\,k\,z)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\right.$$

$$\left(i\cosh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}-g\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sinh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}-g\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}+g\,(2\,s-v)\right)\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\left.\sinh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}+g\,(2\,s-v)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2240.01

$$\int \cosh^m(d\,z)\cosh^v\left(\sqrt{z}\,c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\,(v-2k)\cosh\left(g\,(v-2k)-\frac{c^2\,(v-2k)}{4\,f}\right)C\left(\frac{c\,(v-2k)+2\,f\sqrt{z}\,(v-2k)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)+\right.\right.$$

$$c\,i\sqrt{2\pi}\,(v-2k)\,S\left(-\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)\sinh\left(g\,(v-2k)-\frac{c^2\,(v-2k)}{4\,f}\right)+$$

$$\left.\left.2\,i\sqrt{i\,f\,(v-2k)}\,\sinh\left(g\,(v-2k)+f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(d\,(m-2k)\,z)}{m-2k}+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(-c\sqrt{2\pi}\,(2s-v)\cosh\left(\frac{c^2\,(v-2s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}-2\,g\,s+g\,v\right)\right.\right.$$

$$C\left(\frac{c\,(v-2s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)-i\,c\sqrt{2\pi}\,(2s-v)$$

$$S\left(\frac{c\,(v-2s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)\sinh\left(\frac{c^2\,(v-2s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}-2\,g\,s+g\,v\right)+$$

$$2\,i\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}\,\sinh\left(-2\,g\,s-2\,f\,z\,s-2\,c\sqrt{z}\,s+g\,v+2\,d\,k\,z-\right.$$

$$\left.d\,m\,z+f\,v\,z+c\,v\sqrt{z}\right)\Big/(2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(c\sqrt{2\pi}\,(2s-v)\right.$$

$$\cosh\left(-\frac{c^2\,(v-2s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+2\,g\,s-g\,v\right)C\left(\frac{c\,(2s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)+$$

$$c\,i\sqrt{2\pi}\,(2s-v)\,S\left(\frac{c\,(2s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)\sinh\left(-\frac{c^2\,(v-2s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+\right.$$

$$2\,g\,s-g\,v\Big)+2\,i\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}\,\sinh\left(2\,g\,s+2\,f\,z\,s+2\,c\sqrt{z}\,s-g\,v+\right.$$

$$\left.\left.\left.2\,d\,k\,z-d\,m\,z-f\,v\,z-c\,v\sqrt{z}\right)\Big/(2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.2241.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right.\right.$$

$$\left.C\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(2\,k-m)-d\,z\,m+2\,d\,k\,z)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}+e\,(2\,k-m)-g\,(2\,s-v)\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-S\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(c\,v-2\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)$$

$$\left.\sinh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,(c\,v-2\,c\,s)}+e\,(2\,k-m)-g\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(i\cosh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}+e\,(2\,k-m)+g\,(2\,s-v)\right)\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,v+2\,(2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\left.\sinh\left(-\frac{(2\,d\,k-d\,m+2\,f\,s-f\,v)^2}{4\,(2\,c\,s-c\,v)}+e\,(2\,k-m)+g\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2242.01

$$\int \cosh^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(c\,\sqrt{2\,\pi}\;(v-2\,k)\cosh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.\right.$$

$$c\,i\,\sqrt{2\,\pi}\;(v-2\,k)\,S\left(-\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)+$$

$$\left.\left.2\,i\,\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\,\sqrt{z}\;(v-2\,k)\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sinh(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(-c\sqrt{2\,\pi}\;(2\,s-v)\cosh\left(\frac{c^2\,(v-2\,s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m-2\,g\,s+g\,v\right)\right.\right.$$

$$C\left(\frac{c\,(v-2\,s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)-$$

$$i\,c\sqrt{2\,\pi}\;(2\,s-v)\,S\left(\frac{c\,(v-2\,s)+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)$$

$$\sinh\left(\frac{c^2\,(v-2\,s)^2}{-8\,d\,k+4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m-2\,g\,s+g\,v\right)+2\,i\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\left.\left.\sinh\left(2\,e\,k+2\,d\,z\,k-e\,m-2\,g\,s+g\,v-d\,m\,z-2\,f\,s\,z+f\,v\,z-2\,c\,s\sqrt{z}+c\,v\sqrt{z}\right)\right)\Big/\right.$$

$$(2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(c\sqrt{2\,\pi}\;(2\,s-v)\cosh\left(-\frac{c^2\,(v-2\,s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+\right.\right.$$

$$\left.2\,e\,k-e\,m+2\,g\,s-g\,v\right)C\left(\frac{c\,(2\,s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)+c\,i\sqrt{2\,\pi}\;(2\,s-v)$$

$$S\left(\frac{c\,(2\,s-v)+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)\sinh\left(-\frac{c^2\,(v-2\,s)^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m+\right.$$

$$\left.2\,g\,s-g\,v\right)+2\,i\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}\;\sinh\left(2\,e\,k+2\,d\,z\,k-e\,m+2\,g\,s-g\,v-d\,m\,z+\right.$$

$$\left.\left.\left.2\,f\,s\,z-f\,v\,z+2\,c\,s\sqrt{z}-c\,v\sqrt{z}\right)\right)\Big/(2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cosh^m(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.2243.01

$$\int \cosh^m\left(b\,z^2\right)\cosh^\nu\left(c\,z^2+f\,z+g\right)dz == 2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+$$

$$2^{-m-\nu+\frac{1}{2}}\,i\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)+2^{-m-\nu+\frac{1}{2}}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(\nu-2\,k)}}\left(\binom{\nu}{k}\left(i\cosh\left(g\,(\nu-2\,k)-\frac{f^2\,(\nu-2\,k)}{4\,c}\right)C\left(\frac{f\,(\nu-2\,k)+2\,c\,z\,(\nu-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(\nu-2\,k)}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{f\,(\nu-2\,k)+2\,c\,z\,(\nu-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(\nu-2\,k)}}\right)\sinh\left(g\,(\nu-2\,k)-\frac{f^2\,(\nu-2\,k)}{4\,c}\right)\right)\right)+2^{-m-\nu+\frac{1}{2}}\,\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(i\cosh\left(\frac{f^2\,(\nu-2\,s)^2}{-8\,b\,k+4\,b\,m+8\,c\,s-4\,c\,\nu}+g\,(\nu-2\,s)\right)C\left(\frac{-2\,f\,s+f\,\nu+2\,(2\,b\,k-b\,m-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{-2\,f\,s+f\,\nu+2\,(2\,b\,k-b\,m-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)\sinh\left(\frac{f^2\,(\nu-2\,s)^2}{-8\,b\,k+4\,b\,m+8\,c\,s-4\,c\,\nu}+g\,(\nu-2\,s)\right)\right)\Big/$$

$$\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,\nu}\right)+\left(i\cosh\left(g\,(2\,s-\nu)-\frac{f^2\,(\nu-2\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,\nu}\right)\right.$$

$$C\left(\frac{2\,f\,s-f\,\nu+2\,(2\,b\,k-b\,m+2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)-S\left(\frac{2\,f\,s-f\,\nu+2\,(2\,b\,k-b\,m+2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)\sinh\Bigg($$

$$\left.g\,(2\,s-\nu)-\frac{f^2\,(\nu-2\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,\nu}\right)\Bigg)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,\nu}\right)\Big/;\ m\in\mathbb{N}^+\wedge\nu\in\mathbb{N}^+$$

01.20.21.2244.01

$$\int \cosh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+2}\,(1-v \bmod 2)}{b^2}\binom{v}{\frac{v}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\left(b\,(2k-m)\sqrt{z}\,\sinh\left((2k-m)\,b\sqrt{z}\right)-\cosh\left((2k-m)\,b\sqrt{z}\right)\right)\binom{m}{k}}{(m-2k)^2}+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\,(v-2k)\cosh\left(\frac{c^2\,(v-2k)}{4f}-g\,(v-2k)\right)\right.\right.$$

$$C\left(\frac{c\,(v-2k)+2\,f\sqrt{z}\,(v-2k)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)-i\,c\sqrt{2\pi}\,(v-2k)\,S\left(\frac{c\,(v-2k)+2\,f\sqrt{z}\,(v-2k)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)$$

$$\left.\left.\sinh\left(\frac{c^2\,(v-2k)}{4f}-g\,(v-2k)\right)+2\,i\sqrt{i\,f\,(v-2k)}\,\sinh\left(g\,(v-2k)+f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\cosh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}-\right.\right.\right.$$

$$\left.2\,g\,s+g\,v\right)C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)+i\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,c\,s+c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sinh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}-2\,g\,s+g\,v\right)+$$

$$\left.2\,i\sqrt{i\,f\,v-2\,i\,f\,s}\,\sinh\left(b\sqrt{z}\,(2k-m)-2\,g\,s+g\,v+(f\,v-2\,f\,s)\,z+c\,(v-2\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\cosh\left(-\frac{(b\,(m-2k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+2\,g\,s-g\,v\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)+$$

$$i\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sinh\left(-\frac{(b\,(m-2k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+2\,g\,s-g\,v\right)+2\,i\sqrt{2\,i\,f\,s-i\,f\,v}$$

$$\left.\left.\sinh\left(b\sqrt{z}\,(2k-m)+2\,g\,s-g\,v+(2\,f\,s-f\,v)\,z+c\,(2\,s-v)\sqrt{z}\right)\right)\right)/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.2245.01

$$\int \cosh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(i\cosh(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{i\,b\,(m-2\,k)}}\right)\sinh(e\,(m-2\,k))\right)}{\sqrt{i\,b\,(m-2\,k)}}\right)(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right.\right.$$
$$\left.\left.C\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(i\cosh\left(\frac{f^2\,(v-2\,s)^2}{-8\,b\,k+4\,b\,m+8\,c\,s-4\,c\,v}+g\,(v-2\,s)+e\,(2\,k-m)\right)\right.\right.$$
$$C\left(\frac{-2\,f\,s+f\,v+2\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}}\right)-S\left(\frac{-2\,f\,s+f\,v+2\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}}\right)$$
$$\left.\left.\sinh\left(\frac{f^2\,(v-2\,s)^2}{-8\,b\,k+4\,b\,m+8\,c\,s-4\,c\,v}+g\,(v-2\,s)+e\,(2\,k-m)\right)\right)\Big/$$
$$\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(i\cosh\left(-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(2\,k-m)+g\,(2\,s-v)\right)\right.$$
$$C\left(\frac{2\,f\,s-f\,v+2\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,f\,s-f\,v+2\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}}\right)$$
$$\left.\left.\sinh\left(-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(2\,k-m)+g\,(2\,s-v)\right)\right)\Big/$$
$$\left.\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

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$$\int \cosh^m\left(\sqrt{z}\;b+e\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\left(b\,(2\,k-m)\sqrt{z}\,\sinh\left((2\,k-m)\left(\sqrt{z}\;b+e\right)\right)-\cosh\left((2\,k-m)\left(\sqrt{z}\;b+e\right)\right)\right)\binom{m}{k}}{(m-2\,k)^2}\right)(1-v \bmod 2)+\right.$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\,\pi}\;(v-2\,k)\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)\right)C\left(\frac{c\,(v-2\,k)+2\,f\sqrt{z}\;(v-2\,k)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)-\right.\right.$$

$$i\,c\sqrt{2\,\pi}\;(v-2\,k)\,S\left(\frac{c\,(v-2\,k)+2\,f\sqrt{z}\;(v-2\,k)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)\right)+$$

$$\left.\left.2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\,\pi}\;(2\,b\,k-b\,m-2\,c\,s+c\,v)\cosh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}+\right.\right.\right.$$

$$\left.2\,e\,k-e\,m-2\,g\,s+g\,v\right)C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,f\,v-2\,i\,f\,s}}\right)+$$

$$i\sqrt{2\,\pi}\;(2\,b\,k-b\,m-2\,c\,s+c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(f\,v-2\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,f\,v-2\,i\,f\,s}}\right)$$

$$\sinh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,f\,v-8\,f\,s}+2\,e\,k-e\,m-2\,g\,s+g\,v\right)+$$

$$\left.2\,i\sqrt{i\,f\,v-2\,i\,f\,s}\;\sinh\left(2\,e\,k-e\,m-2\,g\,s+g\,v+(f\,v-2\,f\,s)\,z+b\,(2\,k-m)\sqrt{z}\;+c\,(v-2\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\,\pi}\;(2\,b\,k-b\,m+2\,c\,s-c\,v)\cosh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+\right.\right.$$

$$\left.2\,e\,k-e\,m+2\,g\,s-g\,v\right)C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,s-i\,f\,v}}\right)+$$

$$i\sqrt{2\,\pi}\;(2\,b\,k-b\,m+2\,c\,s-c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,f\,s-f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sinh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,f\,s-4\,f\,v}+2\,e\,k-e\,m+2\,g\,s-g\,v\right)+2\,i\sqrt{2\,i\,f\,s-i\,f\,v}$$

$$\left.\left.\sinh\left(2\,e\,k-e\,m+2\,g\,s-g\,v+(2\,f\,s-f\,v)\,z+b\,(2\,k-m)\sqrt{z}\;+c\,(2\,s-v)\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(b\,z^r + d\,z)\cosh^v(c\,z^r + f\,z + g)$

01.20.21.2247.01

$$\int \cosh^m\left(b\,z^2 + d\,z\right)\cosh^v\left(c\,z^2 + f\,z + g\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)\,(1 - v \bmod 2) + 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\right.$$

$$\left.\left(\binom{m}{k}\left(i\cosh\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)C\left(\frac{d\,(m-2\,k)+2\,b\,z\,(m-2\,k)}{\sqrt{i\,b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d\,(m-2\,k)+2\,b\,z\,(m-2\,k)}{\sqrt{i\,b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)\right)\right)\right)$$

$$(1 - v \bmod 2) + 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right.\right.$$

$$\left.\left.C\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{f\,(v-2\,k)+2\,c\,z\,(v-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(i\cosh\left(g\,(v-2\,s)-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}\right)\right.\right.$$

$$C\left(\frac{2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m-2\,c\,s+c\,v)}}\right)-$$

$$S\left(\frac{2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m-2\,c\,s+c\,v)}}\right)\sinh\left(g\,(v-2\,s)-\right.$$

$$\left.\left.\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}\right)\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(i\cosh\left(g\,(2\,s-v)-\right.\right.$$

$$\left.\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)C\left(\frac{2\,d\,k+4\,b\,z\,k-d\,m+2\,f\,s-f\,v-2\,b\,m\,z+4\,c\,s\,z-2\,c\,v\,z}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m+2\,c\,s-c\,v)}}\right)-$$

$$S\left(\frac{2\,d\,k+4\,b\,z\,k-d\,m+2\,f\,s-f\,v-2\,b\,m\,z+4\,c\,s\,z-2\,c\,v\,z}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m+2\,c\,s-c\,v)}}\right)\sinh\left(g\,(2\,s-v)-\right.$$

$$\left.\left.\left.\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\, m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2248.01

$$\int \cosh^m\left(\sqrt{z}\;b + d\,z\right)\cosh^v\left(\sqrt{z}\;c + g + f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)\,(1 - v \bmod 2) +$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(i\,d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cosh\left(\frac{(m-2\,k)\,b^2}{4\,d}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{i\,d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$i\,b\,(m-2\,k)\,\sqrt{2\,\pi}\;S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{i\,d\,(m-2\,k)}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(m-2\,k)\,b^2}{4\,d}\right)+$$

$$2\,i\,\sqrt{i\,d\,(m-2\,k)}\;\sinh\left(d\,z\,(m-2\,k)+b\,\sqrt{z}\;(m-2\,k)\right)\Bigg)\Bigg)\Bigg)(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\Bigg(\binom{v}{k}\Bigg(c\,(v-2\,k)\,\sqrt{2\,\pi}\;\cosh\left(g\,(v-2\,k)-\frac{(v-2\,k)\,c^2}{4\,f}\right)C\left(\frac{c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)+$$

$$c\,i\,(v-2\,k)\,\sqrt{2\,\pi}\;S\left(\frac{c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{(v-2\,k)\,c^2}{4\,f}\right)+$$

$$2\,i\,\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\,\sqrt{z}\;(v-2\,k)\right)\Bigg)\Bigg)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\Bigg(\sqrt{2\,\pi}\;(2\,b\,k-b\,m-2\,c\,s+c\,v)\cosh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}-2\,g\,s+g\,v\right)$$

$$C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$

$$i\,\sqrt{2\,\pi}\;(2\,b\,k-b\,m-2\,c\,s+c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sinh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}-2\,g\,s+g\,v\right)+2\,i\,\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\sinh\left(b\,\sqrt{z}\;(2\,k-m)-2\,g\,s+g\,v+(2\,d\,k-d\,m-2\,f\,s+f\,v)\,z+c\,(v-2\,s)\,\sqrt{z}\right)\Bigg)\Bigg/$$

$$(2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\Bigg(\sqrt{2\,\pi}\;(2\,b\,k-b\,m+2\,c\,s-c\,v)\cosh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+\right.$$

$$\left.2\,g\,s-g\,v\right)C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}}\right)+$$

$$i\,\sqrt{2\,\pi}\;(2\,b\,k-b\,m+2\,c\,s-c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sinh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+2\,g\,s-g\,v\right)+2\,i\,\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}$$

$$\sinh\left(b\,\sqrt{z}\,\,(2\,k-m)+2\,g\,s-g\,v+(2\,d\,k-d\,m+2\,f\,s-f\,v)\,z+c\,(2\,s-v)\,\sqrt{z}\right)\Big/$$

$$(2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\Big)\,/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cosh^m(b\,z^r+d\,z+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.2249.01

$$\int \cosh^m\left(b\,z^2+d\,z+e\right)\cosh^\nu\left(c\,z^2+f\,z+g\right)dz == 2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\left(\binom{m}{k}\left(i\cosh\left(\frac{d^2\,(m-2\,k)}{4\,b}-e\,(m-2\,k)\right)C\left(\frac{d\,(m-2\,k)+2\,b\,z\,(m-2\,k)}{\sqrt{i\,b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{d\,(m-2\,k)+2\,b\,z\,(m-2\,k)}{\sqrt{i\,b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2\,(m-2\,k)}{4\,b}-e\,(m-2\,k)\right)\right)\right)\right)(1-\nu \bmod 2)+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(\nu-2\,k)}}\left(\binom{\nu}{k}\left(i\cosh\left(g\,(\nu-2\,k)-\frac{f^2\,(\nu-2\,k)}{4\,c}\right)\right.\right.$$

$$\left.\left.C\left(\frac{f\,(\nu-2\,k)+2\,c\,z\,(\nu-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(\nu-2\,k)}}\right)-S\left(\frac{f\,(\nu-2\,k)+2\,c\,z\,(\nu-2\,k)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(\nu-2\,k)}}\right)\sinh\left(g\,(\nu-2\,k)-\frac{f^2\,(\nu-2\,k)}{4\,c}\right)\right)\right)+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(i\cosh\left(-\frac{(-2\,d\,k+d\,m+f\,(\nu-2\,s))^2}{4\,b\,(2\,k-m)+8\,c\,s-4\,c\,\nu}+e\,(2\,k-m)+g\,(2\,s-\nu)\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,\nu+2\,(2\,b\,k-b\,m+2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)-$$

$$S\left(\frac{2\,d\,k-d\,m+2\,f\,s-f\,\nu+2\,(2\,b\,k-b\,m+2\,c\,s-c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)$$

$$\left.\sinh\left(-\frac{(-2\,d\,k+d\,m+f\,(\nu-2\,s))^2}{4\,b\,(2\,k-m)+8\,c\,s-4\,c\,\nu}+e\,(2\,k-m)+g\,(2\,s-\nu)\right)\right)\Big/$$

$$\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,\nu}\right)+\left(i\cosh\left(-\frac{(d\,(2\,k-m)+f\,(\nu-2\,s))^2}{4\,b\,(2\,k-m)+4\,c\,(\nu-2\,s)}+e\,(2\,k-m)-g\,(2\,s-\nu)\right)\right.$$

$$C\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,\nu+2\,(2\,b\,k-b\,m-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)-$$

$$S\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,\nu+2\,(2\,b\,k-b\,m-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)\sinh\left(-\frac{(d\,(2\,k-m)+f\,(\nu-2\,s))^2}{4\,b\,(2\,k-m)+4\,c\,(\nu-2\,s)}+\right.$$

$$\left.\left.\left.e\,(2\,k-m)-g\,(2\,s-\nu)\right)\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,\nu}\right)\right)\Big/;\, m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2250.01

$$\int \cosh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,s}\left(\binom{m}{s}\left(e^{\frac{d^2\,(m-2\,s)^2-4\,b\,e\,(m-2\,s)^2}{4\,b\,(m-2\,s)}}\sqrt{-b\,(m-2\,s)}\ \operatorname{erfi}\left(\frac{-d\,(m-2\,s)-2\,b\,z\,(m-2\,s)}{2\sqrt{-b\,(m-2\,s)}}\right)-\right.\right.$$

$$\left.\left.\left.e^{-\frac{d^2\,(m-2\,s)^2-4\,b\,e\,(m-2\,s)^2}{4\,b\,(m-2\,s)}}\sqrt{b\,(m-2\,s)}\ \operatorname{erfi}\left(\frac{d\,(m-2\,s)+2\,b\,z\,(m-2\,s)}{2\sqrt{b\,(m-2\,s)}}\right)\right)\right)\right)-$$

$$\frac{1}{c}\left(2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(\binom{v}{s}\left(e^{\frac{f^2\,(v-2\,s)^2-4\,c\,g\,(v-2\,s)^2}{4\,c\,(v-2\,s)}}\sqrt{-c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{-f\,(v-2\,s)-2\,c\,z\,(v-2\,s)}{2\sqrt{-c\,(v-2\,s)}}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{-\frac{f^2\,(v-2\,s)^2-4\,c\,g\,(v-2\,s)^2}{4\,c\,(v-2\,s)}}\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{f\,(v-2\,s)+2\,c\,z\,(v-2\,s)}{2\sqrt{c\,(v-2\,s)}}\right)\right)\right)\right)+2^{-m-v-1}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\left(e^{\frac{(2\,f\,k+d\,m-2\,d\,s-f\,v)^2}{8\,c\,k+4\,b\,m-8\,b\,s-4\,c\,v}-2\,g\,k-e\,m+2\,e\,s+g\,v}\operatorname{erfi}\left(\frac{-d\,m-2\,b\,z\,m+2\,d\,s+f\,(v-2\,k)-4\,c\,k\,z+4\,b\,s\,z+2\,c\,v\,z}{2\sqrt{-2\,c\,k-b\,m+2\,b\,s+c\,v}}\right)\right)\Big/\right.$$

$$\left(\sqrt{-2\,c\,k-b\,m+2\,b\,s+c\,v}\right)+$$

$$\left(e^{\frac{(d\,(m-2\,s)+f\,(v-2\,k))^2}{4\,(b\,(m-2\,s)+c\,(v-2\,k))}+2\,g\,k-e\,m+2\,e\,s-g\,v}\operatorname{erfi}\left(\frac{2\,f\,k+4\,c\,z\,k-d\,m+2\,d\,s-f\,v-2\,b\,m\,z+4\,b\,s\,z-2\,c\,v\,z}{2\sqrt{2\,c\,k-b\,m+2\,b\,s-c\,v}}\right)\right)\Big/$$

$$\left(\sqrt{2\,c\,k-b\,m+2\,b\,s-c\,v}\right)+\left(e^{-\frac{(2\,f\,k+d\,m-2\,d\,s-f\,v)^2}{8\,c\,k+4\,b\,m-8\,b\,s-4\,c\,v}+2\,g\,k+e\,m-2\,e\,s-g\,v}\right.$$

$$\left.\operatorname{erfi}\left(\frac{2\,f\,k+d\,m-2\,d\,s-f\,v+2\,(2\,c\,k+b\,m-2\,b\,s-c\,v)\,z}{2\sqrt{2\,c\,k+b\,m-2\,b\,s-c\,v}}\right)\right)\Big/\left(\sqrt{2\,c\,k+b\,m-2\,b\,s-c\,v}\right)+$$

$$\left(e^{-\frac{(d\,(m-2\,s)+f\,(v-2\,k))^2}{4\,(b\,(m-2\,s)+c\,(v-2\,k))}-2\,g\,k+e\,m-2\,e\,s+g\,v}\operatorname{erfi}\left(\frac{d\,m+2\,b\,z\,m-2\,d\,s+f\,(v-2\,k)-4\,c\,k\,z-4\,b\,s\,z+2\,c\,v\,z}{2\sqrt{b\,(m-2\,s)+c\,(v-2\,k)}}\right)\right)\Big/$$

$$\left.\left(\sqrt{b\,(m-2\,s)+c\,(v-2\,k)}\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2251.01

$$\int \cosh^m\left(\sqrt{z}\ b+d\,z+e\right)\cosh^v\left(\sqrt{z}\ c+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(i\,d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(b\,(m-2\,k)\sqrt{2\,\pi}\ \cosh\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)\right)C\left(\frac{b\,(m-2\,k)+2\,d\sqrt{z}\ (m-2\,k)}{\sqrt{i\,d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$i\,b\,(m-2k)\,\sqrt{2\pi}\;S\left(\frac{b\,(m-2k)+2\,d\,\sqrt{z}\;(m-2k)}{\sqrt{i\,d\,(m-2k)}\;\sqrt{2\pi}}\right)\sinh\left(\frac{(m-2k)\,b^2}{4\,d}-e\,(m-2k)\right)+$$

$$2\,i\,\sqrt{i\,d\,(m-2k)}\;\sinh\left(e\,(m-2k)+d\,z\,(m-2k)+b\,\sqrt{z}\;(m-2k)\right)\Bigg)\Bigg)\Bigg)(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\,(v-2k)\,\sqrt{2\pi}\;\cosh\left(g\,(v-2k)-\frac{(v-2k)\,c^2}{4\,f}\right)\right.\right.$$

$$C\left(\frac{c\,(v-2k)+2\,f\,\sqrt{z}\;(v-2k)}{\sqrt{2\pi}\;\sqrt{i\,f\,(v-2k)}}\right)+c\,i\,(v-2k)\,\sqrt{2\pi}\;S\left(\frac{c\,(v-2k)+2\,f\,\sqrt{z}\;(v-2k)}{\sqrt{2\pi}\;\sqrt{i\,f\,(v-2k)}}\right)$$

$$\left.\sinh\left(g\,(v-2k)-\frac{(v-2k)\,c^2}{4\,f}\right)+2\,i\,\sqrt{i\,f\,(v-2k)}\;\sinh\left(g\,(v-2k)+f\,z\,(v-2k)+c\,\sqrt{z}\;(v-2k)\right)\right)\Bigg)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\;(2\,b\,k-b\,m-2\,c\,s+c\,v)\cosh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}+2\,e\,k-\right.\right.\right.$$

$$\left.e\,m-2\,g\,s+g\,v\right)C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$

$$i\,\sqrt{2\pi}\;(2\,b\,k-b\,m-2\,c\,s+c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sinh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}+2\,e\,k-e\,m-2\,g\,s+g\,v\right)+2\,i\,\sqrt{2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\left.\left.\sinh\left(2\,e\,k-e\,m-2\,g\,s+g\,v+(2\,d\,k-d\,m-2\,f\,s+f\,v)\,z+b\,(2\,k-m)\,\sqrt{z}\;+c\,(v-2\,s)\,\sqrt{z}\right)\right)\Big/\right.$$

$$(2\,i\,d\,k-i\,d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\pi}\;(2\,b\,k-b\,m+2\,c\,s-c\,v)\cosh\left(-\frac{(b\,(m-2k)+c\,(v-2\,s))^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+\right.\right.$$

$$\left.2\,e\,k-e\,m+2\,g\,s-g\,v\right)C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}}\right)+$$

$$\left.i\,\sqrt{2\pi}\;(2\,b\,k-b\,m+2\,c\,s-c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\pi}\;\sqrt{2\,i\,d\,k-i\,d\,m+2\,i\,f\,s-i\,f\,v}}\right)\right.$$

$$\sinh\left(-\frac{(b(m-2k)+c(v-2s))^2}{8dk-4dm+8fs-4fv}+2ek-em+2gs-gv\right)+2i\sqrt{2idk-idm+2ifs-ifv}$$

$$\sinh\left(2ek-em+2gs-gv+(2dk-dm+2fs-fv)z+b(2k-m)\sqrt{z}+c(2s-v)\sqrt{z}\right)\Bigg/$$

$$(2idk-idm+2ifs-ifv)^{3/2}\Bigg) /; m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2252.01

$$\int\cosh^m\left(\sqrt{z}\,b+dz+e\right)\cosh^v\left(\sqrt{z}\,c+fz+g\right)dz==2^{-m-v}z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-e(m-2s)}\binom{m}{s}\left(\frac{be^{-\frac{(2bs-bm)^2}{4(2ds-dm)}}\sqrt{\pi}\,(m-2s)\operatorname{erfi}\left(\frac{2(2ds-dm)\sqrt{z}-b(m-2s)}{2\sqrt{2ds-dm}}\right)}{(2ds-dm)^{3/2}}+\right.\right.$$

$$\left.\left.\frac{4e^{e(m-2s)}\sinh\left((m-2s)\left(\sqrt{z}\,b+e+dz\right)\right)}{d(m-2s)}-\frac{be^{2e(m-2s)-\frac{b^2(m-2s)}{4d}}\sqrt{\pi}\,(m-2s)\operatorname{erfi}\left(\frac{b(m-2s)+2(dm-2ds)\sqrt{z}}{2\sqrt{d(m-2s)}}\right)}{(d(m-2s))^{3/2}}\right)\right)$$

$$(1-v\bmod 2)+2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g(v-2s)}\binom{v}{s}\left(-\frac{4e^{g(v-2s)}\sinh\left((v-2s)\left(\sqrt{z}\,c+g+fz\right)\right)}{f(2s-v)}-\right.$$

$$\frac{ce^{2g(v-2s)-\frac{c^2(v-2s)}{4f}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(fv-2fs)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)}{(f(v-2s))^{3/2}}-$$

$$\left.\frac{e^{-\frac{(2cs-cv)^2}{4(2fs-fv)}}\sqrt{\pi}\,(2cs-cv)\operatorname{erfi}\left(\frac{c(2s-v)+2(2fs-fv)\sqrt{z}}{2\sqrt{2fs-fv}}\right)}{(2fs-fv)^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(2e^{-2gk-em-2es-gv}\left(\frac{e^{2em+2gv+(-2fk+dm-2ds+fv)z+(-2ck+bm-2bs+cv)\sqrt{z}}}{-2fk+dm-2ds+fv}+\right.\right.$$

$$\frac{e^{4gk+4es+(2fk-dm+2ds-fv)z+(2ck-bm+2bs-cv)\sqrt{z}}}{2fk-dm+2ds-fv}+\frac{e^{4gk+2em+(2fk+dm-2ds-fv)z+(2ck+bm-2bs-cv)\sqrt{z}}}{2fk+dm-2ds-fv}+$$

$$\left.\frac{e^{4es+2gv+(-2fk-dm+2ds+fv)z+(-2ck-bm+2bs+cv)\sqrt{z}}}{-2fk-dm+2ds+fv}\right)-\left(e^{-\frac{(-2ck-bm+2bs+cv)^2}{4(-2fk-dm+2ds+fv)}-2gk-em+2es+gv}\sqrt{\pi}\right.$$

$$(-2\,c\,k-b\,m+2\,b\,s+c\,v)\,\text{erfi}\left(\frac{-2\,c\,k-b\,m+2\,b\,s+c\,v+2\,(-2\,f\,k-d\,m+2\,d\,s+f\,v)\,\sqrt{z}}{2\,\sqrt{-2\,f\,k-d\,m+2\,d\,s+f\,v}}\right)\Bigg)\Bigg/$$

$$(-2\,f\,k-d\,m+2\,d\,s+f\,v)^{3/2}-\left(e^{-\frac{(2\,c\,k-b\,m+2\,b\,s-c\,v)^2}{4\,(2\,f\,k-d\,m+2\,d\,s-f\,v)}+2\,g\,k-e\,m+2\,e\,s-g\,v}\,\sqrt{\pi}\;(2\,c\,k-b\,m+2\,b\,s-c\,v)\right.$$

$$\left.\text{erfi}\left(\frac{2\,c\,k-b\,m+2\,b\,s-c\,v+2\,(2\,f\,k-d\,m+2\,d\,s-f\,v)\,\sqrt{z}}{2\,\sqrt{2\,f\,k-d\,m+2\,d\,s-f\,v}}\right)\right)\Bigg/$$

$$(2\,f\,k-d\,m+2\,d\,s-f\,v)^{3/2}-\left(e^{-\frac{(2\,c\,k+b\,m-2\,b\,s-c\,v)^2}{4\,(2\,f\,k+d\,m-2\,d\,s-f\,v)}+2\,g\,k+e\,m-2\,e\,s-g\,v}\,\sqrt{\pi}\;(2\,c\,k+b\,m-2\,b\,s-c\,v)\right.$$

$$\left.\text{erfi}\left(\frac{2\,c\,k+b\,m-2\,b\,s-c\,v+2\,(2\,f\,k+d\,m-2\,d\,s-f\,v)\,\sqrt{z}}{2\,\sqrt{2\,f\,k+d\,m-2\,d\,s-f\,v}}\right)\right)\Bigg/$$

$$(2\,f\,k+d\,m-2\,d\,s-f\,v)^{3/2}-\left(e^{-\frac{(b\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,(m-2\,s)+f\,(v-2\,k))}-2\,g\,k+e\,m-2\,e\,s+g\,v}\,\sqrt{\pi}\;(b\,(m-2\,s)+c\,(v-2\,k))\right.$$

$$\left.\text{erfi}\left(\frac{-2\,c\,k+b\,m-2\,b\,s+c\,v+2\,(d\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,s)+f\,(v-2\,k)}}\right)\right)\Bigg/$$

$$\left.(d\,(m-2\,s)+f\,(v-2\,k))^{3/2}\right)/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving rational functions of the direct function

Involving $\frac{1}{a+b\cosh(c\,z)}$

01.20.21.2253.01

$$\int\frac{1}{a+b\cosh(c\,z)}\,dz==-\frac{2}{\sqrt{b^2-a^2}\;c}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)$$

01.20.21.2254.01

$$\int\frac{1}{1+\cosh(z)}\,dz==\tanh\left(\frac{z}{2}\right)$$

01.20.21.2255.01

$$\int\frac{1}{1-\cosh(z)}\,dz==\coth\left(\frac{z}{2}\right)$$

Involving $(a+b\cosh(c\,z))^{-n}$

01.20.21.2256.01

$$\int \frac{1}{(a+b\cosh(c\,z))^2}\,dz == \frac{1}{c}\left(\frac{2\,a}{(b^2-a^2)^{3/2}}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)+\frac{b\sinh(c\,z)}{(b^2-a^2)(a+b\cosh(c\,z))}\right)$$

01.20.21.2257.01

$$\int \frac{1}{(\cosh(z)+1)^2}\,dz == \frac{(\cosh(z)+2)\sinh(z)}{3(\cosh(z)+1)^2}$$

01.20.21.2258.01

$$\int \frac{1}{(1-\cosh(z))^2}\,dz == -\frac{1}{6}\coth\left(\frac{z}{2}\right)\left(\operatorname{csch}^2\left(\frac{z}{2}\right)-2\right)$$

01.20.21.2259.01

$$\int \frac{1}{(a+b\cosh(c\,z))^3}\,dz == \frac{1}{2\,c}\left(\frac{b\left(-4\,a^2-3\,b\cosh(c\,z)\,a+b^2\right)\sinh(c\,z)}{\left(a^2-b^2\right)^2(a+b\cosh(c\,z))^2}-\frac{2\left(2\,a^2+b^2\right)}{\left(b^2-a^2\right)^{5/2}}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\right)$$

01.20.21.2260.01

$$\int \frac{1}{(a+b\cosh(c\,z))^4}\,dz == \frac{1}{6\,c}\left(\frac{6\,a\left(2\,a^2+3\,b^2\right)}{\left(b^2-a^2\right)^{7/2}}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)+\left(b\left(36\,a^4+b^2\,a^2+6\,b\left(9\,a^2+b^2\right)\cosh(c\,z)\,a+8\,b^4+b^2\left(11\,a^2+4\,b^2\right)\cosh(2\,c\,z)\right)\sinh(c\,z)\right)\Big/\left(2\left(b^2-a^2\right)^3(a+b\cosh(c\,z))^3\right)\right)$$

Involving $\frac{1}{a+b\cosh^n(c\,z)}$

01.20.21.2261.01

$$\int \frac{1}{a+b\cosh^2(c\,z)}\,dz == \frac{1}{\sqrt{a}\,\sqrt{a+b}\,c}\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+b}}\right)$$

01.20.21.2262.01

$$\int \frac{1}{\cosh^2(c\,z)+1}\,dz == \frac{1}{\sqrt{2}\,c}\tanh^{-1}\left(\frac{\tanh(c\,z)}{\sqrt{2}}\right)$$

01.20.21.2263.01

$$\int \frac{1}{1-\cosh^2(c\,z)}\,dz == \frac{\coth(c\,z)}{c}$$

01.20.21.2264.01

$$\int \frac{1}{a+b\cosh^4(c\,z)}\,dz == \frac{1}{2\sqrt{a}\,c}\left(\frac{\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+i\sqrt{b}\,\sqrt{a}}}\right)}{\sqrt{a+i\sqrt{b}\,\sqrt{a}}}+\frac{\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a-i\sqrt{a}\,\sqrt{b}}}\right)}{\sqrt{a-i\sqrt{a}\,\sqrt{b}}}\right)$$

Involving $\left(a + b \cosh^2(c\,z)\right)^{-n}$

01.20.21.2265.01

$$\int \frac{1}{\left(a + b \cosh^2(c\,z)\right)^2}\,dz == \frac{1}{2\,a^{3/2}\,c}\left(\frac{2\,a+b}{(a+b)^{3/2}}\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+b}}\right) - \frac{\sqrt{a}\,b\sinh(2\,c\,z)}{(a+b)\,(2\,a+b+b\cosh(2\,c\,z))}\right)$$

01.20.21.2266.01

$$\int \frac{1}{\left(a + b \cosh^2(c\,z)\right)^3}\,dz ==$$

$$\frac{1}{8\,a^{5/2}\,c}\left(\frac{\left(8\,a^2+8\,b\,a+3\,b^2\right)}{(a+b)^{5/2}}\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+b}}\right) - \frac{\sqrt{a}\,b\left(16\,a^2+16\,b\,a+3\,b^2+3\,b\,(2\,a+b)\cosh(2\,c\,z)\right)\sinh(2\,c\,z)}{(a+b)^2\,(2\,a+b+b\cosh(2\,c\,z))^2}\right)$$

Involving $\frac{\cosh(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.2267.01

$$\int \frac{\cosh(d\,z)}{a + b\cosh(c\,z)}\,dz == \frac{e^{(c-d)\,z}}{2\,b\sqrt{a^2-b^2}}\left(-\frac{1}{d-c}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{d}{c},\,1;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1-\frac{d}{c},\,1;\,2-\frac{d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)+\frac{1}{c+d}\,e^{2\,d\,z}$$

$$\left.\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

01.20.21.2268.01

$$\int \frac{\cosh(c\,z)}{a + b\cosh(c\,z)}\,dz == \frac{1}{b}\left(z+\frac{2\,a}{\sqrt{b^2-a^2}\,c}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\right)$$

01.20.21.2269.01

$$\int \frac{\cosh(z)}{1 + \cosh(z)}\,dz == z - \tanh\left(\frac{z}{2}\right)$$

01.20.21.2270.01

$$\int \frac{\cosh(z)}{1 - \cosh(z)}\,dz == \coth\left(\frac{z}{2}\right) - z$$

01.20.21.2271.01

$$\int \frac{A + B\cosh(c\,z)}{a + b\cosh(c\,z)}\,dz == \frac{1}{b}\left(B\,z+\frac{2\,(a\,B-A\,b)}{\sqrt{b^2-a^2}\,c}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\right)$$

01.20.21.2272.01

$$\int \frac{\cosh(2\,c\,z)}{a+b\cosh(c\,z)}\,dz == -\frac{2\,a\,z}{b^2}+\frac{2\sinh(c\,z)}{b\,c}-\frac{2\left(2\,a^2-b^2\right)}{b^2\sqrt{b^2-a^2}\;c}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)$$

01.20.21.2273.01

$$\int \frac{\cosh(c\,z)}{a+b\cosh(2\,c\,z)}\,dz == \frac{1}{\sqrt{2}\;\sqrt{-b}\;\sqrt{a+b}\;c}\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{-b}\;\sinh(c\,z)}{\sqrt{a+b}}\right)$$

Involving $\cosh(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.2274.01

$$\int \frac{\cosh(d\,z)}{(a+b\cosh(c\,z))^2}\,dz == \frac{1}{2}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d)}\left(e^{(c-d)\,z}\left(-\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right)\right.\right.\right.$$
$$\left.{}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d}{c},\,1;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+$$
$$\left.\left.a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c-d}{c},\,1;\,2-\frac{d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d)}\left(e^{(c+d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$
$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)-\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right)$$
$$\left.\left.{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

01.20.21.2275.01

$$\int \frac{A+B\cosh(c\,z)}{(a+b\cosh(c\,z))^2}\,dz == \frac{1}{\left(a^2-b^2\right)c}\left(\frac{(a\,B-A\,b)\sinh(c\,z)}{a+b\cosh(c\,z)}-\frac{2\,(a\,A-b\,B)}{\sqrt{b^2-a^2}}\tan^{-1}\left(\frac{(a-b)}{\sqrt{b^2-a^2}}\tanh\left(\frac{c\,z}{2}\right)\right)\right)$$

01.20.21.2276.01

$$\int \frac{A+B\cosh(c\,z)}{(\cosh(c\,z)+1)^2}\,dz == \frac{(2\,A+B+(A+2\,B)\cosh(c\,z))\sinh(c\,z)}{3\,c\,(\cosh(c\,z)+1)^2}$$

01.20.21.2277.01

$$\int \frac{A+B\cosh(c\,z)}{(1-\cosh(c\,z))^2}\,dz == \frac{(-2\,A+B+(A-2\,B)\cosh(c\,z))\coth\left(\frac{c\,z}{2}\right)\operatorname{csch}^2\left(\frac{c\,z}{2}\right)}{6\,c}$$

01.20.21.2278.01

$$\int \frac{A+B\cosh(c\,z)}{(a+b\cosh(c\,z))^3}\,dz == \frac{1}{2\left(a^2-b^2\right)^2 c}\left(-\frac{2\left(2\,A\,a^2-3\,b\,B\,a+A\,b^2\right)}{\sqrt{b^2-a^2}}\tan^{-1}\left(\frac{(a-b)}{\sqrt{b^2-a^2}}\tanh\left(\frac{c\,z}{2}\right)\right)+\right.$$
$$\left.\frac{\left(B\,a^2-3\,A\,b\,a+2\,b^2\,B\right)\sinh(c\,z)}{a+b\cosh(c\,z)}+\frac{\left(a^2-b^2\right)(a\,B-A\,b)\sinh(c\,z)}{(a+b\cosh(c\,z))^2}\right)$$

01.20.21.2279.01

$$\int \frac{A+B\cosh(c\,z)}{(\cosh(c\,z)+1)^3}\,dz == \frac{(16\,A+9\,B+6\,(2\,A+3\,B)\cosh(c\,z)+(2\,A+3\,B)\cosh(2\,c\,z))\sinh(c\,z)}{30\,c\,(\cosh(c\,z)+1)^3}$$

01.20.21.2280.01

$$\int \frac{A+B\cosh(c\,z)}{(1-\cosh(c\,z))^3}\,dz == \frac{1}{120\,c}\left((16\,A-9\,B-6\,(2\,A-3\,B)\cosh(c\,z)+(2\,A-3\,B)\cosh(2\,c\,z))\coth\left(\frac{c\,z}{2}\right)\operatorname{csch}^4\left(\frac{c\,z}{2}\right)\right)$$

01.20.21.2281.01

$$\int \frac{A+B\cosh(c\,z)+C\cosh^2(c\,z)}{(a+b\cosh(c\,z))^3}\,dz == \frac{1}{2\,c}\left(-\frac{2\left((2\,A+C)\,a^2-3\,b\,B\,a+b^2\,(A+2\,C)\right)}{\left(b^2-a^2\right)^{5/2}}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)+\right.$$
$$\left.\frac{\left(C\,a^3+b\,B\,a^2-b^2\,(3\,A+4\,C)\,a+2\,b^3\,B\right)\sinh(c\,z)}{b\left(a^2-b^2\right)^2(a+b\cosh(c\,z))}+\frac{\left(A\,b^2+a\,(a\,C-b\,B)\right)\sinh(c\,z)}{\left(b^3-a^2\,b\right)(a+b\cosh(c\,z))^2}\right)$$

Involving $\frac{\cosh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.2282.01

$$\int \frac{\cosh(d\,z)}{a+b\cosh^2(c\,z)}\,dz ==$$
$$\frac{1}{2\sqrt{a}\,b\sqrt{a+b}}\left(-\frac{1}{2\,c+d}\left(e^{(2\,c+d)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d}{2\,c}+1,1;\frac{d}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.\right.$$
$$\left.\left.\left.\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d}{2\,c}+1,1;\frac{d}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{2\,c-d}\left(e^{(2\,c-d)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d}{2\,c},1;2-\frac{d}{2\,c};-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.$$
$$\left.\left.\left.\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d}{2\,c},1;2-\frac{d}{2\,c};-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

01.20.21.2283.01

$$\int \frac{\cosh(c\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{1}{\sqrt{b}\,\sqrt{a+b}\,c}\tan^{-1}\left(\frac{\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b}}\right)$$

01.20.21.2284.01

$$\int \frac{\cosh(2\,c\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{2\,z}{b}-\frac{2\,a+b}{\sqrt{a}\,b\sqrt{a+b}\,c}\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+b}}\right)$$

Involving $\frac{\cosh^m(c\,z)}{a+b\cosh^n(c\,z)}$

01.20.21.2285.01

$$\int \frac{\cosh^m(c\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{\cosh^{m+1}(c\,z)\,\text{csch}(c\,z)\sqrt{-\sinh^2(c\,z)}}{a\,c\,(m+1)}\,F_1\left(\frac{m+1}{2};\frac{1}{2},1;\frac{m+3}{2};\cosh^2(c\,z),-\frac{b\cosh^2(c\,z)}{a}\right)$$

01.20.21.2286.01

$$\int \frac{\cosh^2(c\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{1}{b}\left(z-\frac{\sqrt{a}\,\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+b}}\right)}{\sqrt{a+b}\,c}\right)$$

01.20.21.2287.01

$$\int \frac{\cosh^2(c\,z)}{a+b\cosh^4(c\,z)}\,dz == -\frac{i}{2\sqrt{b}\,c}\left(\frac{\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a-i\sqrt{a}\,\sqrt{b}}}\right)}{\sqrt{a-i\sqrt{a}\,\sqrt{b}}}-\frac{\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+i\sqrt{b}\,\sqrt{a}}}\right)}{\sqrt{a+i\sqrt{b}\,\sqrt{a}}}\right)$$

Involving $\cosh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.2288.01

$$\int \frac{\cosh(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == \frac{1}{4\,a^{3/2}\,b\,(a+b)^{3/2}}$$
$$\left(-\frac{1}{2\,c+d}\left(e^{(2\,c+d)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.$$
$$(2\,a+b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d}{2\,c}+1,\,2;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d}{2\,c}+1,\,2;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)-$$
$$\frac{1}{2\,c-d}\left(e^{(2\,c-d)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.$$
$$(2\,a+b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{d}{2\,c},\,2;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{d}{2\,c},\,2;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\cosh^m(c\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.2289.01

$$\int \frac{\cosh^m(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^n}\,dz ==$$
$$\frac{\cosh^{m+1}(c\,z)\,a^{-n}\,\text{csch}(c\,z)\sqrt{-\sinh^2(c\,z)}}{c\,(m+1)}\,F_1\left(\frac{m+1}{2};\,\frac{1}{2},\,n;\,\frac{m+3}{2};\,\cosh^2(c\,z),\,-\frac{b\cosh^2(c\,z)}{a}\right)\,/;\,\nu\in\mathbb{N}^+$$

01.20.21.2290.01

$$\int \frac{\cosh^2(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == \frac{1}{2\,c}\left(\frac{\tanh^{-1}\left(\frac{\sqrt{a}\,\tanh(c\,z)}{\sqrt{a+b}}\right)}{\sqrt{a}\,(a+b)^{3/2}}+\frac{\sinh(2\,c\,z)}{(a+b)\,(2\,a+b+b\cosh(2\,c\,z))}\right)$$

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.2291.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{a+b\cosh(c\,z)}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\,(c-d-e)}\left(e^{(c-d-e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d-e)}\left(e^{(c+d-e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d+e)}\left(e^{(c-d+e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d+e)}\left(e^{(c+d+e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.2292.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-e)}\left(e^{(c-d-e)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-e}{c},\,2;\right.\right.$$
$$\left.\left.\left.\frac{-d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-d-e}{c},\,2;\,\frac{-d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\right.$$

$$\left({}_2F_1\left(\frac{c-d-e}{c},\,2;\,\frac{-d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(\frac{c-d-e}{c},\,2;\,\frac{-d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-e)}\left(e^{(c+d-e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\;\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-e}{c},\,2;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c+d-e}{c},\,2;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d-e}{c},\,2;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{c+d-e}{c},\,2;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+e)}\left(e^{(c-d+e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\;\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+e)}\left(e^{(c+d+e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\;\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+e}{c},\,2;\,\frac{d+e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c+d+e}{c},\,2;\,\frac{d+e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\sqrt{a^2-b^2}$$
$$\left({}_2F_1\left(\frac{c+d+e}{c},\,2;\,\frac{d+e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(\frac{c+d+e}{c},\,2;\,\frac{d+e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.2293.01

$$\int\frac{\cosh(e\,z)\cosh(d\,z)}{b\cosh^2(c\,z)+a}\,dz==$$
$$\frac{1}{4}\left(-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d-e)}\left(e^{(2\,c-d-e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,\,1;\,\frac{-d-e}{2\,c}+2;\right.\right.\right.\right.$$
$$\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right)$$
$${}_2F_1\left(\frac{-d-e}{2\,c}+1,\,1;\,\frac{-d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\Bigg)\Bigg)-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d-e)}$$
$$\left(e^{(2\,c+d-e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{d-e}{2\,c}+1,\,1;\,\frac{d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{d-e}{2\,c}+1,\,1;\,\frac{d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\Bigg)\Bigg)-$$
$$\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d+e)}\left(e^{(2\,c-d+e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right)\right.\right.$$
$${}_2F_1\left(\frac{e-d}{2\,c}+1,\,1;\,\frac{e-d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right)$$
$${}_2F_1\left(\frac{e-d}{2\,c}+1,\,1;\,\frac{e-d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\Bigg)\Bigg)-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d+e)}$$
$$\left(e^{(2\,c+d+e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{d+e}{2\,c}+1,\,1;\,\frac{d+e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{d+e}{2\,c}+1,\,1;\,\frac{d+e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\Bigg)$$

Involving $\cosh(e\,z)\cosh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.2294.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == \frac{1}{4}\left(-\frac{1}{2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-d-e)}\right.$$
$$\left(e^{(2\,c-d-e)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,\,1;\,\frac{-d-e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,\,1;\,\frac{-d-e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,\,2;\,\frac{-d-e}{2\,c}+2;\right.\right.$$
$$\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{-d-e}{2\,c}+1,\,2;\,\frac{-d-e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)-\frac{1}{2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c+d-e)}$$
$$\left(e^{(2\,c+d-e)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-e}{2\,c}+1,\,1;\,\frac{d-e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-e}{2\,c}+1,\,1;\,\frac{d-e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d-e}{2\,c}+1,\,2;\,\frac{d-e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{d-e}{2\,c}+1,\,2;\,\frac{d-e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)-\frac{1}{2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-d+e)}$$
$$\left(e^{(2\,c-d+e)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-d}{2\,c}+1,\,1;\,\frac{e-d}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-d}{2\,c}+1,\,1;\,\frac{e-d}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e-d}{2\,c}+1,\,2;\,\frac{e-d}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{e-d}{2\,c}+1,\,2;\,\frac{e-d}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)-\frac{1}{2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c+d+e)}$$
$$\left(e^{(2\,c+d+e)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+e}{2\,c}+1,\,1;\,\frac{d+e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+e}{2\,c}+1,\,1;\,\frac{d+e}{2\,c}+2;-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$

$$\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\;a-2\,b\,\sqrt{a}\;+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d+e}{2\,c}+1,\,2;\,\frac{d+e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.$$
$$\left(2\,a^{3/2}+2\,\sqrt{a+b}\;a+2\,b\,\sqrt{a}\;+b\,\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{d+e}{2\,c}+1,\,2;\,\frac{d+e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\Bigg)\Bigg)$$

Involving algebraic functions of the direct function

Involving $(a + b\cosh(c\,z))^{\beta}$

01.20.21.2295.01

$$\int(a+b\cosh(c\,z))^{\beta}\,dz==$$
$$\frac{(a+b\cosh(c\,z))^{\beta+1}\operatorname{csch}(c\,z)}{b\,c\,(\beta+1)}F_1\left(\beta+1;\,\frac{1}{2},\,\frac{1}{2};\,\beta+2;\,\frac{a+b\cosh(c\,z)}{a+b},\,\frac{a+b\cosh(c\,z)}{a-b}\right)\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\;\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}$$

01.20.21.2296.01

$$\int(a+a\cosh(c\,z))^{\beta}\,dz==-\frac{(a\,(\cosh(c\,z)+1))^{\beta}\sinh(c\,z)}{(2\,\beta\,c+c)\sqrt{-\sinh^2\left(\frac{c\,z}{2}\right)}}\,{}_2F_1\left(\beta+\frac{1}{2},\,\frac{1}{2};\,\beta+\frac{3}{2};\,\cosh^2\left(\frac{c\,z}{2}\right)\right)$$

01.20.21.2297.01

$$\int(a-a\cosh(c\,z))^{\beta}\,dz==-\frac{(a-a\cosh(c\,z))^{\beta}\sinh(c\,z)}{c}\,{}_2F_1\left(\frac{1}{2},\,\frac{1}{2}-\beta;\,\frac{3}{2};\,\cosh^2\left(\frac{c\,z}{2}\right)\right)\left(-\sinh^2\left(\frac{c\,z}{2}\right)\right)^{-\beta-\frac{1}{2}}$$

01.20.21.2298.01

$$\int(a+b\cosh(c\,z))^{5/2}\,dz==\frac{1}{30\,c\,\sqrt{a+b\cosh(c\,z)}}\left(-4\,i\left(23\,a^3+23\,b\,a^2+9\,b^2\,a+9\,b^3\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$
$$\left.32\,i\,a\left(a^2-b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,b\left(22\,a^2+28\,b\cosh(c\,z)\,a+3\,b^2+3\,b^2\cosh(2\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.2299.01

$$\int(a+b\cosh(c\,z))^{3/2}\,dz==\frac{1}{3\,c\,\sqrt{a+b\cosh(c\,z)}}\left(-8\,i\,a\,(a+b)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$
$$\left.2\,i\left(a^2-b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,b\,(a+b\cosh(c\,z))\sinh(c\,z)\right)$$

01.20.21.2300.01

$$\int \sqrt{a+b\cosh(c\,z)}\;dz == -\frac{2\,i\,\sqrt{a+b\cosh(c\,z)}\;E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)}{c\,\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}}$$

01.20.21.2301.01

$$\int \sqrt{\cosh(c\,z)\,a+a}\;dz == \frac{2\,\sqrt{a\,(\cosh(c\,z)+1)}\;\tanh\left(\frac{c\,z}{2}\right)}{c}$$

01.20.21.2302.01

$$\int \sqrt{a-a\cosh(c\,z)}\;dz == \frac{2\,\sqrt{a-a\cosh(c\,z)}\;\coth\left(\frac{c\,z}{2}\right)}{c}$$

01.20.21.2303.01

$$\int \frac{1}{\sqrt{a+b\cosh(c\,z)}}\,dz == -\frac{2\,i}{c\,\sqrt{a+b\cosh(c\,z)}}\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)$$

01.20.21.2304.01

$$\int \frac{1}{\sqrt{\cosh(c\,z)\,a+a}}\,dz == \frac{4\tan^{-1}\left(\tanh\left(\frac{c\,z}{4}\right)\right)\cosh\left(\frac{c\,z}{2}\right)}{c\,\sqrt{a\,(\cosh(c\,z)+1)}}$$

01.20.21.2305.01

$$\int \frac{1}{\sqrt{a-a\cosh(c\,z)}}\,dz == \frac{2\,\sinh\left(\frac{c\,z}{2}\right)}{c\,\sqrt{a-a\cosh(c\,z)}}\left(\log\left(\sinh\left(\frac{c\,z}{4}\right)\right)-\log\left(\cosh\left(\frac{c\,z}{4}\right)\right)\right)$$

01.20.21.2306.01

$$\int \frac{1}{(a+b\cosh(c\,z))^{3/2}}\,dz == -\frac{2\left(i\,(a+b)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+b\sinh(c\,z)\right)}{(a-b)\,(a+b)\,c\,\sqrt{a+b\cosh(c\,z)}}$$

01.20.21.2307.01

$$\int \frac{1}{(\cosh(c\,z)\,a+a)^{3/2}}\,dz == \frac{\cosh\left(\frac{c\,z}{2}\right)\left(2\tan^{-1}\left(\tanh\left(\frac{c\,z}{4}\right)\right)\cosh^2\left(\frac{c\,z}{2}\right)+\sinh\left(\frac{c\,z}{2}\right)\right)}{c\,(a\,(\cosh(c\,z)+1))^{3/2}}$$

01.20.21.2308.01

$$\int \frac{1}{(a-a\cosh(c\,z))^{3/2}}\,dz == \frac{\coth\left(\frac{c\,z}{2}\right)+\left(\log\left(\sinh\left(\frac{c\,z}{4}\right)\right)-\log\left(\cosh\left(\frac{c\,z}{4}\right)\right)\right)\sinh\left(\frac{c\,z}{2}\right)}{2\,a\,c\,\sqrt{a-a\cosh(c\,z)}}$$

01.20.21.2309.01

$$\int \frac{1}{(a+b\cosh(c\,z))^{5/2}}\,dz ==$$

$$-\left(2\left(4\,i\,a\left(\frac{a+b\cosh(c\,z)}{a+b}\right)^{3/2}E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)(a+b)^2-i\,(a-b)\left(\frac{a+b\cosh(c\,z)}{a+b}\right)^{3/2}F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)(a+b)^2+\right.\right.$$

$$\left.\left.b\left(5\,a^2+4\,b\cosh(c\,z)\,a-b^2\right)\sinh(c\,z)\right)\right)\Big/\left(3\,(a-b)^2\,(a+b)^2\,c\,(a+b\cosh(c\,z))^{3/2}\right)$$

Involving $((a + b\cosh(c\,z))^{\nu})^{\beta}$

01.20.21.2310.01

$$\int \left((a + b\cosh(c\,z))^{\nu}\right)^{\beta} dz == \frac{1}{b\,c\,(\beta\,\nu + 1)}\left(F_1\left(\beta\,\nu + 1;\ \frac{1}{2},\ \frac{1}{2};\ \beta\,\nu + 2;\ \frac{a + b\cosh(c\,z)}{a + b},\ \frac{a + b\cosh(c\,z)}{a - b}\right)\right.$$
$$\left.\sqrt{\frac{b\,(\cosh(c\,z) + 1)}{b - a}}\ \sqrt{\frac{b - b\cosh(c\,z)}{a + b}}\ (a + b\cosh(c\,z))\left((a + b\cosh(c\,z))^{\nu}\right)^{\beta}\operatorname{csch}(c\,z)\right)$$

01.20.21.2311.01

$$\int \sqrt{(a + b\cosh(c\,z))^5}\ dz == \frac{\sqrt{(a + b\cosh(c\,z))^5}}{30\,c\,(a + b\cosh(c\,z))^3}\left(-4\sqrt{\frac{a + b\cosh(c\,z)}{a + b}}\ \left(23\,a^3 + 23\,b\,a^2 + 9\,b^2\,a + 9\,b^3\right) i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a + b}\right) + \right.$$
$$\left.32\,a\sqrt{\frac{a + b\cosh(c\,z)}{a + b}}\ \left(a^2 - b^2\right) i\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a + b}\right) + 2\,b\left(22\,a^2 + 28\,b\cosh(c\,z)\,a + 3\,b^2 + 3\,b^2\cosh(2\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.2312.01

$$\int \sqrt{(a + b\cosh(c\,z))^3}\ dz == \frac{\sqrt{(a + b\cosh(c\,z))^3}}{3\,c\,(a + b\cosh(c\,z))^2}\left(-8\,a\sqrt{\frac{a + b\cosh(c\,z)}{a + b}}\ (a + b)\,i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a + b}\right) + \right.$$
$$\left.2\sqrt{\frac{a + b\cosh(c\,z)}{a + b}}\ \left(a^2 - b^2\right) i\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a + b}\right) + 2\,b\,(a + b\cosh(c\,z))\sinh(c\,z)\right)$$

01.20.21.2313.01

$$\int \frac{1}{\sqrt{(a + b\cosh(c\,z))^3}}\ dz == -\frac{2\,i\,(a + b\cosh(c\,z))}{(a - b)\,(a + b)\,c\sqrt{(a + b\cosh(c\,z))^3}}\left((a + b)\sqrt{\frac{a + b\cosh(c\,z)}{a + b}}\ E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a + b}\right) - i\,b\sinh(c\,z)\right)$$

01.20.21.2314.01

$$\int \frac{1}{\sqrt{(a + b\cosh(c\,z))^5}}\ dz == \frac{1}{3\,c\sqrt{(a + b\cosh(c\,z))^5}}\left(\frac{2\,b\,(a + b\cosh(c\,z))\left(-5\,a^2 - 4\,b\cosh(c\,z)\,a + b^2\right)\sinh(c\,z)}{\left(a^2 - b^2\right)^2} - \right.$$
$$\left.\frac{2\,i\,(a + b)}{(a - b)^2}\left(\frac{a + b\cosh(c\,z)}{a + b}\right)^{5/2}\left(4\,a\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a + b}\right) + (b - a)\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a + b}\right)\right)\right)$$

Involving $(a + b\cosh(c\,z))^{\beta}\cosh(c\,z)$

01.20.21.2315.01

$$\int (a+b\cosh(c\,z))^{\beta}\cosh(d\,z)\,dz ==$$

$$\frac{1}{2\,(d-c\,\beta)\,(d+c\,\beta)}\left(e^{-d\,z}\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left((c\,\beta-d)\,F_1\left(-\frac{d+c\,\beta}{c};-\beta,-\beta;-\frac{d}{c}-\beta+1;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.e^{2\,d\,z}\,(d+c\,\beta)\,F_1\left(\frac{d}{c}-\beta;-\beta,-\beta;\frac{d}{c}-\beta+1;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)\right)\right)$$

01.20.21.2316.01

$$\int (a+b\cosh(c\,z))^{\beta}\cosh(c\,z)\,dz == \frac{1}{b^2\,c\,(\beta+1)\,(\beta+2)}\left(\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\,\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\right.$$

$$(a+b\cosh(c\,z))^{\beta+1}\left((\beta+1)\,F_1\left(\beta+2;\frac{1}{2},\frac{1}{2};\beta+3;\frac{a+b\cosh(c\,z)}{a+b},\frac{a+b\cosh(c\,z)}{a-b}\right)(a+b\cosh(c\,z))-\right.$$

$$\left.\left.a\,(\beta+2)\,F_1\left(\beta+1;\frac{1}{2},\frac{1}{2};\beta+2;\frac{a+b\cosh(c\,z)}{a+b},\frac{a+b\cosh(c\,z)}{a-b}\right)\right)\operatorname{csch}(c\,z)\right)$$

01.20.21.2317.01

$$\int (a+a\cosh(c\,z))^{\beta}\cosh(c\,z)\,dz ==$$

$$-\frac{1}{c\,(\beta-1)\,(\beta+1)}\left(2^{-2\,\beta-1}\,e^{-c\,z}\,(1+e^{c\,z})^{-2\,\beta}\left(e^{-\frac{c\,z}{2}}\,(1+e^{c\,z})\right)^{2\,\beta}\cosh^{-2\,\beta}\left(\frac{c\,z}{2}\right)(a\,(\cosh(c\,z)+1))^{\beta}\right.$$

$$\left.\left((\beta-1)\,{}_2F_1(-\beta-1,-2\,\beta;-\beta;-e^{c\,z})+e^{2\,c\,z}\,(\beta+1)\,{}_2F_1(1-\beta,-2\,\beta;2-\beta;-e^{c\,z})\right)\right)$$

01.20.21.2318.01

$$\int (a-a\cosh(c\,z))^{\beta}\cosh(c\,z)\,dz == -\frac{1}{c\,(\beta-1)\,(\beta+1)}\left(2^{-2\,\beta-1}\,e^{-c\,z}\,(1-e^{c\,z})^{-2\,\beta}\left(e^{-\frac{c\,z}{2}}\,(-1+e^{c\,z})\right)^{2\,\beta}(a-a\cosh(c\,z))^{\beta}\right.$$

$$\left.\left((\beta-1)\,{}_2F_1(-\beta-1,-2\,\beta;-\beta;e^{c\,z})+e^{2\,c\,z}\,(\beta+1)\,{}_2F_1(1-\beta,-2\,\beta;2-\beta;e^{c\,z})\right)\sinh^{-2\,\beta}\left(\frac{c\,z}{2}\right)\right)$$

01.20.21.2319.01

$$\int \sqrt{a+b\cosh(c\,z)}\,\cosh(c\,z)\,dz == \frac{1}{3\,b\,c\,\sqrt{a+b\cosh(c\,z)}}\left(-2\,a\,\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,(a+b)\,i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.2\,\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\left(a^2-b^2\right)i\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,b\,(a+b\cosh(c\,z))\sinh(c\,z)\right)$$

01.20.21.2320.01

$$\int \sqrt{\cosh(c\,z)\,a + a}\,\cosh(c\,z)\,dz == \frac{\sqrt{a\,(\cosh(c\,z)+1)}\,\operatorname{sech}\left(\frac{c\,z}{2}\right)\left(3\sinh\left(\frac{c\,z}{2}\right)+\sinh\left(\frac{3\,c\,z}{2}\right)\right)}{3\,c}$$

01.20.21.2321.01

$$\int \sqrt{a - a\cosh(c\,z)}\,\cosh(c\,z)\,dz == \frac{\sqrt{a - a\cosh(c\,z)}\,\left(\cosh\left(\frac{3\,c\,z}{2}\right)-3\cosh\left(\frac{c\,z}{2}\right)\right)\operatorname{csch}\left(\frac{c\,z}{2}\right)}{3\,c}$$

01.20.21.2322.01

$$\int \frac{\cosh(c\,z)}{\sqrt{a + b\cosh(c\,z)}}\,dz == -\frac{2\,i\,\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\left((a+b)\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)-a\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\right)}{b\,c\,\sqrt{a + b\cosh(c\,z)}}$$

01.20.21.2323.01

$$\int \frac{\cosh(c\,z)}{\sqrt{\cosh(c\,z)\,a + a}}\,dz == \frac{4\cosh\left(\frac{c\,z}{2}\right)\left(\sinh\left(\frac{c\,z}{2}\right)-\tan^{-1}\left(\tanh\left(\frac{c\,z}{4}\right)\right)\right)}{c\,\sqrt{a\,(\cosh(c\,z)+1)}}$$

01.20.21.2324.01

$$\int \frac{\cosh(c\,z)}{\sqrt{a - a\cosh(c\,z)}}\,dz == \frac{2\,\sinh\left(\frac{c\,z}{2}\right)}{c\,\sqrt{a - a\cosh(c\,z)}}\left(2\cosh\left(\frac{c\,z}{2}\right)-\log\left(\cosh\left(\frac{c\,z}{4}\right)\right)+\log\left(\sinh\left(\frac{c\,z}{4}\right)\right)\right)$$

01.20.21.2325.01

$$\int \frac{\cosh(c\,z)}{(a + b\cosh(c\,z))^{3/2}}\,dz == \left(2\,a\,\sqrt{\frac{a + b\cosh(c\,z)}{a+b}}\,(a+b)\,i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)-2\,i\,\left(a^2-b^2\right)\sqrt{\frac{a + b\cosh(c\,z)}{a+b}}\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,a\,b\sinh(c\,z)\right)\Big/\left((a-b)\,b\,(a+b)\,c\,\sqrt{a + b\cosh(c\,z)}\right)$$

01.20.21.2326.01

$$\int \frac{\cosh(c\,z)}{(a + b\cosh(c\,z))^{5/2}}\,dz == \frac{2}{3\,c\,(a + b\cosh(c\,z))^{3/2}}\left(\frac{i}{(a-b)^2\,b}\left(\frac{a + b\cosh(c\,z)}{a+b}\right)^{3/2}\left(\left(a^2+3\,b^2\right)E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+a\,(b-a)\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\right)+\frac{\left(2\,a\left(a^2+b^2\right)+b\left(a^2+3\,b^2\right)\cosh(c\,z)\right)\sinh(c\,z)}{\left(a^2-b^2\right)^2}\right)$$

Involving $((a + b\cosh(c\,z))^{\nu})^{\beta}\cosh(d\,z)$

01.20.21.2327.01

$$\int \left((a+b\cosh(c\,z))^{\nu}\right)^{\beta}\cosh(d\,z)\,dz ==$$

$$\frac{1}{2\,(d-c\,\beta\,\nu)\,(d+c\,\beta\,\nu)}\left(e^{-d\,z}\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta\,\nu}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta\,\nu}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta\,\nu}\right.$$

$$\left((c\,\beta\,\nu-d)\,F_1\left(-\frac{d+c\,\beta\,\nu}{c};\,-\beta\,\nu,\,-\beta\,\nu;\,-\frac{d}{c}-\beta\,\nu+1;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+e^{2\,d\,z}\,(d+c\,\beta\,\nu)\right.$$

$$\left.\left.F_1\left(\frac{d}{c}-\beta\,\nu;\,-\beta\,\nu,\,-\beta\,\nu;\,\frac{d}{c}-\beta\,\nu+1;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)\right)(a+b\cosh(c\,z))^{-\beta\,\nu}\left((a+b\cosh(c\,z))^{\nu}\right)^{\beta}\right)$$

01.20.21.2328.01

$$\int\sqrt{(a+b\cosh(c\,z))^5}\,\cosh(c\,z)\,dz == \frac{\sqrt{(a+b\cosh(c\,z))^5}}{84\,b\,c\,(a+b\cosh(c\,z))^3}$$

$$\left(-8\,a\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\left(3\,a^3+3\,b\,a^2+29\,b^2\,a+29\,b^3\right)i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+8\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\left(3\,a^4+2\,b^2\,a^2-5\,b^4\right)i\right.$$

$$\left.F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,b\left(36\,a^3+44\,b^2\,a+24\,b^2\cosh(2\,c\,z)\,a+b\left(72\,a^2+29\,b^2\right)\cosh(c\,z)+3\,b^3\cosh(3\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.2329.01

$$\int\sqrt{(a+b\cosh(c\,z))^3}\,\cosh(c\,z)\,dz ==$$

$$\frac{\sqrt{(a+b\cosh(c\,z))^3}}{10\,b\,c\,(a+b\cosh(c\,z))^2}\left(-4\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\left(a^3+b\,a^2+3\,b^2\,a+3\,b^3\right)i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.4\,a\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\left(a^2-b^2\right)i\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,b\left(4\,a^2+6\,b\cosh(c\,z)\,a+b^2+b^2\cosh(2\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.2330.01

$$\int\frac{\cosh(c\,z)}{\sqrt{(a+b\cosh(c\,z))^3}}\,dz ==$$

$$\left(2\,(a+b\cosh(c\,z))\left(a\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,(a+b)\,i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)-i\left(a^2-b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+\right.\right.$$

$$\left.\left.a\,b\sinh(c\,z)\right)\right)\Big/\left(b\left(a^2-b^2\right)c\sqrt{(a+b\cosh(c\,z))^3}\right)$$

01.20.21.2331.01

$$\int \frac{\cosh(c\,z)}{\sqrt{(\cosh(c\,z)\,a+a)^3}}\,dz == \frac{6\tan^{-1}\left(\tanh\left(\frac{c\,z}{4}\right)\right)\cosh^3\left(\frac{c\,z}{2}\right)-\frac{1}{2}\sinh(c\,z)}{c\sqrt{(\cosh(c\,z)\,a+a)^3}}$$

01.20.21.2332.01

$$\int \frac{\cosh(c\,z)}{\sqrt{(a-a\cosh(c\,z))^3}}\,dz == -\left(\sinh\left(\frac{c\,z}{2}\right)\left(3\left(\log\left(\cosh\left(\frac{c\,z}{4}\right)\right)-\log\left(\sinh\left(\frac{c\,z}{4}\right)\right)\right)\sinh^2\left(\frac{c\,z}{2}\right)+\cosh\left(\frac{c\,z}{2}\right)\right)\right)\Big/\left(c\sqrt{(a-a\cosh(c\,z))^3}\right)$$

01.20.21.2333.01

$$\int \frac{\cosh(c\,z)}{\sqrt{(a+b\cosh(c\,z))^5}}\,dz == \frac{1}{3c\sqrt{(a+b\cosh(c\,z))^5}}\left(\frac{2i(a+b)}{(a-b)^2 b}\left(\frac{a+b\cosh(c\,z)}{a+b}\right)^{5/2}\left(\left(a^2+3b^2\right)E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2b}{a+b}\right)+a(b-a)F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2b}{a+b}\right)\right)+\frac{1}{\left(a^2-b^2\right)^2}\left(2(a+b\cosh(c\,z))\left(2a\left(a^2+b^2\right)+b\left(a^2+3b^2\right)\cosh(c\,z)\right)\sinh(c\,z)\right)\right)$$

Involving $(a+b\cosh(c\,z))^{\beta}\cosh^{\gamma}(c\,z)$

01.20.21.2334.01

$$\int \frac{\cosh^2(c\,z)}{\sqrt{a+b\cosh(c\,z)}}\,dz == \frac{1}{3b^2c\sqrt{a+b\cosh(c\,z)}}\left(4a\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,(a+b)\,i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2b}{a+b}\right)-2i\left(2a^2+b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2b}{a+b}\right)+2b(a+b\cosh(c\,z))\sinh(c\,z)\right)$$

01.20.21.2335.01

$$\int \frac{\cosh^{\frac{1}{2}}(c\,z)}{a+b\cosh(c\,z)}\,dz == -\frac{i}{bc}\left(2F\left(\frac{i\,c\,z}{2}\,\middle|\,2\right)-\frac{2a}{a+b}\Pi\left(\frac{2b}{a+b};\,\frac{i\,c\,z}{2}\,\middle|\,2\right)\right)$$

Involving $(a+b\cosh(c\,z))^{\beta}$ and rational function of $\cosh(c\,z)$

01.20.21.2336.01

$$\int \frac{\sqrt{a+b\cosh(c\,z)}}{d+e\cosh(c\,z)}\,dz == -\left(2i\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\left(b(d+e)F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2b}{a+b}\right)+(ae-bd)\Pi\left(\frac{2e}{d+e};\,\frac{i\,c\,z}{2}\,\middle|\,\frac{2b}{a+b}\right)\right)\right)\Big/\left(ce(d+e)\sqrt{a+b\cosh(c\,z)}\right)$$

01.20.21.2337.01

$$\int \frac{\sqrt{a+b\cosh(c\,z)}}{\cosh(c\,z)+1}\,dz ==$$

$$\left(\cosh\left(\frac{c\,z}{2}\right)\left(2\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;(a+b)\,i\cosh\left(\frac{c\,z}{2}\right)E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)-2\,i\,(a+b)\cosh\left(\frac{c\,z}{2}\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\right.\right.$$

$$\left.\left.F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,(a+b\cosh(c\,z))\sinh\left(\frac{c\,z}{2}\right)\right)\right)\Big/\left(c\,(\cosh(c\,z)+1)\sqrt{a+b\cosh(c\,z)}\right)$$

01.20.21.2338.01

$$\int \frac{\sqrt{a+b\cosh(c\,z)}}{1-\cosh(c\,z)}\,dz == \frac{1}{c\sqrt{a+b\cosh(c\,z)}}$$

$$\left((a+b\cosh(c\,z))\coth\left(\frac{c\,z}{2}\right)+\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;(a+b)\,i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)-i\,(a-b)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\right)$$

01.20.21.2339.01

$$\int \frac{\sqrt{a+b\cosh(c\,z)}}{(d+e\cosh(c\,z))^2}\,dz == \frac{1}{b\,c\left(d^2-e^2\right)}\left(\left(i\sqrt{-\frac{1}{a+b}}\;\left(b^2-a^2\right)\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\;\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\;\operatorname{csch}(c\,z)\right)\right.$$

$$\left.E\left(i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\cosh(c\,z)}\right)\,\middle|\,\frac{a+b}{a-b}\right)\right)-$$

$$\frac{\left(i\sqrt{\frac{-\cosh(c\,z)\,b-b}{a-b}}\;\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\;\operatorname{csch}(c\,z)\right)F\left(i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\cosh(c\,z)}\right)\,\middle|\,\frac{a+b}{a-b}\right)}{\sqrt{-\frac{1}{a+b}}\;c\,e\,(d+e)}-$$

$$\frac{\left(i\,(4\,a\,d-b\,e)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\right)\Pi\left(\frac{2\,e}{d+e};\,\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)}{2\,c\,(d-e)\,(d+e)^2\sqrt{a+b\cosh(c\,z)}}-\left(\left(i\,b\left(2\,d^2+e^2\right)\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\;\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\;\operatorname{csch}(c\,z)\right)\right.$$

$$\left.\Pi\left(\frac{(a+b)\,e}{a\,e-b\,d};\,i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\cosh(c\,z)}\right)\,\middle|\,\frac{a+b}{a-b}\right)\right)\Big/$$

$$\left(2\sqrt{-\frac{1}{a+b}}\;c\,e\,(b\,d-a\,e)\left(e^2-d^2\right)\right)-\frac{e\sqrt{a+b\cosh(c\,z)}\;\sinh(c\,z)}{c\,(d-e)\,(d+e)\,(d+e\cosh(c\,z))}$$

01.20.21.2340.01

$$\int \frac{A+B\cosh(c\,z)}{\sqrt{a+b\cosh(c\,z)}}\,dz == -\frac{2\,i\,\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\left((a+b)\,B\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+(A\,b-a\,B)\,F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\right)}{b\,c\,\sqrt{a+b\cosh(c\,z)}}$$

01.20.21.2341.01

$$\int \frac{1}{(d+e\cosh(c\,z))\,\sqrt{a+b\cosh(c\,z)}}\,dz == -\frac{2\,i\,\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,\Pi\left(\frac{2\,e}{d+e};\,\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)}{c\,(d+e)\,\sqrt{a+b\cosh(c\,z)}}$$

01.20.21.2342.01

$$\int \frac{1}{(\cosh(c\,z)+1)\,\sqrt{a+b\cosh(c\,z)}}\,dz == \left(\cosh\left(\frac{c\,z}{2}\right)\left(2\,i\,(a+b)\cosh\left(\frac{c\,z}{2}\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)-2\,i\,(a-b)\cosh\left(\frac{c\,z}{2}\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)+2\,(a+b\cosh(c\,z))\sinh\left(\frac{c\,z}{2}\right)\right)\right)\Big/\left((a-b)\,c\,(\cosh(c\,z)+1)\,\sqrt{a+b\cosh(c\,z)}\right)$$

01.20.21.2343.01

$$\int \frac{1}{(1-\cosh(c\,z))\,\sqrt{a+b\cosh(c\,z)}}\,dz == \left((a+b\cosh(c\,z))\coth\left(\frac{c\,z}{2}\right)+\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;(a+b)\,i\,E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)-i\,(a+b)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\right)\Big/\left((a+b)\,c\,\sqrt{a+b\cosh(c\,z)}\right)$$

01.20.21.2344.01

$$\int \frac{1}{(d+e\cosh(c\,z))^2\sqrt{a+b\cosh(c\,z)}}\,dz == \frac{\sqrt{a+b\cosh(c\,z)}\,\sinh(c\,z)\,e^2}{c\,(d-e)\,(d+e)\,(b\,d-a\,e)\,(d+e\cosh(c\,z))} +$$

$$\frac{1}{b\,c\,(b\,d-a\,e)\left(e^2-d^2\right)}\left(\left(i\sqrt{-\frac{1}{a+b}}\,\left(b^2-a^2\right)e\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\,\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\,\operatorname{csch}(c\,z)\right)\right.$$

$$\left.E\left(i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\cosh(c\,z)}\right)\middle|\,\frac{a+b}{a-b}\right)\right) -$$

$$\frac{\left(i\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\,\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\,\operatorname{csch}(c\,z)\right)F\left(i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\cosh(c\,z)}\right)\middle|\,\frac{a+b}{a-b}\right)}{\sqrt{-\frac{1}{a+b}}\,c\,(d+e)\,(a\,e-b\,d)} -$$

$$\frac{\left(i\left(-4\,b\,d^2+4\,a\,e\,d+3\,b\,e^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\right)\Pi\left(\frac{2\,e}{d+e};\,\frac{i\,c\,z}{2}\middle|\,\frac{2\,b}{a+b}\right)}{2\,c\,(d-e)\,(d+e)^2\,(a\,e-b\,d)\sqrt{a+b\cosh(c\,z)}} -$$

$$\left(\left(i\,b\left(2\,d^2+e^2\right)\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\,\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\,\operatorname{csch}(c\,z)\right)\right.$$

$$\left.\Pi\left(\frac{(a+b)\,e}{a\,e-b\,d};\,i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\,\sqrt{a+b\cosh(c\,z)}\right)\middle|\,\frac{a+b}{a-b}\right)\right)\Big/\left(2\sqrt{-\frac{1}{a+b}}\,c\,(b\,d-a\,e)^2\left(d^2-e^2\right)\right)$$

01.20.21.2345.01

$$\int \frac{1}{(\cosh(c\,z)+1)^2\sqrt{a+b\cosh(c\,z)}}\,dz ==$$

$$\left(2\cosh\left(\frac{c\,z}{2}\right)\left(2\,i\left(a^2-2\,b\,a-3\,b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\,E\left(\frac{i\,c\,z}{2}\middle|\,\frac{2\,b}{a+b}\right)\cosh^3\left(\frac{c\,z}{2}\right)-2\,i\left(a^2-3\,b\,a+2\,b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\right.\right.$$

$$\left.F\left(\frac{i\,c\,z}{2}\middle|\,\frac{2\,b}{a+b}\right)\cosh^3\left(\frac{c\,z}{2}\right)+\frac{1}{2}\left(4\,a^2-7\,b\,a-3\,b^2+2\left(a^2-b\,a-4\,b^2\right)\cosh(c\,z)+(a-3\,b)\,b\cosh(2\,c\,z)\right)\right.$$

$$\left.\left.\sinh\left(\frac{c\,z}{2}\right)\right)\right)\Big/\left(3\,(a-b)^2\,c\,(\cosh(c\,z)+1)^2\sqrt{a+b\cosh(c\,z)}\right)$$

01.20.21.2346.01

$$\int \frac{1}{(\cosh(c\,z)-1)^2\,\sqrt{a+b\cosh(c\,z)}}\,dz ==$$

$$\left(2\sinh\left(\frac{c\,z}{2}\right)\left(2\,i\left(a^2+4\,b\,a+3\,b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;E\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\sinh^3\left(\frac{c\,z}{2}\right)-2\,i\right.\right.$$

$$\left(a^2+3\,b\,a+2\,b^2\right)\sqrt{\frac{a+b\cosh(c\,z)}{a+b}}\;F\left(\frac{i\,c\,z}{2}\,\middle|\,\frac{2\,b}{a+b}\right)\sinh^3\left(\frac{c\,z}{2}\right)+$$

$$\left.\left.\frac{1}{2}\cosh\left(\frac{c\,z}{2}\right)\left(-4\,a^2-7\,b\,a+3\,b^2+2\left(a^2+b\,a-4\,b^2\right)\cosh(c\,z)+b\,(a+3\,b)\cosh(2\,c\,z)\right)\right)\right/$$

$$\left(3\,(a+b)^2\,c\,(\cosh(c\,z)-1)^2\,\sqrt{a+b\cosh(c\,z)}\right)$$

01.20.21.2347.01

$$\int \frac{\cosh(c\,z)}{(d+e\cosh(c\,z))\,\sqrt{a+b\cosh(c\,z)}}\,dz ==$$

$$\left(2\,i\,\sqrt{\frac{b-b\cosh(c\,z)}{a+b}}\left((a\,e-b\,d)\,F\left(i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\cosh(c\,z)}\right)\,\middle|\,\frac{a+b}{a-b}\right)+\right.\right.$$

$$\left.\left.b\,d\,\Pi\left(\frac{(a+b)\,e}{a\,e-b\,d};\,i\sinh^{-1}\left(\sqrt{-\frac{1}{a+b}}\;\sqrt{a+b\cosh(c\,z)}\right)\,\middle|\,\frac{a+b}{a-b}\right)\right)\sinh(c\,z)\right)\Big/$$

$$\left((a-b)\sqrt{-\frac{1}{a+b}}\;c\,e\,(a\,e-b\,d)\,(\cosh(c\,z)-1)\sqrt{\frac{b\,(\cosh(c\,z)+1)}{b-a}}\right)$$

01.20.21.2348.01

$$\int \frac{\cosh(c\,z)}{(d+e\cosh(2\,c\,z))\,\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{\sqrt{2}\;c\,\sqrt{d+e}\;\sqrt{b\,d-a\,e}}\tanh^{-1}\left(\frac{\sqrt{2\,b\,d-2\,a\,e}\;\sinh(c\,z)}{\sqrt{d+e}\;\sqrt{a+b\cosh(2\,c\,z)}}\right)$$

Involving $(a+b\cosh(2\,c\,z))^{\beta}\cosh(c\,z)$

01.20.21.2349.01

$$\int (a+b\cosh(2\,c\,z))^{5/2}\cosh(c\,z)\,dz == \frac{1}{32\,c}\left(\frac{5\sqrt{2}\;(a+b)^3}{\sqrt{b}}\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)+\right.$$

$$\left.\frac{2}{3}\sqrt{a+b\cosh(2\,c\,z)}\;\left(33\,a^2+40\,b\,a+19\,b^2+2\,b\,(13\,a+5\,b)\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.2350.01

$$\int (a+b\cosh(2\,c\,z))^{3/2}\cosh(c\,z)\,dz == \frac{1}{16\,c}\left(\frac{3\sqrt{2}\;(a+b)^2}{\sqrt{b}}\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)+2\sqrt{a+b\cosh(2\,c\,z)}\;(5\,a+3\,b+2\,b\cosh(2\,c\,z))\sinh(c\,z)\right)$$

01.20.21.2351.01

$$\int \sqrt{a+b\cosh(2\,c\,z)}\;\cosh(c\,z)\,dz == \frac{1}{4\sqrt{b}\;c}\left(\sqrt{2}\;(a+b)\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)+2\sqrt{b}\;\sqrt{a+b\cosh(2\,c\,z)}\;\sinh(c\,z)\right)$$

01.20.21.2352.01

$$\int \frac{\cosh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{\sqrt{2}\;\sqrt{b}\;c}\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)$$

01.20.21.2353.01

$$\int \frac{\cosh(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \frac{\sinh(c\,z)}{(a+b)\,c\sqrt{a+b\cosh(2\,c\,z)}}$$

01.20.21.2354.01

$$\int \frac{\cosh(c\,z)}{(a+b\cosh(2\,c\,z))^{5/2}}\,dz == \frac{(3\,a+b+2\,b\cosh(2\,c\,z))\sinh(c\,z)}{3\,(a+b)^2\,c\,(a+b\cosh(2\,c\,z))^{3/2}}$$

Involving $((a+b\cosh(2\,c\;z))^m)^{\pm\frac{1}{2}}\cosh(c\,z)$

01.20.21.2355.01

$$\int \sqrt{(a+b\cosh(2\,c\,z))^5}\;\cosh(c\,z)\,dz == \frac{\sqrt{(a+b\cosh(2\,c\,z))^5}}{32\,c}\left(\frac{5\sqrt{2}\;(a+b)^3}{\sqrt{b}\;(a+b\cosh(2\,c\,z))^{5/2}}\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)+\left(2\left(33\,a^2+40\,b\,a+19\,b^2+2\,b\,(13\,a+5\,b)\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)\Big/\left(3\,(a+b\cosh(2\,c\,z))^2\right)\right)$$

01.20.21.2356.01

$$\int \sqrt{(a+b\cosh(2\,c\,z))^3}\;\cosh(c\,z)\,dz == \left(\sqrt{(a+b\cosh(2\,c\,z))^3}\left(3\sqrt{2}\;\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)(a+b)^2+2\sqrt{b}\;\sqrt{a+b\cosh(2\,c\,z)}\;(5\,a+3\,b+2\,b\cosh(2\,c\,z))\sinh(c\,z)\right)\right)\Big/\left(16\sqrt{b}\;c\,(a+b\cosh(2\,c\,z))^{3/2}\right)$$

01.20.21.2357.01

$$\int \frac{\cosh(c\,z)}{\sqrt{(a+b\cosh(2\,c\,z))^3}}\,dz == \frac{(a+b\cosh(2\,c\,z))\sinh(c\,z)}{(a+b)\,c\sqrt{(a+b\cosh(2\,c\,z))^3}}$$

01.20.21.2358.01

$$\int \frac{\cosh(c\,z)}{\sqrt{(a+b\cosh(2\,c\,z))^5}}\,dz == \frac{(a+b\cosh(2\,c\,z))\,(3\,a+b+2\,b\cosh(2\,c\,z))\sinh(c\,z)}{3\,(a+b)^2\,c\sqrt{(a+b\cosh(2\,c\,z))^5}}$$

Involving $(a + b\cosh(2\,c\,z))^{\beta}\cosh^{\nu}(c\,z)$

01.20.21.2359.01

$$\int (a+b\cosh(2\,c\,z))^{3/2}\cosh^2(c\,z)\,dz == \left(-2\,i\left(3\,a^3+23\,b\,a^2+29\,b^2\,a+9\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$2\,i\left(3\,a^3+5\,b\,a^2-3\,b^2\,a-5\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+$$

$$\left.b\left(12\,a^2+10\,b\,a+3\,b^2+2\,b\,(9\,a+5\,b)\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(60\,b\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.2360.01

$$\int (a+b\cosh(2\,c\,z))^{3/2}\cosh^3(c\,z)\,dz == \frac{1}{64\,c}\left(\frac{\sqrt{2}\;(11\,b-a)\,(a+b)^2}{b^{3/2}}\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)+\right.$$

$$\left.\frac{1}{3\,b}\left(2\sqrt{a+b\cosh(2\,c\,z)}\;\left(3\,a^2+52\,b\,a+37\,b^2+2\,b\,(7\,a+11\,b)\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)\right)$$

01.20.21.2361.01

$$\int (a+b\cosh(2\,c\,z))^{3/2}\cosh^4(c\,z)\,dz == \frac{\sqrt{a+b\cosh(2\,c\,z)}}{280\,b^2\,c}$$

$$\left(\frac{1}{\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}}\left(4\,i\left(\left(a^3-7\,b\,a^2-37\,b^2\,a-21\,b^3\right)E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-\left(a^3-8\,b\,a^2-3\,b^2\,a+10\,b^3\right)F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)\right)\right)+\right.$$

$$\left.b\left(2\,a^2+56\,b\,a+45\,b^2+4\,b\,(4\,a+7\,b)\cosh(2\,c\,z)+5\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)$$

01.20.21.2362.01

$$\int \sqrt{a+b\cosh(2\,c\,z)}\;\cosh^2(c\,z)\,dz ==$$

$$\left(-2\,i\left(a^2+4\,b\,a+3\,b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+2\,i\left(a^2-b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.2\,b\,(a+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(12\,b\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.2363.01

$$\int \sqrt{a+b\cosh(2cz)}\,\cosh^3(cz)\,dz ==$$

$$\frac{1}{32\,b^{3/2}\,c}\left(2\sqrt{b}\,\sqrt{a+b\cosh(2cz)}\,(a+7b+2b\cosh(2cz))\sinh(cz)-\sqrt{2}\,\left(a^2-6ba-7b^2\right)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(cz)}{\sqrt{a+b\cosh(2cz)}}\right)\right)$$

01.20.21.2364.01

$$\int \sqrt{a+b\cosh(2cz)}\,\cosh^4(cz)\,dz == \left(8i\left(a^3-4ba^2-17b^2a-12b^3\right)\sqrt{\frac{a+b\cosh(2cz)}{a+b}}\,E\left(icz\,\middle|\,\frac{2b}{a+b}\right)-\right.$$

$$8i\left(a^3-5ba^2-b^2a+5b^3\right)\sqrt{\frac{a+b\cosh(2cz)}{a+b}}\,F\left(icz\,\middle|\,\frac{2b}{a+b}\right)+$$

$$\left.2b\left(2a^2+20ba+3b^2+4b(2a+5b)\cosh(2cz)+3b^2\cosh(4cz)\right)\sinh(2cz)\right)\Big/\left(240\,b^2\,c\,\sqrt{a+b\cosh(2cz)}\right)$$

01.20.21.2365.01

$$\int \frac{\cosh^2(cz)}{\sqrt{a+b\cosh(2cz)}}\,dz == -\frac{i\sqrt{\frac{a+b\cosh(2cz)}{a+b}}\left((a+b)\,E\left(icz\,\middle|\,\frac{2b}{a+b}\right)+(b-a)\,F\left(icz\,\middle|\,\frac{2b}{a+b}\right)\right)}{2bc\sqrt{a+b\cosh(2cz)}}$$

01.20.21.2366.01

$$\int \frac{\cosh^3(cz)}{\sqrt{a+b\cosh(2cz)}}\,dz == \frac{1}{8\,b^{3/2}\,c}\left(2\sqrt{b}\,\sqrt{a+b\cosh(2cz)}\,\sinh(cz)-\sqrt{2}\,(a-3b)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(cz)}{\sqrt{a+b\cosh(2cz)}}\right)\right)$$

01.20.21.2367.01

$$\int \frac{\cosh^4(cz)}{\sqrt{a+b\cosh(2cz)}}\,dz ==$$

$$\left(2i\left(a^2-2ba-3b^2\right)\sqrt{\frac{a+b\cosh(2cz)}{a+b}}\,E\left(icz\,\middle|\,\frac{2b}{a+b}\right)-2i\left(a^2-3ba+2b^2\right)\sqrt{\frac{a+b\cosh(2cz)}{a+b}}\,F\left(icz\,\middle|\,\frac{2b}{a+b}\right)+\right.$$

$$\left.b\,(a+b\cosh(2cz))\sinh(2cz)\right)\Big/\left(12\,b^2\,c\,\sqrt{a+b\cosh(2cz)}\right)$$

01.20.21.2368.01

$$\int \frac{\cosh^2(cz)}{(a+b\cosh(2cz))^{3/2}}\,dz ==$$

$$\left(i\,(a+b)\sqrt{\frac{a+b\cosh(2cz)}{a+b}}\,E\left(icz\,\middle|\,\frac{2b}{a+b}\right)-i\,(a+b)\sqrt{\frac{a+b\cosh(2cz)}{a+b}}\,F\left(icz\,\middle|\,\frac{2b}{a+b}\right)+b\sinh(2cz)\right)\Big/$$

$$\left(2b\,(a+b)\,c\,\sqrt{a+b\cosh(2cz)}\right)$$

01.20.21.2369.01

$$\int \frac{\cosh^3(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \frac{\sqrt{2}\,\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)+\frac{2\sqrt{b}\,(b-a)\sinh(c\,z)}{(a+b)\sqrt{a+b\cosh(2\,c\,z)}}}{4\,b^{3/2}\,c}$$

01.20.21.2370.01

$$\int \frac{\cosh^4(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \left((a-b)\left(2\,i\,(a+b)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-b\sinh(2\,c\,z)\right)-2\,i\,a\,(a+b)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)\right)\Big/\left(4\,b^2\,(a+b)\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.2371.01

$$\int \cosh(e\,z)\cosh(d\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz == \frac{1}{4}\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\left(\frac{e^{(d-e)\,z}}{d-e-c\,\beta}\,F_1\left(\frac{d-e-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+d-e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\frac{e^{(d+e)\,z}}{d+e-c\,\beta}\,F_1\left(\frac{d+e-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+d+e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\frac{e^{(e-d)\,z}}{d-e+c\,\beta}\,F_1\left(-\frac{d-e+c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-d+e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\frac{e^{-(d+e)\,z}}{d+e+c\,\beta}\,F_1\left(-\frac{d+e+c\,\beta}{c};-\beta,-\beta;-\frac{d+e+c\,(\beta-1)}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.2372.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz == \frac{\coth(c\,z)\left(b\cosh^2(c\,z)+a\right)^{\beta}}{c}\left(\frac{b\cosh^2(c\,z)}{a}+1\right)^{-\beta}\sqrt{-\sinh^2(c\,z)}\,F_1\left(\frac{1}{2};\frac{1}{2},-\beta;\frac{3}{2};\cosh^2(c\,z),-\frac{b\cosh^2(c\,z)}{a}\right)$$

01.20.21.2373.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{5/2}\,dz == \left(-16\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(23\,a^3+46\,b\,a^2+31\,b^2\,a+8\,b^3\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\right.$$

$$64\,a\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(2\,a^2+3\,b\,a+b^2\right)i\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+$$

$$\left.\sqrt{2}\;b\left(88\,a^2+88\,b\,a+25\,b^2+28\,b\,(2\,a+b)\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2374.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{3/2}\,dz ==$$

$$\left(-8\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(2\,a^2+3\,b\,a+b^2\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+4\,a\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,(a+b)\,i\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\right.$$

$$\left.\sqrt{2}\;b\,(2\,a+b+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(12\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2375.01

$$\int \sqrt{b\cosh^2(c\,z)+a}\;dz == -\frac{i\sqrt{2\,a+b+b\cosh(2\,c\,z)}}{c\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}}\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)$$

01.20.21.2376.01

$$\int \frac{1}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == -\frac{i\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)}{c\sqrt{2\,a+b+b\cosh(2\,c\,z)}}$$

01.20.21.2377.01

$$\int \frac{1}{\left(a+b\cosh^2(c\,z)\right)^{3/2}}\,dz ==$$

$$\frac{1}{2\,a\,(a+b)\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\left(-2\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;(a+b)\,i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)-\sqrt{2}\;b\sinh(2\,c\,z)\right)$$

01.20.21.2378.01

$$\int \frac{1}{\left(a+b\cosh^2(c\,z)\right)^{5/2}}\,dz ==$$

$$-\left(i\left(2\,(a+b)^2\,(2\,a+b)\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\left(\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}\right)^{3/2}-a\,(a+b)^2\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\left(\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}\right)^{3/2}-\right.\right.$$

$$\left.\left.i\sqrt{2}\;b\left(5\,a^2+5\,b\,a+b^2+b\,(2\,a+b)\cosh(2\,c\,z)\right)\sinh(2\,c\,z)\right)\right)\Big/\left(3\,a^2\,(a+b)^2\,c\,(2\,a+b+b\cosh(2\,c\,z))^{3/2}\right)$$

Involving $\left(a+b\cosh^2(c\,z)\right)^{\beta}\cosh(d\,z)$

01.20.21.2379.01

$$\int\left(a+b\cosh^2(c\,z)\right)^{\beta}\cosh(d\,z)\,dz ==$$

$$\frac{1}{\left(1+e^{2\,d\,z}\right)\left(d^2-4\,c^2\,\beta^2\right)}\left(\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$

$$\left(e^{2\,d\,z}\,(d+2\,c\,\beta)\,F_1\left(\frac{d}{2\,c}-\beta;-\beta,-\beta;\frac{d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-\right.$$

$$\left.\left.(d-2\,c\,\beta)\,F_1\left(-\frac{d+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)\cosh(d\,z)\right)$$

01.20.21.2380.01

$$\int\left(a+b\cosh^2(c\,z)\right)^{\beta}\cosh(c\,z)\,dz == \frac{\left(b\cosh^2(c\,z)+a\right)^{\beta+1}\operatorname{csch}(c\,z)}{2\,b\,c\,(\beta+1)}\,{}_2F_1\left(\beta+1,\frac{1}{2};\beta+2;\frac{b\cosh^2(c\,z)+a}{a+b}\right)\sqrt{-\frac{b\sinh^2(c\,z)}{a+b}}$$

01.20.21.2381.01

$$\int\left(a\cosh^2(c\,z)+a\right)^{\beta}\cosh(d\,z)\,dz == \frac{1}{2\left(d^2-4\,c^2\,\beta^2\right)}\left(e^{-d\,z}\left(6+e^{-2\,c\,z}+e^{2\,c\,z}\right)^{\beta}\left(4+\frac{4\,e^{2\,c\,z}}{3-2\sqrt{2}}\right)^{-\beta}\left(1+\frac{e^{2\,c\,z}}{3+2\sqrt{2}}\right)^{-\beta}\right.$$

$$\left(e^{2\,d\,z}\,(d+2\,c\,\beta)\,F_1\left(\frac{d}{2\,c}-\beta;-\beta,-\beta;\frac{d}{2\,c}-\beta+1;\frac{e^{2\,c\,z}}{-3-2\sqrt{2}},\frac{e^{2\,c\,z}}{-3+2\sqrt{2}}\right)-(d-2\,c\,\beta)\right.$$

$$\left.\left.F_1\left(-\frac{d+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{d}{2\,c}-\beta+1;\frac{e^{2\,c\,z}}{-3-2\sqrt{2}},\frac{e^{2\,c\,z}}{-3+2\sqrt{2}}\right)\right)(\cosh(2\,c\,z)+3)^{-\beta}\,(a\,(\cosh(2\,c\,z)+3))^{\beta}\right)$$

01.20.21.2382.01

$$\int\sqrt{a+b\cosh^2(c\,z)}\;\cosh(c\,z)\,dz ==$$

$$\frac{1}{4\sqrt{b}\;c}\left(2\,(a+b)\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)+\sqrt{2}\;\sqrt{b}\;\sqrt{2\,a+b+b\cosh(2\,c\,z)}\;\sinh(c\,z)\right)$$

01.20.21.2383.01

$$\int\left(a+a\cosh^2(c\,z)\right)^{\beta}\cosh(c\,z)\,dz == \frac{\left(a\left(\cosh^2(c\,z)+1\right)\right)^{\beta+1}\operatorname{csch}(c\,z)\;\sqrt{-\sinh^2(c\,z)}}{2\sqrt{2}\;a\,c\,(\beta+1)}\,{}_2F_1\left(\beta+1,\frac{1}{2};\beta+2;\frac{1}{4}\,(\cosh(2\,c\,z)+3)\right)$$

01.20.21.2384.01

$$\int \left(a - a \cosh^2(c\,z)\right)^{\beta} \cosh(c\,z)\, dz == \frac{\sinh(c\,z)\left(-a \sinh^2(c\,z)\right)^{\beta}}{2\,\beta\,c + c}$$

01.20.21.2385.01

$$\int \frac{\cosh(c\,z)}{\sqrt{a + b \cosh^2(c\,z)}}\, dz == \frac{1}{\sqrt{b}\ c} \tanh^{-1}\left(\frac{\sqrt{2}\ \sqrt{b}\ \sinh(c\,z)}{\sqrt{2\,a + b + b \cosh(2\,c\,z)}}\right)$$

01.20.21.2386.01

$$\int \frac{\cosh(c\,z)}{\sqrt{a \cosh^2(c\,z) + a}}\, dz == \frac{\tanh^{-1}\left(\frac{\sqrt{2}\ \sinh(c\,z)}{\sqrt{\cosh(2\,c\,z)+3}}\right)\sqrt{\cosh(2\,c\,z) + 3}}{c\,\sqrt{a\,(\cosh(2\,c\,z) + 3)}}$$

01.20.21.2387.01

$$\int \frac{\cosh(c\,z)}{\sqrt{a - a \cosh^2(c\,z)}}\, dz == \frac{\log\left(-2 \sinh^2(c\,z)\right)\sinh(c\,z)}{2\,c\,\sqrt{-a \sinh^2(c\,z)}}$$

01.20.21.2388.01

$$\int \frac{\cosh(c\,z)}{\left(a + b \cosh^2(c\,z)\right)^{3/2}}\, dz == \frac{\sqrt{2}\ \sinh(c\,z)}{(a + b)\,c\,\sqrt{2\,a + b + b \cosh(2\,c\,z)}}$$

01.20.21.2389.01

$$\int \frac{\cosh(c\,z)}{\left(a + b \cosh^2(c\,z)\right)^{5/2}}\, dz == \frac{2\sqrt{2}\ (3\,a + 2\,b + b \cosh(2\,c\,z))\sinh(c\,z)}{3\,(a+b)^2\,c\,(2\,a + b + b \cosh(2\,c\,z))^{3/2}}$$

01.20.21.2390.01

$$\int \left(a + b \cosh^2(c\,z)\right)^{\beta} \cosh(2\,c\,z)\, dz == \frac{1}{b^2\,c\,(\beta+1)\,(\beta+2)}\left(2^{-\beta-1}\sqrt{-\frac{b \cosh^2(c\,z)}{a}}\ (2\,a + b + b \cosh(2\,c\,z))^{\beta+1}\right.$$

$$\left((\beta+1)\,F_1\left(\beta+2;\ \frac{1}{2},\ \frac{1}{2};\ \beta+3;\ \frac{2\,a + b + b \cosh(2\,c\,z)}{2\,(a+b)},\ \frac{2\,a + b + b \cosh(2\,c\,z)}{2\,a}\right)(2\,a + b + b \cosh(2\,c\,z)) -\right.$$

$$\left.\left.(2\,a + b)\,(\beta+2)\,F_1\left(\beta+1;\ \frac{1}{2},\ \frac{1}{2};\ \beta+2;\ \frac{2\,a + b + b \cosh(2\,c\,z)}{2\,(a+b)},\ \frac{2\,a + b + b \cosh(2\,c\,z)}{2\,a}\right)\right)\operatorname{csch}(2\,c\,z)\sqrt{-\frac{b \sinh^2(c\,z)}{a+b}}\right)$$

Involving $\left(\left(a + b \cosh^2(c\,z)\right)^{\nu}\right)^{\beta}$

01.20.21.2391.01

$$\int \left(\left(a + b \cosh^2(c\,z)\right)^{\nu}\right)^{\beta} dz == \frac{1}{c}\left(F_1\left(\frac{1}{2};\ \frac{1}{2},\ -\beta\,\nu;\ \frac{3}{2};\ \cosh^2(c\,z),\ -\frac{b \cosh^2(c\,z)}{a}\right)\right.$$

$$\left.\left(\left(b \cosh^2(c\,z) + a\right)^{\nu}\right)^{\beta}\left(\frac{b \cosh^2(c\,z)}{a} + 1\right)^{-\beta\,\nu} \coth(c\,z) \operatorname{csch}^2(c\,z)\sqrt{\sinh^2(c\,z)}\ \sqrt{-\sinh^4(c\,z)}\right)$$

01.20.21.2392.01

$$\int \sqrt{\left(a+b\cosh^2(c\,z)\right)^5}\,dz == \frac{1}{480\,c\,(2\,a+b+b\cosh(2\,c\,z))^3}$$
$$\left(\sqrt{(2\,a+b+b\cosh(2\,c\,z))^5}\left(-32\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(23\,a^3+46\,b\,a^2+31\,b^2\,a+8\,b^3\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\right.\right.$$
$$128\,a\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(2\,a^2+3\,b\,a+b^2\right)i\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+$$
$$\left.\left.2\sqrt{2}\,b\left(88\,a^2+88\,b\,a+25\,b^2+28\,b\,(2\,a+b)\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\right)$$

01.20.21.2393.01

$$\int \sqrt{\left(a+b\cosh^2(c\,z)\right)^3}\,dz ==$$
$$\left(\sqrt{\left(b\cosh^2(c\,z)+a\right)^3}\left(-8\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(2\,a^2+3\,b\,a+b^2\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+4\,a\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\right.\right.$$
$$\left.\left.(a+b)\,i\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\,b\,(2\,a+b+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\right)\Big/\left(3\sqrt{2}\,c\,(2\,a+b+b\cosh(2\,c\,z))^2\right)$$

01.20.21.2394.01

$$\int \frac{1}{\sqrt{\left(a+b\cosh^2(c\,z)\right)^3}}\,dz == -\frac{(2\,a+b+b\cosh(2\,c\,z))\left(2\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,(a+b)\,i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\,b\sinh(2\,c\,z)\right)}{2\,a\,(a+b)\,c\sqrt{(2\,a+b+b\cosh(2\,c\,z))^3}}$$

01.20.21.2395.01

$$\int \frac{1}{\sqrt{\left(a+b\cosh^2(c\,z)\right)^5}}\,dz ==$$
$$\left(i\left(b\cosh^2(c\,z)+a\right)^{5/2}\left(-2\,(a+b)^2\,(2\,a+b)\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\left(\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}\right)^{3/2}+a\,(a+b)^2\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\right.\right.$$
$$\left.\left.\left(\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}\right)^{3/2}+\sqrt{2}\,b\,i\left(5\,a^2+5\,b\,a+b^2+b\,(2\,a+b)\cosh(2\,c\,z)\right)\sinh(2\,c\,z)\right)\right)\Big/$$
$$\left(3\,a^2\,(a+b)^2\,c\sqrt{\left(b\cosh^2(c\,z)+a\right)^5}\,(2\,a+b+b\cosh(2\,c\,z))^{3/2}\right)$$

Involving $\left(\left(a+b\cosh^2(c\,z)\right)^{\nu}\right)^{\beta}\cosh(d\,z)$

01.20.21.2396.01

$$\int\left(\left(a+b\cosh^2(c\,z)\right)^{\nu}\right)^{\beta}\cosh(d\,z)\,dz==\frac{1}{\left(1+e^{2\,d\,z}\right)\left(d^2-4\,c^2\,\beta^2\,\nu^2\right)}$$
$$\left(2^{\beta\,\nu}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\,\sqrt{a\,(a+b)}}+1\right)^{-\beta\,\nu}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\,\sqrt{a\,(a+b)}}+1\right)^{-\beta\,\nu}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta\,\nu}\right.$$
$$\left(e^{2\,d\,z}\,(d+2\,c\,\beta\,\nu)\,F_1\left(\frac{d}{2\,c}-\beta\,\nu;-\beta\,\nu,-\beta\,\nu;\frac{d}{2\,c}-\beta\,\nu+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)-\right.$$
$$\left.\left.(d-2\,c\,\beta\,\nu)\,F_1\left(-\frac{d+2\,c\,\beta\,\nu}{2\,c};-\beta\,\nu,-\beta\,\nu;-\frac{d}{2\,c}-\beta\,\nu+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)\right)\right.$$
$$\left.(2\,a+b+b\cosh(2\,c\,z))^{-\beta\,\nu}\left(2^{-\nu}\,(2\,a+b+b\cosh(2\,c\,z))^{\nu}\right)^{\beta}\cosh(d\,z)\right)$$

01.20.21.2397.01

$$\int\left(\left(a+b\cosh^2(c\,z)\right)^{\nu}\right)^{\beta}\cosh(c\,z)\,dz==$$
$$\frac{\left(b\cosh^2(c\,z)+a\right)\left(\left(b\cosh^2(c\,z)+a\right)^{\nu}\right)^{\beta}\operatorname{csch}(c\,z)}{2\,b\,c\,(\beta\,\nu+1)}\,{}_2F_1\left(\beta\,\nu+1,\frac{1}{2};\beta\,\nu+2;\frac{b\cosh^2(c\,z)+a}{a+b}\right)\sqrt{-\frac{b\sinh^2(c\,z)}{a+b}}$$

01.20.21.2398.01

$$\int\sqrt{\left(a+b\cosh^2(c\,z)\right)^5}\,\cosh(c\,z)\,dz==\frac{\sqrt{\left(b\cosh^2(c\,z)+a\right)^5}}{16\,c\left(b\cosh^2(c\,z)+a\right)^{5/2}}\left(\frac{5\,(a+b)^3}{\sqrt{b}}\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)+\right.$$
$$\left.\frac{1}{3\,\sqrt{2}}\left(\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,\left(33\,a^2+53\,b\,a+23\,b^2+b\,(13\,a+9\,b)\cosh(2\,c\,z)+b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)\right)$$

01.20.21.2399.01

$$\int\sqrt{\left(a+b\cosh^2(c\,z)\right)^3}\,\cosh(c\,z)\,dz==\frac{\sqrt{\left(b\cosh^2(c\,z)+a\right)^3}}{16\,\sqrt{b}\,c\left(b\cosh^2(c\,z)+a\right)^{3/2}}$$
$$\left(6\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)(a+b)^2+\sqrt{2}\,\sqrt{b}\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,(5\,a+4\,b+b\cosh(2\,c\,z))\sinh(c\,z)\right)$$

01.20.21.2400.01

$$\int\frac{\cosh(c\,z)}{\sqrt{\left(b\cosh^2(c\,z)+a\right)^3}}\,dz==\frac{(2\,a+b+b\cosh(2\,c\,z))\sinh(c\,z)}{2\,(a+b)\,c\sqrt{\left(b\cosh^2(c\,z)+a\right)^3}}$$

01.20.21.2401.01

$$\int \frac{\cosh(c\,z)}{\sqrt{\left(b\cosh^2(c\,z)+a\right)^5}}\,dz == \frac{(2\,a+b+b\cosh(2\,c\,z))\,(3\,a+2\,b+b\cosh(2\,c\,z))\sinh(c\,z)}{6\,(a+b)^2\,c\,\sqrt{\left(b\cosh^2(c\,z)+a\right)^5}}$$

01.20.21.2402.01

$$\int \left(\left(a+b\cosh^2(c\,z)\right)^{\nu}\right)^{\beta}\cosh(2\,c\,z)\,dz == \frac{1}{b^2\,c\,(\beta\,\nu+1)\,(\beta\,\nu+2)}\left(2^{-\beta\,\nu-1}\sqrt{-\frac{b\cosh^2(c\,z)}{a}}\,\left(b\cosh^2(c\,z)+a\right)^{-\beta\,\nu}\left(\left(b\cosh^2(c\,z)+a\right)^{\nu}\right)^{\beta}(2\,a+b+b\cosh(2\,c\,z))^{\beta\,\nu+1}\right.$$
$$\left((\beta\,\nu+1)\,F_1\left(\beta\,\nu+2;\,\frac{1}{2},\,\frac{1}{2};\,\beta\,\nu+3;\,\frac{2\,a+b+b\cosh(2\,c\,z)}{2\,(a+b)},\,\frac{2\,a+b+b\cosh(2\,c\,z)}{2\,a}\right)(2\,a+b+b\cosh(2\,c\,z))-(2\,a+b)\right.$$
$$\left.\left.(\beta\,\nu+2)\,F_1\left(\beta\,\nu+1;\,\frac{1}{2},\,\frac{1}{2};\,\beta\,\nu+2;\,\frac{2\,a+b+b\cosh(2\,c\,z)}{2\,(a+b)},\,\frac{2\,a+b+b\cosh(2\,c\,z)}{2\,a}\right)\right)\operatorname{csch}(2\,c\,z)\sqrt{-\frac{b\sinh^2(c\,z)}{a+b}}\right)$$

Involving $\left(a+b\cosh^2(c\,z)\right)^{\beta}\cosh^{\nu}(c\,z)$

01.20.21.2403.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{\beta}\cosh^{\nu}(c\,z)\,dz == \frac{1}{c\,(\nu+1)}\left(F_1\left(\frac{\nu+1}{2};\,\frac{1}{2},\,-\beta;\,\frac{\nu+3}{2};\,\cosh^2(c\,z),\,-\frac{b\cosh^2(c\,z)}{a}\right)\cosh^{\nu+1}(c\,z)\left(b\cosh^2(c\,z)+a\right)^{\beta}\right.$$
$$\left.\left(\frac{b\cosh^2(c\,z)}{a}+1\right)^{-\beta}\operatorname{csch}^3(c\,z)\sqrt{\sinh^2(c\,z)}\,\sqrt{-\sinh^4(c\,z)}\right)$$

01.20.21.2404.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{3/2}\cosh^2(c\,z)\,dz == \left(-16\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(3\,a^3+16\,b\,a^2+21\,b^2\,a+8\,b^3\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\right.$$
$$16\,a\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(3\,a^2+7\,b\,a+4\,b^2\right)i\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\,b$$
$$\left.\left(48\,a^2+68\,b\,a+25\,b^2+4\,b\,(9\,a+7\,b)\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,b\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2405.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{3/2}\cosh^3(c\,z)\,dz == \frac{1}{96\,b^{3/2}\,c}\left(\sqrt{2}\,\sqrt{b}\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,\left(3\,a^2+29\,b\,a+23\,b^2+b\,(7\,a+9\,b)\cosh(2\,c\,z)+b^2\cosh(4\,c\,z)\right)\sinh(c\,z)-6\,(a-5\,b)\,(a+b)^2\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)\right)$$

01.20.21.2406.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{3/2}\cosh^4(c\,z)\,dz == \frac{1}{1120\,b^2\,c}\left(\sqrt{2\,a+b+b\cosh(2\,c\,z)}\left(\frac{1}{\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}}\left(32\,i\left(2\left(a^3-2\,b\,a^2-12\,b^2\,a-8\,b^3\right)E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+a\left(-2\,a^2+5\,b\,a+8\,b^2\right)F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\right)\right)+\sqrt{2}\,b\left(8\,a^2+120\,b\,a+103\,b^2+4\,b\,(8\,a+11\,b)\cosh(2\,c\,z)+5\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\right)$$

01.20.21.2407.01

$$\int \sqrt{a+b\cosh^2(c\,z)}\,\cosh^2(c\,z)\,dz == \frac{1}{12\,b\,c\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\left(-4\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(a^2+3\,b\,a+2\,b^2\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+4\,a\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,(a+b)\,i\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\,b\,(2\,a+b+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)$$

01.20.21.2408.01

$$\int \sqrt{a+b\cosh^2(c\,z)}\,\cosh^3(c\,z)\,dz == \frac{1}{32\,b^{3/2}\,c}\left(2\sqrt{2}\,\sqrt{b}\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,(a+4\,b+b\cosh(2\,c\,z))\sinh(c\,z)-4\left(a^2-2\,b\,a-3\,b^2\right)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)\right)$$

01.20.21.2409.01

$$\int \sqrt{a+b\cosh^2(c\,z)}\,\cosh^4(c\,z)\,dz == \left(16\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(2\,a^3-b\,a^2-11\,b^2\,a-8\,b^3\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)-\right.$$

$$32\,i\,a\left(a^2-b\,a-2\,b^2\right)\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\,b$$

$$\left.\left(8\,a^2+48\,b\,a+25\,b^2+4\,b\,(4\,a+7\,b)\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,b^2\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2410.01

$$\int \sqrt{a+b\cosh^2(c\,z)}\,\cosh^5(c\,z)\,dz == \frac{1}{16\,c}\left(\frac{(a+b)\left(a^2-2\,b\,a+5\,b^2\right)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)}{b^{5/2}}+\right.$$

$$\left.\frac{1}{3\sqrt{2}\,b^2}\left(\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,\left(-3\,a^2+5\,b\,a+23\,b^2+b\,(a+9\,b)\cosh(2\,c\,z)+b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)\right)$$

01.20.21.2411.01

$$\int \frac{\cosh^{\nu}(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{1}{\sqrt{2}\,b\,c}\left(F_1\left(\frac{1}{2};\frac{1-\nu}{2},\frac{1}{2};\frac{3}{2};\frac{2\,a+b+b\cosh(2\,c\,z)}{2\,a},\frac{2\,a+b+b\cosh(2\,c\,z)}{2\,(a+b)}\right)\right.$$

$$\left.\cosh^{\nu-1}(c\,z)\left(-\frac{b\cosh^2(c\,z)}{a}\right)^{\frac{1-\nu}{2}}\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,\operatorname{csch}(c\,z)\sqrt{-\frac{b\sinh^2(c\,z)}{a+b}}\right)$$

01.20.21.2412.01

$$\int \frac{\cosh^2(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == -\frac{i\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left((a+b)\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)-a\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\right)}{b\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}}$$

01.20.21.2413.01

$$\int \frac{\cosh^3(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{\sqrt{2}\,\sqrt{b}\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,\sinh(c\,z)-2\,(a-b)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)}{4\,b^{3/2}\,c}$$

01.20.21.2414.01

$$\int \frac{\cosh^4(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz ==$$

$$\left(8\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(a^2-b^2\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)-4\,i\,a\,(2\,a-b)\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\right.$$

$$\left.\sqrt{2}\,b\,(2\,a+b+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(12\,b^2\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2415.01

$$\int \frac{\cosh^5(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{1}{32\,b^{5/2}\,c}\left(4\left(3\,a^2-2\,b\,a+3\,b^2\right)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)+\right.$$

$$\left.2\sqrt{2}\,\sqrt{b}\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,(-3\,a+4\,b+b\cosh(2\,c\,z))\sinh(c\,z)\right)$$

01.20.21.2416.01

$$\int \frac{\cosh^6(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == \left(-16\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(8\,a^3+b\,a^2+b^2\,a+8\,b^3\right)i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\right.$$

$$16\,a\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\,\left(8\,a^2-3\,b\,a+4\,b^2\right)i\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\,b$$

$$\left.\left(-32\,a^2+28\,b\,a+25\,b^2-4\,(a-7\,b)\,b\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,b^3\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2417.01

$$\int \frac{\cosh^7(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{1}{96\,b^{7/2}\,c}\left(6\,(b-a)\left(5\,a^2+2\,b\,a+5\,b^2\right)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)+\right.$$

$$\left.\sqrt{2}\,\sqrt{b}\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}\,\left(15\,a^2-19\,b\,a+23\,b^2-(5\,a-9\,b)\,b\cosh(2\,c\,z)+b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.2418.01

$$\int \frac{\cosh^2(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{3/2}}\,dz ==$$

$$\left(2\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;(a+b)\,i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)-2\,i\,(a+b)\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\;b\sinh(2\,c\,z)\right)\Big/\left(2\,b\,(a+b)\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2419.01

$$\int \frac{\cosh^3(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{3/2}}\,dz == \frac{\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)-\frac{\sqrt{2}\;a\sqrt{b}\;\sinh(c\,z)}{(a+b)\sqrt{2\,a+b+b\cosh(2\,c\,z)}}}{b^{3/2}\,c}$$

01.20.21.2420.01

$$\int \frac{\cosh^4(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{3/2}}\,dz ==$$

$$-\left(i\left(2\left(2\,a^2+3\,b\,a+b^2\right)\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)-a\left(4\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;(a+b)\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+\sqrt{2}\;b\,i\sinh(2\,c\,z)\right)\right)\right)\Big/\left(2\,b^2\,(a+b)\,c\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)$$

01.20.21.2421.01

$$\int \frac{\cosh^5(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{3/2}}\,dz == \frac{\frac{(b-3\,a)\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)}{b^{5/2}}+\frac{\left(6\,a^2+3\,b\,a+b^2+b\,(a+b)\cosh(2\,c\,z)\right)\sinh(c\,z)}{\sqrt{2}\;b^2\,(a+b)\sqrt{2\,a+b+b\cosh(2\,c\,z)}}}{2\,c}$$

01.20.21.2422.01

$$\int \frac{\cosh^2(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{5/2}}\,dz ==$$

$$\left(2\,(a-b)\,(a+b)^2\,i\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\left(\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}\right)^{3/2}-2\,i\,a\,(a+b)^2\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\left(\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}\right)^{3/2}-\sqrt{2}\;b\left(-4\,a^2-b\,a+b^2-(a-b)\,b\cosh(2\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(6\,a\,b\,(a+b)^2\,c\,(2\,a+b+b\cosh(2\,c\,z))^{3/2}\right)$$

01.20.21.2423.01

$$\int \frac{\cosh^3(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{5/2}}\,dz == \frac{\sqrt{2}\;(5\,a+3\,b+(a+3\,b)\cosh(2\,c\,z))\sinh(c\,z)}{3\,(a+b)^2\,c\,(2\,a+b+b\cosh(2\,c\,z))^{3/2}}$$

01.20.21.2424.01

$$\int \frac{\cosh^4(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{5/2}}\,dz == \left(i\left(2\,(a+2\,b)\,E\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)-(2\,a+3\,b)\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\right)\left(\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}\right)^{3/2}+\frac{\sqrt{2}\;b\left(a^2+4\,b\,a+2\,b^2+b\,(a+2\,b)\cosh(2\,c\,z)\right)\sinh(2\,c\,z)}{(a+b)^2}\right)\Big/\left(3\,b^2\,c\,(2\,a+b+b\cosh(2\,c\,z))^{3/2}\right)$$

Involving $\left(a+b\cosh^2(c\,z)\right)^{\beta}$ and rational function of $\cosh(c\,z)$

01.20.21.2425.01

$$\int \frac{1}{(d+e\cosh(c\,z))\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{1}{c\,d\sqrt{1-\frac{d^2}{e^2}}\;\sqrt{\frac{b\,d^2}{a\,e^2}+1}\;e\sqrt{2\,a+b+b\cosh(2\,c\,z)}}$$

$$\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a}}\left(d\tan^{-1}\left(\frac{\sqrt{\frac{2\,b\,d^2}{a\,e^2}+2}\;\sinh(c\,z)}{\sqrt{1-\frac{d^2}{e^2}}\;\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a}}}\right)+e\sqrt{1-\frac{d^2}{e^2}}\;\sqrt{\frac{b\,d^2}{a\,e^2}+1}\;i\,\Pi\left(\frac{e^2}{d^2};\frac{\pi}{2}-i\,c\,z\,\middle|\,-\frac{b}{a}\right)\right)$$

01.20.21.2426.01

$$\int \frac{\cosh(c\,z)}{(d+e\cosh(c\,z))\sqrt{a+b\cosh^2(c\,z)}}\,dz == \left(4\,i\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right.$$

$$\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{(\cosh(c\,z)+1)^2}}\left((d+e)\,F\left(i\sinh^{-1}\left(\sqrt{-\frac{a+b}{\left(\sqrt{a}-i\sqrt{b}\right)^2}}\;\tanh\left(\frac{c\,z}{2}\right)\right)\middle|\,\frac{\left(\sqrt{a}-i\sqrt{b}\right)^2}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-\right.$$

$$2\,d\,\Pi\left(\frac{\left(\sqrt{a}-i\sqrt{b}\right)(d-e)}{\left(\sqrt{a}+i\sqrt{b}\right)(d+e)};i\sinh^{-1}\left(\sqrt{-\frac{a+b}{\left(\sqrt{a}-i\sqrt{b}\right)^2}}\;\tanh\left(\frac{c\,z}{2}\right)\right)\middle|\,\frac{\left(\sqrt{a}-i\sqrt{b}\right)^2}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\Big)$$

$$\operatorname{sech}^2\left(\frac{c\,z}{2}\right)\sqrt{1-\frac{(a+b)\tanh^2\left(\frac{c\,z}{2}\right)}{\left(\sqrt{a}-i\sqrt{b}\right)^2}}\;\sqrt{1-\frac{(a+b)\tanh^2\left(\frac{c\,z}{2}\right)}{\left(\sqrt{a}+i\sqrt{b}\right)^2}}\Big)\Big/$$

$$\left(\sqrt{\frac{\sqrt{a}+i\sqrt{b}}{-2\sqrt{a}+2\,i\sqrt{b}}}\;c\,(d-e)\,(d+e)\left((2\,a+b+b\cosh(2\,c\,z))\operatorname{sech}^4\left(\frac{c\,z}{2}\right)\right)^{3/2}\right)$$

01.20.21.2427.01

$$\int \frac{\sqrt{b\cosh^2(c\,z)+a}}{e\cosh^2(c\,z)+d}\,dz == -\frac{i\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;\left(b\,(d+e)\,F\left(i\,c\,z\,\middle|\,\frac{b}{a+b}\right)+(a\,e-b\,d)\,\Pi\left(\frac{e}{d+e};i\,c\,z\,\middle|\,\frac{b}{a+b}\right)\right)}{c\,e\,(d+e)\sqrt{2\,a+b+b\cosh(2\,c\,z)}}$$

01.20.21.2428.01

$$\int \frac{1}{\left(d+e\cosh^2(c\,z)\right)\sqrt{a+b\cosh^2(c\,z)}}\,dz == -\frac{i\sqrt{\frac{2\,a+b+b\cosh(2\,c\,z)}{a+b}}\;\Pi\left(\frac{e}{d+e};\,i\,c\,z\,\middle|\,\frac{b}{a+b}\right)}{c\,(d+e)\,\sqrt{2\,a+b+b\cosh(2\,c\,z)}}$$

01.20.21.2429.01

$$\int \frac{\cosh(c\,z)}{\left(d+e\cosh^2(c\,z)\right)\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{\tanh^{-1}\left(\frac{\sqrt{2\,b\,d-2\,a\,e}\;\sinh(c\,z)}{\sqrt{d+e}\;\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)}{c\,\sqrt{d+e}\;\sqrt{b\,d-a\,e}}$$

01.20.21.2430.01

$$\int \frac{\cosh(c\,z)}{\left(d+e\cosh^2(c\,z)\right)^2\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{\frac{(a\,e-b\,(2\,d+e))\tanh^{-1}\left(\frac{\sqrt{2\,b\,d-2\,a\,e}\;\sinh(c\,z)}{\sqrt{d+e}\;\sqrt{2\,a+b+b\cosh(2\,c\,z)}}\right)}{\sqrt{d+e}\;\sqrt{b\,d-a\,e}}+\frac{\sqrt{2}\;e\sqrt{2\,a+b+b\cosh(2\,c\,z)}\;\sinh(c\,z)}{2\,d+e+e\cosh(2\,c\,z)}}{2\,c\,(d+e)\,(a\,e-b\,d)}$$

Involving $\cosh(e\,z)\cosh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.2431.01

$$\int \cosh(e\,z)\cosh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{4}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}$$

$$\left(\frac{e^{(d-e)\,z}}{d-e-2\,c\,\beta}\,F_1\left(\frac{d-e-2\,c\,\beta}{2\,c};\,-\beta,\,-\beta;\,\frac{d-e}{2\,c}-\beta+1;\,-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\,-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+\right.$$

$$\frac{e^{(d+e)\,z}}{d+e-2\,c\,\beta}\,F_1\left(\frac{d+e-2\,c\,\beta}{2\,c};\,-\beta,\,-\beta;\,\frac{d+e}{2\,c}-\beta+1;\,-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\,-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+$$

$$\frac{e^{(e-d)\,z}}{-d+e-2\,c\,\beta}\,F_1\left(-\frac{d-e+2\,c\,\beta}{2\,c};\,-\beta,\,-\beta;\,\frac{e-d}{2\,c}-\beta+1;\,-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\,-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-$$

$$\left.\left.\frac{e^{-(d+e)\,z}}{d+e+2\,c\,\beta}\,F_1\left(-\frac{d+e+2\,c\,\beta}{2\,c};\,-\beta,\,-\beta;\,-\frac{d+e+2\,c\,(\beta-1)}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\,-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)\right)$$

Involving $\left(a+b\cosh^2(c\,z)\right)^{\beta}$ and algebraic function of $\cosh(c\,z)$

01.20.21.2432.01

$$\int \left(a+b\cosh^2(c\,z)\right)^{\nu}\left(d+e\cosh^2(c\,z)\right)^{\beta}\cosh(c\,z)\,dz ==$$

$$\frac{1}{c}\left(F_1\left(\frac{1}{2};-\nu,-\beta;\frac{3}{2};-\frac{b\sinh^2(c\,z)}{a+b},-\frac{e\sinh^2(c\,z)}{d+e}\right)\left(b\cosh^2(c\,z)+a\right)^{\nu}\left(\frac{b\cosh^2(c\,z)+a}{a+b}\right)^{-\nu}\right.$$

$$\left.\left(e\cosh^2(c\,z)+d\right)^{\beta}\left(\frac{e\cosh^2(c\,z)+d}{d+e}\right)^{-\beta}\sinh(c\,z)\right)$$

01.20.21.2433.01

$$\int \frac{\left(d+e\cosh^2(c\,z)\right)^{\beta}\cosh(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{\sinh(c\,z)}{c\sqrt{b\cosh^2(c\,z)+a}}$$

$$F_1\left(\frac{1}{2};\frac{1}{2},-\beta;\frac{3}{2};-\frac{b\sinh^2(c\,z)}{a+b},-\frac{e\sinh^2(c\,z)}{d+e}\right)\sqrt{\frac{b\cosh^2(c\,z)+a}{a+b}}\left(e\cosh^2(c\,z)+d\right)^{\beta}\left(\frac{e\cosh^2(c\,z)+d}{d+e}\right)^{-\beta}$$

Other integrals

01.20.21.2434.01

$$\int \sqrt{\frac{a+b\cosh(e\,z)}{c+d\cosh(e\,z)}}\,dz == \left(2\sqrt{\frac{a+b\cosh(e\,z)}{c+d\cosh(e\,z)}}\sqrt{\frac{(c+d)\coth^2\left(\frac{e\,z}{2}\right)}{c-d}}\right.$$

$$\sqrt{\frac{(a+b)\,(c+d\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{a\,d-b\,c}}\left((a+b)\,d\,F\left(\sin^{-1}\left(\sqrt{\frac{(a+b)\,(c+d\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{2\,a\,d-2\,b\,c}}\right)\middle|\frac{2\,(a\,d-b\,c)}{(a+b)\,(d-c)}\right)-\right.$$

$$b\,(c+d)\,\Pi\left(\frac{a\,d-b\,c}{(a+b)\,d};\sin^{-1}\left(\sqrt{\frac{(a+b)\,(c+d\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{2\,a\,d-2\,b\,c}}\right)\middle|\frac{2\,(a\,d-b\,c)}{(a+b)\,(d-c)}\right)\Bigg)$$

$$\left.\tanh\left(\frac{e\,z}{2}\right)\right)\Bigg/\left((a+b)\,d\,e\sqrt{\frac{(c+d)\,(a+b\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{b\,c-a\,d}}\right)$$

01.20.21.2435.01

$$\int \frac{\sqrt{a+b\cosh(e\,z)}}{\sqrt{c+d\cosh(e\,z)}}\,dz == \left(2\sqrt{a+b\cosh(e\,z)}\,\sqrt{\frac{(c+d)\coth^2\left(\frac{e\,z}{2}\right)}{c-d}}\right.$$

$$\sqrt{\frac{(a+b)\,(c+d\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{a\,d-b\,c}}\left((a+b)\,d\,F\left(\sin^{-1}\left(\sqrt{\frac{(a+b)\,(c+d\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{2\,a\,d-2\,b\,c}}\right)\middle|\,\frac{2\,(a\,d-b\,c)}{(a+b)\,(d-c)}\right)-\right.$$

$$\left.b\,(c+d)\,\Pi\left(\frac{a\,d-b\,c}{(a+b)\,d};\sin^{-1}\left(\sqrt{\frac{(a+b)\,(c+d\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{2\,a\,d-2\,b\,c}}\right)\middle|\,\frac{2\,(a\,d-b\,c)}{(a+b)\,(d-c)}\right)\tanh\left(\frac{e\,z}{2}\right)\right)\Big/$$

$$\left((a+b)\,d\,e\,\sqrt{c+d\cosh(e\,z)}\,\sqrt{\frac{(c+d)\,(a+b\cosh(e\,z))\,\mathrm{csch}^2\left(\frac{e\,z}{2}\right)}{b\,c-a\,d}}\right)$$

01.20.21.2436.01

$$\int \sqrt{\frac{a+b\cosh^2(e\,z)}{\left(c+d\cosh^2(e\,z)\right)^3}}\,dz == \left(\cosh(e\,z)\,\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{(2\,c+d+d\cosh(2\,e\,z))^3}}\,\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))}{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))}}\right.$$

$$\left(2\,(b\,c-a\,d)\,\sqrt{\frac{(a+b)\cosh^2(e\,z)}{2\,a+b+b\cosh(2\,e\,z)}}\,\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}}\,\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))}{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))}}\,\sinh(e\,z)-\right.\right.$$

$$\left.\left.\frac{i\,a\,(2\,c+d+d\cosh(2\,e\,z))\,E\left(i\sinh^{-1}\left(\frac{\sqrt{2}\,\sqrt{\frac{a}{a+b}}\,\sinh(e\,z)}{\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}}}\right)\middle|\,\frac{a\,d-b\,c}{a\,(c+d)}\right)}{\sqrt{\frac{a}{a+b}}}\right)\Big/$$

$$\left((a+b)\,c\,e\,\sqrt{\frac{(a+b)\cosh^2(e\,z)}{2\,a+b+b\cosh(2\,e\,z)}}\,\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}}\right)$$

01.20.21.2437.01

$$\int \frac{1}{\left(b \cosh^2(e z)+a\right)\sqrt{\frac{b \cosh^2(e z)+a}{d \cosh^2(e z)+c}}}\, dz == -\frac{i\sqrt{\frac{a}{a+b}}\,\cosh(e z)}{a e\sqrt{\frac{b \cosh^2(e z)+a}{d \cosh^2(e z)+c}}\sqrt{\frac{(a+b)\cosh^2(e z)}{2 a+b+b \cosh(2 e z)}}\sqrt{\frac{2 a+b+b \cosh(2 e z)}{a+b}}\sqrt{\frac{(a+b)(2 c+d+d \cosh(2 e z))}{(c+d)(2 a+b+b \cosh(2 e z))}}}$$

$$E\left(i \sinh^{-1}\left(\frac{\sqrt{2}\sqrt{\frac{a}{a+b}}\sinh(e z)}{\sqrt{\frac{2 a+b+b \cosh(2 e z)}{a+b}}}\right)\middle| \frac{a d-b c}{a (c+d)}\right)$$

01.20.21.2438.01

$$\int \frac{\sqrt{\frac{b \cosh^2(e z)+a}{d \cosh^2(e z)+c}}}{d \cosh^2(e z)+c}\, dz == \left(\sqrt{2}\sqrt{\frac{(a+b)\cosh^2(e z)}{2 a+b+b \cosh(2 e z)}}\sqrt{\frac{b \cosh^2(e z)+a}{2 c+d+d \cosh(2 e z)}}\,\operatorname{sech}(e z)\right.$$

$$\left(2 (b c-a d)\sqrt{\frac{(a+b)\cosh^2(e z)}{2 a+b+b \cosh(2 e z)}}\sqrt{\frac{2 a+b+b \cosh(2 e z)}{a+b}}\sqrt{\frac{(a+b)(2 c+d+d \cosh(2 e z))}{(c+d)(2 a+b+b \cosh(2 e z))}}\sinh(e z)-\right.$$

$$\left.\left.\frac{i a (2 c+d+d \cosh(2 e z)) E\left(i \sinh^{-1}\left(\frac{\sqrt{2}\sqrt{\frac{a}{a+b}}\sinh(e z)}{\sqrt{\frac{2 a+b+b \cosh(2 e z)}{a+b}}}\right)\middle| \frac{a d-b c}{a (c+d)}\right)}{\sqrt{\frac{a}{a+b}}}\right)\right/$$

$$\left((a+b) c (c+d) e\sqrt{\frac{2 a+b+b \cosh(2 e z)}{a+b}}\sqrt{\frac{(a+b)(2 c+d+d \cosh(2 e z))}{(c+d)(2 a+b+b \cosh(2 e z))}}\right)$$

01.20.21.2439.01

$$\int \frac{1}{\sqrt{\left(b\cosh^2(e\,z)+a\right)\left(d\cosh^2(e\,z)+c\right)}}\,dz ==$$

$$\left((b\,c-a\,d)\cosh(e\,z)\sqrt{\frac{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))\,\text{csch}^2(e\,z)}{b\,c-a\,d}}\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))\,\text{csch}^2(e\,z)}{a\,d-b\,c}}\right.$$

$$\left.F\left(\sin^{-1}\left(\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))\,\text{csch}^2(e\,z)}{2\,a\,d-2\,b\,c}}\right)\middle|\frac{b\,c-a\,d}{a\,c+b\,c}\right)\sinh(e\,z)\right)\Big/$$

$$\left((a+b)\,c\,e\sqrt{(2\,a+b+b\cosh(2\,e\,z))\,(2\,c+d+d\cosh(2\,e\,z))}\sqrt{\frac{(c+d)\coth^2(e\,z)}{c}}\right)$$

01.20.21.2440.01

$$\int \frac{1}{\sqrt{\left(b\cosh^2(e\,z)+a\right)\left(d\cosh^2(e\,z)+c\right)}\,\left(g\cosh^2(e\,z)+f\right)}\,dz ==$$

$$-\left(i\sqrt{b\cosh^2(e\,z)+a}\sqrt{d\cosh^2(e\,z)+c}\left(\left(a\,g\cosh(e\,z)\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}}\right.\right.\right.$$

$$\left.\left.\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))}{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))}}\,\Pi\left(\frac{a\,g-b\,f}{a\,(f+g)};\,i\sinh^{-1}\left(\frac{\sqrt{2}\,\sqrt{\frac{a}{a+b}}\,\sinh(e\,z)}{\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}}}\right)\middle|\frac{a\,d-b\,c}{a\,(c+d)}\right)\right)\Big/$$

$$\left(\left(\frac{a}{a+b}\right)^{3/2}(f+g)\sqrt{\frac{(a+b)\cosh^2(e\,z)}{2\,a+b+b\cosh(2\,e\,z)}}\right)-\frac{1}{2\,(a+b)\,c\sqrt{\frac{(c+d)\coth^2(e\,z)}{c}}}$$

$$\left(i\,b\,(b\,c-a\,d)\sqrt{\frac{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))\,\text{csch}^2(e\,z)}{b\,c-a\,d}}\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))\,\text{csch}^2(e\,z)}{a\,d-b\,c}}\right.$$

$$\left.\left.F\left(\sin^{-1}\left(\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))\,\text{csch}^2(e\,z)}{2\,a\,d-2\,b\,c}}\right)\middle|\frac{b\,c-a\,d}{a\,c+b\,c}\right)\sinh(2\,e\,z)\right)\right)\Big/$$

$$\left(e\,(a\,g-b\,f)\sqrt{\left(b\cosh^2(e\,z)+a\right)\left(d\cosh^2(e\,z)+c\right)}\sqrt{2\,a+b+b\cosh(2\,e\,z)}\sqrt{2\,c+d+d\cosh(2\,e\,z)}\right)$$

01.20.21.2441.01

$$\int \frac{\cosh^2(e\,z)}{\sqrt{\left(b\cosh^2(e\,z)+a\right)\left(d\cosh^2(e\,z)+c\right)^3}}\,dz ==$$

$$\left(\sqrt{b\cosh^2(e\,z)+a}\,\left(d\cosh^2(e\,z)+c\right)^{3/2}\left(\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}\right)^{3/2}\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))}{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))}}\right.$$

$$\left(i\sqrt{\frac{a}{a+b}}\,(a+b)^2\cosh(e\,z)\,(2\,c+d+d\cosh(2\,e\,z))\,E\left(i\sinh^{-1}\left(\frac{\sqrt{2}\,\sqrt{\frac{a}{a+b}}\,\sinh(e\,z)}{\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}}}\right)\middle|\frac{a\,d-b\,c}{a\,(c+d)}\right)-\right.$$

$$\frac{1}{2}(b\,c-a\,d)\sqrt{\frac{(a+b)\cosh^2(e\,z)}{2\,a+b+b\cosh(2\,e\,z)}}\sqrt{\frac{2\,a+b+b\cosh(2\,e\,z)}{a+b}}$$

$$\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))}{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))}}\left(4\,(a+b)\cosh^2(e\,z)-2\,a\sqrt{\frac{(c+d)\coth^2(e\,z)}{c}}\right.$$

$$\sqrt{\frac{(c+d)\,(2\,a+b+b\cosh(2\,e\,z))\,\mathrm{csch}^2(e\,z)}{b\,c-a\,d}}\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))\,\mathrm{csch}^2(e\,z)}{a\,d-b\,c}}$$

$$\left.\left.\left.F\left(\sin^{-1}\left(\sqrt{\frac{(a+b)\,(2\,c+d+d\cosh(2\,e\,z))\,\mathrm{csch}^2(e\,z)}{2\,a\,d-2\,b\,c}}\right)\middle|\frac{b\,c-a\,d}{a\,c+b\,c}\right)\sinh^2(e\,z)\right)\tanh(e\,z)\right)\right)\Big/$$

$$\left((a\,d-b\,c)\,e\sqrt{\left(b\cosh^2(e\,z)+a\right)\left(d\cosh^2(e\,z)+c\right)^3}\sqrt{\frac{(a+b)\cosh^2(e\,z)}{2\,a+b+b\cosh(2\,e\,z)}}\,(2\,a+b+b\cosh(2\,e\,z))^{3/2}\right.$$

$$\left.(2\,c+d+d\cosh(2\,e\,z))^{3/2}\right)$$

Involving functions of the direct function and a power function

Involving powers of the direct function and a power function

Involving powers of cosh and power

Involving $z^{\alpha-1}\cosh^{\nu}(a\,z)$

01.20.21.2442.01

$$\int z^{\alpha-1}\cosh^{\nu}(a\,z)\,dz == 2^{-\nu}\,\frac{(1-\nu \bmod 2)\,z^{\alpha}}{\alpha}\binom{\nu}{\frac{\nu}{2}} - 2^{-\nu}\,z^{\alpha}\sum_{i=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{i}\left(\Gamma(\alpha,\,a\,(2\,i-\nu)\,z)\,(a\,(2\,i-\nu)\,z)^{-\alpha} + (a\,(\nu-2\,i)\,z)^{-\alpha}\,\Gamma(\alpha,\,a\,(\nu-2\,i)\,z)\right) /;\, \nu\in\mathbb{N}^{+}$$

01.20.21.2443.01

$$\int \frac{\cosh^{\nu}(a\,z)}{z}\,dz == 2^{-\nu}\left(2\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\mathrm{Ci}(i\,a\,(\nu-2\,k)\,z) - \binom{\nu}{\frac{\nu}{2}}\log(z)\,(\nu \bmod 2-1)\right) /;\, \nu\in\mathbb{N}^{+}$$

01.20.21.2444.01

$$\int z^{\alpha-1}\cosh^{2}(a\,z)\,dz == \frac{1}{4}\,z^{\alpha}\left(-2^{-\alpha}\,\Gamma(\alpha,\,-2\,a\,z)\,(-a\,z)^{-\alpha} - 2^{-\alpha}\,(a\,z)^{-\alpha}\,\Gamma(\alpha,\,2\,a\,z) + \frac{2}{\alpha}\right)$$

01.20.21.2445.01

$$\int z^{\alpha-1}\cosh^{3}(a\,z)\,dz == -\frac{1}{8}\,3^{-\alpha}\,z^{\alpha}\left(-a^{2}\,z^{2}\right)^{-\alpha}\left(\left(3^{\alpha+1}\,\Gamma(\alpha,\,a\,z) + \Gamma(\alpha,\,3\,a\,z)\right)(-a\,z)^{\alpha} + 3^{\alpha+1}\,(a\,z)^{\alpha}\,\Gamma(\alpha,\,-a\,z) + (a\,z)^{\alpha}\,\Gamma(\alpha,\,-3\,a\,z)\right)$$

01.20.21.2446.01

$$\int z^{n}\cosh^{\nu}(a\,z)\,dz == n!\,\cosh^{\nu}(a\,z)\left(1+e^{-2\,a\,z}\right)^{-\nu}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}}{(n-j)!\,(a\,\nu)^{j+1}}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\,\ldots,\,-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2},\,\ldots,\,1-\frac{\nu}{2};\,-e^{-2\,a\,z}\right) /;\, n\in\mathbb{N}$$

01.20.21.2447.01

$$\int z\cosh^{\nu}(a\,z)\,dz == -\frac{1}{2\,a^{2}}\cosh^{\nu+1}(a\,z)\left(\frac{2\,a\,z}{\nu+1}\,{}_{2}F_{1}\left(1,\,\frac{\nu+2}{2};\,\frac{\nu+3}{2};\,\cosh^{2}(a\,z)\right)\sinh(a\,z) - 2^{-\nu-1}\,\sqrt{\pi}\,\cosh(a\,z)\,\Gamma(\nu+1)\,{}_{3}\tilde{F}_{2}\left(1,\,\frac{\nu+2}{2},\,\frac{\nu+2}{2};\,\frac{\nu+3}{2},\,\frac{\nu+4}{2};\,\cosh^{2}(a\,z)\right)\right)$$

01.20.21.2448.01

$$\int \frac{\cosh^{2}(a\,z)}{z}\,dz == \frac{1}{2}\,(\mathrm{Chi}(2\,a\,z) + \log(z))$$

01.20.21.2449.01

$$\int \frac{\cosh^{3}(a\,z)}{z}\,dz == \frac{1}{4}\,(3\,\mathrm{Chi}(a\,z) + \mathrm{Chi}(3\,a\,z))$$

01.20.21.2450.01

$$\int \frac{\cosh^{4}(a\,z)}{z}\,dz == \frac{1}{8}\,(4\,\mathrm{Chi}(2\,a\,z) + \mathrm{Chi}(4\,a\,z) + 3\log(z))$$

01.20.21.2451.01

$$\int \frac{\cosh^{5}(a\,z)}{z}\,dz == \frac{1}{16}\,(10\,\mathrm{Chi}(a\,z) + 5\,\mathrm{Chi}(3\,a\,z) + \mathrm{Chi}(5\,a\,z))$$

01.20.21.2452.01

$$\int z \cosh^2(a\,z)\,dz == -\frac{\cosh(2\,a\,z) - 2\,a\,z\,(a\,z + \sinh(2\,a\,z))}{8\,a^2}$$

01.20.21.2453.01

$$\int z \cosh^3(a\,z)\,dz == -\frac{27\cosh(a\,z) + \cosh(3\,a\,z) - 3\,a\,z\,(9\sinh(a\,z) + \sinh(3\,a\,z))}{36\,a^2}$$

01.20.21.2454.01

$$\int z \cosh^4(a\,z)\,dz == -\frac{16\cosh(2\,a\,z) + \cosh(4\,a\,z) - 4\,a\,z\,(6\,a\,z + 8\sinh(2\,a\,z) + \sinh(4\,a\,z))}{128\,a^2}$$

01.20.21.2455.01

$$\int z \cosh^5(a\,z)\,dz == \frac{1}{3600\,a^2}(-2250\cosh(a\,z) - 125\cosh(3\,a\,z) - 9\cosh(5\,a\,z) + 2250\,a\,z\sinh(a\,z) + 375\,a\,z\sinh(3\,a\,z) + 45\,a\,z\sinh(5\,a\,z))$$

01.20.21.2456.01

$$\int z^2 \cosh^2(a\,z)\,dz == \frac{4\,a^3\,z^3 - 6\,a\cosh(2\,a\,z)\,z + \left(6\,a^2\,z^2 + 3\right)\sinh(2\,a\,z)}{24\,a^3}$$

01.20.21.2457.01

$$\int z^2 \cosh^3(a\,z)\,dz == \frac{-81\,a\,z\cosh(a\,z) - 3\,a\,z\cosh(3\,a\,z) + \left(45\,a^2\,z^2 + \left(9\,a^2\,z^2 + 2\right)\cosh(2\,a\,z) + 82\right)\sinh(a\,z)}{54\,a^3}$$

01.20.21.2458.01

$$\int z^2 \cosh^4(a\,z)\,dz == \frac{1}{256\,a^3}\left(32\,a^3\,z^3 + 64\,a^2\sinh(2\,a\,z)\,z^2 + 8\,a^2\sinh(4\,a\,z)\,z^2 - 64\,a\cosh(2\,a\,z)\,z - 4\,a\cosh(4\,a\,z)\,z + 32\sinh(2\,a\,z) + \sinh(4\,a\,z)\right)$$

01.20.21.2459.01

$$\int z^2 \cosh^5(a\,z)\,dz == \frac{1}{54\,000\,a^3}\left(-67\,500\,a\,z\cosh(a\,z) - 3750\,a\,z\cosh(3\,a\,z) - 270\,a\,z\cosh(5\,a\,z) + 33\,750\left(a^2\,z^2 + 2\right)\sinh(a\,z) + 625\left(9\,a^2\,z^2 + 2\right)\sinh(3\,a\,z) + 27\left(25\,a^2\,z^2 + 2\right)\sinh(5\,a\,z)\right)$$

01.20.21.2460.01

$$\int z^2 \cosh^6(a\,z)\,dz == \frac{1}{13\,824\,a^3}\left(1440\,a^3\,z^3 + 3240\,a^2\sinh(2\,a\,z)\,z^2 + 648\,a^2\sinh(4\,a\,z)\,z^2 + 72\,a^2\sinh(6\,a\,z)\,z^2 - 3240\,a\cosh(2\,a\,z)\,z - 324\,a\cosh(4\,a\,z)\,z - 24\,a\cosh(6\,a\,z)\,z + 1620\sinh(2\,a\,z) + 81\sinh(4\,a\,z) + 4\sinh(6\,a\,z)\right)$$

01.20.21.2461.01

$$\int z^3 \cosh^2(a\,z)\,dz == \frac{2\,a^4\,z^4 + 2\,a\left(2\,a^2\,z^2 + 3\right)\sinh(2\,a\,z)\,z - 3\left(2\,a^2\,z^2 + 1\right)\cosh(2\,a\,z)}{16\,a^4}$$

01.20.21.2462.01

$$\int z^3 \cosh^3(a\,z)\,dz ==$$

$$-\frac{1}{108\,a^4}\left(243\left(a^2\,z^2+2\right)\cosh(a\,z)+\left(9\,a^2\,z^2+2\right)\cosh(3\,a\,z)-6\,a\,z\left(15\,a^2\,z^2+\left(3\,a^2\,z^2+2\right)\cosh(2\,a\,z)+82\right)\sinh(a\,z)\right)$$

01.20.21.2463.01

$$\int z^3 \cosh^4(a\,z)\,dz == \frac{1}{1024\,a^4}\left(-192\left(2\,a^2\,z^2+1\right)\cosh(2\,a\,z)-\right.$$
$$\left.3\left(8\,a^2\,z^2+1\right)\cosh(4\,a\,z)+4\,a\,z\left(24\,a^3\,z^3+32\left(2\,a^2\,z^2+3\right)\sinh(2\,a\,z)+\left(8\,a^2\,z^2+3\right)\sinh(4\,a\,z)\right)\right)$$

01.20.21.2464.01

$$\int z^{n+\frac{1}{2}} \cosh^{\nu}(a\,z)\,dz == \frac{2^{1-\nu}\,z^{n+\frac{3}{2}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{2\,n+3}-$$
$$2^{-\nu}\,z^{n+\frac{3}{2}}\sum_{j=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{j}\left(\left(\operatorname{erfc}\left(\sqrt{-a\,(2\,j-\nu)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{a\,(2\,j-\nu)\,z}\sum_{k=0}^{n}\frac{(-a\,(2\,j-\nu)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{a\,(2\,j-\nu)\,z}\sum_{k=n+1}^{-1}\frac{(-a\,(2\,j-\nu)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right.$$
$$(-a\,(2\,j-\nu)\,z)^{-n-\frac{3}{2}}+(-a\,(\nu-2\,j)\,z)^{-n-\frac{3}{2}}\left(\operatorname{erfc}\left(\sqrt{-a\,(\nu-2\,j)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+\right.$$
$$\left.\left.e^{a\,(\nu-2\,j)\,z}\sum_{k=0}^{n}\frac{(-a\,(\nu-2\,j)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{a\,(\nu-2\,j)\,z}\sum_{k=n+1}^{-1}\frac{(-a\,(\nu-2\,j)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)\Big/;\ n\in\mathbb{Z}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh^{\nu}(a\,z+b)$

01.20.21.2465.01

$$\int z^{\alpha-1}\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{\alpha}\,2^{-\nu}\,z^{\alpha}\left(\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)-\alpha\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{2\,b\,k-b\,\nu}\left(-a^2\,(\nu-2\,k)^2\,z^2\right)^{-\alpha}\binom{\nu}{k}\right.$$
$$\left.\left(\Gamma(\alpha,\,a\,(\nu-2\,k)\,z)\,(a\,(2\,k-\nu)\,z)^{\alpha}+e^{2\,b\,\nu-4\,b\,k}\,(a\,(\nu-2\,k)\,z)^{\alpha}\,\Gamma(\alpha,\,a\,(2\,k-\nu)\,z)\right)\right)\Big/;\ \alpha\neq 0\bigwedge n\in\mathbb{N}^+$$

01.20.21.2466.01

$$\int\frac{\cosh^{\nu}(b+a\,z)}{z}\,dz ==$$
$$2^{-\nu}\left(2\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}(\cosh(b\,(\nu-2\,k))\,\operatorname{Ci}(i\,a\,(2\,k-\nu)\,z)-\sinh(b\,(\nu-2\,k))\,\operatorname{Shi}(a\,(2\,k-\nu)\,z))-\binom{\nu}{\frac{\nu}{2}}\log(z)\,(\nu \bmod 2-1)\right)\Big/;\ n\in\mathbb{N}^+$$

01.20.21.2467.01

$$\int z^{\alpha-1}\cosh^2(b+a\,z)\,dz == \frac{1}{\alpha}\left(2^{-\alpha-2}\,z^{\alpha}\left(-a^2\,z^2\right)^{-\alpha}\left(-\alpha\,\Gamma(\alpha,\,2\,a\,z)\,(\cosh(b)-\sinh(b))^2\,(-a\,z)^{\alpha}+2^{\alpha+1}\left(-a^2\,z^2\right)^{\alpha}-(a\,z)^{\alpha}\,\alpha\,\Gamma(\alpha,\,-2\,a\,z)\,(\cosh(b)+\sinh(b))^2\right)\right)$$

01.20.21.2468.01

$$\int z^{\alpha-1}\cosh^3(b+a\,z)\,dz == -\frac{1}{8}\,3^{-\alpha}\,z^{\alpha}\left(-a^2\,z^2\right)^{-\alpha}\left(\Gamma(\alpha,\,-3\,a\,z)\,(\cosh(b)+\sinh(b))^3\,(a\,z)^{\alpha}+(\cosh(b)-\sinh(b))\right.$$
$$\left.\left(\left(3^{\alpha+1}\,\Gamma(\alpha,\,a\,z)+\Gamma(\alpha,\,3\,a\,z)\,(\cosh(2\,b)-\sinh(2\,b))\right)(-a\,z)^{\alpha}+3^{\alpha+1}\,(a\,z)^{\alpha}\,\Gamma(\alpha,\,-a\,z)\,(\cosh(b)+\sinh(b))^2\right)\right)$$

01.20.21.2469.01

$$\int z^n\cosh^{\nu}(b+a\,z)\,dz == n!\,\cosh^{\nu}(b+a\,z)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\sum_{j=0}^{n}\frac{\left((-1)^j\,z^{n-j}\right)}{(n-j)!\,(a\,\nu)^{j+1}}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\,\ldots,\,-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2},\,\ldots,\,1-\frac{\nu}{2};\,-e^{-2\,(b+a\,z)}\right)/;\,n\in\mathbb{N}$$

01.20.21.2470.01

$$\int z\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{4\,a^2}\left(\cosh^{\nu+1}(b+a\,z)\left(2^{-\nu}\,\sqrt{\pi}\,\cosh(b+a\,z)\,\Gamma(\nu+1)\,{}_3\tilde{F}_2\left(1,\,\frac{\nu+2}{2},\,\frac{\nu+2}{2};\,\frac{\nu+3}{2},\,\frac{\nu+4}{2};\,\cosh^2(b+a\,z)\right)-\right.\right.$$
$$\frac{1}{\nu+1}\left(4\left(b\,\operatorname{csch}(b+a\,z)\,\sqrt{-\sinh^2(b+a\,z)}\;{}_2F_1\left(\frac{\nu+1}{2},\,\frac{1}{2};\,\frac{\nu+3}{2};\,\cosh^2(b+a\,z)\right)+\right.\right.$$
$$\left.\left.\left.\left.(b+a\,z)\,{}_2F_1\left(1,\,\frac{\nu+2}{2};\,\frac{\nu+3}{2};\,\cosh^2(b+a\,z)\right)\sinh(b+a\,z)\right)\right)\right)\right)$$

01.20.21.2471.01

$$\int\frac{\cosh^2(b+a\,z)}{z^2}\,dz == -\frac{\cosh^2(b+a\,z)}{z}+a\,\operatorname{Chi}(2\,a\,z)\sinh(2\,b)+a\cosh(2\,b)\,\operatorname{Shi}(2\,a\,z)$$

01.20.21.2472.01

$$\int\frac{\cosh^2(b+a\,z)}{z}\,dz == \frac{1}{2}\left(\cosh(2\,b)\,\operatorname{Chi}(2\,a\,z)+\log(z)+\sinh(2\,b)\,\operatorname{Shi}(2\,a\,z)\right)$$

01.20.21.2473.01

$$\int\frac{\cosh^3(b+a\,z)}{z}\,dz == \frac{1}{4}\left(3\cosh(b)\,\operatorname{Chi}(a\,z)+\cosh(3\,b)\,\operatorname{Chi}(3\,a\,z)+3\sinh(b)\,\operatorname{Shi}(a\,z)+\sinh(3\,b)\,\operatorname{Shi}(3\,a\,z)\right)$$

01.20.21.2474.01

$$\int\frac{\cosh^4(b+a\,z)}{z}\,dz == \frac{1}{8}\left(4\cosh(2\,b)\,\operatorname{Chi}(2\,a\,z)+\cosh(4\,b)\,\operatorname{Chi}(4\,a\,z)+3\log(z)+4\sinh(2\,b)\,\operatorname{Shi}(2\,a\,z)+\sinh(4\,b)\,\operatorname{Shi}(4\,a\,z)\right)$$

01.20.21.2475.01

$$\int\frac{\cosh^5(b+a\,z)}{z}\,dz == \frac{1}{16}\left(10\cosh(b)\,\operatorname{Chi}(a\,z)+5\cosh(3\,b)\,\operatorname{Chi}(3\,a\,z)+\right.$$
$$\left.\cosh(5\,b)\,\operatorname{Chi}(5\,a\,z)+10\sinh(b)\,\operatorname{Shi}(a\,z)+5\sinh(3\,b)\,\operatorname{Shi}(3\,a\,z)+\sinh(5\,b)\,\operatorname{Shi}(5\,a\,z)\right)$$

01.20.21.2476.01

$$\int z\cosh^2(b+a\,z)\,dz == -\frac{\cosh(2\,(b+a\,z))-2\,a\,z\,(a\,z+\sinh(2\,(b+a\,z)))}{8\,a^2}$$

01.20.21.2477.01

$$\int z \cosh^3(b+a\,z)\,dz == -\frac{27\cosh(b+a\,z)+\cosh(3\,(b+a\,z))-3\,a\,z\,(9\sinh(b+a\,z)+\sinh(3\,(b+a\,z)))}{36\,a^2}$$

01.20.21.2478.01

$$\int z \cosh^4(b+a\,z)\,dz == -\frac{1}{128\,a^2}\,(16\cosh(2\,(b+a\,z))+\cosh(4\,(b+a\,z))-4\,a\,z\,(6\,a\,z+8\sinh(2\,(b+a\,z))+\sinh(4\,(b+a\,z))))$$

01.20.21.2479.01

$$\int z \cosh^5(b+a\,z)\,dz == \frac{1}{3600\,a^2}\,(-2250\cosh(b+a\,z)-125\cosh(3\,(b+a\,z))-$$
$$9\cosh(5\,(b+a\,z))+2250\,a\,z\sinh(b+a\,z)+375\,a\,z\sinh(3\,(b+a\,z))+45\,a\,z\sinh(5\,(b+a\,z)))$$

01.20.21.2480.01

$$\int z^2 \cosh^2(b+a\,z)\,dz == \frac{4\,a^3\,z^3-6\,a\cosh(2\,(b+a\,z))\,z+\left(6\,a^2\,z^2+3\right)\sinh(2\,(b+a\,z))}{24\,a^3}$$

01.20.21.2481.01

$$\int z^2 \cosh^3(b+a\,z)\,dz ==$$
$$\frac{1}{54\,a^3}\left(-81\,a\,z\cosh(b+a\,z)-3\,a\,z\cosh(3\,(b+a\,z))+\left(45\,a^2\,z^2+\left(9\,a^2\,z^2+2\right)\cosh(2\,(b+a\,z))+82\right)\sinh(b+a\,z)\right)$$

01.20.21.2482.01

$$\int z^2 \cosh^4(b+a\,z)\,dz == \frac{1}{256\,a^3}\left(32\,a^3\,z^3+64\,a^2\sinh(2\,(b+a\,z))\,z^2+8\,a^2\sinh(4\,(b+a\,z))\,z^2-\right.$$
$$\left.64\,a\cosh(2\,(b+a\,z))\,z-4\,a\cosh(4\,(b+a\,z))\,z+32\sinh(2\,(b+a\,z))+\sinh(4\,(b+a\,z))\right)$$

01.20.21.2483.01

$$\int z^2 \cosh^5(b+a\,z)\,dz ==$$
$$\frac{1}{54\,000\,a^3}\left(33\,750\,a^2\sinh(b+a\,z)\,z^2+5625\,a^2\sinh(3\,(b+a\,z))\,z^2+675\,a^2\sinh(5\,(b+a\,z))\,z^2-67\,500\,a\cosh(b+a\,z)\,z-\right.$$
$$\left.3750\,a\cosh(3\,(b+a\,z))\,z-270\,a\cosh(5\,(b+a\,z))\,z+67\,500\sinh(b+a\,z)+1250\sinh(3\,(b+a\,z))+54\sinh(5\,(b+a\,z))\right)$$

01.20.21.2484.01

$$\int z^2 \cosh^6(b+a\,z)\,dz == \frac{1}{13\,824\,a^3}$$
$$\left(1440\,a^3\,z^3+3240\,a^2\sinh(2\,(b+a\,z))\,z^2+648\,a^2\sinh(4\,(b+a\,z))\,z^2+72\,a^2\sinh(6\,(b+a\,z))\,z^2-3240\,a\cosh(2\,(b+a\,z))\,z-\right.$$
$$\left.324\,a\cosh(4\,(b+a\,z))\,z-24\,a\cosh(6\,(b+a\,z))\,z+1620\sinh(2\,(b+a\,z))+81\sinh(4\,(b+a\,z))+4\sinh(6\,(b+a\,z))\right)$$

01.20.21.2485.01

$$\int z^3 \cosh^2(b+a\,z)\,dz == \frac{2\,a^4\,z^4-3\left(2\,a^2\,z^2+1\right)\cosh(2\,(b+a\,z))+\left(4\,a^3\,z^3+6\,a\,z\right)\sinh(2\,(b+a\,z))}{16\,a^4}$$

01.20.21.2486.01

$$\int z^3 \cosh^3(b+a\,z)\,dz == -\frac{1}{108\,a^4}\left(243\left(a^2\,z^2+2\right)\cosh(b+a\,z)+\right.$$
$$\left.\left(9\,a^2\,z^2+2\right)\cosh(3\,(b+a\,z))-6\,a\,z\left(15\,a^2\,z^2+\left(3\,a^2\,z^2+2\right)\cosh(2\,(b+a\,z))+82\right)\sinh(b+a\,z)\right)$$

01.20.21.2487.01

$$\int z^3 \cosh^4(b+a\,z)\,dz == \frac{1}{1024\,a^4}\left(-192\left(2\,a^2\,z^2+1\right)\cosh(2\,(b+a\,z)) - 3\left(8\,a^2\,z^2+1\right)\cosh(4\,(b+a\,z)) + 4\,a\,z\left(24\,a^3\,z^3+32\left(2\,a^2\,z^2+3\right)\sinh(2\,(b+a\,z)) + \left(8\,a^2\,z^2+3\right)\sinh(4\,(b+a\,z))\right)\right)$$

01.20.21.2488.01

$$\int z^{n+\frac{1}{2}} \cosh^{\nu}(b+a\,z)\,dz == \frac{2^{1-\nu}\,z^{n+\frac{3}{2}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{2\,n+3} - 2^{-\nu}\,a^{-n-1}\sqrt{z}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{-a^2\,(2\,s-\nu)^2\,z^2}}$$

$$\left((2\,s-\nu)^{-n-1}\binom{\nu}{s}\left(e^{2\,b\,s-b\,\nu}\left(e^{2\,b\,\nu-4\,b\,s}\sqrt{a\,(\nu-2\,s)\,z}\,\operatorname{erfc}\left(\sqrt{a\,(2\,s-\nu)\,z}\right) - (-1)^n\sqrt{a\,(2\,s-\nu)\,z}\,\operatorname{erfc}\left(\sqrt{a\,(\nu-2\,s)\,z}\right)\right)\right.\right.$$

$$\Gamma\left(n+\frac{3}{2}\right) + e^{b\,(\nu-2\,s)+a\,z\,(\nu-2\,s)}\sqrt{a\,(\nu-2\,s)\,z}\left(\sum_{k=0}^{n}\frac{(a\,(2\,s-\nu)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - \sum_{k=n+1}^{-1}\frac{(a\,(2\,s-\nu)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right) +$$

$$\left.\left.(-1)^n\,e^{(2\,s-\nu)\,(b+a\,z)}\sqrt{a\,(2\,s-\nu)\,z}\left(\sum_{k=n+1}^{-1}\frac{(a\,(\nu-2\,s)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - \sum_{k=0}^{n}\frac{(a\,(\nu-2\,s)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)\right) /;\ n\in\mathbb{Z}\wedge\alpha\neq 0\wedge\nu\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh^{\nu}(a\,z^r)$

01.20.21.2489.01

$$\int z^{\alpha-1}\cosh^{\nu}(a\,z^r)\,dz == \frac{2^{-\nu}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{\alpha} - \frac{1}{r}\,2^{-\nu}\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\Gamma\left(\frac{\alpha}{r},-a\,(\nu-2\,k)\,z^r\right)(-a\,(\nu-2\,k)\,z^r)^{-\frac{\alpha}{r}} + (a\,(\nu-2\,k)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},a\,(\nu-2\,k)\,z^r\right)\right) /;\ \alpha\neq 0\wedge\nu\in\mathbb{N}^+$$

01.20.21.2490.01

$$\int\frac{\cosh^{\nu}(a\,z^r)}{z}\,dz == \frac{1}{r}\,2^{-\nu}\left(r\binom{\nu}{\frac{\nu}{2}}\log(z)\,(1-\nu \bmod 2) + \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\operatorname{Ei}(a\,(2\,k-\nu)\,z^r) + \operatorname{Ei}(a\,(\nu-2\,k)\,z^r)\right)\right) /;\ \nu\in\mathbb{N}^+$$

01.20.21.2491.01

$$\int z^n\cosh^{\nu}\left(a\,z^2\right)dz == -\frac{1}{n+1}\,2^{-\nu-1}\,z^{n+1}\left(-2\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2) + (n+1)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\Gamma\left(\frac{n+1}{2},a\,(2\,k-\nu)\,z^2\right)\left(a\,(2\,k-\nu)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left(a\,(\nu-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},a\,(\nu-2\,k)\,z^2\right)\right)\right) /;\ n\in\mathbb{Z}\wedge n\neq -1\wedge\nu\in\mathbb{N}^+$$

01.20.21.2492.01

$$\int z^{2n} \cosh^{\nu}\left(a z^2\right) dz == \frac{2^{-\nu} z^{2n+1} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)}{2n+1} - 2^{-\nu-1} z^{2n+1}$$
$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\left(\operatorname{erfc}\left(\sqrt{-a(\nu-2k)z^2}\right) \Gamma\left(n+\frac{1}{2}\right) + e^{a(\nu-2k)z^2} \sum_{j=0}^{n-1} \frac{\left(-a(\nu-2k)z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}} - e^{a(\nu-2k)z^2} \sum_{j=n}^{-1} \frac{\left(-a(\nu-2k)z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}} \right) \right.$$
$$\left(-a(\nu-2k)z^2\right)^{\frac{1}{2}(-2n-1)} + \left(a(\nu-2k)z^2\right)^{\frac{1}{2}(-2n-1)} \left(\operatorname{erfc}\left(\sqrt{a(\nu-2k)z^2}\right) \Gamma\left(n+\frac{1}{2}\right) + \right.$$
$$\left. \left. e^{-a(\nu-2k)z^2} \sum_{j=0}^{n-1} \frac{\left(a(\nu-2k)z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}} - e^{-a(\nu-2k)z^2} \sum_{j=n}^{-1} \frac{\left(a(\nu-2k)z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}} \right) \right) /; n \in \mathbb{Z} \wedge \nu \in \mathbb{N}^+$$

01.20.21.2493.01

$$\int z^{2n-1} \cosh^{\nu}\left(a z^2\right) dz ==$$
$$\frac{2^{-\nu-1} z^{2n} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)}{n} - 2^{-\nu-1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} (a(\nu-2k))^{-n} \left(-\frac{\operatorname{Ei}\left(a(\nu-2k)z^2\right)}{(-n)!} + (-1)^n e^{a(\nu-2k)z^2} \sum_{j=0}^{n-1} \frac{\left(-a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}} - \right.$$
$$(-1)^n e^{a(\nu-2k)z^2} \sum_{j=n}^{-1} \frac{\left(-a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}} + \frac{(-1)^{n-1} \operatorname{Ei}\left(-a(\nu-2k)z^2\right)}{(-n)!} +$$
$$\left. e^{-a(\nu-2k)z^2} \sum_{j=0}^{n-1} \frac{\left(a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}} - e^{-a(\nu-2k)z^2} \sum_{j=n}^{-1} \frac{\left(a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}} \right) /; n \in \mathbb{Z} \wedge n \neq 0 \wedge \nu \in \mathbb{N}^+$$

01.20.21.2494.01

$$\int z^n \cosh^{\nu}\left(\sqrt{z}\ a\right) dz == \frac{2^{-\nu} z^{n+1} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)}{n+1} -$$
$$2^{1-\nu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} (a(\nu-2k))^{-2(n+1)} \left(-\frac{\operatorname{Ei}\left(a(\nu-2k)\sqrt{z}\right)}{(-2(n+1))!} + e^{a(\nu-2k)\sqrt{z}} \sum_{j=0}^{2(n+1)-1} \frac{\left(-a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}} - \right.$$
$$e^{a(\nu-2k)\sqrt{z}} \sum_{j=2(n+1)}^{-1} \frac{\left(-a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}} - \frac{\operatorname{Ei}\left(-a(\nu-2k)\sqrt{z}\right)}{(-2(n+1))!} + e^{-a(\nu-2k)\sqrt{z}} \sum_{j=0}^{2(n+1)-1} \frac{\left(a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}} -$$
$$\left. e^{-a(\nu-2k)\sqrt{z}} \sum_{j=2(n+1)}^{-1} \frac{\left(a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}} \right) /; n \in \mathbb{Z} \wedge n \neq -1 \wedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1} \cosh^{\nu}\left(a z^r + b\right)$

01.20.21.2495.01

$$\int z^{\alpha-1} \cosh^{\nu}(a\,z^r+b)\,dz == \frac{2^{-\nu}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{\alpha} -$$

$$\frac{2^{-\nu}\,z^{\alpha}}{r}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{b(\nu-2k)}\,\Gamma\left(\frac{\alpha}{r},-a(\nu-2k)\,z^r\right)(-a(\nu-2k)\,z^r)^{-\frac{\alpha}{r}}+e^{-b(\nu-2k)}\,(a(\nu-2k)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},a(\nu-2k)\,z^r\right)\right)/;\ \alpha\neq 0\bigwedge \nu\in\mathbb{N}^+$$

01.20.21.2496.01

$$\int \frac{\cosh^{\nu}(a\,z^r+b)}{z}\,dz ==$$

$$\frac{1}{r}\,2^{-\nu}\left(r\binom{\nu}{\frac{\nu}{2}}\log(z)\,(1-\nu \bmod 2)+\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{2bk-b\nu}\binom{\nu}{k}\left(\mathrm{Ei}(a(2k-\nu)\,z^r)+e^{2b\nu-4bk}\,\mathrm{Ei}(a(\nu-2k)\,z^r)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2497.01

$$\int z^n \cosh^{\nu}\left(a\,z^2+b\right)dz ==$$

$$-\frac{1}{n+1}\,2^{-\nu-1}\,z^{n+1}\left(-2\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+(n+1)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{b\nu-2bk}\,\Gamma\left(\frac{n+1}{2},a(2k-\nu)\,z^2\right)\left(a(2k-\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{2bk-b\nu}\left(a(\nu-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},a(\nu-2k)\,z^2\right)\right)\right)/;\ n\in\mathbb{Z}\bigwedge n\neq -1\bigwedge \nu\in\mathbb{N}^+$$

01.20.21.2498.01

$$\int z^{2n}\cosh^{\nu}\left(a\,z^2+b\right)dz == \frac{2^{-\nu}\,z^{2n+1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{2n+1}-2^{-\nu-1}\,z^{2n+1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$

$$\left(e^{b(\nu-2k)}\left(\mathrm{erfc}\left(\sqrt{-a(\nu-2k)\,z^2}\right)\Gamma\left(n+\frac{1}{2}\right)+e^{a(\nu-2k)\,z^2}\sum_{j=0}^{n-1}\frac{\left(-a(\nu-2k)\,z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}}-e^{a(\nu-2k)\,z^2}\sum_{j=n}^{-1}\frac{\left(-a(\nu-2k)\,z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}}\right)\right.$$

$$\left(-a(\nu-2k)\,z^2\right)^{\frac{1}{2}(-2n-1)}+e^{-b(\nu-2k)}\left(a(\nu-2k)\,z^2\right)^{\frac{1}{2}(-2n-1)}\left(\mathrm{erfc}\left(\sqrt{a(\nu-2k)\,z^2}\right)\Gamma\left(n+\frac{1}{2}\right)+\right.$$

$$\left.\left.e^{-a(\nu-2k)\,z^2}\sum_{j=0}^{n-1}\frac{\left(a(\nu-2k)\,z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}}-e^{-a(\nu-2k)\,z^2}\sum_{j=n}^{-1}\frac{\left(a(\nu-2k)\,z^2\right)^{j+\frac{1}{2}}}{\left(n+\frac{1}{2}\right)_{j-n+1}}\right)\right)/;\ n\in\mathbb{Z}\bigwedge \nu\in\mathbb{N}^+$$

01.20.21.2499.01

$$\int z^{2n-1}\cosh^{\nu}\left(a z^2+b\right)dz == \frac{2^{-\nu-1} z^{2n}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{n} - 2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}(a(\nu-2k))^{-n}\left((-1)^n e^{b(\nu-2k)}\left(\frac{(-1)^{n-1}\operatorname{Ei}\left(a(\nu-2k)z^2\right)}{(-n)!} + e^{a(\nu-2k)z^2}\sum_{j=0}^{n-1}\frac{\left(-a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}} - e^{a(\nu-2k)z^2}\sum_{j=n}^{-1}\frac{\left(-a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}}\right) + e^{-b(\nu-2k)}\left(\frac{(-1)^{n-1}\operatorname{Ei}\left(-a(\nu-2k)z^2\right)}{(-n)!} + e^{-a(\nu-2k)z^2}\sum_{j=0}^{n-1}\frac{\left(a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}} - e^{-a(\nu-2k)z^2}\sum_{j=n}^{-1}\frac{\left(a(\nu-2k)z^2\right)^j}{(n)_{j-n+1}}\right)\right) /; n\in\mathbb{Z}\wedge n\neq 0\wedge\nu\in\mathbb{N}^+$$

01.20.21.2500.01

$$\int z^n\cosh^{\nu}\left(\sqrt{z}\ a+b\right)dz == \frac{2^{-\nu} z^{n+1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{n+1} - 2^{1-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}(a(\nu-2k))^{-2(n+1)}\left(e^{b(\nu-2k)}\left(-\frac{\operatorname{Ei}\left(a(\nu-2k)\sqrt{z}\right)}{(-2(n+1))!} + e^{a(\nu-2k)\sqrt{z}}\sum_{j=0}^{2(n+1)-1}\frac{\left(-a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}} - e^{a(\nu-2k)\sqrt{z}}\sum_{j=2(n+1)}^{-1}\frac{\left(-a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}}\right) + e^{-b(\nu-2k)}\left(-\frac{\operatorname{Ei}\left(-a(\nu-2k)\sqrt{z}\right)}{(-2(n+1))!} + e^{-a(\nu-2k)\sqrt{z}}\sum_{j=0}^{2(n+1)-1}\frac{\left(a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}} - e^{-a(\nu-2k)\sqrt{z}}\sum_{j=2(n+1)}^{-1}\frac{\left(a(\nu-2k)\sqrt{z}\right)^j}{(2(n+1))_{j-2(n+1)+1}}\right)\right) /; n\in\mathbb{Z}\wedge n\neq -1\wedge\nu\in\mathbb{N}^+$$

Involving $z^n\cosh^{\nu}\left(c z^r+f z\right)$

01.20.21.2501.01

$$\int z^n\cosh^{\nu}\left(c z^2+f z\right)dz == \frac{2^{-\nu} z^{n+1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{n+1} - 2^{-n-\nu-1} c^{-n-1}(-f)^n(f+2cz) \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{\frac{f^2(-2k+\nu)}{4c}}\binom{\nu}{k}\left(e^{\frac{(2k-\nu)f^2}{2c}}\sum_{j=0}^{n}\left(\frac{(2k-\nu)(f+2cz)^2}{c}\right)^{\frac{1}{2}(-j-1)}\left(-\frac{4cz}{f}-2\right)^j\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(2k-\nu)(f+2cz)^2}{4c}\right) + \sum_{j=0}^{n}\left(-\frac{(2k-\nu)(f+2cz)^2}{c}\right)^{\frac{1}{2}(-j-1)}\left(-\frac{4cz}{f}-2\right)^j\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2k-\nu)(f+2cz)^2}{4c}\right)\right) /; n\in\mathbb{N}\wedge\nu\in\mathbb{N}^+$$

01.20.21.2502.01

$$\int z^n \cosh^v\left(\sqrt{z}\, c + f z\right) dz ==$$

$$2^{-2n-v-1} f^{-2n-2} \left(\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{(2k-v)^2} \left(e^{\frac{c^2 (v-2k)}{4f}} \binom{v}{k} \left(e^{\frac{(2k-v) c^2}{2f}} \sum_{j=0}^{n} \sum_{h=0}^{j} 4^j (2k-v) \left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.\right.$$

$$\left(-\frac{2\sqrt{z}\, f}{c} - 1 \right)^{h+j} \binom{j}{h} \binom{n}{j} \left(c(2k-v)\left(c+2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{4f} \right) - \right.$$

$$\left. 2f \sqrt{\frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{f}}\, \Gamma\left(\frac{1}{2}(h+j+2), \frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{4f} \right) \right) + \sum_{j=0}^{n} \sum_{h=0}^{j} 4^j (2k-v)$$

$$\left(-\frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \left(-\frac{2\sqrt{z}\, f}{c} - 1 \right)^{h+j} \binom{j}{h} \binom{n}{j} \left(c(2k-v)\left(c+2f\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1), -\frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{4f} \right) + 2\sqrt{-\frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{f}}\, f\, \Gamma\left(\frac{1}{2}(h+j+2), \right.$$

$$\left. \left. \left. \left. \left. \left. -\frac{(2k-v)\left(c+2f\sqrt{z}\right)^2}{4f} \right) \right) \right) \right) \right) c^{2n} + \frac{2^{-v} z^{n+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)}{n+1} \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cosh^v\left(c z^r + f z + g\right)$

01.20.21.2503.01

$$\int z^n \cosh^v\left(c z^2 + f z + g\right) dz == \frac{2^{-v} z^{n+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)}{n+1} - 2^{-n-v-1} c^{-n-1} (-f)^n (f + 2cz) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{\frac{1}{4}\left(\frac{(v-2k) f^2}{c} + 8gk - 4gv \right)} \binom{v}{k}$$

$$\left(e^{\frac{(2k-v) f^2}{2c} - 4gk + 2gv} \sum_{j=0}^{n} \left(\frac{(2k-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-j-1)} \left(-\frac{4cz}{f} - 2 \right)^j \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(2k-v)(f+2cz)^2}{4c} \right) + \right.$$

$$\left. \sum_{j=0}^{n} \left(-\frac{(2k-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-j-1)} \left(-\frac{4cz}{f} - 2 \right)^j \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2k-v)(f+2cz)^2}{4c} \right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.2504.01

$$\int z^n \cosh^{\nu}\left(\sqrt{z}\, c+g+f z\right) dz = 2^{-2n-\nu-1} f^{-2n-2}$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{(2k-\nu)^2}\left(e^{\frac{1}{4}\left(\frac{(\nu-2k)c^2}{f}+8gk-4g\nu\right)}\binom{\nu}{k}\left(e^{\frac{(2k-\nu)c^2}{2f}-4gk+2g\nu}\sum_{j=0}^{n}\sum_{h=0}^{j} 4^j (2k-\nu)\left(\frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.\right.$$

$$\left(-\frac{2\sqrt{z}\, f}{c}-1\right)^{h+j}\binom{j}{h}\binom{n}{j}\left(c(2k-\nu)\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.2f\sqrt{\frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{f}}\,\Gamma\left(\frac{1}{2}(h+j+2), \frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)+\sum_{j=0}^{n}\sum_{h=0}^{j} 4^j (2k-\nu)$$

$$\left(-\frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\left(-\frac{2\sqrt{z}\, f}{c}-1\right)^{h+j}\binom{j}{h}\binom{n}{j}\left(c(2k-\nu)\left(c+2f\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1), -\frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{4f}\right)+2\sqrt{-\frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{f}}\, f\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.\left.\left.\left.-\frac{(2k-\nu)\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right)\right)\right)c^{2n}+\frac{2^{-\nu} z^{n+1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{n+1}\right) /;\ n\in\mathbb{N}\bigwedge \nu\in\mathbb{N}^+$$

Involving powers of the direct function and algebraic functions

Involving powers of cosh and algebraic functions

Involving $(a z+b)^{\beta}\cosh^{\nu}(c z)$

01.20.21.2505.01

$$\int (b+a\,z)^{\beta}\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu}\,(b+a\,z)^{\beta+1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{a\,(\beta+1)} -$$
$$\frac{1}{a}2^{-\nu}\,(b+a\,z)^{\beta+1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{\frac{b\,c\,(\nu-2\,k)}{a}}\,\Gamma\left(\beta+1,\,\frac{c\,(\nu-2\,k)\,(b+a\,z)}{a}\right)\left(\frac{c\,(\nu-2\,k)\,(b+a\,z)}{a}\right)^{-\beta-1} +$$
$$\left(-\frac{c\,(\nu-2\,k)\,(b+a\,z)}{a}\right)^{-\beta-1}e^{-\frac{b\,c\,(\nu-2\,k)}{a}}\,\Gamma\left(\beta+1,\,-\frac{c\,(\nu-2\,k)\,(b+a\,z)}{a}\right)\Bigg)\,/;\,\nu\in\mathbb{N}$$

01.20.21.2506.01

$$\int (b+a\,z)^{\beta}\cosh^{2}(c\,z)\,dz ==$$
$$\frac{1}{a\,c\,(\beta+1)}\left(2^{-\beta-3}\,(b+a\,z)^{\beta}\left(-\frac{c^2\,(b+a\,z)^2}{a^2}\right)^{-\beta}\left(a\,(\beta+1)\,\Gamma\left(\beta+1,\,-\frac{2\,c\,(b+a\,z)}{a}\right)\left(\cosh\left(\frac{2\,b\,c}{a}\right)-\sinh\left(\frac{2\,b\,c}{a}\right)\right)\left(\frac{c\,(b+a\,z)}{a}\right)^{\beta}+\right.\right.$$
$$\left.\left.2^{\beta+2}\left(-\frac{c^2\,(b+a\,z)^2}{a^2}\right)^{\beta}c\,(b+a\,z)-a\left(-\frac{c\,(b+a\,z)}{a}\right)^{\beta}(\beta+1)\,\Gamma\left(\beta+1,\,\frac{2\,c\,(b+a\,z)}{a}\right)\left(\cosh\left(\frac{2\,b\,c}{a}\right)+\sinh\left(\frac{2\,b\,c}{a}\right)\right)\right)\right)$$

01.20.21.2507.01

$$\int\frac{\cosh^{\nu}(c\,z)}{\sqrt{b+a\,z}}\,dz == \frac{2^{1-\nu}\,\sqrt{b+a\,z}\,\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{a} +$$
$$\frac{1}{a}2^{-\nu}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{-\frac{b\,c\,(\nu-2\,k)}{a}}\,\operatorname{erfi}\left(\sqrt{\frac{c\,(\nu-2\,k)}{a}}\,\sqrt{b+a\,z}\right)}{\sqrt{\frac{c\,(\nu-2\,k)}{a}}}+\frac{e^{\frac{b\,c\,(\nu-2\,k)}{a}}\,\operatorname{erfi}\left(\sqrt{-\frac{c\,(\nu-2\,k)}{a}}\,\sqrt{b+a\,z}\right)}{\sqrt{-\frac{c\,(\nu-2\,k)}{a}}}\right)\,/;\,\nu\in\mathbb{N}$$

01.20.21.2508.01

$$\int\frac{\cosh^{2}(c\,z)}{\sqrt{b+a\,z}}\,dz == \frac{1}{8\,a\,\sqrt{c}}\left(\sqrt{a}\,\sqrt{2\,\pi}\,\operatorname{erfi}\left(\frac{\sqrt{2}\,\sqrt{c}\,\sqrt{b+a\,z}}{\sqrt{a}}\right)\left(\cosh\left(\frac{2\,b\,c}{a}\right)-\sinh\left(\frac{2\,b\,c}{a}\right)\right)+\right.$$
$$\left.\sqrt{a}\,\sqrt{2\,\pi}\,\operatorname{erf}\left(\frac{\sqrt{2}\,\sqrt{c}\,\sqrt{b+a\,z}}{\sqrt{a}}\right)\left(\cosh\left(\frac{2\,b\,c}{a}\right)+\sinh\left(\frac{2\,b\,c}{a}\right)\right)+8\,\sqrt{c}\,\sqrt{b+a\,z}\right)$$

Involving products of the direct function and a power function

Involving products of two direct functions and a power function

Involving $z^{\alpha-1}\cosh(c\,z)\cosh(a\,z)$

01.20.21.2509.01

$$\int z^{\alpha-1}\cosh(b\,z)\cosh(a\,z)\,dz == -\frac{1}{4}z^{\alpha}\left(((a-b)\,z)^{-\alpha}\,\Gamma(\alpha,(a-b)\,z)+((b-a)\,z)^{-\alpha}\,\Gamma(\alpha,(b-a)\,z)+(-(a+b)\,z)^{-\alpha}\,\Gamma(\alpha,-(a+b)\,z)+((a+b)\,z)^{-\alpha}\,\Gamma(\alpha,(a+b)\,z)\right)$$

01.20.21.2510.01

$$\int z^{n}\cosh(b\,z)\cosh(a\,z)\,dz == -\frac{1}{4}n!\left((-a-b)^{-n-1}\,e^{(a+b)\,z}\sum_{k=0}^{n}\frac{(-(a+b)\,z)^{k}}{k!}+(a-b)^{-n-1}\,e^{(b-a)\,z}\sum_{k=0}^{n}\frac{((a-b)\,z)^{k}}{k!}+(b-a)^{-n-1}\,e^{(a-b)\,z}\sum_{k=0}^{n}\frac{((b-a)\,z)^{k}}{k!}+(a+b)^{-n-1}\,e^{-(a+b)\,z}\sum_{k=0}^{n}\frac{((a+b)\,z)^{k}}{k!}\right)/;\ n\in\mathbb{N}$$

01.20.21.2511.01

$$\int z^{-n}\cosh(b\,z)\cosh(a\,z)\,dz == \frac{1}{4\left(a^2-b^2\right)(n-1)!}\left(e^{(b-a)\,z}\left(-(a-b)\,e^{2\,a\,z}\,(n-1)!\,(-a-b)^{n}\sum_{k=1}^{n-1}\frac{(-a-b)^{k-n}\,z^{k-n}}{(1-n)_k}+(-1)^{n}\,e^{(a-b)\,z}((-a-b)^{n}\,(a-b)\,\mathrm{Ei}((a+b)\,z)-(a-b)^{n}\,(a+b)\,\mathrm{Ei}((b-a)\,z))+(a-b)^{n}\,(a+b)\,(n-1)!\sum_{k=1}^{n-1}\frac{(a-b)^{k-n}\,z^{k-n}}{(1-n)_k}\right)+e^{-(2\,a+b)\,z}\left(-(a+b)\,e^{3\,a\,z}\,(n-1)!\,(b-a)^{n}\sum_{k=1}^{n-1}\frac{(b-a)^{k-n}\,z^{k-n}}{(1-n)_k}+(-1)^{n}\,e^{(2\,a+b)\,z}\,((b-a)^{n}\,(a+b)\,\mathrm{Ei}((a-b)\,z)-(a-b)\,(a+b)^{n}\,\mathrm{Ei}(-(a+b)\,z))+(a-b)\,(a+b)^{n}\,e^{a\,z}\,(n-1)!\sum_{k=1}^{n-1}\frac{(a+b)^{k-n}\,z^{k-n}}{(1-n)_k}\right)\right)/;\ n\in\mathbb{N}^{+}$$

01.20.21.2512.01

$$\int\frac{\cosh(c\,z)\cosh(a\,z)}{z}\,dz == \frac{1}{2}(\mathrm{Chi}((a-c)\,z)+\mathrm{Chi}((a+c)\,z))$$

Involving $z^{\alpha-1}\cosh(c\,z)\cosh(a\,z+b)$

01.20.21.2513.01

$$\int z^{\alpha-1}\cosh(c\,z)\cosh(b+a\,z)\,dz == -\frac{1}{4}e^{-b}\,z^{\alpha}\left(\Gamma(\alpha,(a-c)\,z)\,((a-c)\,z)^{-\alpha}+e^{2\,b}\,((c-a)\,z)^{-\alpha}\,\Gamma(\alpha,(c-a)\,z)+e^{2\,b}\,(-(a+c)\,z)^{-\alpha}\,\Gamma(\alpha,-(a+c)\,z)+((a+c)\,z)^{-\alpha}\,\Gamma(\alpha,(a+c)\,z)\right)$$

Involving $z^{\alpha-1}\cosh(c\,z+d)\cosh(a\,z+b)$

01.20.21.2514.01

$$\int z^{\alpha-1}\cosh(d+c\,z)\cosh(b+a\,z)\,dz == -\frac{1}{4}e^{-b-d}\,z^{\alpha}\left(e^{2\,d}\,\Gamma(\alpha,(a-c)\,z)\,((a-c)\,z)^{-\alpha}+e^{2\,b}\,((c-a)\,z)^{-\alpha}\,\Gamma(\alpha,(c-a)\,z)+e^{2\,(b+d)}\,(-(a+c)\,z)^{-\alpha}\,\Gamma(\alpha,-(a+c)\,z)+((a+c)\,z)^{-\alpha}\,\Gamma(\alpha,(a+c)\,z)\right)$$

Involving $z^{n}\cosh(d\,z)\cosh\left(c\,z^{r}\right)$

01.20.21.2515.01

$$\int z^n \cosh(d\,z)\cosh\left(c\,z^2\right) dz ==$$

$$-\frac{1}{8}\left(e^{\frac{d^2}{4c}}\left(\sum_{j=0}^{n} 2^{j-n}\, d^{n-j}\,(-d-2\,c\,z)^{j+1}\left(\frac{(-d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$e^{\frac{d^2}{4c}}\left(\sum_{j=0}^{n} 2^{j-n}\,(-d)^{n-j}\,(d-2\,c\,z)^{j+1}\left(\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{d^2}{4c}}\sum_{j=0}^{n} 2^{j-n}\,d^{n-j}\,(2\,c\,z-d)^{j+1}\left(-\frac{(2\,c\,z-d)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,z-d)^2}{4\,c}\right)+$$

$$\left.c^{-n-1}\,e^{-\frac{d^2}{4c}}\sum_{j=0}^{n} 2^{j-n}\,(-d)^{n-j}\,(d+2\,c\,z)^{j+1}\left(-\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.2516.01

$$\int z^n \cosh(d\,z)\cosh\left(\sqrt{z}\,c\right) dz ==$$

$$2^{-2n-3}\,d^{-2(n+1)}\left(e^{\frac{c^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(-c-2d\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2d\sqrt{z}\right)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c-2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(-c-2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c-2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{\frac{c^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c-2d\sqrt{z}\right)^{h+j}\left(\frac{\left(c-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(c-2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(c-2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(c-2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{-\frac{c^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2d\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2d\sqrt{-\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)+$$

$$e^{-\frac{c^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2d\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2d\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)\Big/;\; n\in\mathbb{N}$$

Involving $z^n \cosh(d\,z+e)\cosh\left(c\,z^r\right)$

01.20.21.2517.01

$$\int z^n \cosh(d\,z+e)\cosh\left(c\,z^2\right)dz ==$$

$$-\frac{1}{8\sqrt{-c^2}}e^{-\frac{d^2}{4c}-e}\left(\sqrt{c}\;e^{\frac{d^2}{2c}}\sum_{q=0}^{n}2^{q-n}(-c)^{-n-\frac{1}{2}}d^{n-q}(-d-2\,c\,z)^{q+1}\left(\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\sqrt{c}\;e^{\frac{d^2}{2c}+2e}\sum_{q=0}^{n}2^{q-n}(-c)^{-n-\frac{1}{2}}(-d)^{n-q}(d-2\,c\,z)^{q+1}\left(\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-2\,c\,z)^2}{4\,c}\right)+$$

$$\sqrt{-c}\;e^{2e}\sum_{q=0}^{n}2^{q-n}\,c^{-n-\frac{1}{2}}(-d)^{n-q}(d+2\,c\,z)^{q+1}\left(-\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,c\,z)^2}{4\,c}\right)+$$

$$\left.\sqrt{-c}\sum_{q=0}^{n}2^{q-n}\,c^{-n-\frac{1}{2}}d^{n-q}\left(-\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}(2\,c\,z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.2518.01

$$\int z^n \cosh(d\,z+e)\cosh\left(c\,\sqrt{z}\right)dz == 2^{-2\,n-3}\,d^{-2\,n-2}$$

$$\left(e^{\frac{c^2}{4\,d}-e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(-c-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c\left(-c-2\,d\,\sqrt{z}\right)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\sqrt{\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{c^2}{4\,d}-e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\left(c-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\sqrt{\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{e-\frac{c^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c)^{-h-k+2\,n}\left(2\,d\,\sqrt{z}-c\right)^{h+k}\left(-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2\,d\sqrt{-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{d}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)-c\left(2\,d\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)\right)+$$

$$e^{e-\frac{c^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c^{-h-k+2\,n}\left(c+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\left(c+2\,d\,\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cosh\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.2519.01

$$\int z^{\alpha-1}\cosh(b\,z^r)\cosh(c\,z^r)\,dz == -\frac{1}{4\,r}\left(z^{\alpha}\left(\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}+((b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-c)\,z^r\right)+((c-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)+((b+c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.2520.01

$$\int z^n\cosh\left(b\,z^2\right)\cosh\left(c\,z^2\right)dz == -\frac{1}{8}\,z^{n+1}\left(\Gamma\left(\frac{n+1}{2},(-b-c)\,z^2\right)\left((-b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b-c)\,z^2\right)+\left((c-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-b)\,z^2\right)+\left((b+c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+c)\,z^2\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.2521.01

$$\int z^n\cosh\left(\sqrt{z}\;b\right)\cosh\left(\sqrt{z}\;c\right)dz == -\frac{1}{2}\left(\Gamma\left(2\,(n+1),(-b-c)\,\sqrt{z}\right)(-b-c)^{-2\,(n+1)}+(b-c)^{-2\,(n+1)}\;\Gamma\left(2\,(n+1),(b-c)\,\sqrt{z}\right)+(c-b)^{-2\,(n+1)}\;\Gamma\left(2\,(n+1),(c-b)\,\sqrt{z}\right)+(b+c)^{-2\,(n+1)}\;\Gamma\left(2\,(n+1),(b+c)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n\cosh(d\,z)\cosh\left(c\,z^r+g\right)$

01.20.21.2522.01

$$\int z^n\cosh(d\,z)\cosh\left(c\,z^2+g\right)dz == -\frac{1}{8}\left(e^{\frac{d^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(-d-2\,c\,z)^{j+1}\left(\frac{(-d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+e^{\frac{d^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d-2\,c\,z)^{j+1}\left(\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+c^{-n-1}\,e^{-\frac{d^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(2\,c\,z-d)^{j+1}\left(-\frac{(2\,c\,z-d)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,z-d)^2}{4\,c}\right)+c^{-n-1}\,e^{-\frac{d^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,c\,z)^{j+1}\left(-\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.2523.01

$$\int z^n \cosh(d\,z)\cosh\left(\sqrt{z}\,c+g\right)dz = 2^{-2n-3}\,d^{-2(n+1)}$$

$$\left(e^{\frac{c^2}{4d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(-c-2d\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2d\sqrt{z}\right)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c-2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(-c-2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c-2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{\frac{c^2}{4d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c-2d\sqrt{z}\right)^{h+j}\left(\frac{\left(c-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(c-2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(c-2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(c-2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{-\frac{c^2}{4d}-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2d\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2d\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2d\sqrt{-\frac{\left(2d\sqrt{z}-c\right)^2}{d}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)-c\left(2d\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(2d\sqrt{z}-c\right)^2}{4d}\right)\right)+$$

$$e^{-\frac{c^2}{4d}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2n}\left(c+2d\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2d\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(c+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(c+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)\Big/;\; n\in\mathbb{N}$$

Involving $z^n \cosh(d\,z+e)\cosh\left(c\,z^r+g\right)$

01.20.21.2524.01

$$\int z^n \cosh(e + d\,z)\cosh\left(c\,z^2 + g\right) dz ==$$

$$-\frac{1}{8}\left(e^{\frac{d^2}{4c}-e-g}\left(\sum_{j=0}^{n} 2^{j-n}\,d^{n-j}\,(-d-2\,c\,z)^{j+1}\left(\frac{(-d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{(-d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1} +\right.$$

$$e^{\frac{d^2}{4c}+e-g}\left(\sum_{j=0}^{n} 2^{j-n}\,(-d)^{n-j}\,(d-2\,c\,z)^{j+1}\left(\frac{(d-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{(d-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1} +$$

$$c^{-n-1}\,e^{-\frac{d^2}{4c}-e+g}\sum_{j=0}^{n} 2^{j-n}\,d^{n-j}\,(2\,c\,z-d)^{j+1}\left(-\frac{(2\,c\,z-d)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ -\frac{(2\,c\,z-d)^2}{4\,c}\right) +$$

$$\left.c^{-n-1}\,e^{-\frac{d^2}{4c}+e+g}\sum_{j=0}^{n} 2^{j-n}\,(-d)^{n-j}\,(d+2\,c\,z)^{j+1}\left(-\frac{(d+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ -\frac{(d+2\,c\,z)^2}{4\,c}\right)\right) /;\ n \in \mathbb{N}$$

01.20.21.2525.01

$$\int z^n \cosh(e+d\,z)\cosh\left(\sqrt{z}\;c+g\right)dz == 2^{-2\,n-3}\,d^{-2\,(n+1)}$$

$$\left(e^{\frac{c^2}{4\,d}-e-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(-c-2\,d\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\left(-c-2\,d\,\sqrt{z}\right)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\sqrt{\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{c^2}{4\,d}-e+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c-2\,d\,\sqrt{z}\right)^{h+j}\left(\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\left(c-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\sqrt{\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(c-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{c^2}{4\,d}+e-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2\,n}\left(2\,d\,\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,d\sqrt{-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{d}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)-c\left(2\,d\,\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(2\,d\,\sqrt{z}-c\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{c^2}{4\,d}+e+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\left(c+2\,d\,\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(c+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cosh\left(b\,z^r\right)\cosh\left(c\,z^r+g\right)$

01.20.21.2526.01

$$\int z^{\alpha-1}\cosh(b\,z^r)\cosh(c\,z^r+g)\,dz == -\frac{1}{4r}\left(z^{\alpha}\left(e^{g}\,\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}+e^{g}\,((b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-c)\,z^r\right)+e^{-g}\,((c-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)+e^{-g}\,((b+c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.2527.01

$$\int z^{n}\cosh\left(b\,z^2\right)\cosh\left(c\,z^2+g\right)dz == -\frac{1}{8}z^{n+1}\left(e^{g}\,\Gamma\left(\frac{n+1}{2},(-b-c)\,z^2\right)\left((-b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{g}\left((b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b-c)\,z^2\right)+e^{-g}\left((c-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-b)\,z^2\right)+e^{-g}\left((b+c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+c)\,z^2\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.2528.01

$$\int z^{n}\cosh\left(\sqrt{z}\ b\right)\cosh\left(\sqrt{z}\ c+g\right)dz == -\frac{1}{2}\left(e^{g}\,\Gamma\left(2\,(n+1),(-b-c)\,\sqrt{z}\right)(-b-c)^{-2\,(n+1)}+(b-c)^{-2\,(n+1)}\,e^{g}\,\Gamma\left(2\,(n+1),(b-c)\,\sqrt{z}\right)+(c-b)^{-2\,(n+1)}\,e^{-g}\,\Gamma\left(2\,(n+1),(c-b)\,\sqrt{z}\right)+(b+c)^{-2\,(n+1)}\,e^{-g}\,\Gamma\left(2\,(n+1),(b+c)\,\sqrt{z}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cosh(b\,z^r+e)\cosh(c\,z^r+g)$

01.20.21.2529.01

$$\int z^{\alpha-1}\cosh(b\,z^r+e)\cosh(c\,z^r+g)\,dz == -\frac{1}{4r}\left(z^{\alpha}\left(e^{e+g}\,\Gamma\left(\frac{\alpha}{r},(-b-c)\,z^r\right)((-b-c)\,z^r)^{-\frac{\alpha}{r}}+e^{g-e}\,((b-c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-c)\,z^r\right)+e^{e-g}\,((c-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(c-b)\,z^r\right)+e^{-e-g}\,((b+c)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+c)\,z^r\right)\right)\right)$$

01.20.21.2530.01

$$\int z^{n}\cosh\left(b\,z^2+e\right)\cosh\left(c\,z^2+g\right)dz == -\frac{1}{8}z^{n+1}\left(e^{e+g}\,\Gamma\left(\frac{n+1}{2},(-b-c)\,z^2\right)\left((-b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{g-e}\left((b-c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b-c)\,z^2\right)+e^{e-g}\left((c-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(c-b)\,z^2\right)+e^{-e-g}\left((b+c)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+c)\,z^2\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.2531.01

$$\int z^{n}\cosh\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g\right)dz == -\frac{1}{2}\left(e^{e+g}\,\Gamma\left(2\,(n+1),(-b-c)\,\sqrt{z}\right)(-b-c)^{-2\,(n+1)}+(b-c)^{-2\,(n+1)}\,e^{g-e}\,\Gamma\left(2\,(n+1),(b-c)\,\sqrt{z}\right)+(c-b)^{-2\,(n+1)}\,e^{e-g}\,\Gamma\left(2\,(n+1),(c-b)\,\sqrt{z}\right)+(b+c)^{-2\,(n+1)}\,e^{-e-g}\,\Gamma\left(2\,(n+1),(b+c)\,\sqrt{z}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{n}\cosh(d\,z)\cosh\left(c\,z^r+f\,z\right)$

01.20.21.2532.01

$$\int z^n \cosh(d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}\left(e^{\frac{(-d-f)^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}(d+f)^{n-j}(-d-f-2\,c\,z)^{j+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$e^{\frac{(d-f)^2}{4c}}\left(\sum_{j=0}^{n}2^{j-n}(f-d)^{n-j}(d-f-2\,c\,z)^{j+1}\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}e^{-\frac{(f-d)^2}{4c}}\sum_{j=0}^{n}2^{j-n}(d-f)^{n-j}(-d+f+2\,c\,z)^{j+1}\left(-\frac{(-d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)+$$

$$\left.c^{-n-1}e^{-\frac{(d+f)^2}{4c}}\sum_{j=0}^{n}2^{j-n}(-d-f)^{n-j}(d+f+2\,c\,z)^{j+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.2533.01

$$\int z^n \cosh(d\,z)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-2n-3}\left(e^{-\frac{c^2}{4(-d-f)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(-d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{-d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2(-d-f)\sqrt{-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{-d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{4(-d-f)}\right)-\right.$$

$$\left.\left.c\left(2(-d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{4(-d-f)}\right)\right)\right)(-d-f)^{-2(n+1)}+$$

$$e^{-\frac{c^2}{4(d-f)}}(d-f)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(d-f)\sqrt{-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)-\right.$$

$$c\left(2\,(d-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\,-c\right)^2}{4\,(d-f)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(f-d)}}\,(f-d)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}}\;(f-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(d+f)}}\,(d+f)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)\Bigg)\Bigg

01.20.21.2534.01

$$\int z^n \cosh(e+d\,z)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}\left(e^{\frac{(-d-f)^2}{4c}-e}\left(\sum_{j=0}^{n}2^{j-n}(d+f)^{n-j}(-d-f-2\,c\,z)^{j+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$e^{\frac{(d-f)^2}{4c}+e}\left(\sum_{j=0}^{n}2^{j-n}(f-d)^{n-j}(d-f-2\,c\,z)^{j+1}\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+c^{-n-1}$$

$$e^{-\frac{(f-d)^2}{4c}-e}\sum_{j=0}^{n}2^{j-n}(d-f)^{n-j}(-d+f+2\,c\,z)^{j+1}\left(-\frac{(-d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)+c^{-n-1}$$

$$\left.e^{-\frac{(d+f)^2}{4c}+e}\sum_{j=0}^{n}2^{j-n}(-d-f)^{n-j}(d+f+2\,c\,z)^{j+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.2535.01

$$\int z^n \cosh(e+d\,z)\cosh\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-2n-3}\left(e^{-\frac{c^2}{4(-d-f)}-e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(-d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{-d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-d-f)\sqrt{-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{-d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{4\,(-d-f)}\right)-\right.$$

$$\left.\left.c\left(2\,(-d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{4\,(-d-f)}\right)\right)\right)(-d-f)^{-2(n+1)}+$$

$$e^{-\frac{c^2}{4(d-f)}+e}(d-f)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(d-f)\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(d-f)\sqrt{-\frac{\left(2\,(d-f)\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(d-f)\sqrt{z}-c\right)^2}{4\,(d-f)}\right)-\right.$$

$$c\left(2\,(d-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\,-c\right)^2}{4\,(d-f)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(f-d)}-e}\,(f-d)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}}\;(f-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(d+f)}+e}\,(d+f)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Big/;\,n\in\mathbb{N}$$

Involving $z^n \cosh(b\,z^r)\cosh(c\,z^r+f\,z)$

01.20.21.2536.01

$$\int z^n \cosh\left(b z^2\right) \cosh\left(c z^2 + f z\right) dz ==$$

$$-\frac{1}{8}\left(e^{\frac{f^2}{4(b+c)}}\left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (-f-2(b+c)z)^{j+1}\left(\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right)(-b-c)^{-n-1} +\right.$$

$$(c-b)^{-n-1} e^{\frac{f^2}{4b-4c}} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-b)z)^{j+1}\left(\frac{(f+2(c-b)z)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{(f+2(c-b)z)^2}{4(b-c)}\right)+$$

$$(b-c)^{-n-1} e^{-\frac{f^2}{4(b-c)}}$$

$$\sum_{j=0}^{n} 2^{j-n} f^{n-j} (-f+2bz-2cz)^{j+1}\left(-\frac{(f-2bz+2cz)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f-2bz+2cz)^2}{4(b-c)}\right)+(b+c)^{-n-1}$$

$$\left.e^{-\frac{f^2}{4(b+c)}} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(b+c)z)^{j+1}\left(-\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right) /; n \in \mathbb{N}$$

01.20.21.2537.01

$$\int z^n \cosh\left(\sqrt{z}\ b\right) \cosh\left(\sqrt{z}\ c + f z\right) dz ==$$

$$2^{-2n-3} f^{-2(n+1)}\left(e^{\frac{(-b-c)^2}{4f}} \sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (-b-c)^{-h-j+2n}\left(-b-c-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-b-c)\left(-b-c-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.\left.2f\sqrt{\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+e^{\frac{(b-c)^2}{4f}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j} (-1)^{j-h} 4^j (b-c)^{-h-j+2n}\left(b-c-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b-c)\left(b-c-2f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)-2f\sqrt{\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{-\frac{(c-b)^2}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c-b)^{-h-j+2n} \left(-b+c+2f\sqrt{z}\right)^{h+j} \left(-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j} \left((c-b)\left(-b+c+2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right) + \right.$$

$$\left. 2\sqrt{-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}}\, f\, \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right) \right) +$$

$$e^{-\frac{(b+c)^2}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (b+c)^{-h-j+2n} \left(b+c+2f\sqrt{z}\right)^{h+j} \left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j} \left((b+c)\left(b+c+2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right) + \right.$$

$$\left. 2\sqrt{-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\, f\, \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right) \right) \Bigg) /; n \in \mathbb{N}$$

Involving $z^n \cosh(b z^r + e) \cosh(c z^r + f z)$

01.20.21.2538.01

$$\int z^n \cosh\left(b\,z^2+e\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$-\frac{1}{8}e^{-e}\left(e^{\frac{f^2}{4(b+c)}}\left(\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f-2(b+c)z)^{j+1}\left(\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right)(-b-c)^{-n-1}+\right.$$

$$(c-b)^{-n-1}\,e^{\frac{f^2}{4b-4c}}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2(c-b)z)^{j+1}\left(\frac{(f+2(c-b)z)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(f+2(c-b)z)^2}{4(b-c)}\right)+$$

$$(b-c)^{-n-1}\,e^{-\frac{f^2-8be+8ce}{4(b-c)}}$$

$$\sum_{j=0}^{n}2^{j-n}\,f^{n-j}\,(-f+2bz-2cz)^{j+1}\left(-\frac{(f-2bz+2cz)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-2bz+2cz)^2}{4(b-c)}\right)+(b+c)^{-n-1}$$

$$\left.e^{-\frac{f^2}{4(b+c)}+2e}\sum_{j=0}^{n}2^{j-n}\,(-f)^{n-j}\,(f+2(b+c)z)^{j+1}\left(-\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.2539.01

$$\int z^n \cosh\left(\sqrt{z}\,b+e\right)\cosh\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-2n-3}\,f^{-2(n+1)}\left(e^{\frac{(-b-c)^2}{4f}-e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b-c)^{-h-j+2n}\left(-b-c-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-b-c)\left(-b-c-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.2f\sqrt{\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+e^{\frac{(b-c)^2}{4f}+e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-c)^{-h-j+2n}\left(b-c-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b-c)\left(b-c-2f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)-2f\sqrt{\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{-\frac{(c-b)^2}{4f}-e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-b)^{-h-j+2n}\left(-b+c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-b)\left(-b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{-\frac{(b+c)^2}{4f}+e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b+c)^{-h-j+2n}\left(b+c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n \cosh(b\,z^r + d\,z)\cosh(c\,z^r + f\,z)$

01.20.21.2540.01

$$\int z^n \cosh\left(b\,z^2+d\,z\right)\cosh\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{1}{8}\left(-\frac{1}{\sqrt{c-b}}e^{\frac{(d-f)^2}{4(b-c)}}\sum_{q=0}^{n}2^{q-n}(c-b)^{-n-\frac{1}{2}}(d-f)^{n-q}\left(\frac{(d-f+2bz-2cz)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}(-d+f-2bz+2cz)^{q+1}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-f+2bz-2cz)^2}{4(b-c)}\right)-\frac{1}{\sqrt{b-c}}e^{-\frac{(d-f)^2}{4(b-c)}}\sum_{q=0}^{n}2^{q-n}(b-c)^{-n-\frac{1}{2}}(f-d)^{n-q}$$

$$(d-f+2bz-2cz)^{q+1}\left(-\frac{(d-f+2bz-2cz)^2}{b-c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-f+2bz-2cz)^2}{4(b-c)}\right)-$$

$$\frac{1}{\sqrt{-b-c}}e^{\frac{(d+f)^2}{4(b+c)}}\sum_{q=0}^{n}2^{q-n}(-b-c)^{-n-\frac{1}{2}}(d+f)^{n-q}(-d-f-2bz-2cz)^{q+1}\left(\frac{(d+f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)-\frac{1}{\sqrt{b+c}}e^{-\frac{(d+f)^2}{4(b+c)}}\sum_{q=0}^{n}2^{q-n}(b+c)^{-n-\frac{1}{2}}(-d-f)^{n-q}$$

$$\left.(d+f+2(b+c)z)^{q+1}\left(-\frac{(d+f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f+2(b+c)z)^2}{4(b+c)}\right)\right)/;\ n\in\mathbb{N}$$

01.20.21.2541.01

$$\int z^n \cosh\left(\sqrt{z}\ b+d\,z\right)\cosh\left(\sqrt{z}\ c+f\,z\right)dz == 2^{-2n-3}$$

$$\left((-d-f)^{-2(n+1)}e^{\frac{(b+c)^2}{4(d+f)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b-c)^{-h-k+2n}\left(-b-c-2(d+f)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)-\right.$$

$$\left.\left.2(d+f)\sqrt{\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\ \Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)+$$

$$e^{\frac{(b-c)^2}{4(d-f)}}(f-d)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c-b)^{-h-k+2n}\left(\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}\left(-b+c+2(f-d)\sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left((c-b)\left(-b+c+2(f-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(f-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+$$

$$e^{-\frac{(b-c)^2}{4(d-f)}}(d-f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+$$

$$e^{-\frac{(b+c)^2}{4(d+f)}}(d+f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cosh(d\,z)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.2542.01

$$\int z^n \cosh(d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz ==$$

$$-\frac{1}{8}\left(e^{\frac{(-d-f)^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}(d+f)^{n-j}(-d-f-2\,c\,z)^{j+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$e^{\frac{(d-f)^2}{4c}-g}\left(\sum_{j=0}^{n}2^{j-n}(f-d)^{n-j}(d-f-2\,c\,z)^{j+1}\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+c^{-n-1}$$

$$e^{-\frac{(f-d)^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}(d-f)^{n-j}(-d+f+2\,c\,z)^{j+1}\left(-\frac{(-d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)+c^{-n-1}$$

$$\left.e^{-\frac{(d+f)^2}{4c}+g}\sum_{j=0}^{n}2^{j-n}(-d-f)^{n-j}(d+f+2\,c\,z)^{j+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)/;\,n\in\mathbb{N}$$

01.20.21.2543.01

$$\int z^n \cosh(d\,z)\cosh\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$2^{-2n-3}\left(e^{-\frac{c^2}{4(-d-f)}-g}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(-d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{-d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2(-d-f)\sqrt{-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{-d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{4(-d-f)}\right)-\right.$$

$$\left.\left.c\left(2(-d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-d-f)\sqrt{z}-c\right)^2}{4(-d-f)}\right)\right)\right)(-d-f)^{-2(n+1)}+$$

$$e^{-\frac{c^2}{4(d-f)}-g}(d-f)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c)^{-h-j+2n}\left(2(d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(d-f)\sqrt{-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(d-f)\sqrt{z}-c\right)^2}{4(d-f)}\right)-\right.$$

$$c\left(2\,(d-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\,-c\right)^2}{4\,(d-f)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(f-d)}+g}\,(f-d)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}}\;(f-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(d+f)}+g}\,(d+f)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \cosh(d\,z+e)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.2544.01

$$\int z^n \cosh(e+d\,z)\cosh\left(c\,z^2+f\,z+g\right)dz == -\frac{1}{8}$$

$$\left(e^{\frac{(-d-f)^2}{4c}-e-g}\left(\sum_{j=0}^{n}2^{j-n}(d+f)^{n-j}(-d-f-2\,c\,z)^{j+1}\left(\frac{(-d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+\right.$$

$$e^{\frac{(d-f)^2}{4c}+e-g}\left(\sum_{j=0}^{n}2^{j-n}(f-d)^{n-j}(d-f-2\,c\,z)^{j+1}\left(\frac{(d-f-2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(d-f-2\,c\,z)^2}{4\,c}\right)\right)(-c)^{-n-1}+$$

$$c^{-n-1}\,e^{-\frac{(f-d)^2}{4c}-e+g}\sum_{j=0}^{n}2^{j-n}(d-f)^{n-j}(-d+f+2\,c\,z)^{j+1}\left(-\frac{(-d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d+f+2\,c\,z)^2}{4\,c}\right)+$$

$$c^{-n-1}\,e^{-\frac{(d+f)^2}{4c}+e+g}$$

$$\left.\sum_{j=0}^{n}2^{j-n}(-d-f)^{n-j}(d+f+2\,c\,z)^{j+1}\left(-\frac{(d+f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f+2\,c\,z)^2}{4\,c}\right)\right)\Big/;\ n\in\mathbb{N}$$

01.20.21.2545.01

$$\int z^n \cosh(e+d\,z)\cosh\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-2n-3}\left(e^{-\frac{c^2}{4(-d-f)}-e-g}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(-d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{-d-f}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-d-f)\sqrt{-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{-d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{4\,(-d-f)}\right)-\right.$$

$$\left.\left.c\left(2\,(-d-f)\sqrt{z}-c\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-d-f)\sqrt{z}-c\right)^2}{4\,(-d-f)}\right)\right)\right)(-d-f)^{-2(n+1)}+$$

$$e^{-\frac{c^2}{4(d-f)}+e-g}(d-f)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c)^{-h-j+2n}\left(2\,(d-f)\sqrt{z}-c\right)^{h+j}\left(-\frac{\left(2\,(d-f)\sqrt{z}-c\right)^2}{d-f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(d-f)\sqrt{-\frac{\left(2\,(d-f)\sqrt{z}-c\right)^2}{d-f}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(d-f)\sqrt{z}-c\right)^2}{4\,(d-f)}\right)-\right.$$

$$c\left(2\,(d-f)\,\sqrt{z}\,-c\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(d-f)\,\sqrt{z}\,-c\right)^2}{4\,(d-f)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(f-d)}-e+g}\,(f-d)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(f-d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(f-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{f-d}}\;(f-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(f-d)\,\sqrt{z}\right)^2}{4\,(f-d)}\right)\Bigg)+$$

$$e^{-\frac{c^2}{4\,(d+f)}+e+g}\,(d+f)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,c^{-h-j+2\,n}\left(c+2\,(d+f)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\left(c+2\,(d+f)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)+$$

$$2\sqrt{-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{d+f}}\;(d+f)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c+2\,(d+f)\,\sqrt{z}\right)^2}{4\,(d+f)}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^n \cosh\left(b\,z^r\right)\cosh\left(c\,z^r+f\,z+g\right)$

01.20.21.2546.01

$$\int z^n \cosh\left(b z^2\right) \cosh\left(c z^2 + f z + g\right) dz ==$$

$$-\frac{1}{8} e^{-g} \left(e^{\frac{f^2}{4(b+c)}} \left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (-f - 2(b+c)z)^{j+1} \left(\frac{(f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(f+2(b+c)z)^2}{4(b+c)} \right) \right) (-b-c)^{-n-1} + \right.$$

$$(c-b)^{-n-1} e^{\frac{f^2+8bg-8cg}{4b-4c}} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-b)z)^{j+1} \left(\frac{(f+2(c-b)z)^2}{b-c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(f+2(c-b)z)^2}{4(b-c)} \right) +$$

$$(b-c)^{-n-1} e^{-\frac{f^2}{4(b-c)}}$$

$$\sum_{j=0}^{n} 2^{j-n} f^{n-j} (-f + 2bz - 2cz)^{j+1} \left(-\frac{(f-2bz+2cz)^2}{b-c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f-2bz+2cz)^2}{4(b-c)} \right) + (b+c)^{-n-1}$$

$$\left. e^{-\frac{f^2}{4(b+c)}+2g} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(b+c)z)^{j+1} \left(-\frac{(f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f+2(b+c)z)^2}{4(b+c)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.2547.01

$$\int z^n \cosh\left(\sqrt{z}\ b\right) \cosh\left(\sqrt{z}\ c + g + f z\right) dz ==$$

$$2^{-2n-3} f^{-2(n+1)} \left(e^{\frac{(-b-c)^2}{4f} - g} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-b-c)^{-h-j+2n} \left(-b-c-2f\sqrt{z}\right)^{h+j} \left(\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left((-b-c)\left(-b-c-2f\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f} \right) - \right.$$

$$\left. 2f \sqrt{\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f} \right) \right) + e^{\frac{(b-c)^2}{4f} - g}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (b-c)^{-h-j+2n} \left(b-c-2f\sqrt{z}\right)^{h+j} \left(\frac{\left(b-c-2f\sqrt{z}\right)^2}{f} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left((b-c)\left(b-c-2f\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f} \right) - 2f \sqrt{\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(b-c-2f\sqrt{z}\right)^2}{4f} \right) \right) +$$

$$e^{-\frac{(c-b)^2}{4f}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-b)^{-h-j+2n}\left(-b+c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-b)\left(-b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{-\frac{(b+c)^2}{4f}+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b+c)^{-h-j+2n}\left(b+c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^n \cosh(b\,z^r+e)\cosh(c\,z^r+f\,z+g)$

01.20.21.2548.01

$$\int z^n \cosh\left(b z^2+e\right)\cosh\left(c z^2+f z+g\right) dz == -\frac{1}{8} e^{-e-g}$$

$$\left(e^{\frac{f^2}{4(b+c)}}\left(\sum_{j=0}^{n} 2^{j-n} f^{n-j} (-f-2(b+c)z)^{j+1}\left(\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right)(-b-c)^{-n-1}+\right.$$

$$(c-b)^{-n-1} e^{\frac{f^2+8bg-8cg}{4b-4c}} \sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(c-b)z)^{j+1}\left(\frac{(f+2(c-b)z)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(f+2(c-b)z)^2}{4(b-c)}\right)+$$

$$(b-c)^{-n-1} e^{-\frac{f^2-8be+8ce}{4(b-c)}} \sum_{j=0}^{n} 2^{j-n} f^{n-j} (-f+2bz-2cz)^{j+1}\left(-\frac{(f-2bz+2cz)^2}{b-c}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f-2bz+2cz)^2}{4(b-c)}\right)+(b+c)^{-n-1} e^{-\frac{f^2}{4(b+c)}+2e+2g}$$

$$\left.\sum_{j=0}^{n} 2^{j-n} (-f)^{n-j} (f+2(b+c)z)^{j+1}\left(-\frac{(f+2(b+c)z)^2}{b+c}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f+2(b+c)z)^2}{4(b+c)}\right)\right) /; n\in\mathbb{N}$$

01.20.21.2549.01

$$\int z^n \cosh\left(\sqrt{z}\ b+e\right)\cosh\left(\sqrt{z}\ c+g+f z\right) dz ==$$

$$2^{-2n-3} f^{-2(n+1)}\left(e^{\frac{(-b-c)^2}{4f}-e-g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (-b-c)^{-h-j+2n}\left(-b-c-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-b-c)\left(-b-c-2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.\left.2f\sqrt{\frac{\left(-b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-b-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+e^{\frac{(b-c)^2}{4f}+e-g}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (b-c)^{-h-j+2n}\left(b-c-2f\sqrt{z}\right)^{h+j}\left(\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b-c)\left(b-c-2f\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)-2f\sqrt{\frac{\left(b-c-2f\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(b-c-2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{-\frac{(c-b)^2}{4f}-e+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c-b)^{-h-j+2n}\left(-b+c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c-b)\left(-b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)+$$

$$e^{-\frac{(b+c)^2}{4f}+e+g}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b+c)^{-h-j+2n}\left(b+c+2f\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((b+c)\left(b+c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cosh(b\,z^r + d\,z)\cosh(c\,z^r + f\,z + g)$

01.20.21.2550.01

$$\int z^n \cosh\left(b z^2 + d z\right) \cosh\left(c z^2 + f z + g\right) dz ==$$

$$\frac{1}{8} e^{-g} \left(-\frac{1}{\sqrt{c-b}} e^{\frac{(d-f)^2}{4(b-c)}+2g} \sum_{q=0}^{n} 2^{q-n} (c-b)^{-n-\frac{1}{2}} (d-f)^{n-q} \left(\frac{(d-f+2bz-2cz)^2}{b-c} \right)^{\frac{1}{2}(-q-1)} (-d+f-2bz+2cz)^{q+1} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d-f+2bz-2cz)^2}{4(b-c)} \right) - \frac{1}{\sqrt{b-c}} e^{-\frac{(d-f)^2}{4(b-c)}} \sum_{q=0}^{n} 2^{q-n} (b-c)^{-n-\frac{1}{2}} (f-d)^{n-q}$$

$$(d-f+2bz-2cz)^{q+1} \left(-\frac{(d-f+2bz-2cz)^2}{b-c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-f+2bz-2cz)^2}{4(b-c)} \right) -$$

$$\frac{1}{\sqrt{-b-c}} e^{\frac{(d+f)^2}{4(b+c)}} \sum_{q=0}^{n} 2^{q-n} (-b-c)^{-n-\frac{1}{2}} (d+f)^{n-q} (-d-f-2bz-2cz)^{q+1} \left(\frac{(d+f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d+f+2(b+c)z)^2}{4(b+c)} \right) - \frac{1}{\sqrt{b+c}} e^{-\frac{(d+f)^2}{4(b+c)}+2g} \sum_{q=0}^{n} 2^{q-n} (b+c)^{-n-\frac{1}{2}} (-d-f)^{n-q}$$

$$\left. (d+f+2(b+c)z)^{q+1} \left(-\frac{(d+f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f+2(b+c)z)^2}{4(b+c)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.2551.01

$$\int z^n \cosh\left(\sqrt{z}\ b + d z\right) \cosh\left(\sqrt{z}\ c + f z + g\right) dz == 2^{-2n-3} e^{-g}$$

$$\left((-d-f)^{-2(n+1)} e^{\frac{(b+c)^2}{4(d+f)}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b-c)^{-h-k+2n} \left(-b-c-2(d+f)\sqrt{z}\right)^{h+k} \left(\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left((b+c)\left(b+c+2(d+f)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)} \right) - \right.$$

$$\left. \left. 2(d+f) \sqrt{\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)} \right) \right) +$$

$$e^{\frac{(b-c)^2}{4(d-f)}+2g} (f-d)^{-2(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c-b)^{-h-k+2n} \left(\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f} \right)^{\frac{1}{2}(-h-k-1)} \left(-b+c+2(f-d)\sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left((c-b)\left(-b+c+2(f-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(f-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+$$

$$e^{-\frac{(b-c)^2}{4(d-f)}}(d-f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+e^{-\frac{(b+c)^2}{4(d+f)}+2g}$$

$$(d+f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)\text{/; }n\in\mathbb{N}$$

Involving $z^n \cosh(b\,z^r + d\,z + e)\cosh(c\,z^r + f\,z + g)$

01.20.21.2552.01

$$\int z^n \cosh\left(b z^2 + d z + e\right) \cosh\left(c z^2 + f z + g\right) dz ==$$

$$\frac{1}{8} e^{-e-g} \left(-\frac{1}{\sqrt{c-b}} e^{\frac{(d-f)^2}{4(b-c)}+2g} \sum_{q=0}^{n} 2^{q-n} (c-b)^{-n-\frac{1}{2}} (d-f)^{n-q} \left(\frac{(d-f+2bz-2cz)^2}{b-c} \right)^{\frac{1}{2}(-q-1)} (-d+f-2bz+2cz)^{q+1} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d-f+2bz-2cz)^2}{4(b-c)} \right) - \frac{1}{\sqrt{b-c}} e^{2e-\frac{(d-f)^2}{4(b-c)}} \sum_{q=0}^{n} 2^{q-n} (b-c)^{-n-\frac{1}{2}} (f-d)^{n-q}$$

$$(d-f+2bz-2cz)^{q+1} \left(-\frac{(d-f+2bz-2cz)^2}{b-c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-f+2bz-2cz)^2}{4(b-c)} \right) -$$

$$\frac{1}{\sqrt{-b-c}} e^{\frac{(d+f)^2}{4(b+c)}} \sum_{q=0}^{n} 2^{q-n} (-b-c)^{-n-\frac{1}{2}} (d+f)^{n-q} (-d-f-2bz-2cz)^{q+1} \left(\frac{(d+f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d+f+2(b+c)z)^2}{4(b+c)} \right) - \frac{1}{\sqrt{b+c}} e^{-\frac{(d+f)^2}{4(b+c)}+2e+2g} \sum_{q=0}^{n} 2^{q-n} (b+c)^{-n-\frac{1}{2}} (-d-f)^{n-q}$$

$$\left. (d+f+2(b+c)z)^{q+1} \left(-\frac{(d+f+2(b+c)z)^2}{b+c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f+2(b+c)z)^2}{4(b+c)} \right) \right) /; n \in \mathbb{N}$$

01.20.21.2553.01

$$\int z^n \cosh\left(\sqrt{z}\ b + d z + e\right) \cosh\left(\sqrt{z}\ c + f z + g\right) dz == 2^{-2n-3} e^{-e-g}$$

$$\left((-d-f)^{-2(n+1)} e^{\frac{(b+c)^2}{4(d+f)}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b-c)^{-h-k+2n} \left(-b-c-2(d+f)\sqrt{z}\right)^{h+k} \left(\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left((b+c)\left(b+c+2(d+f)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)} \right) - \right.$$

$$\left. \left. 2(d+f) \sqrt{\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)} \right) \right) +$$

$$\left. e^{\frac{(b-c)^2}{4(d-f)}+2g} (f-d)^{-2(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c-b)^{-h-k+2n} \left(\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f} \right)^{\frac{1}{2}(-h-k-1)} \left(-b+c+2(f-d)\sqrt{z}\right)^{h+k} \right.$$

$$\binom{k}{h}\binom{n}{k}\left((c-b)\left(-b+c+2(f-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(f-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+$$

$$e^{2e-\frac{(b-c)^2}{4(d-f)}}(d-f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c)^{-h-k+2n}\left(b-c+2(d-f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b-c)\left(b-c+2(d-f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{d-f}}\,(d-f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c+2(d-f)\sqrt{z}\right)^2}{4(d-f)}\right)\right)+e^{-\frac{(b+c)^2}{4(d+f)}+2e+2g}$$

$$(d+f)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c)^{-h-k+2n}\left(b+c+2(d+f)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c)\left(b+c+2(d+f)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{d+f}}\,(d+f)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c+2(d+f)\sqrt{z}\right)^2}{4(d+f)}\right)\right)\right)/;\,n\in\mathbb{N}$$

Involving products of several direct functions and a power function

Involving $z^{\alpha-1}\cosh(a\,z)\cosh(b\,z)\cosh(c\,z)$

01.20.21.2554.01

$$\int z^{\alpha-1}\cosh(a\,z)\cosh(b\,z)\cosh(c\,z)\,dz == \frac{1}{8}z^{\alpha}\left(-(-(a+b-c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a+b-c)\,z)-((a+b-c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+b-c)\,z)-(-(a-b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a-b+c)\,z)-((a-b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a-b+c)\,z)-(-(-a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(-a+b+c)\,z)-((-a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(-a+b+c)\,z)-(-(a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a+b+c)\,z)-((a+b+c)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+b+c)\,z)\right)$$

01.20.21.2555.01

$$\int\frac{\cosh(a\,z)\cosh(b\,z)\cosh(c\,z)}{z}\,dz == \frac{1}{4}(\mathrm{Chi}((a-b-c)\,z)+\mathrm{Chi}((a+b-c)\,z)+\mathrm{Chi}((a-b+c)\,z)+\mathrm{Chi}((a+b+c)\,z))$$

Involving $z^{\alpha-1}\prod_{k=1}^{n}\cosh(a_k\,z)$

01.20.21.2556.01

$$\int z^{\alpha-1}\prod_{k=1}^{n}\cosh(a_k\,z)\,dz == -2^{-n-1}\,z^{\alpha}\sum_{\substack{k_1=-1\\ \Delta k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta k_n=2}}^{1}\left(\left(z\sum_{j=1}^{n}k_j\,a_j\right)^{-\alpha}\Gamma\left(\alpha,\,z\sum_{j=1}^{n}k_j\,a_j\right)+\Gamma\left(\alpha,\,-z\sum_{j=1}^{n}k_j\,a_j\right)\left(-z\sum_{j=1}^{n}k_j\,a_j\right)^{-\alpha}\right)$$

01.20.21.2557.01

$$\int\frac{1}{z}\prod_{k=1}^{n}\cosh(a_k\,z)\,dz == 2^{-n}\sum_{\substack{k_1=-1\\ \Delta k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta k_n=2}}^{1}\left(\mathrm{Chi}\left(z\sum_{j=1}^{n}k_j\,a_j\right)\right)$$

Involving products of powers of the direct function and a power function

Involving product of power of the direct function, the direct function and a power function

Involving $z^{\alpha-1}\cosh(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.2558.01

$$\int z^{\alpha-1}\cosh(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu-1}\,z^{\alpha}\left(\binom{\nu}{\frac{\nu}{2}}(E_{1-\alpha}(-c\,z)+E_{1-\alpha}(c\,z))\,(\nu \bmod 2-1)-\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\right.$$

$$\left.(E_{1-\alpha}((-c-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-c+2\,a\,s-a\,\nu)\,z)+E_{1-\alpha}((c+2\,a\,s-a\,\nu)\,z)+E_{1-\alpha}((c+a\,(\nu-2\,s))\,z))\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.2559.01

$$\int z^{n}\cosh(c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{2}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\,n!$$

$$\left(e^{-c\,z}\sum_{p=0}^{n}\frac{(-1)^p\,z^{n-p}\,(-c-a\,\nu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(-\frac{c+a\,\nu}{2\,a},\,\ldots,\,-\frac{c+a\,\nu}{2\,a},\,-\nu;\,1-\frac{c+a\,\nu}{2\,a},\,\ldots,\,1-\frac{c+a\,\nu}{2\,a};\,-e^{2\,a\,z}\right)+\right.$$

$$\left.e^{c\,z}\sum_{p=0}^{n}\frac{(-1)^p\,z^{n-p}\,(c-a\,\nu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(\frac{c-a\,\nu}{2\,a},\,\ldots,\,\frac{c-a\,\nu}{2\,a},\,-\nu;\,1+\frac{c-a\,\nu}{2\,a},\,\ldots,\,1+\frac{c-a\,\nu}{2\,a};\,-e^{2\,a\,z}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cosh(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.2560.01

$$\int z^{\alpha-1}\cosh(d+c\,z)\cosh^{\nu}(a\,z)\,dz ==$$
$$2^{-\nu-1}\,z^{\alpha}\left(e^{-d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,d}\,E_{1-\alpha}(-c\,z)+E_{1-\alpha}(c\,z)\right)(\nu \bmod 2-1)-e^{-d}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,d}\,(E_{1-\alpha}((-c-2\,a\,s+a\,\nu)\,z)+\right.\right.$$
$$\left.\left.E_{1-\alpha}((-c+2\,a\,s-a\,\nu)\,z))+\,E_{1-\alpha}((c+2\,a\,s-a\,\nu)\,z)+E_{1-\alpha}((c+a\,(\nu-2\,s))\,z)\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.2561.01

$$\int z^{n}\cosh(d+c\,z)\cosh^{\nu}(a\,z)\,dz==\frac{1}{2}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\,n!$$
$$\left(e^{-d-c\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}\,(-c-a\,\nu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(-\frac{c+a\,\nu}{2\,a},\ldots,-\frac{c+a\,\nu}{2\,a},-\nu;-\frac{c+a\,\nu}{2\,a}+1,\ldots,-\frac{c+a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)+\right.$$
$$\left.e^{d+c\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}\,(c-a\,\nu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(\frac{c-a\,\nu}{2\,a},\ldots,\frac{c-a\,\nu}{2\,a},-\nu;\frac{c-a\,\nu}{2\,a}+1,\ldots,\frac{c-a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)\right)/;\,n\in\mathbb{N}^{+}$$

Involving $z^{\alpha-1}\cosh(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.2562.01

$$\int z^{\alpha-1}\cosh(c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$
$$2^{-\nu-1}\,z^{\alpha}\left(\binom{\nu}{\frac{\nu}{2}}(E_{1-\alpha}(-c\,z)+E_{1-\alpha}(c\,z))\,(\nu \bmod 2-1)-\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(e^{4\,b\,s}\,E_{1-\alpha}((-c-2\,a\,s+a\,\nu)\,z)+\right.\right.$$
$$\left.\left.e^{2\,b\,\nu}\,E_{1-\alpha}((-c+2\,a\,s-a\,\nu)\,z)+e^{2\,b\,\nu}\,E_{1-\alpha}((c+2\,a\,s-a\,\nu)\,z)+e^{4\,b\,s}\,E_{1-\alpha}((c+a\,(\nu-2\,s))\,z)\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.2563.01

$$\int z^{n}\cosh(c\,z)\cosh^{\nu}(b+a\,z)\,dz==\frac{1}{2}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\,n!$$
$$\left(e^{-c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(a\,\nu-c)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{c-a\,\nu}{2\,a},\ldots,\frac{c-a\,\nu}{2\,a},-\nu;\frac{c-a\,\nu}{2\,a}+1,\ldots,\frac{c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)+\right.$$
$$\left.e^{c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c+a\,\nu}{2\,a},\ldots,-\frac{c+a\,\nu}{2\,a},-\nu;1-\frac{c+a\,\nu}{2\,a},\ldots,1-\frac{c+a\,\nu}{2\,a};-e^{-2\,(b+a\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cosh(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.2564.01

$$\int z^{\alpha-1} \cosh(d+c\,z) \cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu-1}\, z^{\alpha} \left(e^{-d} \binom{\nu}{\frac{\nu}{2}} \left(e^{2\,d}\, E_{1-\alpha}(-c\,z) + E_{1-\alpha}(c\,z)\right) (\nu \bmod 2 - 1) - \right.$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-d-2\,b\,s-b\,\nu} \binom{\nu}{s} \left(e^{2\,d} \left(e^{4\,b\,s}\, E_{1-\alpha}((-c-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((-c+2\,a\,s-a\,\nu)\,z)\right) + \right.$$

$$\left. \left. e^{2\,b\,\nu}\, E_{1-\alpha}((c+2\,a\,s-a\,\nu)\,z) + e^{4\,b\,s}\, E_{1-\alpha}((c+a\,(\nu-2\,s))\,z)\right) \right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.2565.01

$$\int z^{n} \cosh(d+c\,z) \cosh^{\nu}(b+a\,z)\,dz == \frac{1}{2} \left(1 + e^{-2\,(b+a\,z)}\right)^{-\nu} \cosh^{\nu}(b+a\,z)\, n!$$

$$\left(e^{-d-c\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (a\,\nu-c)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{c-a\,\nu}{2\,a}, \ldots, \frac{c-a\,\nu}{2\,a}, -\nu; \frac{c-a\,\nu}{2\,a}+1, \ldots, \frac{c-a\,\nu}{2\,a}+1; -e^{-2\,(b+a\,z)} \right) + e^{d+c\,z} \right.$$

$$\left. \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (c+a\,\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c+a\,\nu}{2\,a}, \ldots, -\frac{c+a\,\nu}{2\,a}, -\nu; 1-\frac{c+a\,\nu}{2\,a}, \ldots, 1-\frac{c+a\,\nu}{2\,a}; -e^{-2\,(b+a\,z)} \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^{n} \cosh\left(b\,z^{r}\right) \cosh^{\nu}(c\,z)$

01.20.21.2566.01

$$\int z^n \cosh\left(b\,z^2\right) \cosh^{\nu}(c\,z)\,dz == -2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2},\,-b\,z^2\right)\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2(\nu-2s)^2}{4b}}\left(\sum_{j=0}^{n}2^{j-n}\,(c\,(\nu-2\,s))^{n-j}\,(-c\,(\nu-2\,s)-2\,b\,z)^{j+1}\left(\frac{(-c\,(\nu-2\,s)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-c\,(\nu-2\,s)-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+e^{\frac{c^2(\nu-2s)^2}{4b}}\left(\sum_{j=0}^{n}2^{j-n}\,(-c\,(\nu-2\,s))^{n-j}\right.$$

$$(c\,(\nu-2\,s)-2\,b\,z)^{j+1}\left(\frac{(c\,(\nu-2\,s)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(c\,(\nu-2\,s)-2\,b\,z)^2}{4\,b}\right)\Big)(-b)^{-n-1}+$$

$$b^{-n-1}\,e^{-\frac{c^2(\nu-2s)^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(c\,(\nu-2\,s))^{n-j}\,(2\,b\,z-c\,(\nu-2\,s))^{j+1}\left(-\frac{(2\,b\,z-c\,(\nu-2\,s))^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,b\,z-c\,(\nu-2\,s))^2}{4\,b}\right)+b^{-n-1}\,e^{-\frac{c^2(\nu-2s)^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-c\,(\nu-2\,s))^{n-j}\,(c\,(\nu-2\,s)+2\,b\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(c\,(\nu-2\,s)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(c\,(\nu-2\,s)+2\,b\,z)^2}{4\,b}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.2567.01

$$\int z^n \cosh\left(\sqrt{z}\;b\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{b^2}{4c(\nu-2s)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(-b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\right.\right.$$

$$\binom{n}{j}\left(-b\left(-b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(\nu-2\,s)}\right)-2\,c\,(\nu-2\,s)\right.$$

$$\left.\left.\sqrt{\frac{\left(-b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{c\,(\nu-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(\nu-2\,s)}\right)\right)\right)(-c\,(\nu-2\,s))^{-2(n+1)}+$$

$$e^{\frac{b^2}{4c(\nu-2s)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(b\left(b-2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(b-2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)-2c(v-2s)\right.$$

$$\left.\sqrt{\frac{\left(b-2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(b-2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)\right)(-c(v-2s))^{-2(n+1)}+$$

$$e^{-\frac{b^2}{4c(v-2s)}}(c(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-b)^{-h-j+2n}\left(2c(v-2s)\sqrt{z}-b\right)^{h+j}$$

$$\left(-\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2c(v-2s)\sqrt{-\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{4c(v-2s)}\right)-\right.$$

$$\left.b\left(2c(v-2s)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{4c(v-2s)}\right)\right)+e^{-\frac{b^2}{4c(v-2s)}}(c(v-2s))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j b^{-h-j+2n}\left(b+2c(v-2s)\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\left(b+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)+\right.$$

$$\left.2c(v-2s)\sqrt{-\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)\right)-$$

$$2^{-v}b^{-2(n+1)}\binom{v}{\frac{v}{2}}\left(\Gamma\left(2(n+1),-b\sqrt{z}\right)+\Gamma\left(2(n+1),b\sqrt{z}\right)\right)(1-v\bmod 2)\ /;\ n\in$$

$$\mathbb{N}\ \bigwedge$$

$$v\in$$

$$\mathbb{N}^+$$

Involving $z^n \cosh(b z^r + e) \cosh^v(c z)$

01.20.21.2568.01

$$\int z^n \cosh\left(b z^2 + e\right) \cosh^v(c z)\, dz ==$$

$$-2^{-v-2} \binom{v}{\frac{v}{2}} \left(e^e \Gamma\left(\frac{n+1}{2}, -b z^2\right) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} + e^{-e} \left(b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b z^2\right)\right) (1 - v \bmod 2)\, z^{n+1} -$$

$$2^{-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{1}{4} i \left(4 i e - \frac{i c^2 (v-2s)^2}{b}\right)} \left(\sum_{j=0}^{n} 2^{j-n} (c(v-2s))^{n-j} (-c(v-2s) - 2bz)^{j+1} \left(\frac{(-c(v-2s) - 2bz)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(-c(v-2s) - 2bz)^2}{4b}\right) \right) (-b)^{-n-1} + e^{\frac{1}{4} i \left(4 i e - \frac{i c^2 (v-2s)^2}{b}\right)} \left(\sum_{j=0}^{n} 2^{j-n} (-c(v-2s))^{n-j} \right.$$

$$\left. (c(v-2s) - 2bz)^{j+1} \left(\frac{(c(v-2s) - 2bz)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(c(v-2s) - 2bz)^2}{4b}\right) \right) (-b)^{-n-1} +$$

$$b^{-n-1} e^{-\frac{1}{4} i \left(4 i e - \frac{i c^2 (v-2s)^2}{b}\right)} \sum_{j=0}^{n} 2^{j-n} (c(v-2s))^{n-j} (2bz - c(v-2s))^{j+1} \left(-\frac{(2bz - c(v-2s))^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(2bz - c(v-2s))^2}{4b}\right) + b^{-n-1} e^{-\frac{1}{4} i \left(4 i e - \frac{i c^2 (v-2s)^2}{b}\right)} \sum_{j=0}^{n} 2^{j-n} (-c(v-2s))^{n-j} (c(v-2s) + 2bz)^{j+1}$$

$$\left. \left(-\frac{(c(v-2s) + 2bz)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(c(v-2s) + 2bz)^2}{4b}\right) \right) \Big/; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.2569.01

$$\int z^n \cosh\left(\sqrt{z}\ b + e\right) \cosh^v(c z)\, dz ==$$

$$2^{-2n-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{b^2}{4c(v-2s)} - e} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-b)^{-h-j+2n} \left(-b - 2c(v-2s)\sqrt{z}\right)^{h+j} \left(\frac{\left(-b - 2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)} \right)^{\frac{1}{2}(-h-j-1)} \right.\right.$$

$$\left. \binom{j}{h} \binom{n}{j} \left(-b\left(-b - 2c(v-2s)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b - 2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right) - 2c(v-2s) \right.\right.$$

$$\left.\left. \sqrt{\frac{\left(-b - 2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b - 2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right) \right) \right) (-c(v-2s))^{-2(n+1)} +$$

$$e^{\frac{b^2}{4c(v-2s)}+e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b-2c(v-2s)\sqrt{z}\right)^{h+j}\left(\frac{\left(b-2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(b\left(b-2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(b-2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)-2c(v-2s)\right.$$

$$\left.\left.\sqrt{\frac{\left(b-2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(b-2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)\right)\right)(-c(v-2s))^{-2(n+1)}+$$

$$e^{-\frac{b^2}{4c(v-2s)}-e}(c(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(2c(v-2s)\sqrt{z}-b\right)^{h+j}$$

$$\left(-\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2c(v-2s)\sqrt{-\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{4c(v-2s)}\right)-\right.$$

$$\left.b\left(2c(v-2s)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2c(v-2s)\sqrt{z}-b\right)^2}{4c(v-2s)}\right)\right)+e^{e-\frac{b^2}{4c(v-2s)}}(c(v-2s))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b+2c(v-2s)\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\left(b+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)+\right.$$

$$\left.\left.2c(v-2s)\sqrt{-\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{4c(v-2s)}\right)\right)\right)-$$

$$2^{-\nu}\, b^{-2\,(n+1)} \binom{\nu}{\frac{\nu}{2}} \left(e^{e}\, \Gamma\left(2\,(n+1),\, -b\,\sqrt{z}\right) + e^{-e}\, \Gamma\left(2\,(n+1),\, b\,\sqrt{z}\right)\right)$$

$$(1 - \nu \bmod 2) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^{+}$$

Involving $z^n \cosh\left(b\, z^r + d\, z\right) \cosh^{\nu}(cvz)$

01.20.21.2570.01

$$\int z^n \cosh\left(b\, z^2 + d\, z\right) \cosh^{\nu}(c\, z)\, dz ==$$

$$-2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(e^{\frac{d^2}{4\,b}} \left(\sum_{q=0}^{n} 2^{q-n}\, d^{n-q}\, (-d - 2\,b\,z)^{q+1} \left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, \frac{(-d-2\,b\,z)^2}{4\,b}\right)\right) (-b)^{-n-1} +\right.$$

$$b^{-n-1}\, e^{-\frac{d^2}{4\,b}} \sum_{q=0}^{n} 2^{q-n}\, (-d)^{n-q}\, (d + 2\,b\,z)^{q+1} \left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, -\frac{(d+2\,b\,z)^2}{4\,b}\right)\Bigg) -$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{(c\,(2\,s-\nu)-d)^2}{4\,b}} \left(\sum_{q=0}^{n} 2^{q-n}\, (d - c\,(2\,s-\nu))^{n-q}\, (-d + c\,(2\,s-\nu) - 2\,b\,z)^{q+1}\right.\right.$$

$$\left.\left(\frac{(-d+c\,(2\,s-\nu)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, \frac{(-d+c\,(2\,s-\nu)-2\,b\,z)^2}{4\,b}\right)\right) (-b)^{-n-1} +$$

$$e^{\frac{(c\,(\nu-2\,s)-d)^2}{4\,b}} \left(\sum_{q=0}^{n} 2^{q-n}\, (d - c\,(\nu-2\,s))^{n-q}\, (-d + c\,(\nu-2\,s) - 2\,b\,z)^{q+1} \left(\frac{(-d+c\,(\nu-2\,s)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2},\, \frac{(-d+c\,(\nu-2\,s)-2\,b\,z)^2}{4\,b}\right)\right) (-b)^{-n-1} + b^{-n-1}\, e^{-\frac{(d+c\,(2\,s-\nu))^2}{4\,b}} \sum_{q=0}^{n} 2^{q-n}\, (-d - c\,(2\,s-\nu))^{n-q}$$

$$(d + c\,(2\,s-\nu) + 2\,b\,z)^{q+1} \left(-\frac{(d+c\,(2\,s-\nu)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, -\frac{(d+c\,(2\,s-\nu)+2\,b\,z)^2}{4\,b}\right) +$$

$$b^{-n-1}\, e^{-\frac{(d+c\,(\nu-2\,s))^2}{4\,b}} \sum_{q=0}^{n} 2^{q-n}\, (-d - c\,(\nu-2\,s))^{n-q}\, (d + c\,(\nu-2\,s) + 2\,b\,z)^{q+1} \left(-\frac{(d+c\,(\nu-2\,s)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2},\, -\frac{(d+c\,(\nu-2\,s)+2\,b\,z)^2}{4\,b}\right)\right) \right) /;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^{+}$$

01.20.21.2571.01

$$\int z^n \cosh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-2n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{b^2}{4d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-b-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(-b-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(-b\left(-b-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-b-2d\sqrt{z}\right)^2}{4d}\right)-\right.$$

$$\left.\left.\left.2d\sqrt{\frac{\left(-b-2d\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-b-2d\sqrt{z}\right)^2}{4d}\right)\right)\right)(-d)^{-2n-2}+$$

$$d^{-2n-2}\,e^{-\frac{b^2}{4d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$2^{-2n-\nu-2}\sum_{j=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{j}\left(e^{-\frac{b^2}{4(c(\nu-2j)-d)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(2(c(\nu-2j)-d)\sqrt{z}-b\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(2(c(\nu-2j)-d)\sqrt{z}-b\right)^2}{c(\nu-2j)-d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(2(c(\nu-2j)-d)\sqrt{-\frac{\left(2(c(\nu-2j)-d)\sqrt{z}-b\right)^2}{c(\nu-2j)-d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(2(c(\nu-2j)-d)\sqrt{z}-b\right)^2}{4(c(\nu-2j)-d)}\right)-\right.$$

$$\left.\left.b\left(2(c(\nu-2j)-d)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(2(c(\nu-2j)-d)\sqrt{z}-b\right)^2}{4(c(\nu-2j)-d)}\right)\right)\right)$$

$$(c(v-2j)-d)^{-2n-2}+e^{-\frac{b^2}{4(d+c(v-2j))}}(d+c(v-2j))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}$$

$$\left(b+2(d+c(v-2j))\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d+c(v-2j))\sqrt{z}\right)^2}{d+c(v-2j)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b+2(d+c(v-2j))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d+c(v-2j))\sqrt{z}\right)^2}{4(d+c(v-2j))}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+2(d+c(v-2j))\sqrt{z}\right)^2}{d+c(v-2j)}}\,(d+c(v-2j))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+k+2),-\frac{\left(b+2(d+c(v-2j))\sqrt{z}\right)^2}{4(d+c(v-2j))}\right)\right)+$$

$$e^{-\frac{b^2}{4(-d-c(v-2j))}}(-d-c(v-2j))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(2(-d-c(v-2j))\sqrt{z}-b\right)^{h+k}$$

$$\left(-\frac{\left(2(-d-c(v-2j))\sqrt{z}-b\right)^2}{-d-c(v-2j)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(2(-d-c(v-2j))\right.$$

$$\sqrt{-\frac{\left(2(-d-c(v-2j))\sqrt{z}-b\right)^2}{-d-c(v-2j)}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(2(-d-c(v-2j))\sqrt{z}-b\right)^2}{4(-d-c(v-2j))}\right)-$$

$$\left.\left.b\left(2(-d-c(v-2j))\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(2(-d-c(v-2j))\sqrt{z}-b\right)^2}{4(-d-c(v-2j))}\right)\right)+$$

$$e^{-\frac{b^2}{4(d-c(v-2j))}}(d-c(v-2j))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2(d-c(v-2j))\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{d-c\left(v-2\,j\right)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{4\left(d-c\left(v-2\,j\right)\right)}\right)+2\sqrt{-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{d-c\left(v-2\,j\right)}}\left(d-c\left(v-2\,j\right)\right)\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{4\left(d-c\left(v-2\,j\right)\right)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh\left(b\,z^r+d\,z+e\right)\cosh^v(cvz)$

01.20.21.2572.01

$$\int z^n \cosh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}-e}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)\right.$$

$$(-b)^{-n-1}+b^{-n-1}\,e^{e-\frac{d^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(c\,(2\,s-\nu)-d)^2}{4\,b}-e}\left(\sum_{q=0}^{n}2^{q-n}\,(d-c\,(2\,s-\nu))^{n-q}\,(-d+c\,(2\,s-\nu)-2\,b\,z)^{q+1}\right.\right.$$

$$\left.\left(\frac{(-d+c\,(2\,s-\nu)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d+c\,(2\,s-\nu)-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+$$

$$e^{\frac{(c\,(\nu-2\,s)-d)^2}{4\,b}-e}\left(\sum_{q=0}^{n}2^{q-n}\,(d-c\,(\nu-2\,s))^{n-q}\,(-d+c\,(\nu-2\,s)-2\,b\,z)^{q+1}\left(\frac{(-d+c\,(\nu-2\,s)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d+c\,(\nu-2\,s)-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+b^{-n-1}\,e^{e-\frac{(d+c\,(2\,s-\nu))^2}{4\,b}}\sum_{q=0}^{n}2^{q-n}\,(-d-c\,(2\,s-\nu))^{n-q}$$

$$(d+c\,(2\,s-\nu)+2\,b\,z)^{q+1}\left(-\frac{(d+c\,(2\,s-\nu)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+c\,(2\,s-\nu)+2\,b\,z)^2}{4\,b}\right)+$$

$$b^{-n-1}\,e^{e-\frac{(d+c\,(\nu-2\,s))^2}{4\,b}}\sum_{q=0}^{n}2^{q-n}\,(-d-c\,(\nu-2\,s))^{n-q}\,(d+c\,(\nu-2\,s)+2\,b\,z)^{q+1}\left(-\frac{(d+c\,(\nu-2\,s)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+c\,(\nu-2\,s)+2\,b\,z)^2}{4\,b}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2573.01

$$\int z^n \cosh\left(\sqrt{z}\;b+d\,z+e\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{b^2}{4\,d}-e}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-b-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(-b\left(-b-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,d\,\sqrt{\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)(-d)^{-2\,n-2}+$$

$$d^{-2\,n-2}\,e^{e-\frac{b^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$2^{-2\,n-\nu-2}\sum_{j=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{j}\left(e^{-\frac{b^2}{4\,(c\,(\nu-2\,j)-d)}-e}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(2\,(c\,(\nu-2\,j)-d)\,\sqrt{z}\ -b\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(2\,(c\,(\nu-2\,j)-d)\,\sqrt{z}\ -b\right)^2}{c\,(\nu-2\,j)-d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(2\,(c\,(\nu-2\,j)-d)\,\sqrt{-\frac{\left(2\,(c\,(\nu-2\,j)-d)\,\sqrt{z}\ -b\right)^2}{c\,(\nu-2\,j)-d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(2\,(c\,(\nu-2\,j)-d)\,\sqrt{z}\ -b\right)^2}{4\,(c\,(\nu-2\,j)-d)}\right)-\right.$$

$$\left.\left.b\left(2\,(c\,(\nu-2\,j)-d)\,\sqrt{z}\ -b\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(2\,(c\,(\nu-2\,j)-d)\,\sqrt{z}\ -b\right)^2}{4\,(c\,(\nu-2\,j)-d)}\right)\right)\right)$$

$$(c\,(\nu-2\,j)-d)^{-2\,n-2}+e^{e-\frac{b^2}{4\,(d+c\,(\nu-2\,j))}}\,(d+c\,(\nu-2\,j))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}$$

$$\left(b+2\,(d+c\,(\nu-2\,j))\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,(d+c\,(\nu-2\,j))\,\sqrt{z}\right)^2}{d+c\,(\nu-2\,j)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b+2\left(d+c\left(v-2\,j\right)\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+k+1\right),-\frac{\left(b+2\left(d+c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{4\left(d+c\left(v-2\,j\right)\right)}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+2\left(d+c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{d+c\left(v-2\,j\right)}}\left(d+c\left(v-2\,j\right)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\left(h+k+2\right),-\frac{\left(b+2\left(d+c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{4\left(d+c\left(v-2\,j\right)\right)}\right)\right)+$$

$$e^{-\frac{b^2}{4\left(-d-c\left(v-2\,j\right)\right)}-e}\left(-d-c\left(v-2\,j\right)\right)^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}\left(-1\right)^{k-h}4^k\left(-b\right)^{-h-k+2\,n}\left(2\left(-d-c\left(v-2\,j\right)\right)\sqrt{z}-b\right)^{h+k}$$

$$\left(-\frac{\left(2\left(-d-c\left(v-2\,j\right)\right)\sqrt{z}-b\right)^2}{-d-c\left(v-2\,j\right)}\right)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}\left(2\left(-d-c\left(v-2\,j\right)\right)\right.$$

$$\sqrt{-\frac{\left(2\left(-d-c\left(v-2\,j\right)\right)\sqrt{z}-b\right)^2}{-d-c\left(v-2\,j\right)}}\,\Gamma\left(\frac{1}{2}\left(h+k+2\right),-\frac{\left(2\left(-d-c\left(v-2\,j\right)\right)\sqrt{z}-b\right)^2}{4\left(-d-c\left(v-2\,j\right)\right)}\right)-$$

$$\left.b\left(2\left(-d-c\left(v-2\,j\right)\right)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}\left(h+k+1\right),-\frac{\left(2\left(-d-c\left(v-2\,j\right)\right)\sqrt{z}-b\right)^2}{4\left(-d-c\left(v-2\,j\right)\right)}\right)\right)+$$

$$e^{e-\frac{b^2}{4\left(d-c\left(v-2\,j\right)\right)}}\left(d-c\left(v-2\,j\right)\right)^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}\left(-1\right)^{k-h}4^k\,b^{-h-k+2\,n}\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{d-c\left(v-2\,j\right)}\right)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\left(h+k+1\right),-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{4\left(d-c\left(v-2\,j\right)\right)}\right)+2\sqrt{-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{d-c\left(v-2\,j\right)}}$$

$$\left.\left.\left(d-c\left(v-2\,j\right)\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),-\frac{\left(b+2\left(d-c\left(v-2\,j\right)\right)\sqrt{z}\right)^2}{4\left(d-c\left(v-2\,j\right)\right)}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(b\,z^r) \cosh^\nu(f\,z+g)$

01.20.21.2574.01

$$\int z^n \cosh\left(b\,z^2\right) \cosh^\nu(g+f\,z)\,dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2},-b\,z^2\right)\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{-\frac{f^2(\nu-2s)^2}{b}+4g(\nu-2s)}{4}}\left(\sum_{j=0}^{n}2^{j-n}(f(\nu-2s))^{n-j}(-f(\nu-2s)-2bz)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f(\nu-2s)-2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f(\nu-2s)-2bz)^2}{4b}\right)\right)(-b)^{-n-1}+$$

$$e^{-\frac{-\frac{f^2(\nu-2s)^2}{b}-4g(\nu-2s)}{4}}\left(\sum_{j=0}^{n}2^{j-n}(-f(\nu-2s))^{n-j}(f(\nu-2s)-2bz)^{j+1}\left(\frac{(f(\nu-2s)-2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(f(\nu-2s)-2bz)^2}{4b}\right)\right)(-b)^{-n-1}+b^{-n-1}\,e^{\frac{1}{4}\left(-\frac{f^2(\nu-2s)^2}{b}-4g(\nu-2s)\right)}\sum_{j=0}^{n}2^{j-n}(f(\nu-2s))^{n-j}$$

$$(2bz-f(\nu-2s))^{j+1}\left(-\frac{(2bz-f(\nu-2s))^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2bz-f(\nu-2s))^2}{4b}\right)+$$

$$b^{-n-1}\,e^{\frac{1}{4}\left(-\frac{f^2(\nu-2s)^2}{b}+4g(\nu-2s)\right)}\sum_{j=0}^{n}2^{j-n}(-f(\nu-2s))^{n-j}(f(\nu-2s)+2bz)^{j+1}\left(-\frac{(f(\nu-2s)+2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(\nu-2s)+2bz)^2}{4b}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2575.01

$$\int z^n \cosh\left(\sqrt{z}\ b\right)\cosh^\nu(g+f\,z)\,dz == 2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}(f(\nu-2s))^{-2(n+1)}\binom{\nu}{s}$$

$$\left(e^{\frac{b^2}{4f(\nu-2s)}-g(\nu-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(-b-2f(\nu-2s)\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-2f(\nu-2s)\sqrt{z}\right)^2}{f(\nu-2s)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\left.\binom{j}{h}\binom{n}{j}\left(-b\left(-b-2f(\nu-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-b-2f(\nu-2s)\sqrt{z}\right)^2}{4f(\nu-2s)}\right)-\right.\right.$$

$$2 f (v-2 s) \sqrt{\frac{\left(-b-2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b-2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\Bigg)+$$

$$e^{\frac{b^2}{4 f (v-2 s)}-g (v-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j b^{-h-j+2 n} \left(b-2 f (v-2 s) \sqrt{z}\right)^{h+j} \left(\frac{\left(b-2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(b \left(b-2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(b-2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)-$$

$$2 f (v-2 s) \sqrt{\frac{\left(b-2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(b-2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\Bigg)+$$

$$e^{-\frac{b^2}{4 f (v-2 s)}+g (v-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-b)^{-h-j+2 n} \left(2 f (v-2 s) \sqrt{z}-b\right)^{h+j} \left(-\frac{\left(2 f (v-2 s) \sqrt{z}-b\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2 f (v-2 s) \sqrt{-\frac{\left(2 f (v-2 s) \sqrt{z}-b\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2 f (v-2 s) \sqrt{z}-b\right)^2}{4 f (v-2 s)}\right)-$$

$$b \left(2 f (v-2 s) \sqrt{z}-b\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2 f (v-2 s) \sqrt{z}-b\right)^2}{4 f (v-2 s)}\right)\Bigg)+$$

$$e^{-\frac{b^2}{4 f (v-2 s)}+g (v-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j b^{-h-j+2 n} \left(b+2 f (v-2 s) \sqrt{z}\right)^{h+j} \left(-\frac{\left(b+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(b \left(b+2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(b+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)+$$

$$2 f (v-2 s) \sqrt{-\frac{\left(b+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(b+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\Bigg)\Bigg)-$$

$$2^{-\nu}\, b^{-2\,(n+1)} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2\,(n+1),\, -b\,\sqrt{z}\right) + \Gamma\left(2\,(n+1),\, b\,\sqrt{z}\right)\right) (1 - \nu \bmod 2) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n \cosh\left(b\, z^r + e\right) \cosh^{\nu}(f\, z + g)$

01.20.21.2576.01

$$\int z^n \cosh\left(b\, z^2 + e\right) \cosh^{\nu}(g + f\, z)\, dz ==$$

$$-2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} \left(e^{e}\, \Gamma\left(\frac{n+1}{2},\, -b\, z^2\right) \left(-b\, z^2\right)^{\frac{1}{2}(-n-1)} + e^{-e} \left(b\, z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2},\, b\, z^2\right)\right) (1 - \nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{-\frac{f^2\,(\nu-2\,s)^2}{b} + 4\,g\,(\nu-2\,s) + 4\,e}{4}} \left(\sum_{j=0}^{n} 2^{j-n}\, (f\,(\nu-2\,s))^{n-j}\, (-f\,(\nu-2\,s) - 2\,b\,z)^{j+1} \right.\right.$$

$$\left. \left(\frac{(-f\,(\nu-2\,s) - 2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(-f\,(\nu-2\,s) - 2\,b\,z)^2}{4\,b}\right) \right) (-b)^{-n-1} +$$

$$e^{-\frac{-\frac{f^2\,(\nu-2\,s)^2}{b} - 4\,g\,(\nu-2\,s) + 4\,e}{4}} \left(\sum_{j=0}^{n} 2^{j-n}\, (-f\,(\nu-2\,s))^{n-j}\, (f\,(\nu-2\,s) - 2\,b\,z)^{j+1} \left(\frac{(f\,(\nu-2\,s) - 2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(f\,(\nu-2\,s) - 2\,b\,z)^2}{4\,b}\right) \right) (-b)^{-n-1} + b^{-n-1}\, e^{\frac{1}{4}\left(-\frac{f^2\,(\nu-2\,s)^2}{b} - 4\,g\,(\nu-2\,s) + 4\,e\right)} \sum_{j=0}^{n} 2^{j-n}\, (f\,(\nu-2\,s))^{n-j} \right.$$

$$(2\,b\,z - f\,(\nu-2\,s))^{j+1} \left(-\frac{(2\,b\,z - f\,(\nu-2\,s))^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(2\,b\,z - f\,(\nu-2\,s))^2}{4\,b}\right) +$$

$$b^{-n-1}\, e^{\frac{1}{4}\left(-\frac{f^2\,(\nu-2\,s)^2}{b} + 4\,g\,(\nu-2\,s) + 4\,e\right)} \sum_{j=0}^{n} 2^{j-n}\, (-f\,(\nu-2\,s))^{n-j}\, (f\,(\nu-2\,s) + 2\,b\,z)^{j+1}$$

$$\left. \left(-\frac{(f\,(\nu-2\,s) + 2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(f\,(\nu-2\,s) + 2\,b\,z)^2}{4\,b}\right) \right) \Big) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2577.01

$$\int z^n \cosh\left(\sqrt{z}\; b + e\right) \cosh^{\nu}(g + f\, z)\, dz == 2^{-2\,n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} (f\,(\nu-2\,s))^{-2\,(n+1)} \binom{\nu}{s}$$

$$\left(e^{\frac{b^2}{4\,f\,(\nu-2\,s)} - e - g\,(\nu-2\,s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-b)^{-h-j+2\,n} \left(-b - 2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^{h+j} \left(\frac{\left(-b - 2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{f\,(\nu-2\,s)} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left(-b\left(-b-2 f (v-2 s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-b-2 f (v-2 s)\sqrt{z}\right)^2}{4 f (v-2 s)}\right)-\right.$$

$$\left.2 f (v-2 s)\sqrt{\frac{\left(-b-2 f (v-2 s)\sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b-2 f (v-2 s)\sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right)+$$

$$e^{\frac{b^2}{4 f (v-2 s)}+e-g (v-2 s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2 n}\left(b-2 f (v-2 s)\sqrt{z}\right)^{h+j}\left(\frac{\left(b-2 f (v-2 s)\sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\left(b-2 f (v-2 s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(b-2 f (v-2 s)\sqrt{z}\right)^2}{4 f (v-2 s)}\right)-\right.$$

$$\left.2 f (v-2 s)\sqrt{\frac{\left(b-2 f (v-2 s)\sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(b-2 f (v-2 s)\sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right)+$$

$$e^{-\frac{b^2}{4 f (v-2 s)}-e+g (v-2 s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2 n}\left(2 f (v-2 s)\sqrt{z}-b\right)^{h+j}\left(-\frac{\left(2 f (v-2 s)\sqrt{z}-b\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2 f (v-2 s)\sqrt{-\frac{\left(2 f (v-2 s)\sqrt{z}-b\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2 f (v-2 s)\sqrt{z}-b\right)^2}{4 f (v-2 s)}\right)-\right.$$

$$\left.b\left(2 f (v-2 s)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2 f (v-2 s)\sqrt{z}-b\right)^2}{4 f (v-2 s)}\right)\right)+$$

$$e^{-\frac{b^2}{4 f (v-2 s)}+e+g (v-2 s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2 n}\left(b+2 f (v-2 s)\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2 f (v-2 s)\sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\left(b+2 f (v-2 s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(b+2 f (v-2 s)\sqrt{z}\right)^2}{4 f (v-2 s)}\right)+\right.$$

$$2\,f\,(v-2\,s)\sqrt{-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\Bigg)\Bigg)-$$

$$2^{-v}\,b^{-2\,(n+1)}\binom{v}{\frac{v}{2}}\left(e^{e}\,\Gamma\left(2\,(n+1),\,-b\,\sqrt{z}\right)+e^{-e}\,\Gamma\left(2\,(n+1),\,b\,\sqrt{z}\right)\right)(1-v\bmod 2)\;/;\;n\in$$

$$\mathbb{N}\bigwedge$$

$$v\in$$

$$\mathbb{N}^{+}$$

Involving $z^n \cosh\left(b\,z^r+d\,z\right)\cosh^v(f\,z+g)$

01.20.21.2578.01

$$\int z^n \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}}\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(-d-2\,b\,z)^{j+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+\right.$$

$$b^{-n-1}\,e^{-\frac{d^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,b\,z)^{j+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(f(2s-\nu)-d)^2}{4b}+g(2s-\nu)}\left(\sum_{j=0}^{n}2^{j-n}\,(d-f(2s-\nu))^{n-j}\,(-d+f(2s-\nu)-2\,b\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-d+f(2s-\nu)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d+f(2s-\nu)-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+$$

$$e^{\frac{(f(\nu-2s)-d)^2}{4b}+g(\nu-2s)}\left(\sum_{j=0}^{n}2^{j-n}\,(d-f(\nu-2s))^{n-j}\,(-d+f(\nu-2s)-2\,b\,z)^{j+1}\left(\frac{(-d+f(\nu-2s)-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{(-d+f(\nu-2s)-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+b^{-n-1}\,e^{g(2s-\nu)-\frac{(d+f(2s-\nu))^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-d-f(2s-\nu))^{n-j}$$

$$(d+f(2s-\nu)+2\,b\,z)^{j+1}\left(-\frac{(d+f(2s-\nu)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f(2s-\nu)+2\,b\,z)^2}{4\,b}\right)+$$

$$b^{-n-1}\,e^{g(\nu-2s)-\frac{(d+f(\nu-2s))^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-d-f(\nu-2s))^{n-j}\,(d+f(\nu-2s)+2\,b\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(d+f(\nu-2s)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f(\nu-2s)+2\,b\,z)^2}{4\,b}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2579.01

$$\int z^n \cosh\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz == 2^{-2n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(-b-2\,d\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left.-b\left(-b-2\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\,\sqrt{\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b+2\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)$$

$$d^{-2n-2}+2^{-2n-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{b^2}{4(f(2k-v)-d)}+g(2k-v)}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(2\,(f(2k-v)-d)\,\sqrt{z}-b\right)^{h+j}$$

$$\left(-\frac{\left(2\,(f(2k-v)-d)\,\sqrt{z}-b\right)^2}{f(2k-v)-d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(f(2k-v)-d)$$

$$\sqrt{-\frac{\left(2\,(f(2k-v)-d)\,\sqrt{z}-b\right)^2}{f(2k-v)-d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,(f(2k-v)-d)\,\sqrt{z}-b\right)^2}{4\,(f(2k-v)-d)}\right)-b$$

$$\left(2\,(f(2k-v)-d)\,\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\,(f(2k-v)-d)\,\sqrt{z}-b\right)^2}{4\,(f(2k-v)-d)}\right)\Bigg)\Bigg)$$

$$(f(2k-v)-d)^{-2n-2}+e^{-\frac{b^2}{4(d+f(2k-v))}+g(2k-v)}\,(d+f(2k-v))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b+2\,(d+f(2k-v))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2\,(d+f(2k-v))\,\sqrt{z}\right)^2}{d+f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(b\left(b+2\,(d+f(2k-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(b+2\,(d+f(2k-v))\,\sqrt{z}\right)^2}{4\,(d+f(2k-v))}\right)+$$

$$2\sqrt{-\frac{\left(b+2\,(d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{d+f\,(2\,k-v)}}\;(d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+2\,(d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,k-v))}\right)+$$

$$e^{-\frac{b^2}{4\,(f\,(v-2\,k)-d)}+g\,(v-2\,k)}\,(f\,(v-2\,k)-d)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2\,n}\left(2\,(f\,(v-2\,k)-d)\,\sqrt{z}\,-b\right)^{h+j}$$

$$\left(-\frac{\left(2\,(f\,(v-2\,k)-d)\,\sqrt{z}\,-b\right)^2}{f\,(v-2\,k)-d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(f\,(v-2\,k)-d)\sqrt{-\frac{\left(2\,(f\,(v-2\,k)-d)\,\sqrt{z}\,-b\right)^2}{f\,(v-2\,k)-d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(f\,(v-2\,k)-d)\,\sqrt{z}\,-b\right)^2}{4\,(f\,(v-2\,k)-d)}\right)-\right.$$

$$\left.b\left(2\,(f\,(v-2\,k)-d)\,\sqrt{z}\,-b\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(f\,(v-2\,k)-d)\,\sqrt{z}\,-b\right)^2}{4\,(f\,(v-2\,k)-d)}\right)\right)+$$

$$e^{-\frac{b^2}{4\,(d+f\,(v-2\,k))}+g\,(v-2\,k)}\,(d+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2\,n}\left(b+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{d+f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\left(b+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(b+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{d+f\,(v-2\,k)}}\right.$$

$$\left.(d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,k))}\right)\right)\Big/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh\left(b\,z^r+d\,z+e\right)\cosh^v(f\,z+g)$

01.20.21.2580.01

$$\int z^n \cosh\left(b z^2 + d z + e\right) \cosh^{\nu}(g + f z)\, dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1 - \nu \bmod 2)\left(e^{\frac{d^2}{4b}-e}\left(\sum_{j=0}^{n} 2^{j-n}\, d^{n-j}\,(-d-2bz)^{j+1}\left(\frac{(-d-2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{(-d-2bz)^2}{4b}\right)\right)\right.$$

$$(-b)^{-n-1} + b^{-n-1}\, e^{e-\frac{d^2}{4b}}\sum_{j=0}^{n} 2^{j-n}\,(-d)^{n-j}\,(d+2bz)^{j+1}\left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d+2bz)^2}{4b}\right)\Bigg) - 2^{-\nu-2}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(f(2s-\nu)-d)^2}{4b}-e+g(2s-\nu)}\left(\sum_{j=0}^{n} 2^{j-n}\,(d - f(2s-\nu))^{n-j}\,(-d+f(2s-\nu)-2bz)^{j+1}\left(\frac{(-d+f(2s-\nu)-2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{(-d+f(2s-\nu)-2bz)^2}{4b}\right)\right)(-b)^{-n-1} + e^{\frac{(f(\nu-2s)-d)^2}{4b}-e+g(\nu-2s)}\left(\sum_{j=0}^{n} 2^{j-n}\,(d - f(\nu-2s))^{n-j}\right.$$

$$\left.(-d+f(\nu-2s)-2bz)^{j+1}\left(\frac{(-d+f(\nu-2s)-2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{(-d+f(\nu-2s)-2bz)^2}{4b}\right)\right)$$

$$(-b)^{-n-1} + b^{-n-1}\, e^{-\frac{(d+f(2s-\nu))^2}{4b}+e+g(2s-\nu)}\sum_{j=0}^{n} 2^{j-n}\,(-d - f(2s-\nu))^{n-j}\,(d+f(2s-\nu)+2bz)^{j+1}$$

$$\left(-\frac{(d+f(2s-\nu)+2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d+f(2s-\nu)+2bz)^2}{4b}\right) +$$

$$b^{-n-1}\, e^{-\frac{(d+f(\nu-2s))^2}{4b}+e+g(\nu-2s)}\sum_{j=0}^{n} 2^{j-n}\,(-d - f(\nu-2s))^{n-j}\,(d+f(\nu-2s)+2bz)^{j+1}$$

$$\left.\left(-\frac{(d+f(\nu-2s)+2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d+f(\nu-2s)+2bz)^2}{4b}\right)\right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2581.01

$$\int z^n \cosh\left(\sqrt{z}\ b + e + d z\right) \cosh^{\nu}(g + f z)\, dz == 2^{-2n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1 - \nu \bmod 2)$$

$$\left(e^{\frac{b^2}{4d}-e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(-b-2d\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left(-b\left(-b-2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b-2d\sqrt{z}\right)^2}{4d}\right) - 2d\sqrt{\frac{\left(-b-2d\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b-2d\sqrt{z}\right)^2}{4d}\right)\right) +$$

$$e^{e-\frac{b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b+2d\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\left(b+2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)$$

$$d^{-2n-2}+2^{-2n-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{b^2}{4(f(2k-v)-d)}-e+g(2k-v)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(2(f(2k-v)-d)\sqrt{z}-b\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(2(f(2k-v)-d)\sqrt{z}-b\right)^2}{f(2k-v)-d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2(f(2k-v)-d)\right.$$

$$\left.\sqrt{-\frac{\left(2(f(2k-v)-d)\sqrt{z}-b\right)^2}{f(2k-v)-d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(f(2k-v)-d)\sqrt{z}-b\right)^2}{4(f(2k-v)-d)}\right)-b\right.$$

$$\left.\left.\left(2(f(2k-v)-d)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f(2k-v)-d)\sqrt{z}-b\right)^2}{4(f(2k-v)-d)}\right)\right)\right)$$

$$(f(2k-v)-d)^{-2n-2}+e^{-\frac{b^2}{4(d+f(2k-v))}+e+g(2k-v)}\,(d+f(2k-v))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b+2(d+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\left(b+2(d+f(2k-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}}\;(d+f(2k-v))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+2),-\frac{\left(b+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\right)\right)+$$

$$e^{-\frac{b^2}{4(f(v-2k)-d)}-e+g(v-2k)}(f(v-2k)-d)^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-b)^{-h-j+2n}\left(2(f(v-2k)-d)\sqrt{z}-b\right)^{h+j}$$

$$\left(-\frac{\left(2(f(v-2k)-d)\sqrt{z}-b\right)^2}{f(v-2k)-d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2(f(v-2k)-d)\sqrt{-\frac{\left(2(f(v-2k)-d)\sqrt{z}-b\right)^2}{f(v-2k)-d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(f(v-2k)-d)\sqrt{z}-b\right)^2}{4(f(v-2k)-d)}\right)-\right.$$

$$\left.b\left(2(f(v-2k)-d)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(f(v-2k)-d)\sqrt{z}-b\right)^2}{4(f(v-2k)-d)}\right)\right)+$$

$$e^{-\frac{b^2}{4(d+f(v-2k))}+e+g(v-2k)}(d+f(v-2k))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j b^{-h-j+2n}\left(b+2(d+f(v-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+2(d+f(v-2k))\sqrt{z}\right)^2}{d+f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\left(b+2(d+f(v-2k))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(b+2(d+f(v-2k))\sqrt{z}\right)^2}{4(d+f(v-2k))}\right)+2\sqrt{-\frac{\left(b+2(d+f(v-2k))\sqrt{z}\right)^2}{d+f(v-2k)}}$$

$$\left.(d+f(v-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+2(d+f(v-2k))\sqrt{z}\right)^2}{4(d+f(v-2k))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(b\,z)\cosh^v(c\,z^r)$

01.20.21.2582.01

$$\int z^n \cosh(b\,z)\cosh^{\nu}\left(c\,z^2\right)dz == -2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,-b\,z)\,(-b)^{-n-1}+b^{-n-1}\,\Gamma(n+1,\,b\,z)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{b^2}{4\,c\,(2\,s-\nu)}}\left(\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\,(2\,c\,(2\,s-\nu)\,z-b)^{q+1}\left(-\frac{(2\,c\,(2\,s-\nu)\,z-b)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,c\,(2\,s-\nu)\,z-b)^2}{4\,c\,(2\,s-\nu)}\right)\right)(c\,(2\,s-\nu))^{-n-1}+e^{-\frac{b^2}{4\,c\,(2\,s-\nu)}}$$

$$\left(\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b+2\,c\,(2\,s-\nu)\,z)^{q+1}\left(-\frac{(b+2\,c\,(2\,s-\nu)\,z)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b+2\,c\,(2\,s-\nu)\,z)^2}{4\,c\,(2\,s-\nu)}\right)\right)$$

$$(c\,(2\,s-\nu))^{-n-1}+e^{-\frac{b^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\,(2\,c\,(\nu-2\,s)\,z-b)^{q+1}\left(-\frac{(2\,c\,(\nu-2\,s)\,z-b)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,c\,(\nu-2\,s)\,z-b)^2}{4\,c\,(\nu-2\,s)}\right)+e^{-\frac{b^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b+2\,c\,(\nu-2\,s)\,z)^{q+1}$$

$$\left.\left(-\frac{(b+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2583.01

$$\int z^n \cosh(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2\,(2\,s-\nu)^2}{4\,b}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-\nu))^{-h-k+2\,n}\left(c\,(2\,s-\nu)-2\,b\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c\,(2\,s-\nu)-2\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-\nu)\left(c\,(2\,s-\nu)-2\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c\,(2\,s-\nu)-2\,b\,\sqrt{z}\right)^2}{4\,b}\right)-2\,b\right.$$

$$\left.\left.\sqrt{\frac{\left(c\,(2\,s-\nu)-2\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c\,(2\,s-\nu)-2\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)\right)(-b)^{-2\,n-2}+$$

$$e^{\frac{c^2\,(\nu-2\,s)^2}{4\,b}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,s))^{-h-k+2\,n}\left(c\,(\nu-2\,s)-2\,b\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c\,(\nu-2\,s)-2\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c\,(v-2\,s)-2\,b\,\sqrt{z}\right)^2}{4\,b}\right)-2\,b\right.$$

$$\left.\sqrt{\frac{\left(c\,(v-2\,s)-2\,b\,\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c\,(v-2\,s)-2\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)(-b)^{-2\,n-2}+b^{-2\,n-2}$$

$$e^{-\frac{c^2\,(2\,s-v)^2}{4\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,\sqrt{z}\ b+c\,(2\,s-v)\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\ b+c\,(2\,s-v)\right)^2}{b}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,\sqrt{z}\ b+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(2\,\sqrt{z}\ b+c\,(2\,s-v)\right)^2}{4\,b}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(2\,\sqrt{z}\ b+c\,(2\,s-v)\right)^2}{b}}\ b\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(2\,\sqrt{z}\ b+c\,(2\,s-v)\right)^2}{4\,b}\right)\right)+b^{-2\,n-2}\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,b}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,\sqrt{z}\ b+c\,(v-2\,s)\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\ b+c\,(v-2\,s)\right)^2}{b}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(2\,\sqrt{z}\ b+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(2\,\sqrt{z}\ b+c\,(v-2\,s)\right)^2}{4\,b}\right)+\right.$$

$$\left.\left.2\,\sqrt{-\frac{\left(2\,\sqrt{z}\ b+c\,(v-2\,s)\right)^2}{b}}\ b\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(2\,\sqrt{z}\ b+c\,(v-2\,s)\right)^2}{4\,b}\right)\right)\right)-$$

$$2^{-v-1}\binom{v}{\frac{v}{2}}\left(\Gamma(n+1,\,-b\,z)\,(-b)^{-n-1}+b^{-n-1}\,\Gamma(n+1,\,b\,z)\right)(1-v\bmod 2)\ /;\ n\in$$

$$\mathbb{N}\bigwedge$$

$$v\in$$

$$\mathbb{N}^+$$

Involving $z^n \cosh(d\,z+e)\cosh^v\left(c\,z^r\right)$

01.20.21.2584.01

$$\int z^n \cosh(e+d\,z)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$-2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^e\,\Gamma(n+1,\,-d\,z)\,(-d)^{-n-1}+d^{-n-1}\,e^{-e}\,\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(e^{-\frac{d^2}{4\,c\,(2\,s-\nu)}-e}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(2\,c\,(2\,s-\nu)\,z-d)^{q+1}\left(-\frac{(2\,c\,(2\,s-\nu)\,z-d)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,c\,(2\,s-\nu)\,z-d)^2}{4\,c\,(2\,s-\nu)}\right)\right)\right.$$

$$(c\,(2\,s-\nu))^{-n-1}+e^{e-\frac{d^2}{4\,c\,(2\,s-\nu)}}\left(\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,c\,(2\,s-\nu)\,z)^{q+1}\left(-\frac{(d+2\,c\,(2\,s-\nu)\,z)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+2\,c\,(2\,s-\nu)\,z)^2}{4\,c\,(2\,s-\nu)}\right)\right)(c\,(2\,s-\nu))^{-n-1}+e^{-\frac{d^2}{4\,c\,(\nu-2\,s)}-e}\,(c\,(\nu-2\,s))^{-n-1}\right.$$

$$\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(2\,c\,(\nu-2\,s)\,z-d)^{q+1}\left(-\frac{(2\,c\,(\nu-2\,s)\,z-d)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,c\,(\nu-2\,s)\,z-d)^2}{4\,c\,(\nu-2\,s)}\right)+$$

$$e^{e-\frac{d^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,c\,(\nu-2\,s)\,z)^{q+1}\left(-\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2585.01

$$\int z^n \cosh(e+d\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz == 2^{-2\,n-\nu-2}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2\,(2\,s-\nu)^2}{4\,d}-e}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-\nu))^{-h-k+2\,n}\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-\nu)\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\right.$$

$$\left.\left.\sqrt{\frac{\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)(-d)^{-2\,n-2}+$$

$$e^{\frac{c^2 (v-2s)^2}{4d}-e}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\right.$$

$$\left.\left.\sqrt{\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)(-d)^{-2\,n-2}+d^{-2\,n-2}$$

$$e^{e-\frac{c^2\,(2\,s-v)^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,\sqrt{z}\ d+c\,(2\,s-v)\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\ d+c\,(2\,s-v)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,\sqrt{z}\ d+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(2\,\sqrt{z}\ d+c\,(2\,s-v)\right)^2}{4\,d}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(2\,\sqrt{z}\ d+c\,(2\,s-v)\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(2\,\sqrt{z}\ d+c\,(2\,s-v)\right)^2}{4\,d}\right)\right)+d^{-2\,n-2}\,e^{e-\frac{c^2\,(v-2\,s)^2}{4\,d}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,\sqrt{z}\ d+c\,(v-2\,s)\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\ d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(2\,\sqrt{z}\ d+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(2\,\sqrt{z}\ d+c\,(v-2\,s)\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.2\,\sqrt{-\frac{\left(2\,\sqrt{z}\ d+c\,(v-2\,s)\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(2\,\sqrt{z}\ d+c\,(v-2\,s)\right)^2}{4\,d}\right)\right)\right)-$$

$$2^{-v-1}\binom{v}{\frac{v}{2}}\left(e^e\,\Gamma(n+1,\,-d\,z)\,(-d)^{-n-1}+d^{-n-1}\,e^{-e}\,\Gamma(n+1,\,d\,z)\right)(1-v\bmod 2)\ /;\ n\in$$

$\mathbb{N}\bigwedge$

$v\in$

$\mathbb{N}^+$

Involving $z^{\alpha-1}\cosh(b\,z^r)\cosh^{\nu}(c\,z^r)$

01.20.21.2586.01

$$\int z^{\alpha-1}\cosh(b\,z^r)\cosh^{\nu}(c\,z^r)\,dz == \frac{2^{-\nu-1}\,z^{\alpha}}{r}\left(-\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{\alpha}{r},-b\,z^r\right)(-b\,z^r)^{-\frac{\alpha}{r}}+(b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},b\,z^r\right)\right)(1-\nu \bmod 2)-\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)((-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}+((b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+\right.$$

$$\left.\left.((-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)+((b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.2587.01

$$\int z^n\cosh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2\right)dz == -2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2},-b\,z^2\right)\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{n+1}{2},(-b-2\,c\,s+c\,\nu)\,z^2\right)\left((-b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.\right.$$

$$\Gamma\left(\frac{n+1}{2},(b-2\,c\,s+c\,\nu)\,z^2\right)+\left((-b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(-b+2\,c\,s-c\,\nu)\,z^2\right)+$$

$$\left.\left.\left((b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+2\,c\,s-c\,\nu)\,z^2\right)\right)\right)z^{n+1}\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2588.01

$$\int z^n\cosh\left(b\sqrt{z}\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == -2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2\,(n+1),-b\sqrt{z}\right)+\Gamma\left(2\,(n+1),b\sqrt{z}\right)\right)(1-\nu \bmod 2)\,b^{-2\,(n+1)}-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(2\,(n+1),(c\,(\nu-2\,s)-b)\sqrt{z}\right)(c\,(\nu-2\,s)-b)^{-2\,(n+1)}+(b+c\,(\nu-2\,s))^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),(b+c\,(\nu-2\,s))\sqrt{z}\right)+(-b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-b-c\,(\nu-2\,s))\sqrt{z}\right)+$$

$$\left.(b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(b-c\,(\nu-2\,s))\sqrt{z}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh(b\,z^r+e)\cosh^{\nu}(c\,z^r)$

01.20.21.2589.01

$$\int z^{\alpha-1}\cosh(b\,z^r+e)\cosh^{\nu}(c\,z^r)\,dz ==$$

$$\frac{2^{-\nu-1}\,z^{\alpha}}{r}\left(-\binom{\nu}{\frac{\nu}{2}}\left(e^{e}\,\Gamma\left(\frac{\alpha}{r},\,-b\,z^r\right)(-b\,z^r)^{-\frac{\alpha}{r}}+e^{-e}\,(b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,b\,z^r\right)\right)(1-\nu \bmod 2)-\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,s+c\,\nu)\,z^r\right)\right.\right.$$

$$((-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}+e^{-e}\,((b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b-2\,c\,s+c\,\nu)\,z^r\right)+e^{e}\,((-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-e}\,((b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.2590.01

$$\int z^{n}\cosh\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^{e}\,\Gamma\left(\frac{n+1}{2},\,-b\,z^2\right)\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-e}\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\,\Gamma\left(\frac{n+1}{2},\,(-b-2\,c\,s+c\,\nu)\,z^2\right)\left((-b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-e}\left((b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.\right.$$

$$\Gamma\left(\frac{n+1}{2},\,(b-2\,c\,s+c\,\nu)\,z^2\right)+e^{e}\left((-b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b+2\,c\,s-c\,\nu)\,z^2\right)+$$

$$\left.\left.e^{-e}\left((b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(b+2\,c\,s-c\,\nu)\,z^2\right)\right)\right)z^{n+1}\,/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.2591.01

$$\int z^{n}\cosh\left(\sqrt{z}\;b+e\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz==-2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(e^{e}\,\Gamma\left(2\,(n+1),\,-b\,\sqrt{z}\right)+e^{-e}\,\Gamma\left(2\,(n+1),\,b\,\sqrt{z}\right)\right)(1-\nu \bmod 2)\,b^{-2\,(n+1)}-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\,\Gamma\left(2\,(n+1),\,(c\,(\nu-2\,s)-b)\,\sqrt{z}\right)(c\,(\nu-2\,s)-b)^{-2\,(n+1)}+e^{-e}\,(b+c\,(\nu-2\,s))^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\,(b+c\,(\nu-2\,s))\,\sqrt{z}\right)+e^{e}\,(-b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b-c\,(\nu-2\,s))\,\sqrt{z}\right)+$$

$$\left.e^{-e}\,(b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(b-c\,(\nu-2\,s))\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

Involving $z^n\cosh\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.2592.01

$$\int z^n \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+\right.$$

$$b^{-n-1}\,e^{-\frac{d^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{4\,(c\,(2\,s-\nu)-b)}}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(2\,(c\,(2\,s-\nu)-b)\,z-d)^{q+1}\left(-\frac{(2\,(c\,(2\,s-\nu)-b)\,z-d)^2}{c\,(2\,s-\nu)-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(2\,(c\,(2\,s-\nu)-b)\,z-d)^2}{4\,(c\,(2\,s-\nu)-b)}\right)\right)(c\,(2\,s-\nu)-b)^{-n-1}+e^{-\frac{d^2}{4\,(b+c\,(2\,s-\nu))}}\,(b+c\,(2\,s-\nu))^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,(b+c\,(2\,s-\nu))\,z)^{q+1}\left(-\frac{(d+2\,(b+c\,(2\,s-\nu))\,z)^2}{b+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.-\frac{(d+2\,(b+c\,(2\,s-\nu))\,z)^2}{4\,(b+c\,(2\,s-\nu))}\right)+e^{-\frac{d^2}{4\,(c\,(\nu-2\,s)-b)}}\,(c\,(\nu-2\,s)-b)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(2\,(c\,(\nu-2\,s)-b)\,z-d)^{q+1}$$

$$\left(-\frac{(2\,(c\,(\nu-2\,s)-b)\,z-d)^2}{c\,(\nu-2\,s)-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,(c\,(\nu-2\,s)-b)\,z-d)^2}{4\,(c\,(\nu-2\,s)-b)}\right)+$$

$$e^{-\frac{d^2}{4\,(b+c\,(\nu-2\,s))}}\,(b+c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,(b+c\,(\nu-2\,s))\,z)^{q+1}$$

$$\left.\left(-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{b+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{4\,(b+c\,(\nu-2\,s))}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2593.01

$$\int z^n \cosh\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{b^2}{4\,d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-b-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left.\left.\binom{k}{h}\binom{n}{k}\left(-b\left(-b-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.\right.\right.$$

$$2\,d\,\sqrt{\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)(-d)^{-2\,n-2}+$$

$$d^{-2\,n-2}\,e^{-\frac{b^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\;-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\;-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(e^{\frac{(c\,(\nu-2\,s)-b)^2}{4\,d}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,s)-b)^{-h-k+2\,n}\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((c\,(\nu-2\,s)-b)\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d$$

$$\sqrt{\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)(-d)^{-2\,n-2}+$$

$$e^{\frac{(-b-c\,(\nu-2\,s))^2}{4\,d}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-c\,(\nu-2\,s))^{-h-k+2\,n}\left(-b-c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-b-c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((-b-c\,(\nu-2\,s))\left(-b-c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(-b-c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\,\sqrt{\frac{\left(-b-c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-b-c(v-2s)-2d\sqrt{z}\right)^2}{4d}\right)\Bigg)(-d)^{-2n-2}+d^{-2n-2}\,e^{-\frac{(b+c(v-2s))^2}{4d}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c(v-2s))^{-h-k+2n}\left(b+c(v-2s)+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+c(v-2s))\left(b+c(v-2s)+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{4d}\right)+$$

$$2\sqrt{-\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{4d}\right)\Bigg)+$$

$$d^{-2n-2}\,e^{-\frac{(b-c(v-2s))^2}{4d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c(v-2s))^{-h-k+2n}\left(b-c(v-2s)+2d\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((b-c(v-2s))\left(b-c(v-2s)+2d\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\ -\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{4d}\Bigg)+2\sqrt{-\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\Bigg($$

$$\frac{1}{2}(h+k+2),\ -\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{4d}\Bigg)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.2594.01

$$\int z^n \cosh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}-e}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)\right.$$

$$(-b)^{-n-1}+b^{-n-1}\,e^{e-\frac{d^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{4(c(2s-\nu)-b)}-e}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(2\,(c\,(2\,s-\nu)-b)\,z-d)^{q+1}\left(-\frac{(2\,(c\,(2\,s-\nu)-b)\,z-d)^2}{c\,(2\,s-\nu)-b}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,(c\,(2\,s-\nu)-b)\,z-d)^2}{4\,(c\,(2\,s-\nu)-b)}\right)\right)(c\,(2\,s-\nu)-b)^{-n-1}+e^{e-\frac{d^2}{4(b+c(2s-\nu))}}\,(b+c\,(2\,s-\nu))^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,(b+c\,(2\,s-\nu))\,z)^{q+1}\left(-\frac{(d+2\,(b+c\,(2\,s-\nu))\,z)^2}{b+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.-\frac{(d+2\,(b+c\,(2\,s-\nu))\,z)^2}{4\,(b+c\,(2\,s-\nu))}\right)+e^{-\frac{d^2}{4(c(\nu-2s)-b)}-e}\,(c\,(\nu-2\,s)-b)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(2\,(c\,(\nu-2\,s)-b)\,z-d)^{q+1}$$

$$\left(-\frac{(2\,(c\,(\nu-2\,s)-b)\,z-d)^2}{c\,(\nu-2\,s)-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,(c\,(\nu-2\,s)-b)\,z-d)^2}{4\,(c\,(\nu-2\,s)-b)}\right)+$$

$$e^{e-\frac{d^2}{4(b+c(\nu-2s))}}\,(b+c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,(b+c\,(\nu-2\,s))\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{b+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{4\,(b+c\,(\nu-2\,s))}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

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$$\int z^n \cosh\left(\sqrt{z}\;b+d\,z+e\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{b^2}{4d}-e}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-b-2\,d\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left.\left(\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-b\left(-b-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.\right.$$

$$2\,d\,\sqrt{\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)(-d)^{-2\,n-2}+$$

$$d^{-2\,n-2}\,e^{e-\frac{b^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(e^{\frac{(c\,(2\,s-\nu)-b)^2}{4\,d}-e}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-\nu)-b)^{-h-k+2\,n}\left(-b+c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(-b+c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((c\,(2\,s-\nu)-b)\left(-b+c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(-b+c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\,\sqrt{\frac{\left(-b+c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{d}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(-b+c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)(-d)^{-2\,n-2}+e^{\frac{(c\,(\nu-2\,s)-b)^2}{4\,d}-e}$$

$$\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,s)-b)^{-h-k+2\,n}\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((c\,(\nu-2\,s)-b)\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-$$

$$2\,d\,\sqrt{\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)(-d)^{-2\,n-2}+$$

$$d^{-2n-2}\, e^{e-\frac{(b+c(2s-v))^2}{4d}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, (b+c(2s-v))^{-h-k+2n} \left(b+c(2s-v)+2d\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c(2s-v)+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left((b+c(2s-v))\left(b+c(2s-v)+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c(2s-v)+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+c(2s-v)+2d\sqrt{z}\right)^2}{d}}\; d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+c(2s-v)+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$d^{-2n-2}\, e^{e-\frac{(b+c(v-2s))^2}{4d}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, (b+c(v-2s))^{-h-k+2n} \left(b+c(v-2s)+2d\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left((b+c(v-2s))\left(b+c(v-2s)+2d\sqrt{z}\right)\Gamma\right.$$

$$\left(\frac{1}{2}(h+k+1), -\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{d}}\; d\,\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+k+2), -\frac{\left(b+c(v-2s)+2d\sqrt{z}\right)^2}{4d}\right)\right)\right); n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.2596.01

$$\int z^n \cosh(d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{d^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(-d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{d^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{g\,(\nu-2\,s)-\frac{d^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}\right.$$

$$\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(2\,c\,(\nu-2\,s)\,z-d)^{j+1}\left(-\frac{(2\,c\,(\nu-2\,s)\,z-d)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,(\nu-2\,s)\,z-d)^2}{4\,c\,(\nu-2\,s)}\right)+$$

$$e^{g\,(\nu-2\,s)-\frac{d^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2597.01

$$\int z^n \cosh(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-2\,n-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\right)\left(e^{\frac{c^2\,(\nu-2\,s)^2}{4\,d}-g\,(\nu-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-2\,\sqrt{z}\;d-c\,(\nu-2\,s)\right)^{h+j}\right.$$

$$\left(\frac{\left(-2\,\sqrt{z}\;d-c\,(\nu-2\,s)\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left.\left(-c\,(\nu-2\,s)\left(-2\,\sqrt{z}\;d-c\,(\nu-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-2\,\sqrt{z}\;d-c\,(\nu-2\,s)\right)^2}{4\,d}\right)-2\,d\right.\right.$$

$$\sqrt{\frac{\left(-2\sqrt{z}\,d-c\,(v-2\,s)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-2\sqrt{z}\,d-c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)+e^{\frac{c^2\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+j}\left(\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d$$

$$\sqrt{\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{-\frac{c^2\,(v-2\,s)^2}{4\,d}-g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,d\,\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{4\,d}\right)-c\,(v-2\,s)$$

$$\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)+e^{g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,d}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)+2$$

$$\sqrt{-\frac{\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)\Bigg)$$

$$d^{-2(n+1)} + (-1)^n\, 2^{-\nu-1} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma(n+1,\, d\,z)\,(-d)^{-n-1} + d^{-n-1}\,\Gamma(n+1,\, -d\,z)\right)$$

$$(1 - \nu \bmod 2) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n \cosh(d\,z+e) \cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2598.01

$$\int z^n \cosh(e+d\,z) \cosh^{\nu}\left(c\,z^2+g\right) dz ==$$

$$(-1)^n\, 2^{-\nu-1} \binom{\nu}{\frac{\nu}{2}} \left(e^{-e}\,\Gamma(n+1,\, d\,z)\,(-d)^{-n-1} + d^{-n-1}\, e^{e}\,\Gamma(n+1,\, -d\,z)\right)(1-\nu \bmod 2) - 2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{d^2}{4\,c\,(\nu-2\,s)} - e - g\,(\nu-2\,s)} \right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n}\, d^{n-j}\, (-d-2\,c\,(\nu-2\,s)\,z)^{j+1} \left(\frac{(-d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(-d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right)$$

$$(-c\,(\nu-2\,s))^{-n-1} + e^{\frac{d^2}{4\,c\,(\nu-2\,s)} + e - g\,(\nu-2\,s)} \left(\sum_{j=0}^{n} 2^{j-n}\, (-d)^{n-j}\, (d-2\,c\,(\nu-2\,s)\,z)^{j+1} \left(\frac{(d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right) (-c\,(\nu-2\,s))^{-n-1} + e^{-\frac{d^2}{4\,c\,(\nu-2\,s)} - e + g\,(\nu-2\,s)}\, (c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n}\, d^{n-j}\, (2\,c\,(\nu-2\,s)\,z-d)^{j+1} \left(-\frac{(2\,c\,(\nu-2\,s)\,z-d)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(2\,c\,(\nu-2\,s)\,z-d)^2}{4\,c\,(\nu-2\,s)} \right) +$$

$$e^{-\frac{d^2}{4\,c\,(\nu-2\,s)} + e + g\,(\nu-2\,s)}\, (c\,(\nu-2\,s))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (-d)^{n-j}\, (d+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \Bigg) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2599.01

$$\int z^n \cosh(e+d\,z) \cosh^{\nu}\left(\sqrt{z}\;c+g\right) dz ==$$

$$2^{-2\,n-\nu-2} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{c^2\,(\nu-2\,s)^2}{4\,d} - g\,(\nu-2\,s) - e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c\,(\nu-2\,s))^{-h-j+2\,n} \left(-2\,\sqrt{z}\;d - c\,(\nu-2\,s)\right)^{h+j} \right. \right.$$

$$\left. \left. \left(\frac{\left(-2\,\sqrt{z}\;d - c\,(\nu-2\,s)\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \right. \right.$$

$$\left(-c\,(v-2\,s)\left(-2\,\sqrt{z}\;d-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(-2\,\sqrt{z}\;d-c\,(v-2\,s)\right)^2}{4\,d}\right)-2\,d\right.$$

$$\left.\sqrt{\frac{\left(-2\,\sqrt{z}\;d-c\,(v-2\,s)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(-2\,\sqrt{z}\;d-c\,(v-2\,s)\right)^2}{4\,d}\right)\right)+e^{\frac{c^2\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)-e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+j}\left(\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\right.$$

$$\left.\sqrt{\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+e^{-\frac{c^2\,(v-2\,s)^2}{4\,d}-g\,(v-2\,s)+e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,d\,\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{4\,d}\right)-c\,(v-2\,s)\right.$$

$$\left.\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,d\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{4\,d}\right)\right)+e^{-\frac{c^2\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)+e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)+2\right.$$

$$\sqrt{-\frac{\left(2\sqrt{z}\,d+c\,(v-2\,s)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\,d+c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)$$

$$d^{-2(n+1)}+(-1)^n\,2^{-v-1}\binom{v}{\frac{v}{2}}\left(e^{-e}\,\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,e^{e}\,\Gamma(n+1,\,-d\,z)\right)$$

$$(1-v \bmod 2)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.2600.01

$$\int z^{\alpha-1}\cosh(b\,z^r)\cosh^v(c\,z^r+g)\,dz==-\frac{2^{-v-1}\binom{v}{\frac{v}{2}}\left(\Gamma\left(\frac{\alpha}{r},-b\,z^r\right)(-b\,z^r)^{-\frac{\alpha}{r}}+(b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},b\,z^r\right)\right)(1-v \bmod 2)\,z^\alpha}{r}-$$

$$\frac{2^{-v-1}\,z^\alpha}{r}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,s+c\,v)\,z^r\right)((-b-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{2\,g\,s-g\,v}\,((b-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-2\,c\,s+c\,v)\,z^r\right)+e^{-2\,g\,s+g\,v}\,((-b+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,s-c\,v)\,z^r\right)+e^{-2\,g\,s+g\,v}\,((b+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+2\,c\,s-c\,v)\,z^r\right)\right)/;\;v\in\mathbb{N}^+$$

01.20.21.2601.01

$$\int z^n\cosh\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz==$$

$$-2^{-v-2}\binom{v}{\frac{v}{2}}\left(\Gamma\left(\frac{n+1}{2},-b\,z^2\right)\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b\,z^2\right)\right)(1-v \bmod 2)\,z^{n+1}-$$

$$2^{-v-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{n+1}{2},(-b-2\,c\,s+c\,v)\,z^2\right)\left((-b-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{2\,g\,s-g\,v}\left((b-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},(b-2\,c\,s+c\,v)\,z^2\right)+e^{-2\,g\,s+g\,v}\left((-b+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(-b+2\,c\,s-c\,v)\,z^2\right)+$$

$$\left.e^{-2\,g\,s+g\,v}\left((b+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+2\,c\,s-c\,v)\,z^2\right)\right)/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.2602.01

$$\int z^n\cosh\left(\sqrt{z}\;b\right)\cosh^v\left(\sqrt{z}\;c+g\right)dz==-2^{-v}\binom{v}{\frac{v}{2}}\left(\Gamma\left(2\,(n+1),-b\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),b\,\sqrt{z}\right)\right)(1-v \bmod 2)\,b^{-2\,(n+1)}-$$

$$2^{-v}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g\,(v-2\,s)}\,\Gamma\left(2\,(n+1),(c\,(v-2\,s)-b)\,\sqrt{z}\right)(c\,(v-2\,s)-b)^{-2\,(n+1)}+e^{-g\,(v-2\,s)}\,(b+c\,(v-2\,s))^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),(b+c\,(v-2\,s))\,\sqrt{z}\right)+e^{g\,(v-2\,s)}\,(-b-c\,(v-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-b-c\,(v-2\,s))\,\sqrt{z}\right)+$$

$$\left.e^{g\,(v-2\,s)}\,(b-c\,(v-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(b-c\,(v-2\,s))\,\sqrt{z}\right)\right)/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh(b\,z^r+e)\cosh^\nu(c\,z^r+g)$

01.20.21.2603.01

$$\int z^{\alpha-1}\cosh(b\,z^r+e)\cosh^\nu(c\,z^r+g)\,dz == -\frac{2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^e\,\Gamma\left(\frac{\alpha}{r},-b\,z^r\right)(-b\,z^r)^{-\frac{\alpha}{r}}+e^{-e}\,(b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},b\,z^r\right)\right)(1-\nu \bmod 2)\,z^\alpha}{r}-$$

$$\frac{2^{-\nu-1}\,z^\alpha}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)((-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-e+2\,g\,s-g\,\nu}\,((b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+e^{e-2\,g\,s+g\,\nu}\,((-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-e-2\,g\,s+g\,\nu}\,((b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

01.20.21.2604.01

$$\int z^n\cosh\left(b\,z^2+e\right)\cosh^\nu\left(c\,z^2+g\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^e\,\Gamma\left(\frac{n+1}{2},-b\,z^2\right)\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-e}\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-2^{-\nu-2}\,z^{n+1}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{n+1}{2},(-b-2\,c\,s+c\,\nu)\,z^2\right)\left((-b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-e+2\,g\,s-g\,\nu}\left((b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},(b-2\,c\,s+c\,\nu)\,z^2\right)+e^{e-2\,g\,s+g\,\nu}\left(\left(-b+2\,c\,s-c\,\nu\right)z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(-b+2\,c\,s-c\,\nu)\,z^2\right)+$$

$$\left.e^{-e-2\,g\,s+g\,\nu}\left((b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(b+2\,c\,s-c\,\nu)\,z^2\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2605.01

$$\int z^n\cosh\left(\sqrt{z}\;b+e\right)\cosh^\nu\left(\sqrt{z}\;c+g\right)dz == -2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(e^e\,\Gamma\left(2\,(n+1),-b\,\sqrt{z}\right)+e^{-e}\,\Gamma\left(2\,(n+1),b\,\sqrt{z}\right)\right)(1-\nu \bmod 2)\,b^{-2\,(n+1)}-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e-g\,(\nu-2\,s)}\,\Gamma\left(2\,(n+1),(c\,(\nu-2\,s)-b)\,\sqrt{z}\right)(c\,(\nu-2\,s)-b)^{-2\,(n+1)}+e^{-e-g\,(\nu-2\,s)}\,(b+c\,(\nu-2\,s))^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),(b+c\,(\nu-2\,s))\,\sqrt{z}\right)+e^{e+g\,(\nu-2\,s)}\,(-b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-b-c\,(\nu-2\,s))\,\sqrt{z}\right)+$$

$$\left.e^{g\,(\nu-2\,s)-e}\,(b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(b-c\,(\nu-2\,s))\,\sqrt{z}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^n\cosh(b\,z^r+d\,z)\cosh^\nu(c\,z^r+g)$

01.20.21.2606.01

$$\int z^n \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}}\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(-d-2\,b\,z)^{j+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+\right.$$

$$b^{-n-1}\,e^{-\frac{d^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,b\,z)^{j+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{g\,(2\,s-\nu)-\frac{d^2}{4\,(c\,(2\,s-\nu)-b)}}\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(2\,(c\,(2\,s-\nu)-b)\,z-d)^{j+1}\left(-\frac{(2\,(c\,(2\,s-\nu)-b)\,z-d)^2}{c\,(2\,s-\nu)-b}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(c\,(2\,s-\nu)-b)\,z-d)^2}{4\,(c\,(2\,s-\nu)-b)}\right)\right)(c\,(2\,s-\nu)-b)^{-n-1}+e^{g\,(2\,s-\nu)-\frac{d^2}{4\,(b+c\,(2\,s-\nu))}}\right.$$

$$(b+c\,(2\,s-\nu))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,(b+c\,(2\,s-\nu))\,z)^{j+1}\left(-\frac{(d+2\,(b+c\,(2\,s-\nu))\,z)^2}{b+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,(b+c\,(2\,s-\nu))\,z)^2}{4\,(b+c\,(2\,s-\nu))}\right)+e^{g\,(\nu-2\,s)-\frac{d^2}{4\,(c\,(\nu-2\,s)-b)}}\,(c\,(\nu-2\,s)-b)^{-n-1}\sum_{j=0}^{n}2^{j-n}\,d^{n-j}$$

$$(2\,(c\,(\nu-2\,s)-b)\,z-d)^{j+1}\left(-\frac{(2\,(c\,(\nu-2\,s)-b)\,z-d)^2}{c\,(\nu-2\,s)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,(c\,(\nu-2\,s)-b)\,z-d)^2}{4\,(c\,(\nu-2\,s)-b)}\right)+$$

$$e^{g\,(\nu-2\,s)-\frac{d^2}{4\,(b+c\,(\nu-2\,s))}}\,(b+c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,(b+c\,(\nu-2\,s))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{b+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{4\,(b+c\,(\nu-2\,s))}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2607.01

$$\int z^n \cosh\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz == 2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2\,n}\left(-b-2\,d\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left(-b\left(-b-2\,d\,\sqrt{z}\right)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d\,\sqrt{\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-b-2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{b^2}{4d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j b^{-h-j+2n} \left(b+2d\sqrt{z}\right)^{h+j} \left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j} \left(b\left(b+2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right) + 2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\; d\,\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)$$

$$d^{-2n-2} + 2^{-2n-v-2} \left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{k} \left(e^{\frac{(c(2k-v)-b)^2}{4d}+g(2k-v)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c(2k-v)-b)^{-h-j+2n}\right.\right.$$

$$\left(-b+c(2k-v)-2d\sqrt{z}\right)^{h+j} \left(\frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}$$

$$\left((c(2k-v)-b)\left(-b+c(2k-v)-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{4d}\right) - 2\right.$$

$$\left.d\sqrt{\frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{4d}\right)\right) +$$

$$e^{\frac{(c(v-2k)-b)^2}{4d}+g(v-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c(v-2k)-b)^{-h-j+2n} \left(-b+c(v-2k)-2d\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j} \left((c(v-2k)-b)\left(-b+c(v-2k)-2d\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{4d}\right) - 2d\sqrt{\frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{4d}\right)\right) + e^{g(2k-v)-\frac{(b+c(2k-v))^2}{4d}}\right)$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b+c\,(2\,k-v))^{-h-j+2\,n}\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((b+c\,(2\,k-v))\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{(b+c\,(v-2\,k))^{2}}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b+c\,(v-2\,k))^{-h-j+2\,n}\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b+c\,(v-2\,k))\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{d}}$$

$$\left.\left.d\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)\right)\right)\Bigg)\,d^{-2\,n-2}\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^{n}\cosh\left(b\,z^{r}+d\,z+e\right)\cosh^{v}\left(c\,z^{r}+g\right)$

01.20.21.2608.01

$$\int z^n \cosh\left(b z^2+d z+e\right) \cosh^{\nu}\left(c z^2+g\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}-e}\left(\sum_{j=0}^{n} 2^{j-n} d^{n-j} (-d-2 b z)^{j+1}\left(\frac{(-d-2 b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{(-d-2 b z)^2}{4 b}\right)\right)\right.$$

$$(-b)^{-n-1}+b^{-n-1} e^{e-\frac{d^2}{4b}} \sum_{j=0}^{n} 2^{j-n} (-d)^{n-j} (d+2 b z)^{j+1}\left(-\frac{(d+2 b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d+2 b z)^2}{4 b}\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{4(c(2 s-\nu)-b)}-e+g(2 s-\nu)}\left(\sum_{j=0}^{n} 2^{j-n} d^{n-j} (2(c(2 s-\nu)-b) z-d)^{j+1}\left(-\frac{(2(c(2 s-\nu)-b) z-d)^2}{c(2 s-\nu)-b}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(2(c(2 s-\nu)-b) z-d)^2}{4(c(2 s-\nu)-b)}\right)\right)(c(2 s-\nu)-b)^{-n-1}+e^{-\frac{d^2}{4(b+c(2 s-\nu))}+e+g(2 s-\nu)}$$

$$(b+c(2 s-\nu))^{-n-1}\sum_{j=0}^{n} 2^{j-n} (-d)^{n-j} (d+2(b+c(2 s-\nu)) z)^{j+1}\left(-\frac{(d+2(b+c(2 s-\nu)) z)^2}{b+c(2 s-\nu)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d+2(b+c(2 s-\nu)) z)^2}{4(b+c(2 s-\nu))}\right)+e^{-\frac{d^2}{4(c(\nu-2 s)-b)}-e+g(\nu-2 s)}(c(\nu-2 s)-b)^{-n-1}\sum_{j=0}^{n} 2^{j-n} d^{n-j}$$

$$(2(c(\nu-2 s)-b) z-d)^{j+1}\left(-\frac{(2(c(\nu-2 s)-b) z-d)^2}{c(\nu-2 s)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(2(c(\nu-2 s)-b) z-d)^2}{4(c(\nu-2 s)-b)}\right)+$$

$$e^{-\frac{d^2}{4(b+c(\nu-2 s))}+e+g(\nu-2 s)}(b+c(\nu-2 s))^{-n-1}\sum_{j=0}^{n} 2^{j-n} (-d)^{n-j} (d+2(b+c(\nu-2 s)) z)^{j+1}$$

$$\left.\left.\left(-\frac{(d+2(b+c(\nu-2 s)) z)^2}{b+c(\nu-2 s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d+2(b+c(\nu-2 s)) z)^2}{4(b+c(\nu-2 s))}\right)\right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2609.01

$$\int z^n \cosh\left(\sqrt{z}\ b+e+d z\right) \cosh^{\nu}\left(\sqrt{z}\ c+g\right) dz == 2^{-2 n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{b^2}{4d}-e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (-b)^{-h-j+2 n}\left(-b-2 d \sqrt{z}\right)^{h+j}\left(\frac{\left(-b-2 d \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.\left(-b\left(-b-2 d \sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b-2 d \sqrt{z}\right)^2}{4 d}\right)-2 d \sqrt{\frac{\left(-b-2 d \sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b-2 d \sqrt{z}\right)^2}{4 d}\right)\right)+$$

$$e^{e-\frac{b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b+2d\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\left(b+2d\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)$$

$$d^{-2n-2}+2^{-2n-v-2}\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{(c(2k-v)-b)^2}{4d}-e+g(2k-v)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c(2k-v)-b)^{-h-j+2n}\right.\right.$$

$$\left(-b+c(2k-v)-2d\sqrt{z}\right)^{h+j}\left(\frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c(2k-v)-b)\left(-b+c(2k-v)-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{4d}\right)-2\right.$$

$$\left.d\sqrt{\frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-b+c(2k-v)-2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$e^{\frac{(c(v-2k)-b)^2}{4d}-e+g(v-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c(v-2k)-b)^{-h-j+2n}\left(-b+c(v-2k)-2d\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c(v-2k)-b)\left(-b+c(v-2k)-2d\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-b+c(v-2k)-2d\sqrt{z}\right)^2}{4d}\right)\right)+e^{-\frac{(b+c(2k-v))^2}{4d}+e+g(2k-v)}\right)$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b+c\,(2\,k-v))^{-h-j+2\,n}\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((b+c\,(2\,k-v))\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+c\,(2\,k-v)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)\right)+$$

$$e^{-\frac{(b+c\,(v-2\,k))^{2}}{4\,d}+e+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b+c\,(v-2\,k))^{-h-j+2\,n}\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b+c\,(v-2\,k))\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{d}}$$

$$\left.\left.d\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+c\,(v-2\,k)+2\,d\,\sqrt{z}\right)^{2}}{4\,d}\right)\right)\right)\Bigg)\,d^{-2\,n-2}\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^{n}\cosh(d\,z)\cosh^{v}\left(c\,z^{r}+f\,z\right)$

01.20.21.2610.01

$$\int z^n \cosh(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-d-f(\nu-2s))^2}{4c(\nu-2s)}}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(d+f(\nu-2s))^{n-j}\,(-d-f(\nu-2s)-2c(\nu-2s)z)^{j+1}\left(\frac{(-d-f(\nu-2s)-2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d-f(\nu-2s)-2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)\right)(-c(\nu-2s))^{-n-1}+e^{\frac{(d-f(\nu-2s))^2}{4c(\nu-2s)}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(f(\nu-2s)-d)^{n-j}\,(d-f(\nu-2s)-2c(\nu-2s)z)^{j+1}\left(\frac{(d-f(\nu-2s)-2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d-f(\nu-2s)-2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)\right)(-c(\nu-2s))^{-n-1}+e^{-\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)}}(c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(d-f(\nu-2s))^{n-j}\,(-d+f(\nu-2s)+2c(\nu-2s)z)^{j+1}\left(-\frac{(-d+f(\nu-2s)+2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-d+f(\nu-2s)+2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)+e^{-\frac{(d+f(\nu-2s))^2}{4c(\nu-2s)}}(c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-f(\nu-2s))^{n-j}\,(d+f(\nu-2s)+2c(\nu-2s)z)^{j+1}\left(-\frac{(d+f(\nu-2s)+2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+f(\nu-2s)+2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2611.01

$$\int z^n \cosh(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == (-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2(\nu-2s)^2}{4(f(\nu-2s)-d)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c(\nu-2s))^{-h-j+2n}\right.\right.$$

$$\left.\left(c(\nu-2s)+2(f(\nu-2s)-d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c(\nu-2s)+2(f(\nu-2s)-d)\sqrt{z}\right)^2}{f(\nu-2s)-d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}}$$

$$\left.(f\,(v-2\,s)-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)\right)\Bigg)$$

$$(f\,(v-2\,s)-d)^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d+f\,(v-2\,s))}}\,(d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+\right.$$

$$2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}\;(d+f\,(v-2\,s))\,\Gamma\Bigg($$

$$\left.\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d-f\,(v-2\,s))}}\,(-d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{-d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-d-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{-d-f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.\right.$$

$$-\frac{\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(-d-f\left(v-2s\right)\right)}\Bigg)-c\left(v-2s\right)\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(-d-f\left(v-2s\right)\right)}\Bigg)\Bigg)+e^{-\frac{c^2\left(v-2s\right)^2}{4\left(d-f\left(v-2s\right)\right)}}$$

$$\left(d-f\left(v-2s\right)\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\left(-c\left(v-2s\right)\right)^{-h-j+2n}\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{d-f\left(v-2s\right)}\right)^{\frac{1}{2}\left(-h-j-1\right)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\left(d-f\left(v-2s\right)\right)\sqrt{-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{d-f\left(v-2s\right)}}\ \Gamma\Bigg(\frac{1}{2}\left(h+j+2\right),$$

$$-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(d-f\left(v-2s\right)\right)}\Bigg)-c\left(v-2s\right)\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(d-f\left(v-2s\right)\right)}\Bigg)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2612.01

$$\int z^n \cosh(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-e}\,\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,e^{e}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-e}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(d+f\,(\nu-2\,s))^{n-j}\,(-d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{(d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+e}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(\nu-2\,s)-d)^{n-j}\,(d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{(f\,(\nu-2\,s)-d)^2}{4\,c\,(\nu-2\,s)}-e}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(d-f\,(\nu-2\,s))^{n-j}\,(-d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(-d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+e^{e-\frac{(d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(\nu-2\,s))^{n-j}\,(d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2613.01

$$\int z^n \cosh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == (-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-e}\,\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,e^{e}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(f\,(\nu-2\,s)-d)}-e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left.\left.\left(c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(\nu-2\,s)-d}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}}$$

$$\left.(f\,(v-2\,s)-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)\right)\Bigg)$$

$$(f\,(v-2\,s)-d)^{-2\,(n+1)}+e^{e-\frac{c^2\,(v-2\,s)^2}{4\,(d+f\,(v-2\,s))}}\,(d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+\right.$$

$$2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}\,(d+f\,(v-2\,s))\,\Gamma\Bigg($$

$$\left.\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d-f\,(v-2\,s))}-e}\,(-d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-d-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-d-f\,(v-2\,s)}}\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.\right.$$

$$-\frac{\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(-d-f\left(v-2s\right)\right)}\Bigg)-c\left(v-2s\right)\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(-d-f\left(v-2s\right)\right)}\Bigg)\Bigg)+e^{e-\frac{c^2\left(v-2s\right)^2}{4\left(d-f\left(v-2s\right)\right)}}$$

$$\left(d-f\left(v-2s\right)\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\left(-c\left(v-2s\right)\right)^{-h-j+2n}\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{d-f\left(v-2s\right)}\right)^{\frac{1}{2}\left(-h-j-1\right)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\left(d-f\left(v-2s\right)\right)\sqrt{-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{d-f\left(v-2s\right)}}\ \Gamma\Bigg(\frac{1}{2}\left(h+j+2\right),$$

$$-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(d-f\left(v-2s\right)\right)}\Bigg)-c\left(v-2s\right)\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(d-f\left(v-2s\right)\right)}\Bigg)\Bigg)\Bigg)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh\left(b\,z^r\right)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2614.01

$$\int z^n \cosh\left(b\,z^2\right) \cosh^{\nu}\left(c\,z^2+f\,z\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2},-b\,z^2\right)\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(e^{\frac{f^2(\nu-2s)^2}{4(b+2cs-c\nu)}}\left(\sum_{j=0}^{n}2^{j-n}\left(-f(\nu-2s)\right)^{n-j}\left(f(\nu-2s)+2(c(\nu-2s)-b)z\right)^{j+1}\left(-\frac{\left(f(\nu-2s)+2(c(\nu-2s)-b)z\right)^2}{c(\nu-2s)-b}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(f(\nu-2s)+2(c(\nu-2s)-b)z\right)^2}{4(c(\nu-2s)-b)}\right)\right)(c(\nu-2s)-b)^{-n-1}+e^{\frac{f^2(\nu-2s)^2}{4(-b+2cs-c\nu)}}(b+c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(-f(\nu-2s)\right)^{n-j}\left(f(\nu-2s)+2(b+c(\nu-2s))z\right)^{j+1}\left(-\frac{\left(f(\nu-2s)+2(b+c(\nu-2s))z\right)^2}{b+c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(f(\nu-2s)+2(b+c(\nu-2s))z\right)^2}{4(b+c(\nu-2s))}\right)+e^{-\frac{f^2(\nu-2s)^2}{4(-b+2cs-c\nu)}}(-b-c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(\nu-2s)\right)^{n-j}\left(2(-b-c(\nu-2s))z-f(\nu-2s)\right)^{j+1}\left(-\frac{\left(2(-b-c(\nu-2s))z-f(\nu-2s)\right)^2}{-b-c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2(-b-c(\nu-2s))z-f(\nu-2s)\right)^2}{4(-b-c(\nu-2s))}\right)+e^{-\frac{f^2(\nu-2s)^2}{4(b+2cs-c\nu)}}(b-c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(\nu-2s)\right)^{n-j}\left(2(b-c(\nu-2s))z-f(\nu-2s)\right)^{j+1}\left(-\frac{\left(2(b-c(\nu-2s))z-f(\nu-2s)\right)^2}{b-c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2(b-c(\nu-2s))z-f(\nu-2s)\right)^2}{4(b-c(\nu-2s))}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2615.01

$$\int z^n \cosh\left(b\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz == 2^{-2n-\nu-2}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(f(\nu-2s)\right)^{-2(n+1)}\left(e^{\frac{(-b-c(\nu-2s))^2}{4f(\nu-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\left(-b-c(\nu-2s)\right)^{-h-j+2n}\left(-b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2}{f(\nu-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-b-c(\nu-2s)\right)\left(-b-c(\nu-2s)-\right.$$

$$2 f (v-2 s) \sqrt{z}\Big) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(-b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) - 2 f (v-2 s)$$

$$\sqrt{\frac{\left(-b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}} \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\Bigg) +$$

$$e^{\frac{(b-c (v-2 s))^2}{4 f (v-2 s)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (b-c (v-2 s))^{-h-j+2 n} \left(b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \Bigg((b-c (v-2 s)) \left(b-c (v-2 s)-\right.$$

$$2 f (v-2 s) \sqrt{z}\Big) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) - 2 f (v-2 s)$$

$$\sqrt{\frac{\left(b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}} \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(b-c (v-2 s)-2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\Bigg) +$$

$$e^{-\frac{(c (v-2 s)-b)^2}{4 f (v-2 s)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (c (v-2 s)-b)^{-h-j+2 n} \left(-b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\Bigg((c (v-2 s)-b) \left(-b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left. -\frac{\left(-b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) + 2 f (v-2 s) \sqrt{-\frac{\left(-b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(-b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right) +$$

$$e^{-\frac{(b+c(v-2s))^2}{4f(v-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b+c(v-2s))^{-h-j+2n}\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b+c(v-2s))\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+2f(v-2s)\sqrt{-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\;\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+2),\,-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)\Bigg)-$$

$$2^{-v}\,b^{-2(n+1)}\binom{v}{\frac{v}{2}}\left(\Gamma\left(2(n+1),\,-b\sqrt{z}\right)+\Gamma\left(2(n+1),\,b\sqrt{z}\right)\right)(1-v\bmod 2)\;/;\;n\in$$

$$\mathbb{N}\bigwedge$$

$$v\in$$

$$\mathbb{N}^+$$

Involving $z^n\cosh\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2616.01

$$\int z^n \cosh\left(b z^2+e\right) \cosh^v\left(c z^2+f z\right) dz ==$$

$$-2^{-v-2}\binom{v}{\frac{v}{2}}\left(e^e\,\Gamma\left(\frac{n+1}{2},-b z^2\right)\left(-b z^2\right)^{\frac{1}{2}(-n-1)}+e^{-e}\left(b z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b z^2\right)\right)(1-v \bmod 2)\, z^{n+1}-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{i b+2 i c s-i c v}+4 i e\right)}\left(\sum_{j=0}^{n}2^{j-n}\left(-f(v-2s)\right)^{n-j}\left(f(v-2s)+2(c(v-2s)-b)z\right)^{j+1}\right.\right.$$

$$\left.\left(-\frac{\left(f(v-2s)+2(c(v-2s)-b)z\right)^2}{c(v-2s)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(f(v-2s)+2(c(v-2s)-b)z\right)^2}{4(c(v-2s)-b)}\right)\right)$$

$$(c(v-2s)-b)^{-n-1}+e^{-\frac{1}{4}i\left(4 i e-\frac{f^2(v-2s)^2}{-i b+2 i c s-i c v}\right)}(b+c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(-f(v-2s)\right)^{n-j}\left(f(v-2s)+2(b+c(v-2s))z\right)^{j+1}\left(-\frac{\left(f(v-2s)+2(b+c(v-2s))z\right)^2}{b+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(f(v-2s)+2(b+c(v-2s))z\right)^2}{4(b+c(v-2s))}\right)+e^{\frac{1}{4}i\left(4 i e-\frac{f^2(v-2s)^2}{-i b+2 i c s-i c v}\right)}(-b-c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(v-2s)\right)^{n-j}\left(2(-b-c(v-2s))z-f(v-2s)\right)^{j+1}\left(-\frac{\left(2(-b-c(v-2s))z-f(v-2s)\right)^2}{-b-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2(-b-c(v-2s))z-f(v-2s)\right)^2}{4(-b-c(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{i b+2 i c s-i c v}+4 i e\right)}(b-c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(v-2s)\right)^{n-j}\left(2(b-c(v-2s))z-f(v-2s)\right)^{j+1}\left(-\frac{\left(2(b-c(v-2s))z-f(v-2s)\right)^2}{b-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2(b-c(v-2s))z-f(v-2s)\right)^2}{4(b-c(v-2s))}\right)\right) /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.2617.01

$$\int z^n \cosh\left(\sqrt{z}\ b+e\right) \cosh^v\left(\sqrt{z}\ c+f z\right) dz ==$$

$$2^{-2n-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(f(v-2s)\right)^{-2(n+1)}\left(e^{\frac{(-b-c(v-2s))^2}{4f(v-2s)}-e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j\left(-b-c(v-2s)\right)^{-h-j+2n}\right.$$

$$\left.\left(-b-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-b-c\,(v-2\,s))\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\left.\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+2),\;\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{\frac{(b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}e\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-c\,(v-2\,s))^{-h-j+2\,n}\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b-c\,(v-2\,s))\left(b-c\,(v-2\,s)-\right.\right.$$

$$\left.\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\right.$$

$$\left.\sqrt{\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(c\,(v-2\,s)-b)^2}{4\,f\,(v-2\,s)}}e\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-b)^{-h-j+2\,n}\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-b)\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+2\,f\,(v-2\,s)\sqrt{-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+$$

$$e^{e-\frac{(b+c(v-2s))^2}{4f(v-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b+c(v-2s))^{-h-j+2n}\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b+c(v-2s))\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+2f(v-2s)\sqrt{-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+2),-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)\Bigg)-$$

$$2^{-v}b^{-2(n+1)}\binom{v}{\frac{v}{2}}\left(e^{e}\Gamma\left(2(n+1),-b\sqrt{z}\right)+e^{-e}\Gamma\left(2(n+1),b\sqrt{z}\right)\right)$$

$$(1-v \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \cosh\left(b z^r + d z\right) \cosh^v\left(c z^r + f z\right)$

01.20.21.2618.01

$$\int z^n \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}}\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(-d-2\,b\,z)^{j+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+\right.$$

$$b^{-n-1}\,e^{-\frac{d^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,b\,z)^{j+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(f\,(2\,s-\nu)-d)^2}{4\,(c\,(2\,s-\nu)-b)}}\left(\sum_{j=0}^{n}2^{j-n}\,(d-f\,(2\,s-\nu))^{n-j}\,(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^{j+1}\right.\right.$$

$$\left(-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{c\,(2\,s-\nu)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{4\,(c\,(2\,s-\nu)-b)}\right)\right)(c\,(2\,s-\nu)-b)^{-n-1}+$$

$$e^{-\frac{(d+f\,(2\,s-\nu))^2}{4\,(b+c\,(2\,s-\nu))}}\,(b+c\,(2\,s-\nu))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(2\,s-\nu))^{n-j}\,(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^{j+1}$$

$$\left(-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{b+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{4\,(b+c\,(2\,s-\nu))}\right)+$$

$$e^{-\frac{(f\,(\nu-2\,s)-d)^2}{4\,(c\,(\nu-2\,s)-b)}}\,(c\,(\nu-2\,s)-b)^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d-f\,(\nu-2\,s))^{n-j}\,(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^{j+1}$$

$$\left(-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{c\,(\nu-2\,s)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{4\,(c\,(\nu-2\,s)-b)}\right)+e^{-\frac{(d+f\,(\nu-2\,s))^2}{4\,(b+c\,(\nu-2\,s))}}\,(b+c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(\nu-2\,s))^{n-j}$$

$$(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^{j+1}\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{b+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{4\,(b+c\,(\nu-2\,s))}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2619.01

$$\int z^n \cosh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}\left(\sqrt{z}\ c + f\,z\right) dz == 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left(e^{\frac{b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-b)^{-h-j+2\,n} \left(-b - 2\,d\,\sqrt{z}\right)^{h+j} \left(\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-b \left(-b - 2\,d\,\sqrt{z}\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) - 2\,d \sqrt{\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) +$$

$$e^{-\frac{b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, b^{-h-j+2\,n} \left(b + 2\,d\,\sqrt{z}\right)^{h+j} \left(-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b \left(b + 2\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) \right) d^{-2\,n-2} +$$

$$2^{-2\,n-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-\frac{(c\,(2\,k-\nu)-b)^2}{4\,(f\,(2\,k-\nu)-d)}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(2\,k-\nu)-b)^{-h-j+2\,n} \left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu)-d)\,\sqrt{z}\right)^{h+j} \right.\right.$$

$$\left(-\frac{\left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu)-d)\,\sqrt{z}\right)^2}{f\,(2\,k-\nu)-d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left((c\,(2\,k-\nu)-b) \left(-b + c\,(2\,k-\nu) + \right.\right.$$

$$\left. 2\,(f\,(2\,k-\nu)-d)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu)-d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,k-\nu)-d)} \right) + 2$$

$$\left. \left. \sqrt{-\frac{\left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu)-d)\,\sqrt{z}\right)^2}{f\,(2\,k-\nu)-d}}\ (f\,(2\,k-\nu)-d) \right) \right)$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c(2k-v)+2(f(2k-v)-d)\sqrt{z}\right)^2}{4(f(2k-v)-d)}\right)\Bigg)\Bigg)$$

$$(f(2k-v)-d)^{-2n-2}+e^{-\frac{(b+c(2k-v))^2}{4(d+f(2k-v))}}(d+f(2k-v))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b+c(2k-v))^{-h-j+2n}$$

$$\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((b+c(2k-v))\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(h+j+1),$$

$$-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\Bigg)+2\sqrt{-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}}$$

$$(d+f(2k-v))\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\right)\Bigg)+e^{-\frac{(c(v-2k)-b)^2}{4(f(v-2k)-d)}}$$

$$(f(v-2k)-d)^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k)-b)^{-h-j+2n}\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{f(v-2k)-d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((c(v-2k)-b)\left(-b+c(v-2k)+\right.$$

$$\left.2(f(v-2k)-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{4(f(v-2k)-d)}\right)+$$

$$2\sqrt{-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{f(v-2k)-d}}\,(f(v-2k)-d)\Gamma\Bigg(\frac{1}{2}(h+j+2),$$

$$-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{4(f(v-2k)-d)}\Bigg)\Bigg)+e^{-\frac{(b+c(v-2k))^2}{4(d+f(v-2k))}}(d+f(v-2k))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b+c\,(v-2\,k))^{-h-j+2\,n}\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b+c\,(v-2\,k))\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,k)}}$$

$$\left.\left.(d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,k))}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \cosh\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2620.01

$$\int z^n \cosh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}-e}\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(-d-2\,b\,z)^{j+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)\right.$$

$$(-b)^{-n-1}+b^{-n-1}\,e^{e-\frac{d^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,b\,z)^{j+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(f\,(2\,s-\nu)-d)^2}{4\,(c\,(2\,s-\nu)-b)}-e}\left(\sum_{j=0}^{n}2^{j-n}\,(d-f\,(2\,s-\nu))^{n-j}\,(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^{j+1}\right.\right.$$

$$\left(-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{c\,(2\,s-\nu)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{4\,(c\,(2\,s-\nu)-b)}\right)\right)(c\,(2\,s-\nu)-b)^{-n-1}+$$

$$e^{e-\frac{(d+f\,(2\,s-\nu))^2}{4\,(b+c\,(2\,s-\nu))}}\,(b+c\,(2\,s-\nu))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(2\,s-\nu))^{n-j}\,(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^{j+1}$$

$$\left(-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{b+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{4\,(b+c\,(2\,s-\nu))}\right)+$$

$$e^{-\frac{(f\,(\nu-2\,s)-d)^2}{4\,(c\,(\nu-2\,s)-b)}-e}\,(c\,(\nu-2\,s)-b)^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d-f\,(\nu-2\,s))^{n-j}\,(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^{j+1}$$

$$\left(-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{c\,(\nu-2\,s)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{4\,(c\,(\nu-2\,s)-b)}\right)+e^{e-\frac{(d+f\,(\nu-2\,s))^2}{4\,(b+c\,(\nu-2\,s))}}\,(b+c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(\nu-2\,s))^{n-j}$$

$$(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^{j+1}\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{b+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{4\,(b+c\,(\nu-2\,s))}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2621.01

$$\int z^n \cosh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz =$$

$$2^{-2n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{b^2}{4d}-e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2n}\left(-b-2d\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-b-2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-b\left(-b-2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-b-2d\sqrt{z}\right)^2}{4d}\right)-\right.$$

$$\left.2d\sqrt{\frac{\left(-b-2d\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b-2d\sqrt{z}\right)^2}{4d}\right)\right)+e^{e-\frac{b^2}{4d}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2n}\left(b+2d\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)d^{-2n-2}+$$

$$2^{-2n-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{(c(2k-\nu)-b)^2}{4(f(2k-\nu)-d)}-e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c(2k-\nu)-b)^{-h-j+2n}\left(-b+c(2k-\nu)+2(f(2k-\nu)-d)\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-b+c(2k-\nu)+2(f(2k-\nu)-d)\sqrt{z}\right)^2}{f(2k-\nu)-d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((c(2k-\nu)-b)\left(-b+c(2k-\nu)+\right.\right.$$

$$\left.2(f(2k-\nu)-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-b+c(2k-\nu)+2(f(2k-\nu)-d)\sqrt{z}\right)^2}{4(f(2k-\nu)-d)}\right)+2$$

$$\left.\left.\sqrt{-\frac{\left(-b+c(2k-\nu)+2(f(2k-\nu)-d)\sqrt{z}\right)^2}{f(2k-\nu)-d}}\ (f(2k-\nu)-d)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c(2k-v)+2(f(2k-v)-d)\sqrt{z}\right)^2}{4(f(2k-v)-d)}\right)\Bigg)\Bigg)$$

$$(f(2k-v)-d)^{-2n-2}+e^{e-\frac{(b+c(2k-v))^2}{4(d+f(2k-v))}}(d+f(2k-v))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b+c(2k-v))^{-h-j+2n}$$

$$\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((b+c(2k-v))\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(h+j+1),$$

$$-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\Bigg)+2\sqrt{-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}}$$

$$(d+f(2k-v))\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\right)\Bigg)+e^{-\frac{(c(v-2k)-b)^2}{4(f(v-2k)-d)}-e}$$

$$(f(v-2k)-d)^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k)-b)^{-h-j+2n}\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{f(v-2k)-d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((c(v-2k)-b)\left(-b+c(v-2k)+\right.$$

$$\left.2(f(v-2k)-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{4(f(v-2k)-d)}\right)+$$

$$2\sqrt{-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{f(v-2k)-d}}(f(v-2k)-d)\Gamma\Bigg(\frac{1}{2}(h+j+2),$$

$$-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{4(f(v-2k)-d)}\Bigg)\Bigg)+e^{e-\frac{(b+c(v-2k))^2}{4(d+f(v-2k))}}(d+f(v-2k))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b+c\,(v-2\,k))^{-h-j+2\,n}\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b+c\,(v-2\,k))\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,k)}}$$

$$\left.\left.(d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c\,(v-2\,k)+2\,(d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,k))}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^{n}\cosh(d\,z)\cosh^{v}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.2622.01

$$\int z^n \cosh(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-d-f(\nu-2s))^2}{4c(\nu-2s)}-g(\nu-2s)}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(d+f(\nu-2s))^{n-j}\,(-d-f(\nu-2s)-2c(\nu-2s)z)^{j+1}\left(\frac{(-d-f(\nu-2s)-2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d-f(\nu-2s)-2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)\right)(-c(\nu-2s))^{-n-1}+e^{\frac{(d-f(\nu-2s))^2}{4c(\nu-2s)}-g(\nu-2s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(f(\nu-2s)-d)^{n-j}\,(d-f(\nu-2s)-2c(\nu-2s)z)^{j+1}\left(\frac{(d-f(\nu-2s)-2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d-f(\nu-2s)-2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)\right)(-c(\nu-2s))^{-n-1}+e^{g(\nu-2s)-\frac{(f(\nu-2s)-d)^2}{4c(\nu-2s)}}(c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(d-f(\nu-2s))^{n-j}\,(-d+f(\nu-2s)+2c(\nu-2s)z)^{j+1}\left(-\frac{(-d+f(\nu-2s)+2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-d+f(\nu-2s)+2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)+e^{g(\nu-2s)-\frac{(d+f(\nu-2s))^2}{4c(\nu-2s)}}(c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-f(\nu-2s))^{n-j}\,(d+f(\nu-2s)+2c(\nu-2s)z)^{j+1}\left(-\frac{(d+f(\nu-2s)+2c(\nu-2s)z)^2}{c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+f(\nu-2s)+2c(\nu-2s)z)^2}{4c(\nu-2s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2623.01

$$\int z^n \cosh(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz == (-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{g(\nu-2s)-\frac{c^2(\nu-2s)^2}{4(f(\nu-2s)-d)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c(\nu-2s))^{-h-j+2n}\right.\right.$$

$$\left.\left.\left(c(\nu-2s)+2(f(\nu-2s)-d)\sqrt{z}\right)^{h+j}\left(-\frac{\left(c(\nu-2s)+2(f(\nu-2s)-d)\sqrt{z}\right)^2}{f(\nu-2s)-d}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}}$$

$$\left.(f\,(v-2\,s)-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)\right)\Bigg)$$

$$(f\,(v-2\,s)-d)^{-2\,(n+1)}+e^{g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,(d+f\,(v-2\,s))}}\,(d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+\right.$$

$$2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}\;(d+f\,(v-2\,s))\,\Gamma\Bigg($$

$$\left.\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d-f\,(v-2\,s))}-g\,(v-2\,s)}\,(-d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{-d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-d-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{-d-f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.\right.$$

$$-\frac{\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(-d-f\left(v-2s\right)\right)}\Bigg)-c\left(v-2s\right)\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(-d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(-d-f\left(v-2s\right)\right)}\Bigg)\Bigg)+$$

$$e^{-\frac{c^2\left(v-2s\right)^2}{4\left(d-f\left(v-2s\right)\right)}-g\left(v-2s\right)}\left(d-f\left(v-2s\right)\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\left(-c\left(v-2s\right)\right)^{-h-j+2n}$$

$$\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^{h+j}\Bigg(-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{d-f\left(v-2s\right)}\Bigg)^{\frac{1}{2}\left(-h-j-1\right)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\left(d-f\left(v-2s\right)\right)\sqrt{-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{d-f\left(v-2s\right)}}\ \Gamma\Bigg(\frac{1}{2}\left(h+j+2\right),$$

$$-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(d-f\left(v-2s\right)\right)}\Bigg)-c\left(v-2s\right)\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(d-f\left(v-2s\right)\right)\sqrt{z}\ -c\left(v-2s\right)\right)^2}{4\left(d-f\left(v-2s\right)\right)}\Bigg)\Bigg)\Bigg)\Bigg)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.2624.01

$$\int z^n \cosh(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-e}\,\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,e^{e}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-e-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(d+f\,(\nu-2\,s))^{n-j}\,(-d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left.\left(\frac{(-d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\right.$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{(d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+e-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(\nu-2\,s)-d)^{n-j}\,(d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{(f\,(\nu-2\,s)-d)^2}{4\,c\,(\nu-2\,s)}-e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d-f\,(\nu-2\,s))^{n-j}$$

$$(-d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(-d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-\frac{(-d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+e^{-\frac{(d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(\nu-2\,s))^{n-j}\,(d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2625.01

$$\int z^n \cosh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-e}\,\Gamma(n+1,\,d\,z)\,(-d)^{-n-1}+d^{-n-1}\,e^{e}\,\Gamma(n+1,\,-d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(f\,(\nu-2\,s)-d)}+g\,(\nu-2\,s)-e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}}$$

$$\left.(f\,(v-2\,s)-d)\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)\right)\Bigg)$$

$$(f\,(v-2\,s)-d)^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d+f\,(v-2\,s))}+g\,(v-2\,s)+e}\,(d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+\right.$$

$$2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}\;(d+f\,(v-2\,s))\,\Gamma\Bigg($$

$$\left.\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d-f\,(v-2\,s))}-g\,(v-2\,s)-e}\,(-d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-d-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{-d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-d-f(v-2s))\sqrt{-\frac{\left(2(-d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{-d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-d-f(v-2s))}\right)-c(v-2s)\left(2(-d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(-d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-d-f(v-2s))}\right)\right)+$$

$$e^{-\frac{c^2(v-2s)^2}{4(d-f(v-2s))}-g(v-2s)+e}(d-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2s))^{-h-j+2n}$$

$$\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}\left(-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{d-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(d-f(v-2s))\sqrt{-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(d-f(v-2s))}\right)-c(v-2s)\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(d-f(v-2s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.2626.01

$$\int z^n \cosh\left(b z^2\right) \cosh^v\left(c z^2 + f z + g\right) dz ==$$

$$-2^{-v-2} \binom{v}{\frac{v}{2}} \left(\Gamma\left(\frac{n+1}{2}, -b z^2\right) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} + \left(b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b z^2\right)\right) (1 - v \bmod 2)\, z^{n+1} -$$

$$2^{-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{1}{4} i \left(\frac{f^2 (v-2s)^2}{i b + 2 i c s - i c v} - 4 i g (v-2s) \right)} \left(\sum_{j=0}^{n} 2^{j-n} \left(-f (v-2s)\right)^{n-j} \left(f (v-2s) + 2 \left(c (v-2s) - b\right) z\right)^{j+1} \right.\right.$$

$$\left(-\frac{\left(f (v-2s) + 2 \left(c (v-2s) - b\right) z\right)^2}{c (v-2s) - b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(f (v-2s) + 2 \left(c (v-2s) - b\right) z\right)^2}{4 \left(c (v-2s) - b\right)} \right) \Bigg)$$

$$\left(c (v-2s) - b\right)^{-n-1} + e^{-\frac{1}{4} i \left(4 i g (v-2s) - \frac{f^2 (v-2s)^2}{-i b + 2 i c s - i c v} \right)} \left(b + c (v-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} \left(-f (v-2s)\right)^{n-j} \left(f (v-2s) + 2 \left(b + c (v-2s)\right) z\right)^{j+1} \left(-\frac{\left(f (v-2s) + 2 \left(b + c (v-2s)\right) z\right)^2}{b + c (v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(f (v-2s) + 2 \left(b + c (v-2s)\right) z\right)^2}{4 \left(b + c (v-2s)\right)} \right) + e^{\frac{1}{4} i \left(4 i g (v-2s) - \frac{f^2 (v-2s)^2}{-i b + 2 i c s - i c v} \right)} \left(-b - c (v-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} \left(f (v-2s)\right)^{n-j} \left(2 \left(-b - c (v-2s)\right) z - f (v-2s)\right)^{j+1} \left(-\frac{\left(2 \left(-b - c (v-2s)\right) z - f (v-2s)\right)^2}{-b - c (v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(2 \left(-b - c (v-2s)\right) z - f (v-2s)\right)^2}{4 \left(-b - c (v-2s)\right)} \right) + e^{-\frac{1}{4} i \left(\frac{f^2 (v-2s)^2}{i b + 2 i c s - i c v} - 4 i g (v-2s) \right)} \left(b - c (v-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} \left(f (v-2s)\right)^{n-j} \left(2 \left(b - c (v-2s)\right) z - f (v-2s)\right)^{j+1} \left(-\frac{\left(2 \left(b - c (v-2s)\right) z - f (v-2s)\right)^2}{b - c (v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(2 \left(b - c (v-2s)\right) z - f (v-2s)\right)^2}{4 \left(b - c (v-2s)\right)} \right) \right) \Bigg) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.2627.01

$$\int z^n \cosh\left(b \sqrt{z}\right) \cosh^v\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$2^{-2n-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(f (v-2s)\right)^{-2(n+1)} \left(e^{\frac{\left(-b - c (v-2s)\right)^2}{4 f (v-2s)} - g (v-2s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j \left(-b - c (v-2s)\right)^{-h-j+2n} \right.$$

$$\left. \left(-b - c (v-2s) - 2 f (v-2s) \sqrt{z}\right)^{h+j} \left(\frac{\left(-b - c (v-2s) - 2 f (v-2s) \sqrt{z}\right)^2}{f (v-2s)} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left((-b-c\,(v-2\,s))\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\left.\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+2),\;\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{\frac{(b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-c\,(v-2\,s))^{-h-j+2\,n}\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b-c\,(v-2\,s))\left(b-c\,(v-2\,s)-\right.\right.$$

$$\left.\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\right.$$

$$\left.\sqrt{\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{g\,(v-2\,s)-\frac{(c\,(v-2\,s)-b)^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-b)^{-h-j+2\,n}\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-b)\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+2\,f\,(v-2\,s)\sqrt{-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+$$

$$e^{g(v-2s)-\frac{(b+c(v-2s))^2}{4f(v-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b+c(v-2s))^{-h-j+2n}\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b+c(v-2s))\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+2f(v-2s)\sqrt{-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+2),-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)\Bigg)-$$

$$2^{-v}b^{-2(n+1)}\binom{v}{\frac{v}{2}}\left(\Gamma\left(2(n+1),-b\sqrt{z}\right)+\Gamma\left(2(n+1),b\sqrt{z}\right)\right)(1-v\bmod 2)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(b z^r + e) \cosh^v(c z^r + f z + g)$

01.20.21.2628.01

$$\int z^n \cosh\left(b z^2+e\right) \cosh^v\left(c z^2+f z+g\right) dz ==$$

$$-2^{-v-2}\binom{v}{\frac{v}{2}}\left(e^e\,\Gamma\left(\frac{n+1}{2},-b z^2\right)\left(-b z^2\right)^{\frac{1}{2}(-n-1)}+e^{-e}\left(b z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b z^2\right)\right)(1-v \bmod 2)\, z^{n+1}-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{i b+2 i c s-i c v}-4 i g (v-2s)+4 i e\right)}\left(\sum_{j=0}^{n}2^{j-n}\left(-f(v-2s)\right)^{n-j}\left(f(v-2s)+2\left(c(v-2s)-b\right)z\right)^{j+1}\right.\right.$$

$$\left.\left(-\frac{\left(f(v-2s)+2\left(c(v-2s)-b\right)z\right)^2}{c(v-2s)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(f(v-2s)+2\left(c(v-2s)-b\right)z\right)^2}{4\left(c(v-2s)-b\right)}\right)\right)$$

$$(c(v-2s)-b)^{-n-1}+e^{-\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{-i b+2 i c s-i c v}+4 g i (v-2s)+4 i e\right)}(b+c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(-f(v-2s)\right)^{n-j}\left(f(v-2s)+2(b+c(v-2s))z\right)^{j+1}\left(-\frac{\left(f(v-2s)+2(b+c(v-2s))z\right)^2}{b+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{\left(f(v-2s)+2(b+c(v-2s))z\right)^2}{4(b+c(v-2s))}\right)+e^{\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{-i b+2 i c s-i c v}+4 g i (v-2s)+4 i e\right)}(-b-c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(v-2s)\right)^{n-j}\left(2(-b-c(v-2s))z-f(v-2s)\right)^{j+1}\left(-\frac{\left(2(-b-c(v-2s))z-f(v-2s)\right)^2}{-b-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2(-b-c(v-2s))z-f(v-2s)\right)^2}{4(-b-c(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{i b+2 i c s-i c v}-4 i g (v-2s)+4 i e\right)}(b-c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(v-2s)\right)^{n-j}\left(2(b-c(v-2s))z-f(v-2s)\right)^{j+1}\left(-\frac{\left(2(b-c(v-2s))z-f(v-2s)\right)^2}{b-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2(b-c(v-2s))z-f(v-2s)\right)^2}{4(b-c(v-2s))}\right)\right) /; n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.2629.01

$$\int z^n \cosh\left(\sqrt{z}\ b+e\right) \cosh^v\left(\sqrt{z}\ c+g+f z\right) dz ==$$

$$2^{-2n-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(f(v-2s)\right)^{-2(n+1)}\left(e^{\frac{(-b-c(v-2s))^2}{4f(v-2s)}-e-g(v-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j\left(-b-c(v-2s)\right)^{-h-j+2n}\right.$$

$$\left.\left(-b-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}\left(\frac{\left(-b-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left((-b-c\,(v-2\,s))\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\left.\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+2),\;\frac{\left(-b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{\frac{(b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-c\,(v-2\,s))^{-h-j+2\,n}\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b-c\,(v-2\,s))\left(b-c\,(v-2\,s)-\right.\right.$$

$$\left.\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\right.$$

$$\left.\sqrt{\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(c\,(v-2\,s)-b)^2}{4\,f\,(v-2\,s)}-e+g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-b)^{-h-j+2\,n}\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-b)\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+2\,f\,(v-2\,s)\sqrt{-\frac{\left(-b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+$$

$$e^{-\frac{(b+c(v-2s))^2}{4f(v-2s)}+e+g(v-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b+c(v-2s))^{-h-j+2n}\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b+c(v-2s))\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+2f(v-2s)\sqrt{-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+2),-\frac{\left(b+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)\Bigg)-$$

$$2^{-v}b^{-2(n+1)}\binom{v}{\frac{v}{2}}\left(e^e\,\Gamma\left(2(n+1),-b\sqrt{z}\right)+e^{-e}\,\Gamma\left(2(n+1),b\sqrt{z}\right)\right)$$

$$(1-v \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cosh\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.2630.01

$$\int z^n \cosh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}}\left(\sum_{j=0}^{n}2^{j-n}\,d^{n-j}\,(-d-2\,b\,z)^{j+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}+\right.$$

$$b^{-n-1}\,e^{-\frac{d^2}{4b}}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,b\,z)^{j+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{g\,(2\,s-\nu)-\frac{(f\,(2\,s-\nu)-d)^2}{4\,(c\,(2\,s-\nu)-b)}}\left(\sum_{j=0}^{n}2^{j-n}\,(d-f\,(2\,s-\nu))^{n-j}\,(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^{j+1}\right.\right.$$

$$\left(-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{c\,(2\,s-\nu)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{4\,(c\,(2\,s-\nu)-b)}\right)\right)(c\,(2\,s-\nu)-b)^{-n-1}+$$

$$e^{g\,(2\,s-\nu)-\frac{(d+f\,(2\,s-\nu))^2}{4\,(b+c\,(2\,s-\nu))}}\,(b+c\,(2\,s-\nu))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(2\,s-\nu))^{n-j}\,(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^{j+1}$$

$$\left(-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{b+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{4\,(b+c\,(2\,s-\nu))}\right)+$$

$$e^{g\,(\nu-2\,s)-\frac{(f\,(\nu-2\,s)-d)^2}{4\,(c\,(\nu-2\,s)-b)}}\,(c\,(\nu-2\,s)-b)^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d-f\,(\nu-2\,s))^{n-j}\,(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^{j+1}$$

$$\left(-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{c\,(\nu-2\,s)-b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{4\,(c\,(\nu-2\,s)-b)}\right)+$$

$$e^{g\,(\nu-2\,s)-\frac{(d+f\,(\nu-2\,s))^2}{4\,(b+c\,(\nu-2\,s))}}\,(b+c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(\nu-2\,s))^{n-j}\,(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{b+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{4\,(b+c\,(\nu-2\,s))}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2631.01

$$\int z^n \cosh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}\left(\sqrt{z}\ c + g + f\,z\right) dz == 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left(e^{\frac{b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-b)^{-h-j+2\,n} \left(-b - 2\,d\,\sqrt{z}\right)^{h+j} \left(\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-b \left(-b - 2\,d\,\sqrt{z}\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) - 2\,d \sqrt{\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) +$$

$$e^{-\frac{b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, b^{-h-j+2\,n} \left(b + 2\,d\,\sqrt{z}\right)^{h+j} \left(-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b \left(b + 2\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) \right) d^{-2\,n-2} +$$

$$2^{-2\,n-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{g\,(2\,k-\nu) - \frac{(c\,(2\,k-\nu)-b)^2}{4\,(f\,(2\,k-\nu)-d)}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(2\,k-\nu) - b)^{-h-j+2\,n} \left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu) - d)\,\sqrt{z}\right)^{h+j} \right.\right.$$

$$\left(-\frac{\left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu) - d)\,\sqrt{z}\right)^2}{f\,(2\,k-\nu) - d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left((c\,(2\,k-\nu) - b) \left(-b + c\,(2\,k-\nu) + \right.\right.$$

$$\left. 2\,(f\,(2\,k-\nu) - d)\,\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu) - d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,k-\nu) - d)} \right) + 2$$

$$\left. \left. \sqrt{-\frac{\left(-b + c\,(2\,k-\nu) + 2\,(f\,(2\,k-\nu) - d)\,\sqrt{z}\right)^2}{f\,(2\,k-\nu) - d}}\ (f\,(2\,k-\nu) - d) \right) \right)$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b+c(2k-v)+2(f(2k-v)-d)\sqrt{z}\right)^2}{4(f(2k-v)-d)}\right)\Bigg)(f(2k-v)-d)^{-2n-2}+$$

$$e^{g(2k-v)-\frac{(b+c(2k-v))^2}{4(d+f(2k-v))}}(d+f(2k-v))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b+c(2k-v))^{-h-j+2n}$$

$$\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((b+c(2k-v))\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\right)+2\sqrt{-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{d+f(2k-v)}}$$

$$(d+f(2k-v))\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c(2k-v)+2(d+f(2k-v))\sqrt{z}\right)^2}{4(d+f(2k-v))}\right)\Bigg)+e^{g(v-2k)-\frac{(c(v-2k)-b)^2}{4(f(v-2k)-d)}}$$

$$(f(v-2k)-d)^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k)-b)^{-h-j+2n}\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{f(v-2k)-d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((c(v-2k)-b)\left(-b+c(v-2k)+\right.$$

$$\left.2(f(v-2k)-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{4(f(v-2k)-d)}\right)+$$

$$2\sqrt{-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{f(v-2k)-d}}(f(v-2k)-d)\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(-b+c(v-2k)+2(f(v-2k)-d)\sqrt{z}\right)^2}{4(f(v-2k)-d)}\right)\Bigg)+$$

$$e^{g(v-2k)-\frac{(b+c(v-2k))^2}{4(d+f(v-2k))}}(d+f(v-2k))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b+c(v-2k))^{-h-j+2n}$$

$$\left(b+c(v-2k)+2(d+f(v-2k))\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+c(v-2k)+2(d+f(v-2k))\sqrt{z}\right)^2}{d+f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((b+c(v-2k))\left(b+c(v-2k)+2(d+f(v-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b+c(v-2k)+2(d+f(v-2k))\sqrt{z}\right)^2}{4(d+f(v-2k))}\right)+2\sqrt{-\frac{\left(b+c(v-2k)+2(d+f(v-2k))\sqrt{z}\right)^2}{d+f(v-2k)}}$$

$$\left.(d+f(v-2k))\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+c(v-2k)+2(d+f(v-2k))\sqrt{z}\right)^2}{4(d+f(v-2k))}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh(b z^r + d z + e) \cosh^v(c z^r + f z + g)$

01.20.21.2632.01

$$\int z^n \cosh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{d^2}{4b}-e}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(-d-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,b\,z)^2}{4\,b}\right)\right)\right.$$

$$(-b)^{-n-1}+b^{-n-1}\,e^{e-\frac{d^2}{4b}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(f\,(2\,s-\nu)-d)^2}{4\,(c\,(2\,s-\nu)-b)}-e+g\,(2\,s-\nu)}\left(\sum_{q=0}^{n}2^{q-n}\,(d-f\,(2\,s-\nu))^{n-q}\,(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^{q+1}\right.\right.$$

$$\left(-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{c\,(2\,s-\nu)-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(-d+f\,(2\,s-\nu)+2\,(c\,(2\,s-\nu)-b)\,z)^2}{4\,(c\,(2\,s-\nu)-b)}\right)\right)(c\,(2\,s-\nu)-b)^{-n-1}+$$

$$e^{-\frac{(d+f\,(2\,s-\nu))^2}{4\,(b+c\,(2\,s-\nu))}+e+g\,(2\,s-\nu)}\,(b+c\,(2\,s-\nu))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d-f\,(2\,s-\nu))^{n-q}\,(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{b+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f\,(2\,s-\nu)+2\,(b+c\,(2\,s-\nu))\,z)^2}{4\,(b+c\,(2\,s-\nu))}\right)+$$

$$e^{-\frac{(f\,(\nu-2\,s)-d)^2}{4\,(c\,(\nu-2\,s)-b)}-e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s)-b)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d-f\,(\nu-2\,s))^{n-q}\,(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^{q+1}$$

$$\left(-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{c\,(\nu-2\,s)-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-d+f\,(\nu-2\,s)+2\,(c\,(\nu-2\,s)-b)\,z)^2}{4\,(c\,(\nu-2\,s)-b)}\right)+$$

$$e^{-\frac{(d+f\,(\nu-2\,s))^2}{4\,(b+c\,(\nu-2\,s))}+e+g\,(\nu-2\,s)}\,(b+c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d-f\,(\nu-2\,s))^{n-q}\,(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{b+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z)^2}{4\,(b+c\,(\nu-2\,s))}\right)\right);\, n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.2633.01

$$\int z^n \cosh\left(\sqrt{z}\ b + d\,z + e\right) \cosh^{\nu}\left(\sqrt{z}\ c + f\,z + g\right) dz ==$$

$$2^{-2n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(e^{\frac{b^2}{4d} - e} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b)^{-h-k+2n} \left(-b - 2d\sqrt{z}\right)^{h+k} \right.\right.$$

$$\left(\frac{\left(-b - 2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-b \left(-b - 2d\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(-b - 2d\sqrt{z}\right)^2}{4d} \right) - \right.$$

$$\left.\left.\left. 2d \sqrt{\frac{\left(-b - 2d\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(-b - 2d\sqrt{z}\right)^2}{4d} \right) \right) \right) (-d)^{-2n-2} +$$

$$d^{-2n-2}\, e^{e - \frac{b^2}{4d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b + 2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(b + 2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b + 2d\sqrt{z}\right) \right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b + 2d\sqrt{z}\right)^2}{4d} \right) + 2 \sqrt{-\frac{\left(b + 2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b + 2d\sqrt{z}\right)^2}{4d} \right) \right) \right) +$$

$$2^{-2n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(c(2s-\nu)-b)^2}{4(f(2s-\nu)-d)} - e + g(2s-\nu)} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c(2s-\nu)-b)^{-h-k+2n} \left(-b + c(2s-\nu) + 2(f(2s-\nu)-d)\right.\right.\right.$$

$$\left.\left.\left. \sqrt{z}\right)^{h+k} \left(-\left(-b + c(2s-\nu) + 2(f(2s-\nu)-d)\sqrt{z}\right)^2 \Big/ (f(2s-\nu)-d) \right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\left.\left. \binom{k}{h} \binom{n}{k} \left((c(2s-\nu)-b) \left(-b + c(2s-\nu) + 2(f(2s-\nu)-d)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \right.\right.\right.\right.$$

$$\left.\left.\left.\left. -\left(-b + c(2s-\nu) + 2(f(2s-\nu)-d)\sqrt{z}\right)^2 \Big/ (4(f(2s-\nu)-d)) \right) + 2 \right.\right.\right.$$

$$\left.\left.\left. \sqrt{\left(-\left(-b + c(2s-\nu) + 2(f(2s-\nu)-d)\sqrt{z}\right)^2 \Big/ (f(2s-\nu)-d) \right)} (f(2s-\nu)-d) \right.\right.$$

$$\left.\left.\left. \Gamma\left(\frac{1}{2}(h+k+2), -\left(-b + c(2s-\nu) + 2(f(2s-\nu)-d)\sqrt{z}\right)^2 \Big/ (4(f(2s-\nu)-d)) \right) \right) \right)$$

$$(f(2s-\nu)-d)^{-2n-2} + e^{-\frac{(b+c(2s-\nu))^2}{4(d+f(2s-\nu))} + e + g(2s-\nu)} (d + f(2s-\nu))^{-2n-2}$$

$$\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b + c(2s-\nu))^{-h-k+2n} \left(b + c(2s-\nu) + 2(d + f(2s-\nu))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b + c(2s-\nu) + 2(d + f(2s-\nu))\sqrt{z}\right)^2 \Big/ (d + f(2s-\nu)) \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}$$

$$\binom{n}{k}\left((b+c(2s-v))\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$
$$\left.-\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2\Big/(4(d+f(2s-v)))\right)+$$
$$2\sqrt{\left(-\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2\Big/(d+f(2s-v))\right)}(d+f(2s-v))\Gamma\left(\frac{1}{2}(h+k+2),\right.$$
$$\left.\left.-\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2\Big/(4(d+f(2s-v)))\right)\right)+e^{-\frac{(c(v-2s)-b)^2}{4(f(v-2s)-d)}-e+g(v-2s)}$$
$$(f(v-2s)-d)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(v-2s)-b)^{-h-k+2n}\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^{h+k}$$
$$\left(-\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2\Big/(f(v-2s)-d)\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$
$$\binom{n}{k}\left((c(v-2s)-b)\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$
$$\left.-\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2\Big/(4(f(v-2s)-d))\right)+$$
$$2\sqrt{\left(-\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2\Big/(f(v-2s)-d)\right)}(f(v-2s)-d)\Gamma\left(\frac{1}{2}(h+k+2),\right.$$
$$\left.\left.-\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2\Big/(4(f(v-2s)-d))\right)\right)+e^{-\frac{(b+c(v-2s))^2}{4(d+f(v-2s))}+e+g(v-2s)}$$
$$(d+f(v-2s))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+c(v-2s))^{-h-k+2n}\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^{h+k}$$
$$\left(-\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2\Big/(d+f(v-2s))\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$
$$\binom{n}{k}\left((b+c(v-2s))\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$
$$\left.-\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2\Big/(4(d+f(v-2s)))\right)+$$
$$2\sqrt{\left(-\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2\Big/(d+f(v-2s))\right)}(d+f(v-2s))\Gamma\left(\frac{1}{2}(h+k+2),\right.$$
$$\left.\left.\left.-\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2\Big/(4(d+f(v-2s)))\right)\right)\right/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving product of powers of two direct functions and a power function

Involving $z^{\alpha-1}\cosh^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.2634.01

$$\int z^{\alpha-1}\cosh^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz ==$$

$$2^{-m-\nu}\,z^{\alpha}\left(\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(E_{1-\alpha}(-c\,(m-2\,s)\,z)+E_{1-\alpha}(c\,(m-2\,s)\,z))+\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\frac{(m \bmod 2-1)\,(\nu \bmod 2-1)}{\alpha}+\right.$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}(a\,(2\,s-\nu)\,z)+E_{1-\alpha}(a\,(\nu-2\,s)\,z))-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}((2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z)+$$

$$\left.E_{1-\alpha}((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)+E_{1-\alpha}((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)\right)\Big/;\ m\in\mathbb{N}^{+}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.2635.01

$$\int z^{n}\cosh^{\mu}(c\,z)\cosh^{\nu}(a\,z)\,dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh^{\mu}(c\,z)\,n!\,(1-\nu \bmod 2)\left(\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}\,(-c\,\mu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};-e^{2\,c\,z}\right)\right)$$

$$\left(1+e^{2\,c\,z}\right)^{-\mu}+2^{-\nu}\cosh^{\mu}(c\,z)\,n!\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{a\,(\nu-2\,s)\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}\,(a\,(\nu-2\,s)-c\,\mu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\right.\right.$$

$$\left(\frac{a\,(\nu-2\,s)-c\,\mu}{2\,c},\ldots,\frac{a\,(\nu-2\,s)-c\,\mu}{2\,c},-\mu;\frac{a\,(\nu-2\,s)-c\,\mu}{2\,c}+1,\ldots,\frac{a\,(\nu-2\,s)-c\,\mu}{2\,c}+1;-e^{2\,c\,z}\right)+$$

$$e^{-a\,(\nu-2\,s)\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}\,(-a\,(\nu-2\,s)-c\,\mu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(-\frac{a\,(\nu-2\,s)+c\,\mu}{2\,c},\ldots,-\frac{a\,(\nu-2\,s)+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;1-\frac{a\,(\nu-2\,s)+c\,\mu}{2\,c},\ldots,1-\frac{a\,(\nu-2\,s)+c\,\mu}{2\,c};-e^{2\,c\,z}\right)\right)\right)\left(1+e^{2\,c\,z}\right)^{-\mu}\Big/;\ \nu\in\mathbb{Z}\bigwedge\nu\geq 0\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cosh^{\mu}(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.2636.01

$$\int z^{\alpha-1}\cosh^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-m-\nu}\,z^{\alpha}$$

$$\left(\frac{\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)(\nu \bmod 2-1)}{\alpha}+\binom{\nu}{\frac{\nu}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(E_{1-\alpha}(-c\,(m-2\,s)\,z)+E_{1-\alpha}(c\,(m-2\,s)\,z))\right)(\nu \bmod 2-1)+\right.$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-b\,(2\,s+\nu)}\binom{\nu}{s}\left(e^{2\,b\,\nu}\,E_{1-\alpha}(a\,(2\,s-\nu)\,z)+e^{4\,b\,s}\,E_{1-\alpha}(a\,(\nu-2\,s)\,z)\right)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(e^{4\,b\,s}\,E_{1-\alpha}((2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)+e^{2\,b\,\nu}\,E_{1-\alpha}((-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z)+\right.$$

$$\left.\left.e^{2\,b\,\nu}\,E_{1-\alpha}((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)+e^{4\,b\,s}\,E_{1-\alpha}((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)\right)\right)\Big/;\ m\in\mathbb{N}^{+}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.2637.01

$$\int z^{n}\cosh^{\mu}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu}\left(1+e^{-2\,c\,z}\right)^{-\mu}\binom{\nu}{\frac{\nu}{2}}n!\,(1-\nu \bmod 2)$$

$$\cosh^{\mu}(c\,z)\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};-e^{-2\,c\,z}\right)+$$

$$2^{-\nu}\left(1+e^{-2\,c\,z}\right)^{-\mu}n!\cosh^{\mu}(c\,z)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{2\,b\,k+2\,a\,z\,k-b\,\nu-a\,\nu\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(c\,\mu-a\,(\nu-2\,k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\right.$$

$$\left(-\frac{2\,a\,k-a\,\nu+c\,\mu}{2\,c},\ldots,-\frac{2\,a\,k-a\,\nu+c\,\mu}{2\,c},-\mu;1-\frac{2\,a\,k-a\,\nu+c\,\mu}{2\,c},\ldots,1-\frac{2\,a\,k-a\,\nu+c\,\mu}{2\,c};-e^{-2\,c\,z}\right)+$$

$$e^{b\,(\nu-2\,k)+a\,(\nu-2\,k)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c},\ldots,-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$

$$\left.\left.-\mu;1-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c},\ldots,1-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c};-e^{-2\,c\,z}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

Involving $z^{\alpha-1}\cosh^{\mu}(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.2638.01

$$\int z^{\alpha-1}\cosh^m(d+c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-m-\nu}\,z^\alpha\left(\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\frac{(m \bmod 2-1)(\nu \bmod 2-1)}{\alpha}+\right.$$

$$\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-d(m-2s)}\binom{m}{s}\left(e^{2d(m-2s)}E_{1-\alpha}(-c(m-2s)z)+E_{1-\alpha}(c(m-2s)z)\right)+$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-b(2s+\nu)}\binom{\nu}{s}\left(e^{2b\nu}E_{1-\alpha}(a(2s-\nu)z)+e^{4bs}E_{1-\alpha}(a(\nu-2s)z)\right)-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}e^{-2dk-dm-2bs-b\nu}\left(e^{2dm}\left(e^{4bs}E_{1-\alpha}((2ck-cm-2as+a\nu)z)+e^{2b\nu}E_{1-\alpha}((2ck-cm+2as-a\nu)z)\right)+\right.$$

$$\left.\left.e^{4dk}\left(e^{2b\nu}E_{1-\alpha}((-2ck+cm+2as-a\nu)z)+e^{4bs}E_{1-\alpha}((c(m-2k)+a(\nu-2s))z)\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2639.01

$$\int z^n\cosh^\mu(d+c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-\nu}\left(1+e^{-2(d+cz)}\right)^{-\mu}\binom{\nu}{\frac{\nu}{2}}n!\,(1-\nu \bmod 2)$$

$$\cosh^\mu(d+c\,z)\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};-e^{-2(d+cz)}\right)+2^{-\nu}$$

$$\left(1+e^{-2(d+cz)}\right)^{-\mu}n!\cosh^\mu(d+c\,z)$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{2bk+2azk-b\nu-az\nu}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(c\,\mu-a(\nu-2k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{2ak-a\nu+c\,\mu}{2c},\ldots,-\frac{2ak-a\nu+c\,\mu}{2c},\right.\right.$$

$$\left.-\mu;1-\frac{2ak-a\nu+c\,\mu}{2c},\ldots,1-\frac{2ak-a\nu+c\,\mu}{2c};-e^{-2(d+cz)}\right)+e^{b(\nu-2k)+a(\nu-2k)z}$$

$$\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a(\nu-2k)+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a(\nu-2k)+c\,\mu}{2c},\ldots,-\frac{a(\nu-2k)+c\,\mu}{2c},-\mu;\right.$$

$$\left.\left.1-\frac{a(\nu-2k)+c\,\mu}{2c},\ldots,1-\frac{a(\nu-2k)+c\,\mu}{2c};-e^{-2(d+cz)}\right)\right)/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^n\cosh^m(b\,z)\cosh^\nu(c\,z^r)$

01.20.21.2640.01

$$\int z^n \cosh^m(b\,z)\cosh^v\left(c\,z^2\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{n+1}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{n+1}{2},\,-c\,(2\,s-v)\,z^2\right)\left(-c\,(2\,s-v)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(-c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,s)\,z^2\right)\right)+$$

$$\frac{2^{-m-v}\,z^{n+1}\,(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}-2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,-b\,(2\,k-m)\,z)\,(-b\,(2\,k-m))^{-n-1}+(-b\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-b\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{b^2\,(2\,k-m)^2}{4\,c\,(2\,s-v)}}\,(c\,(2\,s-v))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-b\,(2\,k-m))^{n-q}\,(b\,(2\,k-m)+2\,c\,(2\,s-v)\,z)^{q+1}\right.$$

$$\left(-\frac{(b\,(2\,k-m)+2\,c\,(2\,s-v)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b\,(2\,k-m)+2\,c\,(2\,s-v)\,z)^2}{4\,c\,(2\,s-v)}\right)+$$

$$e^{-\frac{b^2\,(m-2\,k)^2}{4\,c\,(2\,s-v)}}\,(c\,(2\,s-v))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-b\,(m-2\,k))^{n-q}\,(b\,(m-2\,k)+2\,c\,(2\,s-v)\,z)^{q+1}$$

$$\left(-\frac{(b\,(m-2\,k)+2\,c\,(2\,s-v)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b\,(m-2\,k)+2\,c\,(2\,s-v)\,z)^2}{4\,c\,(2\,s-v)}\right)+$$

$$e^{-\frac{b^2\,(2\,k-m)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-b\,(2\,k-m))^{n-q}\,(b\,(2\,k-m)+2\,c\,(v-2\,s)\,z)^{q+1}$$

$$\left(-\frac{(b\,(2\,k-m)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b\,(2\,k-m)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{-\frac{b^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-b\,(m-2\,k))^{n-q}\,(b\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{q+1}$$

$$\left(-\frac{(b\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},\,-\frac{(b\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2641.01

$$\int z^n \cosh^m(b\,z)\cosh^v\left(c\sqrt{z}\right)dz == \frac{2^{-m-v}\,z^{n+1}\,(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}} - 2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,-b\,(2\,k-m)\,z)\,(-b\,(2\,k-m))^{-n-1} + (-b\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-b\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\Gamma\left(2\,(n+1),\,-c\,(2\,s-v)\sqrt{z}\right)(-c\,(2\,s-v))^{-2\,(n+1)} + (-c\,(v-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,-c\,(v-2\,s)\sqrt{z}\right)\right) + 2^{-m-2\,n-v-1}$$

$$\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(2\,s-v)^2}{4\,b\,(2\,j-m)}}\,(b\,(2\,j-m))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^{h+k}\right.$$

$$\left(-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{b\,(2\,j-m)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{4\,b\,(2\,j-m)}\right)+2\,b\,(2\,j-m)$$

$$\left.\left.\sqrt{-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{b\,(2\,j-m)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{4\,b\,(2\,j-m)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,b\,(2\,j-m)}}\,(b\,(2\,j-m))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^{h+k}$$

$$\left(-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{b\,(2\,j-m)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{4\,b\,(2\,j-m)}\right)+2\,b\,(2\,j-m)$$

$$\left.\left.\sqrt{-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{b\,(2\,j-m)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,b\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{4\,b\,(2\,j-m)}\right)\right)+$$

$$e^{-\frac{c^2 (2s-v)^2}{4b(m-2j)}} (b(m-2j))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c(2s-v))^{-h-k+2n} \left(2b\sqrt{z}\,(m-2j)+c(2s-v)\right)^{h+k}$$

$$\left(-\frac{\left(2b\sqrt{z}\,(m-2j)+c(2s-v)\right)^2}{b(m-2j)}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(c(2s-v)\left(2b\sqrt{z}\,(m-2j)+c(2s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2b\sqrt{z}\,(m-2j)+c(2s-v)\right)^2}{4b(m-2j)}\right) + 2b(m-2j)$$

$$\left.\sqrt{-\frac{\left(2b\sqrt{z}\,(m-2j)+c(2s-v)\right)^2}{b(m-2j)}}\;\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2b\sqrt{z}\,(m-2j)+c(2s-v)\right)^2}{4b(m-2j)}\right)\right) +$$

$$e^{-\frac{c^2 (v-2s)^2}{4b(m-2j)}} (b(m-2j))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c(v-2s))^{-h-k+2n} \left(2b\sqrt{z}\,(m-2j)+c(v-2s)\right)^{h+k}$$

$$\left(-\frac{\left(2b\sqrt{z}\,(m-2j)+c(v-2s)\right)^2}{b(m-2j)}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left(c(v-2s)\left(2b\sqrt{z}\,(m-2j)+c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2b\sqrt{z}\,(m-2j)+c(v-2s)\right)^2}{4b(m-2j)}\right)\right. +$$

$$2b(m-2j)\sqrt{-\frac{\left(2b\sqrt{z}\,(m-2j)+c(v-2s)\right)^2}{b(m-2j)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2b\sqrt{z}\,(m-2j)+c(v-2s)\right)^2}{4b(m-2j)}\right)\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cosh^m(d\,z+e) \cosh^v\left(c\,z^r\right)$

01.20.21.2642.01

$$\int z^n \cosh^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz == \frac{\left(2^{-m-v}\,z^{n+1}\right)(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}} - 2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(z^{n+1}\,\Gamma\left(\frac{n+1}{2},\,-c\,(2\,s-v)\,z^2\right)\left(-c\,(2\,s-v)\,z^2\right)^{\frac{1}{2}(-n-1)} + z^{n+1}\left(-c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,s)\,z^2\right)\right) -$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e\,(2\,k-m)}\,\Gamma(n+1,\,-d\,(2\,k-m)\,z)\,(-d\,(2\,k-m))^{-n-1} + e^{e\,(m-2\,k)}\,(-d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e\,(2\,k-m)-\frac{d^2\,(2\,k-m)^2}{4\,c\,(2\,s-v)}}\,(c\,(2\,s-v))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d\,(2\,k-m))^{n-q}\,(d\,(2\,k-m)+2\,c\,(2\,s-v)\,z)^{q+1}\right.$$

$$\left(-\frac{(d\,(2\,k-m)+2\,c\,(2\,s-v)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(2\,k-m)+2\,c\,(2\,s-v)\,z)^2}{4\,c\,(2\,s-v)}\right)+$$

$$e^{e\,(m-2\,k)-\frac{d^2\,(m-2\,k)^2}{4\,c\,(2\,s-v)}}\,(c\,(2\,s-v))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d\,(m-2\,k))^{n-q}\,(d\,(m-2\,k)+2\,c\,(2\,s-v)\,z)^{q+1}$$

$$\left(-\frac{(d\,(m-2\,k)+2\,c\,(2\,s-v)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(m-2\,k)+2\,c\,(2\,s-v)\,z)^2}{4\,c\,(2\,s-v)}\right)+$$

$$e^{e\,(2\,k-m)-\frac{d^2\,(2\,k-m)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d\,(2\,k-m))^{n-q}\,(d\,(2\,k-m)+2\,c\,(v-2\,s)\,z)^{q+1}$$

$$\left(-\frac{(d\,(2\,k-m)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(2\,k-m)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{e\,(m-2\,k)-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d\,(m-2\,k))^{n-q}\,(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{q+1}$$

$$\left(-\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right) /;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2643.01

$$\int z^n \cosh^m(e+d\,z)\cosh^v\left(c\sqrt{z}\right)dz == \frac{2^{-m-v}\,z^{n+1}\,(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}} - 2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e\,(2\,k-m)}\,\Gamma(n+1,\,-d\,(2\,k-m)\,z)\,(-d\,(2\,k-m))^{-n-1} + e^{e\,(m-2\,k)}\,(-d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,-c\,(2\,s-v)\,\sqrt{z}\right)(-c\,(2\,s-v))^{-2\,(n+1)} + (-c\,(v-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,-c\,(v-2\,s)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e\,(2\,j-m)-\frac{c^2\,(2\,s-v)^2}{4\,d\,(2\,j-m)}}\,(d\,(2\,j-m))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(2\,j-m)+\right.\right.$$

$$\left.c\,(2\,s-v)\right)^{h+k}\left(-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{d\,(2\,j-m)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,d\,\sqrt{z}\right.\right.$$

$$\left.(2\,j-m)+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{4\,d\,(2\,j-m)}\right)+2\,d\,(2\,j-m)$$

$$\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{d\,(2\,j-m)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(2\,s-v)\right)^2}{4\,d\,(2\,j-m)}\right)\Bigg)+$$

$$e^{e\,(2\,j-m)-\frac{c^2\,(v-2\,s)^2}{4\,d\,(2\,j-m)}}\,(d\,(2\,j-m))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^{h+k}$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{d\,(2\,j-m)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{4\,d\,(2\,j-m)}\right)+2\,d\,(2\,j-m)$$

$$\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{d\,(2\,j-m)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,d\,\sqrt{z}\;(2\,j-m)+c\,(v-2\,s)\right)^2}{4\,d\,(2\,j-m)}\right)\Bigg)+$$

$$e^{e\,(m-2\,j)-\frac{c^2\,(2\,s-v)^2}{4\,d\,(m-2\,j)}}\,(d\,(m-2\,j))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(2\,s-v)\right)^{h+k}$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(2\,s-v)\right)^2}{d\,(m-2\,j)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,j)}\right)+2\,d\,(m-2\,j)$$

$$\left.\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(2\,s-v)\right)^2}{d\,(m-2\,j)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,j)}\right)\right)+$$

$$e^{e\,(m-2\,j)-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,j)}}\,(d\,(m-2\,j))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(v-2\,s)\right)^{h+k}$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(v-2\,s)\right)^2}{d\,(m-2\,j)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(v-2\,s)\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,j)}\right)+\right.$$

$$2\,d\,(m-2\,j)\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(v-2\,s)\right)^2}{d\,(m-2\,j)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,j)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,j)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh^m(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.2644.01

$$\int z^{\alpha-1}\cosh^m(b\,z^r)\cosh^v(c\,z^r)\,dz == \frac{2^{-m-v}\,z^\alpha}{r}\left(\frac{r\,(1-m \bmod 2)\,(1-v \bmod 2)}{\alpha}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}-\right.$$

$$\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},\,-b\,(2k-m)\,z^r\right)(-b\,(2k-m)\,z^r)^{-\frac{\alpha}{r}}+(b\,(2k-m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,b\,(2k-m)\,z^r\right)\right)-$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,-c\,(v-2s)\,z^r\right)(-c\,(v-2s)\,z^r)^{-\frac{\alpha}{r}}+(c\,(v-2s)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,(v-2s)\,z^r\right)\right)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm-2cs+cv)\,z^r\right)((-2bk+bm-2cs+cv)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$((2bk-bm-2cs+cv)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2bk-bm-2cs+cv)\,z^r\right)+$$

$$((-2bk+bm+2cs-cv)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm+2cs-cv)\,z^r\right)+$$

$$\left.\left.((2bk-bm+2cs-cv)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2bk-bm+2cs-cv)\,z^r\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2645.01

$$\int z^n \cosh^m\left(b\,z^2\right) \cosh^v\left(c\,z^2\right) dz == -2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \left(\Gamma\left(\frac{n+1}{2}, -b\,(m-2\,k)\,z^2\right)\left(-b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b\,(m-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1} - 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(\Gamma\left(\frac{n+1}{2}, -c\,(v-2\,s)\,z^2\right)\left(-c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left(c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c\,(v-2\,s)\,z^2\right)\right)\right) z^{n+1} -$$

$$2^{-m-v-1}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(\Gamma\left(\frac{n+1}{2}, (c\,(v-2\,s) - b\,(m-2\,k))\,z^2\right)\left((c\,(v-2\,s) - b\,(m-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)} + \right.\right.$$

$$\left((b\,(m-2\,k) + c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b\,(m-2\,k) + c\,(v-2\,s))\,z^2\right) +$$

$$\left((-b\,(m-2\,k) - c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b\,(m-2\,k) - c\,(v-2\,s))\,z^2\right) +$$

$$\left.\left.\left((b\,(m-2\,k) - c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b\,(m-2\,k) - c\,(v-2\,s))\,z^2\right)\right)\right) z^{n+1} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.2646.01

$$\int z^n \cosh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$-2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(\Gamma\left(2(n+1),\,-b(m-2k)\sqrt{z}\right)+\Gamma\left(2(n+1),\,b(m-2k)\sqrt{z}\right)\right)\right)$$

$$b^{-2(n+1)}+\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}-$$

$$2^{-m-v+1}c^{-2(n+1)}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(\Gamma\left(2(n+1),\,-c(v-2s)\sqrt{z}\right)+\Gamma\left(2(n+1),\,c(v-2s)\sqrt{z}\right)\right)-$$

$$2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(2(n+1),\,(c(v-2s)-b(m-2k))\sqrt{z}\right)(c(v-2s)-b(m-2k))^{-2(n+1)}+\right.$$

$$(b(m-2k)+c(v-2s))^{-2(n+1)}\Gamma\left(2(n+1),\,(b(m-2k)+c(v-2s))\sqrt{z}\right)+$$

$$(-b(m-2k)-c(v-2s))^{-2(n+1)}\Gamma\left(2(n+1),\,(-b(m-2k)-c(v-2s))\sqrt{z}\right)+$$

$$\left.(b(m-2k)-c(v-2s))^{-2(n+1)}\Gamma\left(2(n+1),\,(b(m-2k)-c(v-2s))\sqrt{z}\right)\right)/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.2647.01

$$\int z^n \cosh^m(d\,z)\cosh^v\left(c\,z^2+g\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\right.$$

$$\left.\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1}+(d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k))^{n-j}\,(-d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-d\,(m-2\,k))^{n-j}\,(d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{g\,(v-2\,s)-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k))^{n-j}\,(2\,c\,(v-2\,s)\,z-d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,(v-2\,s)\,z-d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{g\,(v-2\,s)-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d\,(m-2\,k))^{n-j}\,(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2648.01

$$\int z^n \cosh^m(d\,z) \cosh^v\left(\sqrt{z}\ c+g\right) dz ==$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\, 2^{-m-v} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}$$

$$\left(\Gamma(n+1,\, d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1} + (d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\, -d\,(m-2\,k)\,z)\right) - 2^{-m-v+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (c\,(v-2\,k))^{-2\,(n+1)} \binom{v}{k} \left(e^{g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\, -c\,(v-2\,k)\,\sqrt{z}\right) + e^{-g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\, c\,(v-2\,k)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)} - g\,(v-2\,s)} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c\,(v-2\,s))^{-h-j+2\,n} \left(-2\,d\,\sqrt{z}\ (m-2\,k) - c\,(v-2\,s)\right)^{h+j} \right.\right.$$

$$\left(\frac{\left(-2\,d\,\sqrt{z}\ (m-2\,k) - c\,(v-2\,s)\right)^2}{d\,(m-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-c\,(v-2\,s) \left(-2\,d\,\sqrt{z}\ (m-2\,k) - \right.\right.$$

$$\left.\left. c\,(v-2\,s)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, \frac{\left(-2\,d\,\sqrt{z}\ (m-2\,k) - c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)} \right) - 2\,d\,(m-2\,k) \right.$$

$$\left.\left. \sqrt{\frac{\left(-2\,d\,\sqrt{z}\ (m-2\,k) - c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\, \frac{\left(-2\,d\,\sqrt{z}\ (m-2\,k) - c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)} \right) \right) \right)$$

$$(-d\,(m-2\,k))^{-2\,(n+1)} + e^{\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)} + g\,(v-2\,s)} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(v-2\,s))^{-h-j+2\,n} \right.$$

$$\left(c\,(v-2\,s) - 2\,d\,(m-2\,k)\,\sqrt{z} \right)^{h+j} \left(\frac{\left(c\,(v-2\,s) - 2\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(c\,(v-2\,s) \left(c\,(v-2\,s) - 2\,d\,(m-2\,k)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\, \frac{\left(c\,(v-2\,s) - 2\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)} \right) - \right.$$

$$2\,d\,(m-2\,k)\sqrt{\frac{\left(c\,(v-2\,s)-2\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(c\,(v-2\,s)-2\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\right)(-d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)}$$

$$(d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,d\,(m-2\,k)\,\sqrt{z}\;-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,d\,(m-2\,k)\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,d\,(m-2\,k)\right.$$

$$\sqrt{-\frac{\left(2\,d\,(m-2\,k)\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,d\,(m-2\,k)\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$\left.c\,(v-2\,s)\left(2\,d\,(m-2\,k)\,\sqrt{z}\;-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,d\,(m-2\,k)\,\sqrt{z}\;-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\,(d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(2\,d\,\sqrt{z}\;\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\;\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,\sqrt{z}\;\,(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,d\,\sqrt{z}\;\,(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,(m-2\,k)\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,d\,\sqrt{z}\;\,(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(d\,z + e) \cosh^v\left(c\,z^r + g\right)$

01.20.21.2649.01

$$\int z^n \cosh^m(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\right.$$

$$\left.\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-e\,(m-2\,k)}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1}+e^{e\,(m-2\,k)}\,(d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-e\,(m-2\,k)-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k))^{n-j}\,(-d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,(m-2\,k)-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-d\,(m-2\,k))^{n-j}\,(d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-e\,(m-2\,k)+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k))^{n-j}\,(2\,c\,(v-2\,s)\,z-d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,(v-2\,s)\,z-d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,(m-2\,k)+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d\,(m-2\,k))^{n-j}\,(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2650.01

$$\int z^n \cosh^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-e\,(m-2\,k)}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1} + e^{e\,(m-2\,k)}\,(d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right) + e^{-g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)-e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(-2\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\left(\frac{\left(-2\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(-c\,(v-2\,s)\left(-2\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-2\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,d\,(m-2\,k)\sqrt{\frac{\left(-2\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-2\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-d\,(m-2\,k))^{-2\,(n+1)} +$$

$$e^{\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)-e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(c\,(v-2\,s)-2\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,d\,(m-2\,k)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(c(v-2s)-2d(m-2k)\sqrt{z}\right)^2}{4d(m-2k)}\right)-2d(m-2k)$$

$$\sqrt{\frac{\left(c(v-2s)-2d(m-2k)\sqrt{z}\right)^2}{d(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(c(v-2s)-2d(m-2k)\sqrt{z}\right)^2}{4d(m-2k)}\right)\Bigg)\Bigg)$$

$$(-d(m-2k))^{-2(n+1)}+e^{-\frac{c^2(v-2s)^2}{4d(m-2k)}-g(v-2s)+e(m-2k)}(d(m-2k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2s))^{-h-j+2n}\left(2d(m-2k)\sqrt{z}-c(v-2s)\right)^{h+j}$$

$$\left(-\frac{\left(2d(m-2k)\sqrt{z}-c(v-2s)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2d(m-2k)$$

$$\sqrt{-\frac{\left(2d(m-2k)\sqrt{z}-c(v-2s)\right)^2}{d(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2d(m-2k)\sqrt{z}-c(v-2s)\right)^2}{4d(m-2k)}\right)-$$

$$c(v-2s)\left(2d(m-2k)\sqrt{z}-c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2d(m-2k)\sqrt{z}-c(v-2s)\right)^2}{4d(m-2k)}\right)\Bigg)+$$

$$e^{-\frac{c^2(v-2s)^2}{4d(m-2k)}+g(v-2s)+e(m-2k)}(d(m-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}$$

$$\left(2d\sqrt{z}\ (m-2k)+c(v-2s)\right)^{h+j}\left(-\frac{\left(2d\sqrt{z}\ (m-2k)+c(v-2s)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(c(v-2s)\left(2d\sqrt{z}\ (m-2k)+c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2d\sqrt{z}\ (m-2k)+c(v-2s)\right)^2}{4d(m-2k)}\right)+$$

$$2d(m-2k)\sqrt{-\frac{\left(2d\sqrt{z}\ (m-2k)+c(v-2s)\right)^2}{d(m-2k)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2d\sqrt{z}\ (m-2k)+c(v-2s)\right)^2}{4d(m-2k)}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh^m(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.2651.01

$$\int z^{\alpha-1}\cosh^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz == -\frac{2^{-m-v}}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^\alpha$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2gk-gv}\,\Gamma\left(\frac{\alpha}{r},(cv-2ck)z^r\right)((cv-2ck)z^r)^{-\frac{\alpha}{r}}+e^{gv-2gk}\,((2ck-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ck-cv)z^r\right)\right)+$$

$$\frac{2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{\alpha}-\frac{2^{-m-v}\,z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},(bm-2bk)z^r\right)((bm-2bk)z^r)^{-\frac{\alpha}{r}}+((2bk-bm)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2bk-bm)z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z^\alpha}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2gs-gv}\,\Gamma\left(\frac{\alpha}{r},(-2bk+bm-2cs+cv)z^r\right)((-2bk+bm-2cs+cv)z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{2gs-gv}\,((2bk-bm-2cs+cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2bk-bm-2cs+cv)z^r\right)+$$

$$e^{gv-2gs}\,((-2bk+bm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2bk+bm+2cs-cv)z^r\right)+$$

$$\left.e^{gv-2gs}\,((2bk-bm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2bk-bm+2cs-cv)z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2652.01

$$\int z^n \cosh^m\left(b\,z^2\right) \cosh^v\left(c\,z^2+g\right) dz == -2^{-m-v-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \left(\Gamma\left(\frac{n+1}{2}, -b\,(m-2\,k)\,z^2\right)\left(-b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b\,(m-2\,k)\,z^2\right)\right)\right) z^{n+1} -$$

$$2^{-m-v-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(e^{g\,(v-2\,s)}\, \Gamma\left(\frac{n+1}{2}, -c\,(v-2\,s)\,z^2\right)\left(-c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)} + \right.\right.$$

$$\left.\left. e^{-g\,(v-2\,s)} \left(c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c\,(v-2\,s)\,z^2\right)\right)\right) z^{n+1} -$$

$$2^{-m-v-1} \left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(e^{-g\,(v-2\,s)}\, \Gamma\left(\frac{n+1}{2}, (c\,(v-2\,s)-b\,(m-2\,k))\,z^2\right)\left((c\,(v-2\,s)-b\,(m-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)} + \right.\right.$$

$$e^{-g\,(v-2\,s)} \left((b\,(m-2\,k)+c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b\,(m-2\,k)+c\,(v-2\,s))\,z^2\right) +$$

$$e^{g\,(v-2\,s)} \left((-b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right) +$$

$$\left.\left. e^{g\,(v-2\,s)} \left((b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right)\right)\right) z^{n+1} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{n+1} /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.2653.01

$$\int z^n \cosh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz ==$$

$$-2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(\Gamma\left(2(n+1),\,-b(m-2k)\sqrt{z}\right)+\Gamma\left(2(n+1),\,b(m-2k)\sqrt{z}\right)\right)\right)$$

$$b^{-2(n+1)}+\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}-2^{-m-v+1}c^{-2(n+1)}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(e^{g(v-2s)}\Gamma\left(2(n+1),\,-c(v-2s)\sqrt{z}\right)+e^{-g(v-2s)}\Gamma\left(2(n+1),\,c(v-2s)\sqrt{z}\right)\right)-$$

$$2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g(v-2s)}\Gamma\left(2(n+1),\,(c(v-2s)-b(m-2k))\sqrt{z}\right)(c(v-2s)-b(m-2k))^{-2(n+1)}+\right.$$
$$e^{-g(v-2s)}(b(m-2k)+c(v-2s))^{-2(n+1)}\Gamma\left(2(n+1),\,(b(m-2k)+c(v-2s))\sqrt{z}\right)+$$
$$e^{g(v-2s)}(-b(m-2k)-c(v-2s))^{-2(n+1)}\Gamma\left(2(n+1),\,(-b(m-2k)-c(v-2s))\sqrt{z}\right)+e^{g(v-2s)}$$
$$\left.(b(m-2k)-c(v-2s))^{-2(n+1)}\Gamma\left(2(n+1),\,(b(m-2k)-c(v-2s))\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cosh^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.2654.01

$$\int z^{\alpha-1}\cosh^m(b\,z^r+e)\cosh^v(c\,z^r+g)\,dz==\frac{2^{-m-v}z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{\alpha}-\frac{2^{-m-v}z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2ek-em}\Gamma\left(\frac{\alpha}{r},\,(bm-2bk)z^r\right)((bm-2bk)z^r)^{-\frac{\alpha}{r}}+e^{em-2ek}((2bk-bm)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(2bk-bm)z^r\right)\right)-$$

$$\frac{2^{-m-v}z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2gk-gv}\Gamma\left(\frac{\alpha}{r},\,(cv-2ck)z^r\right)((cv-2ck)z^r)^{-\frac{\alpha}{r}}+e^{gv-2gk}((2ck-cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(2ck-cv)z^r\right)\right)-$$

$$\frac{2^{-m-v}z^\alpha}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2ek-em+2gs-gv}\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm-2cs+cv)z^r\right)((-2bk+bm-2cs+cv)z^r)^{-\frac{\alpha}{r}}+\right.$$
$$e^{-2ek+em+2gs-gv}((2bk-bm-2cs+cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(2bk-bm-2cs+cv)z^r\right)+$$
$$e^{2ek-em-2gs+gv}((-2bk+bm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm+2cs-cv)z^r\right)+$$
$$\left.e^{-2ek+em-2gs+gv}((2bk-bm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(2bk-bm+2cs-cv)z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2655.01

$$\int z^n \cosh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+g\right)dz ==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e\,(m-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-b\,(m-2\,k)\,z^2\right)\left(-b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-e\,(m-2\,k)}\left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g\,(v-2\,s)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,s)\,z^2\right)\left(-c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-g\,(v-2\,s)}\left(c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,s)\,z^2\right)\right)\right)z^{n+1}-$$

$$2^{-m-v-1}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e\,(m-2\,k)-g\,(v-2\,s)}\,\Gamma\left(\frac{n+1}{2},\,(c\,(v-2\,s)-b\,(m-2\,k))\,z^2\right)\left((c\,(v-2\,s)-b\,(m-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$e^{-e\,(m-2\,k)-g\,(v-2\,s)}\left((b\,(m-2\,k)+c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(b\,(m-2\,k)+c\,(v-2\,s))\,z^2\right)+$$

$$e^{e\,(m-2\,k)+g\,(v-2\,s)}\left((-b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(-b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right)+$$

$$\left.\left.e^{g\,(v-2\,s)-e\,(m-2\,k)}\left((b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(b\,(m-2\,k)-c\,(v-2\,s))\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}\;/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cosh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == -2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(e^{e(m-2k)}\,\Gamma\left(2(n+1),\,-b(m-2k)\sqrt{z}\right)+e^{-e(m-2k)}\,\Gamma\left(2(n+1),\,b(m-2k)\sqrt{z}\right)\right)\right)b^{-2(n+1)}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}-2^{-m-v+1}\,c^{-2(n+1)}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(e^{g(v-2s)}\,\Gamma\left(2(n+1),\,-c(v-2s)\sqrt{z}\right)+e^{-g(v-2s)}\,\Gamma\left(2(n+1),\,c(v-2s)\sqrt{z}\right)\right)-2^{-m-v+1}\,z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e(m-2k)-g(v-2s)}\,\Gamma\left(2(n+1),\,(c(v-2s)-b(m-2k))\sqrt{z}\right)\left((c(v-2s)-b(m-2k))\sqrt{z}\right)^{-2(n+1)}+\right.$$

$$e^{-e(m-2k)-g(v-2s)}\left((b(m-2k)+c(v-2s))\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(b(m-2k)+c(v-2s))\sqrt{z}\right)+$$

$$e^{e(m-2k)+g(v-2s)}\left((-b(m-2k)-c(v-2s))\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(-b(m-2k)-c(v-2s))\sqrt{z}\right)+$$

$$\left.e^{g(v-2s)-e(m-2k)}\left((b(m-2k)-c(v-2s))\sqrt{z}\right)^{-2(n+1)}\right.$$

$$\left.\Gamma\left(2(n+1),\,(b(m-2k)-c(v-2s))\sqrt{z}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2657.01

$$\int z^n \cosh^m(d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(\Gamma(n+1,\,d(m-2k)z)\,(-d(m-2k))^{-n-1}+(d(m-2k))^{-n-1}\,\Gamma(n+1,\,-d(m-2k)z)\right)-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2(v-2k)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f(v-2k))^{n-j}\,(-f(v-2k)-2cz(v-2k))^{j+1}\left(\frac{(-f(v-2k)-2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f(v-2k)-2cz(v-2k))^2}{4c(v-2k)}\right)\right)(-c(v-2k))^{-n-1}+\right.$$

$$\left.e^{-\frac{f^2(v-2k)}{4c}}\,(c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f(v-2k))^{n-j}\,(f(v-2k)+2cz(v-2k))^{j+1}\right.$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{(-d(m-2k)-f(v-2s))^2}{4c(v-2s)}}\left(\sum_{j=0}^{n}2^{j-n}(d(m-2k)+f(v-2s))^{n-j}\right.$$

$$(-d(m-2k)-f(v-2s)-2c(v-2s)z)^{j+1}\left(\frac{(-d(m-2k)-f(v-2s)-2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d(m-2k)-f(v-2s)-2c(v-2s)z)^2}{4c(v-2s)}\right)\right)(-c(v-2s))^{-n-1}+$$

$$e^{\frac{(d(m-2k)-f(v-2s))^2}{4c(v-2s)}}\left(\sum_{j=0}^{n}2^{j-n}(f(v-2s)-d(m-2k))^{n-j}(d(m-2k)-f(v-2s)-2c(v-2s)z)^{j+1}\right.$$

$$\left(\frac{(d(m-2k)-f(v-2s)-2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{(d(m-2k)-f(v-2s)-2c(v-2s)z)^2}{4c(v-2s)}\right)\right)(-c(v-2s))^{-n-1}+$$

$$e^{-\frac{(f(v-2s)-d(m-2k))^2}{4c(v-2s)}}(c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(d(m-2k)-f(v-2s))^{n-j}$$

$$(-d(m-2k)+f(v-2s)+2c(v-2s)z)^{j+1}\left(-\frac{(-d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{4c(v-2s)}\right)+$$

$$e^{-\frac{(d(m-2k)+f(v-2s))^2}{4c(v-2s)}}(c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d(m-2k)-f(v-2s))^{n-j}$$

$$(d(m-2k)+f(v-2s)+2c(v-2s)z)^{j+1}\left(-\frac{(d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{4c(v-2s)}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cosh^m(d\,z) \cosh^v\left(\sqrt{z}\; c+g+f\,z\right) dz == \frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\, 2^{-m-v} \binom{v}{\frac{v}{2}}$$

$$(1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\Gamma(n+1,\, d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1} + (d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\, -d\,(m-2\,k)\,z)\right) +$$

$$2^{-m-2\,n-v-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (f\,(v-2\,k))^{-2\,(n+1)} \binom{v}{k} \left(e^{\frac{c^2\,(v-2\,k)}{4\,f} - g\,(v-2\,k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c\,(v-2\,k))^{-h-j+2\,n} \left(-c\,(v-2\,k) - 2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j} \right.$$

$$\left(\frac{\left(-c\,(v-2\,k) - 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-c\,(v-2\,k) \left(-c\,(v-2\,k) - 2\,f\,\sqrt{z}\;(v-2\,k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}\,(h+j+1),\, \frac{\left(-c\,(v-2\,k) - 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)} \right) - 2\,f\,(v-2\,k) \right.$$

$$\left. \sqrt{\frac{\left(-c\,(v-2\,k) - 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\; \Gamma\left(\frac{1}{2}\,(h+j+2),\, \frac{\left(-c\,(v-2\,k) - 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)} \right) \right) +$$

$$e^{g\,(v-2\,k) - \frac{c^2\,(v-2\,k)}{4\,f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(v-2\,k))^{-h-j+2\,n} \left(c\,(v-2\,k) + 2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k) + 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(c\,(v-2\,k) \left(c\,(v-2\,k) + 2\,f\,\sqrt{z}\;(v-2\,k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}\,(h+j+1),\, -\frac{\left(c\,(v-2\,k) + 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)} \right) + 2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2), \right.\right.$$

$$\left.\left. -\frac{\left(c\,(v-2\,k) + 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)} \right) \sqrt{-\frac{\left(c\,(v-2\,k) + 2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\; \right) +$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g(v-2s)-\frac{c^2(v-2s)^2}{4(f(v-2s)-d(m-2k))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)+2(f(v-2s)-\right.\right.\right.$$

$$\left.\left.\left.d(m-2k))\sqrt{z}\right)^{h+j}\left(-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{f(v-2s)-d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c(v-2s)\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-d(m-2k))}\right)+2(f(v-2s)-d(m-2k))\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-d(m-2k))}\right)$$

$$\left.\sqrt{-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{f(v-2s)-d(m-2k)}}\right)\Bigg)$$

$$(f(v-2s)-d(m-2k))^{-2(n+1)}+e^{g(v-2s)-\frac{c^2(v-2s)^2}{4(d(m-2k)+f(v-2s))}}(d(m-2k)+f(v-2s))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}\right)^2}{d(m-2k)+f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c(v-2s)\left(c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}\right)^2}{4(d(m-2k)+f(v-2s))}\right)+$$

$$\left.2(d(m-2k)+f(v-2s))\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}\right)^2}{4(d(m-2k)+f(v-2s))}\right)\right)$$

$$\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,(m-2\,k)+f\,(v-2\,s)}}\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)}\,(-d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-d\,(m-2\,k)-f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}\right)-c\,(v-2\,s)\,\Big(2\,(-d\,(m-2\,k)-f\,(v-2\,s))$$

$$\sqrt{z}\,-c\,(v-2\,s)\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)}\,(d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(d\,(m-2\,k)-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)-f\,(v-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(d(m-2k)-f(v-2s))}\right)-$$

$$c(v-2s)\left(2(d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2(d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(d(m-2k)-f(v-2s))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cosh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2659.01

$$\int z^n\cosh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-e(m-2k)}\,\Gamma(n+1,\,d(m-2k)z)\,(-d(m-2k))^{-n-1}+e^{e(m-2k)}\,(d(m-2k))^{-n-1}\,\Gamma(n+1,\,-d(m-2k)z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2(v-2k)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f(v-2k))^{n-j}\,(-f(v-2k)-2czv+2ck)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f(v-2k)-2czv+2ck)^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f(v-2k)-2czv+2ck)^2}{4c(v-2k)}\right)\right)$$

$$(-c(v-2k))^{-n-1}+e^{-\frac{f^2(v-2k)}{4c}}\,(c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f(v-2k))^{n-j}\,(f(v-2k)+2czv-2ck)^{j+1}$$

$$\left.\left(-\frac{(f(v-2k)+2czv-2ck)^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f(v-2k)+2czv-2ck)^2}{4c(v-2k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(-d(m-2k)-f(v-2s))^2}{4c(v-2s)}-e(m-2k)}\left(\sum_{j=0}^{n}2^{j-n}\,(d(m-2k)+f(v-2s))^{n-j}\right.\right.$$

$$\left.\left.(-d(m-2k)-f(v-2s)-2c(v-2s)z)^{j+1}\left(\frac{(-d(m-2k)-f(v-2s)-2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}+e\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-d\,(m-2\,k))^{n-j}\,(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left(\frac{(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f\,(v-2\,s)-d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}-e\,(m-2\,k)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{e\,(m-2\,k)-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cosh^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-e\,(m-2\,k)}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1}+e^{e\,(m-2\,k)}\,(d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\right)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-d\,(m-2\,k))}-e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-\right.\right.\right.$$

$$\left.\left.\left.d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d\,(m-2\,k))}\right)+2\,(f\,(v-2\,s)-d\,(m-2\,k))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d\,(m-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d\,(m-2\,k)}}\right)$$

$$(f\,(v-2\,s)-d\,(m-2\,k))^{-2\,(n+1)}+e^{e\,(m-2\,k)-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\,(d\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}-e\,(m-2\,k)}\,(-d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{-d\left(m-2k\right)-f\left(v-2s\right)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{-d\left(m-2k\right)-f\left(v-2s\right)}}\;\Gamma\left(\frac{1}{2}\left(h+j+2\right),\right.\right.$$

$$\left.-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)-c\left(v-2s\right)\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\right.$$

$$\left.\left.\sqrt{z}-c\left(v-2s\right)\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)\right)+$$

$$e^{e\left(m-2k\right)-\frac{c^2\left(v-2s\right)^2}{4\left(d\left(m-2k\right)-f\left(v-2s\right)\right)}}\left(d\left(m-2k\right)-f\left(v-2s\right)\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\left(-c\left(v-2s\right)\right)^{-h-j+2n}$$

$$\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{d\left(m-2k\right)-f\left(v-2s\right)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{d\left(m-2k\right)-f\left(v-2s\right)}}\right.$$

$$\Gamma\left(\frac{1}{2}\left(h+j+2\right),-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)-$$

$$c\left(v-2s\right)\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\right.$$

$$\left.\left.-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)\right)\Big/;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m\left(b\,z^r\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n \cosh^m\left(b\,z^2\right) \cosh^v\left(c\,z^2+f\,z\right) dz == -2^{-m-v-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \left(\Gamma\left(\frac{n+1}{2}, -b\,(m-2\,k)\,z^2\right)\left(-b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b\,(m-2\,k)\,z^2\right)\right)\right) z^{n+1} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$2^{-m-v-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{k} \left(e^{-\frac{f^2\,(2\,k-v)}{4\,c}} \left(\sum_{j=0}^{n} 2^{j-n}\,(-f\,(2\,k-v))^{n-j}\,(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^{j+1}\right.\right.$$

$$\left.\left(-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{4\,c\,(2\,k-v)}\right)\right) (c\,(2\,k-v))^{-n-1} +$$

$$e^{-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(e^{-\frac{f^2\,(2\,s-v)^2}{4\,(c\,(2\,s-v)-b\,(2\,k-m))}} \left(\sum_{j=0}^{n} 2^{j-n}\,(-f\,(2\,s-v))^{n-j}\,(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(2\,k-m))\,z)^{j+1}\right.\right.$$

$$\left(-\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(2\,k-m))\,z)^2}{c\,(2\,s-v)-b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2}, -\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(2\,k-m))\,z)^2}{4\,(c\,(2\,s-v)-b\,(2\,k-m))}\right)\right) (c\,(2\,s-v)-b\,(2\,k-m))^{-n-1} +$$

$$e^{-\frac{f^2\,(2\,s-v)^2}{4\,(c\,(2\,s-v)-b\,(m-2\,k))}}\,(c\,(2\,s-v)-b\,(m-2\,k))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\,(-f\,(2\,s-v))^{n-j}$$

$$(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^{j+1} \left(-\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^2}{c\,(2\,s-v)-b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^2}{4\,(c\,(2\,s-v)-b\,(m-2\,k))}\right) +$$

$$e^{-\frac{f^2\,(v-2\,s)^2}{4\,(c\,(v-2\,s)-b\,(2\,k-m))}}\,(c\,(v-2\,s)-b\,(2\,k-m))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\,(-f\,(v-2\,s))^{n-j}$$

$$(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^{j+1}\left(-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^2}{c\,(v-2\,s)-b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^2}{4\,(c\,(v-2\,s)-b\,(2\,k-m))}\right)+$$

$$e^{-\frac{f^2\,(v-2\,s)^2}{4\,(c\,(v-2\,s)-b\,(m-2\,k))}}\,(c\,(v-2\,s)-b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,s))^{n-j}$$

$$(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^{j+1}\left(-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^2}{c\,(v-2\,s)-b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^2}{4\,(c\,(v-2\,s)-b\,(m-2\,k))}\right)\Bigg)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cosh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz==$$

$$-2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2\,k)^{-2\,(n+1)}\binom{m}{k}\left(\Gamma\left(2\,(n+1),-b\,(m-2\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)$$

$$b^{-2\,(n+1)}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f\,(v-2\,k))^{-2\,(n+1)}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\Gamma\left(\frac{1}{2}\,(h+j+2),\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\right)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(f\,(v-2\,s)\right)^{-2\,(n+1)}\left(e^{\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-b\,(m-2\,k)-c\,(v-2\,s))\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{\frac{(b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)-c\,(v-2\,s))\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{-\frac{(c\,(v-2\,s)-b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-b\,(m-2\,k))^{-h-j+2\,n}\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-b\,(m-2\,k))\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)+c\,(v-2\,s))\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n\cosh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e\,(m-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-b\,(m-2\,k)\,z^2\right)\left(-b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-e\,(m-2\,k)}\left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{f^2\,(2\,k-v)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,k-v))^{n-j}\,(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^{j+1}\left(-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{4\,c\,(2\,k-v)}\right)\right)(c\,(2\,k-v))^{-n-1}+\right.$$

$$e^{-\frac{f^2 (v-2k)}{4c}} (c (v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-f (v-2k))^{n-j} (f (v-2k)+2 c z (v-2k))^{j+1}$$

$$\left(-\frac{(f (v-2k)+2 c z (v-2k))^2}{c (v-2k)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (v-2k)+2 c z (v-2k))^2}{4 c (v-2k)}\right)\Bigg) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \Bigg(e^{-\frac{f^2 (2s-v)^2}{4 (c (2s-v)-b (2k-m))}-e (2k-m)} \Bigg(\sum_{j=0}^{n} 2^{j-n} (-f (2s-v))^{n-j} (f (2s-v)+2 (c (2s-v)-b (2k-m)) z)^{j+1}$$

$$\left(-\frac{(f (2s-v)+2 (c (2s-v)-b (2k-m)) z)^2}{c (2s-v)-b (2k-m)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(f (2s-v)+2 (c (2s-v)-b (2k-m)) z)^2}{4 (c (2s-v)-b (2k-m))}\right)\Bigg) (c (2s-v)-b (2k-m))^{-n-1} +$$

$$e^{-\frac{f^2 (2s-v)^2}{4 (c (2s-v)-b (m-2k))}-e (m-2k)} (c (2s-v)-b (m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-f (2s-v))^{n-j}$$

$$(f (2s-v)+2 (c (2s-v)-b (m-2k)) z)^{j+1} \left(-\frac{(f (2s-v)+2 (c (2s-v)-b (m-2k)) z)^2}{c (2s-v)-b (m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (2s-v)+2 (c (2s-v)-b (m-2k)) z)^2}{4 (c (2s-v)-b (m-2k))}\right) +$$

$$e^{-\frac{f^2 (v-2s)^2}{4 (c (v-2s)-b (2k-m))}-e (2k-m)} (c (v-2s)-b (2k-m))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-f (v-2s))^{n-j}$$

$$(f (v-2s)+2 (c (v-2s)-b (2k-m)) z)^{j+1} \left(-\frac{(f (v-2s)+2 (c (v-2s)-b (2k-m)) z)^2}{c (v-2s)-b (2k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (v-2s)+2 (c (v-2s)-b (2k-m)) z)^2}{4 (c (v-2s)-b (2k-m))}\right) +$$

$$e^{-\frac{f^2 (v-2s)^2}{4 (c (v-2s)-b (m-2k))}-e (m-2k)} (c (v-2s)-b (m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-f (v-2s))^{n-j}$$

$$(f (v-2s)+2 (c (v-2s)-b (m-2k)) z)^{j+1} \left(-\frac{(f (v-2s)+2 (c (v-2s)-b (m-2k)) z)^2}{c (v-2s)-b (m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (v-2s)+2 (c (v-2s)-b (m-2k)) z)^2}{4 (c (v-2s)-b (m-2k))}\right)\Bigg) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int z^n \cosh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz == -2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(e^{e(m-2k)}\,\Gamma\left(2(n+1),\,-b(m-2k)\sqrt{z}\right)+e^{-e(m-2k)}\,\Gamma\left(2(n+1),\,b(m-2k)\sqrt{z}\right)\right)\right)b^{-2(n+1)}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}+2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(v-2k))^{-2(n+1)}\left(e^{\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2k))^{-h-j+2n}\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c(v-2k)\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),\,\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{4f(v-2k)}\right)-2f(v-2k)$$

$$\left.\sqrt{\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{f(v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{4f(v-2k)}\right)\right)+$$

$$e^{-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}\ (v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2k)+2f\sqrt{z}\ (v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c(v-2k)\left(c(v-2k)+2f\sqrt{z}\ (v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),\,-\frac{\left(c(v-2k)+2f\sqrt{z}\ (v-2k)\right)^2}{4f(v-2k)}\right)+2f(v-2k)\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c(v-2k)+2f\sqrt{z}\ (v-2k)\right)^2}{4f(v-2k)}\right)\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}\ (v-2k)\right)^2}{f(v-2k)}}\right)\right)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-2\,(n+1)}\left(e^{\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-e\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\right.$$

$$(-b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-b\,(m-2\,k)-c\,(v-2\,s))\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{\frac{(b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)-c\,(v-2\,s))\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\Bigg)\Bigg)+e^{-\frac{(c\,(v-2\,s)-b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}-e\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-b\,(m-2\,k))^{-h-j+2\,n}\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c\,(v-2\,s)-b\,(m-2\,k))\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\sqrt{-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\Bigg)+e^{e\,(m-2\,k)-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((b\,(m-2\,k)+c\,(v-2\,s))\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+$$

$$2f(v-2s)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)$$

$$\sqrt{-\frac{\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\Bigg)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cosh^m(b\,z^r+d\,z)\cosh^v(c\,z^r+f\,z)$

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$$\int z^n\cosh^m\left(bz^2+dz\right)\cosh^v\left(cz^2+fz\right)dz==$$

$$\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{\frac{d^2(2k-m)}{4b}}\left(\sum_{j=0}^{n}2^{j-n}(d(2k-m))^{n-j}(-d(2k-m)-2bz(2k-m))^{j+1}\left(\frac{(-d(2k-m)-2bz(2k-m))^2}{b(2k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},\frac{(-d(2k-m)-2bz(2k-m))^2}{4b(2k-m)}\right)\right)(-b(2k-m))^{-n-1}+\right.$$

$$e^{\frac{d^2(m-2k)}{4b}}(-b(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(d(m-2k))^{n-j}(-d(m-2k)-2bz(m-2k))^{j+1}$$

$$\left.\left(\frac{(-d(m-2k)-2bz(m-2k))^2}{b(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d(m-2k)-2bz(m-2k))^2}{4b(m-2k)}\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{f^2(2k-v)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}(-f(2k-v))^{n-j}(f(2k-v)+2cz(2k-v))^{j+1}\right.\right.$$

$$\left.\left.\left(-\frac{(f(2k-v)+2cz(2k-v))^2}{c(2k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(2k-v)+2cz(2k-v))^2}{4c(2k-v)}\right)\right)(c(2k-v))^{-n-1}+\right.$$

$$e^{-\frac{f^2(v-2k)}{4c}}(c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2k))^{n-j}(f(v-2k)+2cz(v-2k))^{j+1}$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(f(2s-v)-d(2k-m))^2}{4(c(2s-v)-b(2k-m))}}\Bigg(\sum_{j=0}^{n}2^{j-n}(d(2k-m)-f(2s-v))^{n-j}(-d(2k-m)+f(2s-v)+2(c(2s-v)-$$

$$b(2k-m))z)^{j+1}\left(-\frac{(-d(2k-m)+f(2s-v)+2(c(2s-v)-b(2k-m))z)^2}{c(2s-v)-b(2k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d(2k-m)+f(2s-v)+2(c(2s-v)-b(2k-m))z)^2}{4(c(2s-v)-b(2k-m))}\right)\Bigg)$$

$$(c(2s-v)-b(2k-m))^{-n-1}+e^{-\frac{(f(2s-v)-d(m-2k))^2}{4(c(2s-v)-b(m-2k))}}(c(2s-v)-b(m-2k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(d(m-2k)-f(2s-v))^{n-j}(-d(m-2k)+f(2s-v)+2(c(2s-v)-b(m-2k))z)^{j+1}$$

$$\left(-\frac{(-d(m-2k)+f(2s-v)+2(c(2s-v)-b(m-2k))z)^2}{c(2s-v)-b(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d(m-2k)+f(2s-v)+2(c(2s-v)-b(m-2k))z)^2}{4(c(2s-v)-b(m-2k))}\right)+$$

$$e^{-\frac{(f(v-2s)-d(2k-m))^2}{4(c(v-2s)-b(2k-m))}}(c(v-2s)-b(2k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}(d(2k-m)-f(v-2s))^{n-j}$$

$$(-d(2k-m)+f(v-2s)+2(c(v-2s)-b(2k-m))z)^{j+1}$$

$$\left(-\frac{(-d(2k-m)+f(v-2s)+2(c(v-2s)-b(2k-m))z)^2}{c(v-2s)-b(2k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d(2k-m)+f(v-2s)+2(c(v-2s)-b(2k-m))z)^2}{4(c(v-2s)-b(2k-m))}\right)+$$

$$e^{-\frac{(f(v-2s)-d(m-2k))^2}{4(c(v-2s)-b(m-2k))}}(c(v-2s)-b(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(d(m-2k)-f(v-2s))^{n-j}$$

$$(-d(m-2k)+f(v-2s)+2(c(v-2s)-b(m-2k))z)^{j+1}$$

$$\left(-\frac{(-d(m-2k)+f(v-2s)+2(c(v-2s)-b(m-2k))z)^2}{c(v-2s)-b(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d(m-2k)+f(v-2s)+2(c(v-2s)-b(m-2k))z)^2}{4(c(v-2s)-b(m-2k))}\right)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cosh^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(\sqrt{z}\ c + f\,z\right) dz ==$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} (d\,(2k-m))^{-2n-2} \left(e^{\frac{b^2 (2k-m)}{4d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-b\,(2k-m))^{-h-j+2n} \left(-b\,(2k-m) - 2d\sqrt{z}\ (2k-m)\right)^{h+j} \right.$$

$$\left(\frac{\left(-b\,(2k-m) - 2d\sqrt{z}\ (2k-m)\right)^2}{d\,(2k-m)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-b\,(2k-m) \left(-b\,(2k-m) - 2d\sqrt{z}\ (2k-m)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-b\,(2k-m) - 2d\sqrt{z}\ (2k-m)\right)^2}{4d\,(2k-m)} \right) - 2d\,(2k-m)$$

$$\left. \left. \sqrt{\frac{\left(-b\,(2k-m) - 2d\sqrt{z}\ (2k-m)\right)^2}{d\,(2k-m)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b\,(2k-m) - 2d\sqrt{z}\ (2k-m)\right)^2}{4d\,(2k-m)} \right) \right) +$$

$$e^{\frac{b^2 (m-2k)}{4d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-b\,(m-2k))^{-h-j+2n} \left(-b\,(m-2k) - 2d\sqrt{z}\ (m-2k)\right)^{h+j}$$

$$\left(\frac{\left(-b\,(m-2k) - 2d\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-b\,(m-2k) \left(-b\,(m-2k) - 2d\sqrt{z}\ (m-2k)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-b\,(m-2k) - 2d\sqrt{z}\ (m-2k)\right)^2}{4d\,(m-2k)} \right) - 2d\,(m-2k)$$

$$\left. \left. \left. \sqrt{\frac{\left(-b\,(m-2k) - 2d\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-b\,(m-2k) - 2d\sqrt{z}\ (m-2k)\right)^2}{4d\,(m-2k)} \right) \right) \right) +$$

$$2^{-m-2n-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (f\,(2k-v))^{-2n-2} \left(e^{-\frac{c^2 (2k-v)}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(2k-v))^{-h-j+2n} \right.$$

$$\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^{h+j}\left(-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{f\,(2\,k-\nu)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(2\,k-\nu)\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{4\,f\,(2\,k-\nu)}\right)+2\,f\,(2\,k-\right.$$

$$\left.\nu)\sqrt{-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{f\,(2\,k-\nu)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{4\,f\,(2\,k-\nu)}\right)\right)+$$

$$e^{-\frac{c^2\,(\nu-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,k))^{-h-j+2\,n}\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(\nu-2\,k)\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{4\,f\,(\nu-2\,k)}\right)+2\,f\,(\nu-2\,k)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{f\,(\nu-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{4\,f\,(\nu-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{(c\,(2\,k-\nu)-b\,(2\,s-m))^2}{4\,(f\,(2\,k-\nu)-d\,(2\,s-m))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-\nu)-b\,(2\,s-m))^{-h-j+2\,n}\right.\right.$$

$$\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)^{h+j}\left(-\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+\right.\right.$$

$$\left.\left.2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/\left(f\,(2\,k-\nu)-d\,(2\,s-m)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(c\,(2\,k-\nu)-b\,(2\,s-m)\right)\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.\left(4\,(f\,(2\,k-\nu)-d\,(2\,s-m))\right)\right)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.\left(4\,(f\,(2\,k-\nu)-d\,(2\,s-m))\right)\right)\sqrt{\left(-\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+\right.\right.\right.$$

$$2\,(f\,(2\,k-v)-d\,(2\,s-m))\,\sqrt{z}\Big)^2\Big/\,(f\,(2\,k-v)-d\,(2\,s-m))\Big)\Big)\Big)$$

$$(f\,(2\,k-v)-d\,(2\,s-m))^{-2\,n-2}+e^{-\frac{(c\,(2\,k-v)-b\,(m-2\,s))^2}{4\,(f\,(2\,k-v)-d\,(m-2\,s))}}\,(f\,(2\,k-v)-d\,(m-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}$$

$$4^j\,(c\,(2\,k-v)-b\,(m-2\,s))^{-h-j+2\,n}\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\,(f\,(2\,k-v)-d\,(m-2\,s))\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Big((c\,(2\,k-v)-b\,(m-2\,s))\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(2\,k-v)-d\,(m-2\,s)))\Big)+2\,(f\,(2\,k-v)-d\,(m-2\,s))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(2\,k-v)-d\,(m-2\,s)))\Big)\sqrt{\Big(-\left(-b\,(m-2\,s)+c\,(2\,k-v)+\right.}$$

$$\left.2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\,(f\,(2\,k-v)-d\,(m-2\,s))\Big)\Big)+$$

$$e^{-\frac{(c\,(v-2\,k)-b\,(2\,s-m))^2}{4\,(f\,(v-2\,k)-d\,(2\,s-m))}}\,(f\,(v-2\,k)-d\,(2\,s-m))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k)-b\,(2\,s-m))^{-h-j+2\,n}$$

$$\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/\,(f\,(v-2\,k)-d\,(2\,s-m))\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Big((c\,(v-2\,k)-b\,(2\,s-m))\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(v-2\,k)-d\,(2\,s-m)))\Big)+2\,(f\,(v-2\,k)-d\,(2\,s-m))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(v-2\,k)-d\,(2\,s-m)))\Big)\sqrt{\Big(-\left(-b\,(2\,s-m)+c\,(v-2\,k)+\right.}$$

$$\left.2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/\,(f\,(v-2\,k)-d\,(2\,s-m))\Big)\Big)+$$

$$e^{-\frac{(c\,(v-2\,k)-b\,(m-2\,s))^2}{4\,(f\,(v-2\,k)-d\,(m-2\,s))}}\,(f\,(v-2\,k)-d\,(m-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k)-b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\,(f\,(v-2\,k)-d\,(m-2\,s))\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((c\,(v-2\,k)-b\,(m-2\,s))\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f\,(v-2\,k)-d\,(m-2\,s)))\right)+2\,(f\,(v-2\,k)-d\,(m-2\,s))$$
$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(f\,(v-2\,k)-d\,(m-2\,s)))\right)\sqrt{\left(-\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\right.\right.}$$
$$\left.\left.\sqrt{z}\right)^2\Big/\left(f\,(v-2\,k)-d\,(m-2\,s)\right)\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\cosh^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1}+(d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2\,k)}{4\,c}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}\right.\right.$$
$$\left.\left.\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)\right.$$
$$(-c\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$
$$\left.\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(-d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k)+f\,(v-2\,s))^{n-j}\right.\right.$$
$$\left.\left.(-d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-d\,(m-2\,k))^{n-j}\,(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left(\frac{(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{g\,(v-2\,s)-\frac{(f\,(v-2\,s)-d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{g\,(v-2\,s)-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cosh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1}+(d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\ \frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\ -\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\ \right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-d\,(m-2\,k))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-\right.\right.\right.$$

$$\left.\left.\left.d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d\,(m-2\,k))}\right)+2\,(f\,(v-2\,s)-d\,(m-2\,k))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d\,(m-2\,k))}\right)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d\,(m-2\,k)}}\right)\right)$$

$$(f\,(v-2\,s)-d\,(m-2\,k))^{-2\,(n+1)}+e^{g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\,(d\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)}\,(-d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{-d\left(m-2k\right)-f\left(v-2s\right)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{-d\left(m-2k\right)-f\left(v-2s\right)}}\;\Gamma\left(\frac{1}{2}\left(h+j+2\right),\right.\right.$$

$$\left.-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)-c\left(v-2s\right)\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\right.$$

$$\left.\left.\sqrt{z}-c\left(v-2s\right)\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),-\frac{\left(2\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(-d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)\right)+$$

$$e^{-\frac{c^2\left(v-2s\right)^2}{4\left(d\left(m-2k\right)-f\left(v-2s\right)\right)}-g\left(v-2s\right)}\left(d\left(m-2k\right)-f\left(v-2s\right)\right)^{-2\left(n+1\right)}\sum_{j=0}^{n}\sum_{h=0}^{j}\left(-1\right)^{j-h}4^j\left(-c\left(v-2s\right)\right)^{-h-j+2n}$$

$$\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{d\left(m-2k\right)-f\left(v-2s\right)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{d\left(m-2k\right)-f\left(v-2s\right)}}\right.$$

$$\Gamma\left(\frac{1}{2}\left(h+j+2\right),-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)-$$

$$c\left(v-2s\right)\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)\Gamma\left(\frac{1}{2}\left(h+j+1\right),\right.$$

$$\left.\left.-\frac{\left(2\left(d\left(m-2k\right)-f\left(v-2s\right)\right)\sqrt{z}-c\left(v-2s\right)\right)^2}{4\left(d\left(m-2k\right)-f\left(v-2s\right)\right)}\right)\right)\Bigg/;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \cosh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-e\,(m-2\,k)}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)\,(-d\,(m-2\,k))^{-n-1}+e^{e\,(m-2\,k)}\,(d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2\,k)}{4\,c}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)$$

$$(-c\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(-d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-e\,(m-2\,k)-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k)+f\,(v-2\,s))^{n-j}\right.\right.$$

$$(-d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}+e\,(m-2\,k)-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-d\,(m-2\,k))^{n-j}\right.$$

$$(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f(v-2s)-d(m-2k))^2}{4c(v-2s)}-e(m-2k)+g(v-2s)}(c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(d(m-2k)-f(v-2s))^{n-j}$$

$$(-d(m-2k)+f(v-2s)+2c(v-2s)z)^{j+1}\left(-\frac{(-d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{4c(v-2s)}\right)+$$

$$e^{-\frac{(d(m-2k)+f(v-2s))^2}{4c(v-2s)}+e(m-2k)+g(v-2s)}(c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d(m-2k)-f(v-2s))^{n-j}$$

$$(d(m-2k)+f(v-2s)+2c(v-2s)z)^{j+1}\left(-\frac{(d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d(m-2k)+f(v-2s)+2c(v-2s)z)^2}{4c(v-2s)}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cosh^m(e+dz)\cosh^v\left(\sqrt{z}\,c+g+fz\right)dz==$$

$$\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+(-1)^n2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-e(m-2k)}\Gamma(n+1,d(m-2k)z)(-d(m-2k))^{-n-1}+e^{e(m-2k)}(d(m-2k))^{-n-1}\Gamma(n+1,-d(m-2k)z)\right)+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f(v-2k))^{-2(n+1)}\binom{v}{k}\left(e^{\frac{c^2(v-2k)}{4f}-g(v-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\right.$$

$$\left(-c(v-2k)-2f\sqrt{z}\,(v-2k)\right)^{h+j}\left(\frac{\left(-c(v-2k)-2f\sqrt{z}\,(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c(v-2k)\right.$$

$$\left(-c(v-2k)-2f\sqrt{z}\,(v-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c(v-2k)-2f\sqrt{z}\,(v-2k)\right)^2}{4f(v-2k)}\right)-2f(v-2k)$$

$$\left.\left.\sqrt{\frac{\left(-c(v-2k)-2f\sqrt{z}\,(v-2k)\right)^2}{f(v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c(v-2k)-2f\sqrt{z}\,(v-2k)\right)^2}{4f(v-2k)}\right)\right)+$$

$$e^{g(v-2k)-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c(v-2k)\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}(h+j+1),-\frac{\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^2}{4f(v-2k)}\Bigg)+2f(v-2k)\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^2}{4f(v-2k)}\right)\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^2}{f(v-2k)}}\right)\Bigg)+2^{-m-2n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2(v-2s)^2}{4(f(v-2s)-d(m-2k))}+g(v-2s)-e(m-2k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)+2(f(v-2s)-\right.\right.\right.$$

$$\left.\left.\left.d(m-2k))\sqrt{z}\right)^{h+j}\left(-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{f(v-2s)-d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c(v-2s)\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-d(m-2k))}\right)+2(f(v-2s)-d(m-2k))$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-d(m-2k))}\right)$$

$$\left.\left.\sqrt{-\frac{\left(c(v-2s)+2(f(v-2s)-d(m-2k))\sqrt{z}\right)^2}{f(v-2s)-d(m-2k)}}\right)\right)$$

$$(f(v-2s)-d(m-2k))^{-2(n+1)}+e^{-\frac{c^2(v-2s)^2}{4(d(m-2k)+f(v-2s))}+g(v-2s)+e(m-2k)}(d(m-2k)+f(v-2s))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)-e\,(m-2\,k)}\,(-d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-d\,(m-2\,k)-f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}\right)-c\,(v-2\,s)\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\right.$$

$$\left.\left.\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-d\,(m-2\,k)-f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)+e\,(m-2\,k)}\,(d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}\right)-$$

$$c\,(v-2\,s)\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2\,(d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^n\cosh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},-b\,(m-2\,k)\,z^2\right)\left(-b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{g\,(2\,k-v)-\frac{f^2\,(2\,k-v)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,k-v))^{n-j}\,(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^{j+1}\right.\right.$$

$$\left.\left(-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{4\,c\,(2\,k-v)}\right)\right)(c\,(2\,k-v))^{-n-1}+$$

$$e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{g\,(2\,s-v)-\frac{f^2\,(2\,s-v)^2}{4\,(c\,(2\,s-v)-b\,(2\,k-m))}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,s-v))^{n-j}\,(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(2\,k-m))\,z)^{j+1}\right.$$

$$\left(-\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(2\,k-m))\,z)^2}{c\,(2\,s-v)-b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(2\,k-m))\,z)^2}{4\,(c\,(2\,s-v)-b\,(2\,k-m))}\right)\right)(c\,(2\,s-v)-b\,(2\,k-m))^{-n-1}+$$

$$e^{g\,(2\,s-v)-\frac{f^2\,(2\,s-v)^2}{4\,(c\,(2\,s-v)-b\,(m-2\,k))}}\,(c\,(2\,s-v)-b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,s-v))^{n-j}$$

$$(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^{j+1}\left(-\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^2}{c\,(2\,s-v)-b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^2}{4\,(c\,(2\,s-v)-b\,(m-2\,k))}\right)+$$

$$e^{g\,(v-2\,s)-\frac{f^2\,(v-2\,s)^2}{4\,(c\,(v-2\,s)-b\,(2\,k-m))}}\,(c\,(v-2\,s)-b\,(2\,k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,s))^{n-j}$$

$$(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^{j+1}\left(-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^2}{c\,(v-2\,s)-b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^2}{4\,(c\,(v-2\,s)-b\,(2\,k-m))}\right)+$$

$$e^{g\,(v-2\,s)-\frac{f^2\,(v-2\,s)^2}{4\,(c\,(v-2\,s)-b\,(m-2\,k))}}\,(c\,(v-2\,s)-b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,s))^{n-j}$$

$$(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^{j+1}\left(-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^2}{c\,(v-2\,s)-b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^2}{4\,(c\,(v-2\,s)-b\,(m-2\,k))}\right)\right)\Bigg);\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cosh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$-2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(\Gamma\left(2(n+1),-b(m-2k)\sqrt{z}\right)+\Gamma\left(2(n+1),b(m-2k)\sqrt{z}\right)\right)\right)$$

$$b^{-2(n+1)}+\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(v-2k))^{-2(n+1)}\left(e^{\frac{c^2(v-2k)}{4f}-g(v-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\right.$$

$$\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^{h+j}\left(\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c(v-2k)\right.$$

$$\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)-2f(v-2k)$$

$$\left.\left.\sqrt{\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)\right)+\right.$$

$$e^{g(v-2k)-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c(v-2k)\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)+2f(v-2k)\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}}\right)\right)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-2\,(n+1)}\left(e^{\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\right.$$

$$(-b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-b\,(m-2\,k)-c\,(v-2\,s))\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{\frac{(b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)-c\,(v-2\,s))\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(b(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\Bigg)+e^{g(v-2s)-\frac{(c(v-2s)-b(m-2k))^2}{4f(v-2s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s)-b(m-2k))^{-h-j+2n}\left(-b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c(v-2s)-b(m-2k))\left(-b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+$$

$$2f(v-2s)\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)$$

$$\sqrt{-\frac{\left(-b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\Bigg)+e^{g(v-2s)-\frac{(b(m-2k)+c(v-2s))^2}{4f(v-2s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b(m-2k)+c(v-2s))^{-h-j+2n}\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((b(m-2k)+c(v-2s))\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)+$$

$$2f(v-2s)\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)$$

$$\sqrt{-\frac{\left(b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\Bigg)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cosh^m(bz^r+e)\cosh^v(cz^r+fz+g)$

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$$\int z^n\cosh^m\left(bz^2+e\right)\cosh^v\left(cz^2+fz+g\right)dz==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e(m-2k)}\Gamma\left(\frac{n+1}{2},-b(m-2k)z^2\right)\left(-b(m-2k)z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-e(m-2k)}\left(b(m-2k)z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},b(m-2k)z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{g(2k-v)-\frac{f^2(2k-v)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}(-f(2k-v))^{n-j}(f(2k-v)+2cz(2k-v))^{j+1}\right.\right.$$

$$\left.\left.\left(-\frac{(f(2k-v)+2cz(2k-v))^2}{c(2k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(2k-v)+2cz(2k-v))^2}{4c(2k-v)}\right)\right)(c(2k-v))^{-n-1}+\right.$$

$$e^{g(v-2k)-\frac{f^2(v-2k)}{4c}}(c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2k))^{n-j}(f(v-2k)+2cz(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{f^2(2s-v)^2}{4(c(2s-v)-b(2k-m))}+g(2s-v)-e(2k-m)}\left(\sum_{j=0}^{n}2^{j-n}(-f(2s-v))^{n-j}\right.\right.$$

$$(f(2s-v)+2(c(2s-v)-b(2k-m))z)^{j+1}\left(-\frac{(f(2s-v)+2(c(2s-v)-b(2k-m))z)^2}{c(2s-v)-b(2k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(2s-v)+2(c(2s-v)-b(2k-m))z)^2}{4(c(2s-v)-b(2k-m))}\right)(c(2s-v)-b(2k-m))^{-n-1}+$$

$$e^{-\frac{f^2(2s-v)^2}{4(c(2s-v)-b(m-2k))}+g(2s-v)-e(m-2k)}(c(2s-v)-b(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(2s-v))^{n-j}$$

$$(f(2s-v)+2(c(2s-v)-b(m-2k))z)^{j+1}\left(-\frac{(f(2s-v)+2(c(2s-v)-b(m-2k))z)^2}{c(2s-v)-b(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(2s-v)+2(c(2s-v)-b(m-2k))z)^2}{4(c(2s-v)-b(m-2k))}\right)+$$

$$e^{-\frac{f^2(v-2s)^2}{4(c(v-2s)-b(2k-m))}+g(v-2s)-e(2k-m)}(c(v-2s)-b(2k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(c(v-2s)-b(2k-m))z)^{j+1}\left(-\frac{(f(v-2s)+2(c(v-2s)-b(2k-m))z)^2}{c(v-2s)-b(2k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-b(2k-m))z)^2}{4(c(v-2s)-b(2k-m))}\right)+$$

$$e^{-\frac{f^2(v-2s)^2}{4(c(v-2s)-b(m-2k))}+g(v-2s)-e(m-2k)}(c(v-2s)-b(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(c(v-2s)-b(m-2k))z)^{j+1}\left(-\frac{(f(v-2s)+2(c(v-2s)-b(m-2k))z)^2}{c(v-2s)-b(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-b(m-2k))z)^2}{4(c(v-2s)-b(m-2k))}\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cosh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g+f z\right)dz == -2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(e^{e(m-2k)}\Gamma\left(2(n+1),-b(m-2k)\sqrt{z}\right)+e^{-e(m-2k)}\Gamma\left(2(n+1),b(m-2k)\sqrt{z}\right)\right)\right)b^{-2(n+1)}+$$

$$\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f\,(v-2\,k))^{-2\,(n+1)}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-2\,(n+1)}\left(e^{\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-e\,(m-2\,k)-g\,(v-2\,s)}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-b\,(m-2\,k)-c\,(v-2\,s))\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{\frac{(b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e\,(m-2\,k)-g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)-c\,(v-2\,s))\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{-\frac{(c\,(v-2\,s)-b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}-e\,(m-2\,k)+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-b\,(m-2\,k))^{-h-j+2\,n}\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-b\,(m-2\,k))\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e\,(m-2\,k)+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)+c\,(v-2\,s))\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(b z^r + d z) \cosh^v(c z^r + f z + g)$

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$$\int z^n \cosh^m\left(b z^2 + d z\right) \cosh^v\left(c z^2 + f z + g\right) dz ==$$

$$\frac{2^{-m-v} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{n+1} - 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}$$

$$\left(e^{\frac{d^2 (2k-m)}{4b}} \left(\sum_{j=0}^{n} 2^{j-n} (d (2k-m))^{n-j} (-d (2k-m) - 2 b z (2k-m))^{j+1} \left(\frac{(-d (2k-m) - 2 b z (2k-m))^2}{b (2k-m)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right.\right.$$

$$\left.\left. \Gamma\left(\frac{j+1}{2}, \frac{(-d (2k-m) - 2 b z (2k-m))^2}{4 b (2k-m)} \right) \right) (-b (2k-m))^{-n-1} +$$

$$e^{\frac{d^2 (m-2k)}{4b}} (-b (m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (d (m-2k))^{n-j} (-d (m-2k) - 2 b z (m-2k))^{j+1}$$

$$\left(\frac{(-d (m-2k) - 2 b z (m-2k))^2}{b (m-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(-d (m-2k) - 2 b z (m-2k))^2}{4 b (m-2k)} \right) -$$

$$2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{g (2k-v) - \frac{f^2 (2k-v)}{4c}} \left(\sum_{j=0}^{n} 2^{j-n} (-f (2k-v))^{n-j} (f (2k-v) + 2 c z (2k-v))^{j+1} \right.\right.$$

$$\left.\left. \left(-\frac{(f (2k-v) + 2 c z (2k-v))^2}{c (2k-v)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (2k-v) + 2 c z (2k-v))^2}{4 c (2k-v)} \right) \right) (c (2k-v))^{-n-1} +$$

$$e^{g (v-2k) - \frac{f^2 (v-2k)}{4c}} (c (v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-f (v-2k))^{n-j} (f (v-2k) + 2 c z (v-2k))^{j+1}$$

$$\left(-\frac{(f (v-2k) + 2 c z (v-2k))^2}{c (v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (v-2k) + 2 c z (v-2k))^2}{4 c (v-2k)} \right) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{g (2s-v) - \frac{(f (2s-v) - d (2k-m))^2}{4 (c (2s-v) - b (2k-m))}} \left(\sum_{j=0}^{n} 2^{j-n} (d (2k-m) - f (2s-v))^{n-j} \right.\right.$$

$$(-d (2k-m) + f (2s-v) + 2 (c (2s-v) - b (2k-m)) z)^{j+1}$$

$$\left.\left. \left(-\frac{(-d (2k-m) + f (2s-v) + 2 (c (2s-v) - b (2k-m)) z)^2}{c (2s-v) - b (2k-m)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right)$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d\,(2\,k-m)+f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(2\,k-m))\,z)^2}{4\,(c\,(2\,s-v)-b\,(2\,k-m))}\right)\Bigg)$$

$$(c\,(2\,s-v)-b\,(2\,k-m))^{-n-1}+e^{g\,(2\,s-v)-\frac{(f\,(2\,s-v)-d\,(m-2\,k))^2}{4\,(c\,(2\,s-v)-b\,(m-2\,k))}}\,(c\,(2\,s-v)-b\,(m-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k)-f\,(2\,s-v))^{n-j}\,(-d\,(m-2\,k)+f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(-d\,(m-2\,k)+f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^2}{c\,(2\,s-v)-b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d\,(m-2\,k)+f\,(2\,s-v)+2\,(c\,(2\,s-v)-b\,(m-2\,k))\,z)^2}{4\,(c\,(2\,s-v)-b\,(m-2\,k))}\right)+$$

$$e^{g\,(v-2\,s)-\frac{(f\,(v-2\,s)-d\,(2\,k-m))^2}{4\,(c\,(v-2\,s)-b\,(2\,k-m))}}\,(c\,(v-2\,s)-b\,(2\,k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d\,(2\,k-m)-f\,(v-2\,s))^{n-j}$$

$$(-d\,(2\,k-m)+f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^{j+1}$$

$$\left(-\frac{(-d\,(2\,k-m)+f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^2}{c\,(v-2\,s)-b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d\,(2\,k-m)+f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(2\,k-m))\,z)^2}{4\,(c\,(v-2\,s)-b\,(2\,k-m))}\right)+$$

$$e^{g\,(v-2\,s)-\frac{(f\,(v-2\,s)-d\,(m-2\,k))^2}{4\,(c\,(v-2\,s)-b\,(m-2\,k))}}\,(c\,(v-2\,s)-b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-d\,(m-2\,k)+f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(-d\,(m-2\,k)+f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^2}{c\,(v-2\,s)-b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-d\,(m-2\,k)+f\,(v-2\,s)+2\,(c\,(v-2\,s)-b\,(m-2\,k))\,z)^2}{4\,(c\,(v-2\,s)-b\,(m-2\,k))}\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cosh^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{\frac{b^2\,(2\,k-m)}{4\,d}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(2\,k-m))^{-h-j+2\,n}\left(-b\,(2\,k-m)-2\,d\,\sqrt{z}\;(2\,k-m)\right)^{h+j}\right.$$

$$\left(\frac{\left(-b\,(2\,k-m)-2\,d\,\sqrt{z}\,\,(2\,k-m)\right)^2}{d\,(2\,k-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-b\,(2\,k-m)\left(-b\,(2\,k-m)-2\,d\,\sqrt{z}\,\,(2\,k-m)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-b\,(2\,k-m)-2\,d\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)-2\,d\,(2\,k-m)$$

$$\left.\sqrt{\frac{\left(-b\,(2\,k-m)-2\,d\,\sqrt{z}\,\,(2\,k-m)\right)^2}{d\,(2\,k-m)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-b\,(2\,k-m)-2\,d\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)\right)\Bigg)$$

$$(-d\,(2\,k-m))^{-2\,n-2}+e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(-d\,(m-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(m-2\,k))^{-h-j+2\,n}$$

$$\left(-b\,(m-2\,k)-2\,d\,\sqrt{z}\,\,(m-2\,k)\right)^{h+j}\left(\frac{\left(-b\,(m-2\,k)-2\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(-b\,(m-2\,k)\left(-b\,(m-2\,k)-2\,d\,\sqrt{z}\,\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-b\,(m-2\,k)-2\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,d\,(m-2\,k)\sqrt{\frac{\left(-b\,(m-2\,k)-2\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}}\,\,\Gamma\Bigg($$

$$\left.\left.\frac{1}{2}\,(h+j+2),\,\frac{\left(-b\,(m-2\,k)-2\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\Bigg)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{g\,(2\,k-v)-\frac{c^2\,(2\,k-v)}{4\,f}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-v))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^{h+j}\left(-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(2\,k-v)\right.$$

$$\left.\left.\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{4\,f\,(2\,k-v)}\right)+2\,f\,(2\,k-v)\right)\right)$$

$$\sqrt{-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{f\,(2\,k-\nu)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{4\,f\,(2\,k-\nu)}\right)\Bigg)\Bigg)$$

$$(f\,(2\,k-\nu))^{-2\,n-2}+e^{g\,(\nu-2\,k)-\frac{c^2\,(\nu-2\,k)}{4\,f}}\,(f\,(\nu-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,k))^{-h-j+2\,n}$$

$$\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^{h+j}\left(-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{f\,(\nu-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\,(\nu-2\,k)$$

$$\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{4\,f\,(\nu-2\,k)}\right)+2\,f\,(\nu-2\,k)$$

$$\sqrt{-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{f\,(\nu-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{4\,f\,(\nu-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{g\,(2\,k-\nu)-\frac{(c\,(2\,k-\nu)-b\,(2\,s-m))^2}{4\,(f\,(2\,k-\nu)-d\,(2\,s-m))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-\nu)-b\,(2\,s-m))^{-h-j+2\,n}$$

$$\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)^{h+j}\Bigg(-\Big(-b\,(2\,s-m)+c\,(2\,k-\nu)+$$

$$2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\Big)^2\Big/\,(f\,(2\,k-\nu)-d\,(2\,s-m))\Bigg)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c\,(2\,k-\nu)-b\,(2\,s-m))\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(2\,k-\nu)-d\,(2\,s-m)))\Bigg)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(-b\,(2\,s-m)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(2\,k-\nu)-d\,(2\,s-m)))\Bigg)\sqrt{\Bigg(-\Big(-b\,(2\,s-m)+c\,(2\,k-\nu)+$$

$$2\,(f\,(2\,k-\nu)-d\,(2\,s-m))\,\sqrt{z}\Big)^2\Big/\,(f\,(2\,k-\nu)-d\,(2\,s-m))\Bigg)\Bigg)\Bigg)$$

$$(f\,(2\,k-\nu)-d\,(2\,s-m))^{-2\,n-2}+e^{g\,(2\,k-\nu)-\frac{(c\,(2\,k-\nu)-b\,(m-2\,s))^2}{4\,(f\,(2\,k-\nu)-d\,(m-2\,s))}}\,(f\,(2\,k-\nu)-d\,(m-2\,s))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-\nu)-b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(-b\,(m-2\,s)+c\,(2\,k-\nu)+2\,(f\,(2\,k-\nu)-d\,(m-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\,(f\,(2\,k-v)-d\,(m-2\,s))\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Big((c\,(2\,k-v)-b\,(m-2\,s))\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(2\,k-v)-d\,(m-2\,s)))\Big)+2\,(f\,(2\,k-v)-d\,(m-2\,s))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\left(-b\,(m-2\,s)+c\,(2\,k-v)+2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(2\,k-v)-d\,(m-2\,s)))\Big)\sqrt{\left(-\left(-b\,(m-2\,s)+c\,(2\,k-v)+\right.\right.}$$

$$\left.\left.2\,(f\,(2\,k-v)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\,(f\,(2\,k-v)-d\,(m-2\,s))\right)}+$$

$$e^{g\,(v-2\,k)-\frac{(c\,(v-2\,k)-b\,(2\,s-m))^2}{4\,(f\,(v-2\,k)-d\,(2\,s-m))}}\,(f\,(v-2\,k)-d\,(2\,s-m))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k)-b\,(2\,s-m))^{-h-j+2\,n}$$

$$\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/\,(f\,(v-2\,k)-d\,(2\,s-m))\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Big((c\,(v-2\,k)-b\,(2\,s-m))\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(v-2\,k)-d\,(2\,s-m)))\Big)+2\,(f\,(v-2\,k)-d\,(2\,s-m))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\left(-b\,(2\,s-m)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(v-2\,k)-d\,(2\,s-m)))\Big)\sqrt{\left(-\left(-b\,(2\,s-m)+c\,(v-2\,k)+\right.\right.}$$

$$\left.\left.2\,(f\,(v-2\,k)-d\,(2\,s-m))\,\sqrt{z}\right)^2\Big/\,(f\,(v-2\,k)-d\,(2\,s-m))\right)}+$$

$$e^{g\,(v-2\,k)-\frac{(c\,(v-2\,k)-b\,(m-2\,s))^2}{4\,(f\,(v-2\,k)-d\,(m-2\,s))}}\,(f\,(v-2\,k)-d\,(m-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k)-b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/\,(f\,(v-2\,k)-d\,(m-2\,s))\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Big((c\,(v-2\,k)-b\,(m-2\,s))\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\left(-b\,(m-2\,s)+c\,(v-2\,k)+2\,(f\,(v-2\,k)-d\,(m-2\,s))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(f\,(v-2\,k)-d\,(m-2\,s)))\Big)+2\,(f\,(v-2\,k)-d\,(m-2\,s))$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\,-\left(-b(m-2s)+c(v-2k)+2(f(v-2k)-d(m-2s))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4(f(v-2k)-d(m-2s)))\right)\sqrt{\left(-\left(-b(m-2s)+c(v-2k)+2(f(v-2k)-d(m-2s))\right.\right.}$$
$$\left.\left.\sqrt{z}\right)^2\Big/(f(v-2k)-d(m-2s))\right)\Bigg]/;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cosh^m(b z^r + d z + e) \cosh^v(c z^r + f z + g)$

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$$\int z^n \cosh^m\left(b z^2+d z+e\right)\cosh^v\left(c z^2+f z+g\right)dz ==$$
$$\frac{2^{-m-v}\,z^{n+1}\,(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e(2k-m)-\frac{d^2(2k-m)}{4b}}(b(2k-m))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d(2k-m))^{n-q}(d(2k-m)+2bz(2k-m))^{q+1}\right.$$
$$\left.\left(-\frac{(d(2k-m)+2bz(2k-m))^2}{b(2k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(2k-m)+2bz(2k-m))^2}{4b(2k-m)}\right)+\right.$$
$$e^{e(m-2k)-\frac{d^2(m-2k)}{4b}}(b(m-2k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d(m-2k))^{n-q}(d(m-2k)+2bz(m-2k))^{q+1}$$
$$\left.\left(-\frac{(d(m-2k)+2bz(m-2k))^2}{b(m-2k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2bz(m-2k))^2}{4b(m-2k)}\right)\right)-2^{-m-v-1}\binom{m}{\frac{m}{2}}$$
$$(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g(2s-v)-\frac{f^2(2s-v)}{4c}}(c(2s-v))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f(2s-v))^{n-q}(f(2s-v)+2cz(2s-v))^{q+1}\right.$$
$$\left.\left(-\frac{(f(2s-v)+2cz(2s-v))^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f(2s-v)+2cz(2s-v))^2}{4c(2s-v)}\right)+\right.$$
$$e^{g(v-2s)-\frac{f^2(v-2s)}{4c}}(c(v-2s))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-f(v-2s))^{n-q}(f(v-2s)+2cz(v-2s))^{q+1}$$
$$\left.\left(-\frac{(f(v-2s)+2cz(v-2s))^2}{c(v-2s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(f(v-2s)+2cz(v-2s))^2}{4c(v-2s)}\right)\right)-$$
$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d(2k-m)+f(2s-v))^2}{4(b(2k-m)+c(2s-v))}+e(2k-m)+g(2s-v)}(b(2k-m)+c(2s-v))^{-n-1}\right.$$

$$\sum_{q=0}^{n} 2^{q-n} \left(-d\,(2\,k-m)-f\,(2\,s-v)\right)^{n-q} \left(d\,(2\,k-m)+f\,(2\,s-v)+2\,(b\,(2\,k-m)+c\,(2\,s-v))\,z\right)^{q+1}$$

$$\left(-(d\,(2\,k-m)+f\,(2\,s-v)+2\,(b\,(2\,k-m)+c\,(2\,s-v))\,z)^2 \big/ (b\,(2\,k-m)+c\,(2\,s-v))\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\, -(d\,(2\,k-m)+f\,(2\,s-v)+2\,(b\,(2\,k-m)+c\,(2\,s-v))\,z)^2 \big/ (4\,(b\,(2\,k-m)+c\,(2\,s-v)))\right) +$$

$$e^{-\frac{(d\,(m-2\,k)+f\,(2\,s-v))^2}{4\,(b\,(m-2\,k)+c\,(2\,s-v))}+e\,(m-2\,k)+g\,(2\,s-v)} \left(b\,(m-2\,k)+c\,(2\,s-v)\right)^{-n-1}$$

$$\sum_{q=0}^{n} 2^{q-n} \left(-d\,(m-2\,k)-f\,(2\,s-v)\right)^{n-q} \left(d\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,(m-2\,k)+c\,(2\,s-v))\,z\right)^{q+1}$$

$$\left(-(d\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,(m-2\,k)+c\,(2\,s-v))\,z)^2 \big/ (b\,(m-2\,k)+c\,(2\,s-v))\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\, -(d\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,(m-2\,k)+c\,(2\,s-v))\,z)^2 \big/ (4\,(b\,(m-2\,k)+c\,(2\,s-v)))\right) +$$

$$e^{-\frac{(d\,(2\,k-m)+f\,(v-2\,s))^2}{4\,(b\,(2\,k-m)+c\,(v-2\,s))}+e\,(2\,k-m)+g\,(v-2\,s)} \left(b\,(2\,k-m)+c\,(v-2\,s)\right)^{-n-1}$$

$$\sum_{q=0}^{n} 2^{q-n} \left(-d\,(2\,k-m)-f\,(v-2\,s)\right)^{n-q} \left(d\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,(2\,k-m)+c\,(v-2\,s))\,z\right)^{q+1}$$

$$\left(-(d\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,(2\,k-m)+c\,(v-2\,s))\,z)^2 \big/ (b\,(2\,k-m)+c\,(v-2\,s))\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\, -(d\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,(2\,k-m)+c\,(v-2\,s))\,z)^2 \big/ (4\,(b\,(2\,k-m)+c\,(v-2\,s)))\right) +$$

$$e^{-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{4\,(b\,(m-2\,k)+c\,(v-2\,s))}+e\,(m-2\,k)+g\,(v-2\,s)} \left(b\,(m-2\,k)+c\,(v-2\,s)\right)^{-n-1}$$

$$\sum_{q=0}^{n} 2^{q-n} \left(-d\,(m-2\,k)-f\,(v-2\,s)\right)^{n-q} \left(d\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,(m-2\,k)+c\,(v-2\,s))\,z\right)^{q+1}$$

$$\left(-(d\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,(m-2\,k)+c\,(v-2\,s))\,z)^2 \big/ (b\,(m-2\,k)+c\,(v-2\,s))\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2},\, -(d\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,(m-2\,k)+c\,(v-2\,s))\,z)^2 \big/ \right.$$

$$\left. (4\,(b\,(m-2\,k)+c\,(v-2\,s)))\right) \Big/;\; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int z^n \cosh^m\left(\sqrt{z}\;b+d\,z+e\right) \cosh^v\left(\sqrt{z}\;c+f\,z+g\right) dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\,(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} + 2^{-m-v-2\,n-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2)$$

$$\sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \left(e^{e\,(2\,j-m)-\frac{b^2\,(2\,j-m)}{4\,d}} \left(d\,(2\,j-m)\right)^{-2\,n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k \left(b\,(2\,j-m)\right)^{-h-k+2\,n} \left(b\,(2\,j-m)+2\,d\,\sqrt{z}\;(2\,j-m)\right)^{h+k} \right.$$

$$\left(-\frac{\left(b\,(2\,j-m)+2\,d\,\sqrt{z}\,\,(2\,j-m)\right)^2}{d\,(2\,j-m)}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\,(2\,j-m)\left(b\,(2\,j-m)+2\,d\,\sqrt{z}\,\,(2\,j-m)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(2\,j-m)+2\,d\,\sqrt{z}\,\,(2\,j-m)\right)^2}{4\,d\,(2\,j-m)}\right)+2\,d\,(2\,j-m)\sqrt{-\frac{\left(b\,(2\,j-m)+2\,d\,\sqrt{z}\,\,(2\,j-m)\right)^2}{d\,(2\,j-m)}}\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(2\,j-m)+2\,d\,\sqrt{z}\,\,(2\,j-m)\right)^2}{4\,d\,(2\,j-m)}\right)\right)+$$

$$e^{e\,(m-2\,j)-\frac{b^2\,(m-2\,j)}{4\,d}}\,(d\,(m-2\,j))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,j))^{-h-k+2\,n}\left(b\,(m-2\,j)+2\,d\,\sqrt{z}\,\,(m-2\,j)\right)^{h+k}\left(-\frac{\left(b\,(m-2\,j)+2\,d\,\sqrt{z}\,\,(m-2\,j)\right)^2}{d\,(m-2\,j)}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,j)\left(b\,(m-2\,j)+2\,d\,\sqrt{z}\,\,(m-2\,j)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,j)+2\,d\,\sqrt{z}\,\,(m-2\,j)\right)^2}{4\,d\,(m-2\,j)}\right)+2\,d\,(m-2\,j)\sqrt{-\frac{\left(b\,(m-2\,j)+2\,d\,\sqrt{z}\,\,(m-2\,j)\right)^2}{d\,(m-2\,j)}}\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,j)+2\,d\,\sqrt{z}\,\,(m-2\,j)\right)^2}{4\,d\,(m-2\,j)}\right)\right)\right)+$$

$$2^{-m-v-2\,n-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g\,(2\,s-v)-\frac{c^2\,(2\,s-v)}{4\,f}}\,(f\,(2\,s-v))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)+2\,f\,\sqrt{z}\,\,(2\,s-v)\right)^{h+k}\left(-\frac{\left(c\,(2\,s-v)+2\,f\,\sqrt{z}\,\,(2\,s-v)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,f\,\sqrt{z}\,\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c\,(2\,s-v)+2\,f\,\sqrt{z}\,\,(2\,s-v)\right)^2}{4\,f\,(2\,s-v)}\right)+2\,f\,(2\,s-v)\sqrt{-\frac{\left(c\,(2\,s-v)+2\,f\,\sqrt{z}\,\,(2\,s-v)\right)^2}{f\,(2\,s-v)}}\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c\,(2\,s-v)+2\,f\,\sqrt{z}\,\,(2\,s-v)\right)^2}{4\,f\,(2\,s-v)}\right)\right)+$$

$$e^{g(v-2s)-\frac{c^2(v-2s)}{4f}}(f(v-2s))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(v-2s))^{-h-k+2n}\left(c(v-2s)+2f\sqrt{z}(v-2s)\right)^{h+k}$$

$$\left(-\frac{\left(c(v-2s)+2f\sqrt{z}(v-2s)\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c(v-2s)\left(c(v-2s)+2f\sqrt{z}(v-2s)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),-\frac{\left(c(v-2s)+2f\sqrt{z}(v-2s)\right)^2}{4f(v-2s)}\right)+2f(v-2s)$$

$$\left.\sqrt{-\frac{\left(c(v-2s)+2f\sqrt{z}(v-2s)\right)^2}{f(v-2s)}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c(v-2s)+2f\sqrt{z}(v-2s)\right)^2}{4f(v-2s)}\right)\right)\Bigg)+$$

$$2^{-m-v-2n-1}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(b(2j-m)+c(2s-v))^2}{4(d(2j-m)+f(2s-v))}+e(2j-m)+g(2s-v)}(d(2j-m)+f(2s-v))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\right.$$

$$4^k(b(2j-m)+c(2s-v))^{-h-k+2n}\left(b(2j-m)+c(2s-v)+2(d(2j-m)+f(2s-v))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(2j-m)+c(2s-v)+2(d(2j-m)+f(2s-v))\sqrt{z}\right)^2\Big/(d(2j-m)+f(2s-v))\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Big((b(2j-m)+c(2s-v))\left(b(2j-m)+c(2s-v)+2(d(2j-m)+f(2s-v))\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}(h+k+1),-\left(b(2j-m)+c(2s-v)+2(d(2j-m)+f(2s-v))\sqrt{z}\right)^2\Big/$$

$$(4(d(2j-m)+f(2s-v)))\Big)+2(d(2j-m)+f(2s-v))\,\Gamma\Big(\frac{1}{2}(h+k+2),$$

$$-\left(b(2j-m)+c(2s-v)+2(d(2j-m)+f(2s-v))\sqrt{z}\right)^2\Big/(4(d(2j-m)+f(2s-v)))\Big)$$

$$\sqrt{\left(-\left(b(2j-m)+c(2s-v)+2(d(2j-m)+f(2s-v))\sqrt{z}\right)^2\Big/(d(2j-m)+f(2s-v))\right)}\Big)+$$

$$e^{-\frac{(b(m-2j)+c(2s-v))^2}{4(d(m-2j)+f(2s-v))}+e(m-2j)+g(2s-v)}(d(m-2j)+f(2s-v))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k$$

$$(b(m-2j)+c(2s-v))^{-h-k+2n}\left(b(m-2j)+c(2s-v)+2(d(m-2j)+f(2s-v))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(m-2j)+c(2s-v)+2(d(m-2j)+f(2s-v))\sqrt{z}\right)^2\Big/(d(m-2j)+f(2s-v))\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Big((b(m-2j)+c(2s-v))\left(b(m-2j)+c(2s-v)+2(d(m-2j)+f(2s-v))\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}(h+k+1),-\left(b(m-2j)+c(2s-v)+2(d(m-2j)+f(2s-v))\sqrt{z}\right)^2\Big/$$

$$(4(d(m-2j)+f(2s-v)))\Big)+2(d(m-2j)+f(2s-v))\,\Gamma\Big(\frac{1}{2}(h+k+2),$$

$$-\left(b\,(m-2\,j)+c\,(2\,s-v)+2\,(d\,(m-2\,j)+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,(m-2\,j)+f\,(2\,s-v))\right)\Big)$$

$$\sqrt{\left(-\left(b\,(m-2\,j)+c\,(2\,s-v)+2\,(d\,(m-2\,j)+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\left(d\,(m-2\,j)+f\,(2\,s-v)\right)\right)}+$$

$$e^{-\frac{(b\,(2\,j-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,j-m)+f\,(v-2\,s))}+e\,(2\,j-m)+g\,(v-2\,s)}\,(d\,(2\,j-m)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(b\,(2\,j-m)+c\,(v-2\,s))^{-h-k+2\,n}\left(b\,(2\,j-m)+c\,(v-2\,s)+2\,(d\,(2\,j-m)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b\,(2\,j-m)+c\,(v-2\,s)+2\,(d\,(2\,j-m)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(2\,j-m)+f\,(v-2\,s)\right)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Big((b\,(2\,j-m)+c\,(v-2\,s))\left(b\,(2\,j-m)+c\,(v-2\,s)+2\,(d\,(2\,j-m)+f\,(v-2\,s))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\left(b\,(2\,j-m)+c\,(v-2\,s)+2\,(d\,(2\,j-m)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/$$

$$\left(4\,(d\,(2\,j-m)+f\,(v-2\,s))\right)\Big)+2\,(d\,(2\,j-m)+f\,(v-2\,s))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$

$$-\left(b\,(2\,j-m)+c\,(v-2\,s)+2\,(d\,(2\,j-m)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,(2\,j-m)+f\,(v-2\,s))\right)\Big)$$

$$\sqrt{\left(-\left(b\,(2\,j-m)+c\,(v-2\,s)+2\,(d\,(2\,j-m)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(2\,j-m)+f\,(v-2\,s)\right)\right)}+$$

$$e^{-\frac{(b\,(m-2\,j)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,j)+f\,(v-2\,s))}+e\,(m-2\,j)+g\,(v-2\,s)}\,(d\,(m-2\,j)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(b\,(m-2\,j)+c\,(v-2\,s))^{-h-k+2\,n}\left(b\,(m-2\,j)+c\,(v-2\,s)+2\,(d\,(m-2\,j)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b\,(m-2\,j)+c\,(v-2\,s)+2\,(d\,(m-2\,j)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(m-2\,j)+f\,(v-2\,s)\right)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Big((b\,(m-2\,j)+c\,(v-2\,s))\left(b\,(m-2\,j)+c\,(v-2\,s)+2\,(d\,(m-2\,j)+f\,(v-2\,s))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\left(b\,(m-2\,j)+c\,(v-2\,s)+2\,(d\,(m-2\,j)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/$$

$$\left(4\,(d\,(m-2\,j)+f\,(v-2\,s))\right)\Big)+2\,(d\,(m-2\,j)+f\,(v-2\,s))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$

$$-\left(b\,(m-2\,j)+c\,(v-2\,s)+2\,(d\,(m-2\,j)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,(m-2\,j)+f\,(v-2\,s))\right)\Big)$$

$$\sqrt{\left(-\left(b\,(m-2\,j)+c\,(v-2\,s)+2\,(d\,(m-2\,j)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.\left(d\,(m-2\,j)+f\,(v-2\,s)\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving rational functions of the direct function and a power function

Involving $\frac{z}{a+b\cosh(c\,z+d)}$

01.20.21.2679.01

$$\int \frac{z}{1-\cosh(c\,z)}\,dz == \frac{c\,z\coth\left(\frac{c\,z}{2}\right)-2\log\left(\sinh\left(\frac{c\,z}{2}\right)\right)}{c^2}$$

01.20.21.2680.01

$$\int \frac{z}{\cosh(c\,z)+1}\,dz == \frac{c\,z\tanh\left(\frac{c\,z}{2}\right)-2\log\left(\cosh\left(\frac{c\,z}{2}\right)\right)}{c^2}$$

01.20.21.2681.01

$$\int \frac{z}{a+b\cosh(c\,z)}\,dz == -\frac{1}{\sqrt{b^2-a^2}\;c^2}\left(2\,c\,z\tan^{-1}\left(\frac{(a+b)\coth\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)-2\,i\cos^{-1}\left(-\frac{a}{b}\right)\tan^{-1}\left(\frac{(b-a)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)+\right.$$

$$\left(\cos^{-1}\left(-\frac{a}{b}\right)-2\left(\tan^{-1}\left(\frac{(a+b)\coth\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)+\tan^{-1}\left(\frac{(b-a)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\right)\right)\log\left(\frac{\sqrt{b^2-a^2}\;e^{\frac{c\,z}{2}}}{\sqrt{2}\;\sqrt{b}\;\sqrt{a+b\cosh(c\,z)}}\right)+$$

$$\left(\cos^{-1}\left(-\frac{a}{b}\right)+2\left(\tan^{-1}\left(\frac{(a+b)\coth\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)+\tan^{-1}\left(\frac{(b-a)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\right)\right)\log\left(\frac{\sqrt{b^2-a^2}\;e^{-\frac{c\,z}{2}}}{\sqrt{2}\;\sqrt{b}\;\sqrt{a+b\cosh(c\,z)}}\right)-$$

$$\left(\cos^{-1}\left(-\frac{a}{b}\right)+2\tan^{-1}\left(\frac{(b-a)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\right)\log\left(\frac{(a+b)\left(a-b+i\sqrt{b^2-a^2}\right)\left(\tanh\left(\frac{c\,z}{2}\right)-1\right)}{b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{c\,z}{2}\right)\right)}\right)-$$

$$\left(\cos^{-1}\left(-\frac{a}{b}\right)-2\tan^{-1}\left(\frac{(b-a)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\right)\log\left(\frac{(a+b)\left(-a+b+i\sqrt{b^2-a^2}\right)\left(\tanh\left(\frac{c\,z}{2}\right)+1\right)}{b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{c\,z}{2}\right)\right)}\right)+$$

$$\left.i\left(\mathrm{Li}_2\left(\frac{\left(a-i\sqrt{b^2-a^2}\right)\left(a+b-i\sqrt{b^2-a^2}\;\tanh\left(\frac{c\,z}{2}\right)\right)}{b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{c\,z}{2}\right)\right)}\right)-\mathrm{Li}_2\left(\frac{\left(a+i\sqrt{b^2-a^2}\right)\left(a+b-i\sqrt{b^2-a^2}\;\tanh\left(\frac{c\,z}{2}\right)\right)}{b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{c\,z}{2}\right)\right)}\right)\right)\right)$$

01.20.21.2682.01

$$\int \frac{z}{a+b\cosh(c\,z+d)}\,dz ==$$

$$-\frac{1}{\sqrt{b^2-a^2}\;c^2}\left(2\,(d+c\,z)\tan^{-1}\left(\frac{(a+b)\coth\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)-2\left(d-i\cos^{-1}\left(-\frac{a}{b}\right)\right)\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)+\right.$$

$$\left(\cos^{-1}\left(-\frac{a}{b}\right)+2\tan^{-1}\left(\frac{(a+b)\coth\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)-2\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)\right)$$

$$\log\left(\frac{\sqrt{b^2-a^2}\;e^{-\frac{d}{2}-\frac{c\,z}{2}}}{\sqrt{2}\;\sqrt{b}\;\sqrt{a+b\cosh(d+c\,z)}}\right)+\left(\cos^{-1}\left(-\frac{a}{b}\right)-2\tan^{-1}\left(\frac{(a+b)\coth\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)+\right.$$

$$\left.2\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)\right)\log\left(\frac{\sqrt{b^2-a^2}\;e^{\frac{1}{2}(d+c\,z)}}{\sqrt{2}\;\sqrt{b}\;\sqrt{a+b\cosh(d+c\,z)}}\right)-$$

$$\left(\cos^{-1}\left(-\frac{a}{b}\right)-2\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)\right)\log\left(\frac{(a+b)\left(a-b+i\sqrt{b^2-a^2}\right)\left(\tanh\left(\frac{1}{2}(d+c\,z)\right)-1\right)}{b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{1}{2}(d+c\,z)\right)\right)}\right)-$$

$$\left(\cos^{-1}\left(-\frac{a}{b}\right)+2\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{1}{2}(d+c\,z)\right)}{\sqrt{b^2-a^2}}\right)\right)\log\left(\frac{(a+b)\left(-a+b+i\sqrt{b^2-a^2}\right)\left(\tanh\left(\frac{1}{2}(d+c\,z)\right)+1\right)}{b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{1}{2}(d+c\,z)\right)\right)}\right)+$$

$$i\left(\mathrm{Li}_2\left(\left(\left(a-i\sqrt{b^2-a^2}\right)\left(a+b-i\sqrt{b^2-a^2}\;\tanh\left(\frac{1}{2}(d+c\,z)\right)\right)\right)\Big/\left(b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{1}{2}(d+c\,z)\right)\right)\right)\right)-\right.$$

$$\left.\left.\mathrm{Li}_2\left(\left(\left(a+i\sqrt{b^2-a^2}\right)\left(a+b-i\sqrt{b^2-a^2}\;\tanh\left(\frac{1}{2}(d+c\,z)\right)\right)\right)\Big/\left(b\left(a+b+\sqrt{b^2-a^2}\;i\tanh\left(\frac{1}{2}(d+c\,z)\right)\right)\right)\right)\right)\right)$$

Involving $\frac{z\cosh(c\,z)}{a+b\cosh(2\,c\,z)}$

01.20.21.2683.01

$$\int \frac{z\cosh(c\,z)}{a+b\cosh(2\,c\,z)}\,dz ==$$

$$\frac{1}{4\sqrt{2}\;b\sqrt{-\frac{a+b}{b}}\;c^2}\left(-8\sin^{-1}\left(\frac{1}{2}\sqrt{2-i\sqrt{2}\;\sqrt{-\frac{a+b}{b}}}\right)\tan^{-1}\left(\frac{\left(-2\,i+\sqrt{2}\;\sqrt{-\frac{a+b}{b}}\right)\tan\left(\frac{1}{4}(\pi-2\,i\,c\,z)\right)}{\sqrt{2-\frac{2\,a}{b}}}\right)+\right.$$

$$8 \sin^{-1}\left(\frac{1}{2}\sqrt{2+i\sqrt{2}\,\sqrt{-\frac{a+b}{b}}}\right)\tan^{-1}\left(\frac{\left(2i+\sqrt{2}\,\sqrt{-\frac{a+b}{b}}\right)\tan\left(\frac{1}{4}(\pi-2icz)\right)}{\sqrt{2-\frac{2a}{b}}}\right)-$$

$$2czlog\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{1-\frac{a}{b}}-\sqrt{-\frac{a+b}{b}}\right)+2\right)\right)-$$

$$4i\sin^{-1}\left(\frac{1}{2}\sqrt{2+i\sqrt{2}\,\sqrt{-\frac{a+b}{b}}}\right)\log\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{1-\frac{a}{b}}-\sqrt{-\frac{a+b}{b}}\right)+2\right)\right)-$$

$$i\pi\log\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{1-\frac{a}{b}}-\sqrt{-\frac{a+b}{b}}\right)+2\right)\right)+2czlog\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{-\frac{a+b}{b}}-\sqrt{1-\frac{a}{b}}\right)+2\right)\right)+$$

$$4i\sin^{-1}\left(\frac{1}{2}\sqrt{2-i\sqrt{2}\,\sqrt{-\frac{a+b}{b}}}\right)\log\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{-\frac{a+b}{b}}-\sqrt{1-\frac{a}{b}}\right)+2\right)\right)+$$

$$i\pi\log\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{-\frac{a+b}{b}}-\sqrt{1-\frac{a}{b}}\right)+2\right)\right)+2czlog\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{1-\frac{a}{b}}+\sqrt{-\frac{a+b}{b}}\right)+2\right)\right)-$$

$$4i\sin^{-1}\left(\frac{1}{2}\sqrt{2-i\sqrt{2}\,\sqrt{-\frac{a+b}{b}}}\right)\log\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{1-\frac{a}{b}}+\sqrt{-\frac{a+b}{b}}\right)+2\right)\right)+$$

$$i\pi\log\left(\frac{1}{2}\left(\sqrt{2}\,e^{cz}\left(\sqrt{1-\frac{a}{b}}+\sqrt{-\frac{a+b}{b}}\right)+2\right)\right)-2czlog\left(\frac{1}{2}\left(2-\sqrt{2}\left(\sqrt{1-\frac{a}{b}}+\sqrt{-\frac{a+b}{b}}\right)e^{cz}\right)\right)+$$

$$4i\sin^{-1}\left(\frac{1}{2}\sqrt{2+i\sqrt{2}\,\sqrt{-\frac{a+b}{b}}}\right)\log\left(\frac{1}{2}\left(2-\sqrt{2}\left(\sqrt{1-\frac{a}{b}}+\sqrt{-\frac{a+b}{b}}\right)e^{cz}\right)\right)-$$

$$i\pi\log\left(\frac{1}{2}\left(2-\sqrt{2}\left(\sqrt{1-\frac{a}{b}}+\sqrt{-\frac{a+b}{b}}\right)e^{cz}\right)\right)+i\pi\log\left(2\sinh(cz)+\sqrt{2}\,\sqrt{-\frac{a+b}{b}}\right)-$$

$$i\pi\log\left(\sqrt{2}\,\sqrt{-\frac{a+b}{b}}-2\sinh(cz)\right)+2\,\mathrm{Li}_2\left(\frac{\left(\sqrt{1-\frac{a}{b}}-\sqrt{-\frac{a+b}{b}}\right)e^{cz}}{\sqrt{2}}\right)-$$

Involving algebraic functions of the direct function and a power function

Involving $\frac{z\cosh(c\,z)}{(a+b\cosh^2(c\,z))^{\beta}}$

01.20.21.2684.01

$$\int \frac{z\cosh(c\,z)}{\left(a+b\cosh^2(c\,z)\right)^{3/2}}\,dz == \frac{1}{(a+b)\,c^2}\left(\frac{\sqrt{2}\;c\,z\sinh(c\,z)}{\sqrt{2\,a+b+b\cosh(2\,c\,z)}} - \frac{\log\left(\sqrt{2}\;\sqrt{b}\;\cosh(c\,z)+\sqrt{2\,a+b+b\cosh(2\,c\,z)}\right)}{\sqrt{b}}\right)$$

Involving functions of the direct function and algebraic functions

Involving products of the direct function and algebraic functions

Involving products of two direct functions and algebraic functions

Involving $(f+e\,z)^{\alpha-1}\cosh(d+c\,z)\cosh(b+a\,z)$

01.20.21.2685.01

$$\int (f+e\,z)^{\alpha-1}\cosh(d+c\,z)\cosh(b+a\,z)\,dz == -\frac{1}{4\,e}\left((f+e\,z)^{\alpha}\left(-\frac{(a-c)^2\,(f+e\,z)^2}{e^2}\right)^{-\alpha}\left(-\frac{(a+c)^2\,(f+e\,z)^2}{e^2}\right)^{-\alpha}\right.$$
$$\left(\left(\Gamma\left(\alpha,-\frac{(a+c)\,(f+e\,z)}{e}\right)\left(\cosh\left(b+d-\frac{(a+c)\,f}{e}\right)+\sinh\left(b+d-\frac{(a+c)\,f}{e}\right)\right)\left(\frac{(a+c)\,(f+e\,z)}{e}\right)^{\alpha}+\right.\right.$$
$$\left.\left.\left(-\frac{(a+c)\,(f+e\,z)}{e}\right)^{\alpha}\Gamma\left(\alpha,\frac{(a+c)\,(f+e\,z)}{e}\right)\left(\cosh\left(b+d-\frac{(a+c)\,f}{e}\right)-\sinh\left(b+d-\frac{(a+c)\,f}{e}\right)\right)\right)\right.$$
$$\left(-\frac{(a-c)^2\,(f+e\,z)^2}{e^2}\right)^{\alpha}+\left(\frac{(c-a)\,(f+e\,z)}{e}\right)^{\alpha}\left(-\frac{(a+c)^2\,(f+e\,z)^2}{e^2}\right)^{\alpha}\Gamma\left(\alpha,\frac{(a-c)\,(f+e\,z)}{e}\right)$$
$$\left(\cosh\left(b-d+\frac{(c-a)\,f}{e}\right)-\sinh\left(b-d+\frac{(c-a)\,f}{e}\right)\right)+\left(\frac{(a-c)\,(f+e\,z)}{e}\right)^{\alpha}\left(-\frac{(a+c)^2\,(f+e\,z)^2}{e^2}\right)^{\alpha}$$
$$\left.\left.\Gamma\left(\alpha,\frac{(c-a)\,(f+e\,z)}{e}\right)\left(\cosh\left(b-d+\frac{(c-a)\,f}{e}\right)+\sinh\left(b-d+\frac{(c-a)\,f}{e}\right)\right)\right)\right)$$

01.20.21.2686.01

$$\int \frac{\cosh(d+c\,z)\cosh(b+a\,z)}{f+e\,z}\,dz ==$$
$$\frac{1}{2\,e}\left(\cosh\left(\frac{b\,e-d\,e-a\,f+c\,f}{e}\right)\mathrm{Chi}\left(\frac{(a-c)\,(f+e\,z)}{e}\right)+\cosh\left(b+d-\frac{(a+c)\,f}{e}\right)\mathrm{Chi}\left(\frac{(a+c)\,(f+e\,z)}{e}\right)+\right.$$
$$\left.\sinh\left(\frac{b\,e-d\,e-a\,f+c\,f}{e}\right)\mathrm{Shi}\left(\frac{(a-c)\,(f+e\,z)}{e}\right)+\sinh\left(b+d-\frac{(a+c)\,f}{e}\right)\mathrm{Shi}\left(\frac{(a+c)\,(f+e\,z)}{e}\right)\right)$$

01.20.21.2687.01

$$\int \frac{\cosh(a\,z)\cosh(b+a\,z)}{b+a\,z}\,dz == \frac{\cosh(b)\,\mathrm{Chi}(2\,(b+a\,z))+\cosh(b)\log(b+a\,z)-\sinh(b)\,\mathrm{Shi}(2\,(b+a\,z))}{2\,a}$$

Involving functions of the direct function and exponential function

Involving powers of the direct function and exponential function

Involving powers of cosh and exp

Involving $e^{b\,z}\cosh^{\nu}(a\,z)$

01.20.21.2688.01

$$\int e^{b\,z}\cosh^{\nu}(a\,z)\,dz == \frac{e^{b\,z}\cosh^{\nu}(a\,z)\left(1+e^{2\,a\,z}\right)^{-\nu}}{b-a\,\nu}\,{}_2F_1\left(\frac{b-a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{b}{a}-\nu+2\right);\,-e^{2\,a\,z}\right)$$

01.20.21.2689.01

$$\int e^{b\,z}\cosh^{\nu}(a\,z)\,dz == 2^{-\nu}\,\frac{e^{b\,z}\,(1-\nu \bmod 2)}{b}\binom{\nu}{\frac{\nu}{2}}+2^{-\nu}\sum_{i=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{i}\left(\frac{e^{(b+2\,a\,i-a\,\nu)\,z}}{b+2\,a\,i-a\,\nu}+\frac{e^{(b-2\,a\,i+a\,\nu)\,z}}{b-2\,a\,i+a\,\nu}\right)/;\,\nu\in\mathbb{N}$$

01.20.21.2690.01

$$\int e^{b\,z}\cosh^{2}(a\,z)\,dz == \frac{e^{b\,z}\left(-4\,a^2-2\,b\sinh(2\,a\,z)\,a+b^2+b^2\cosh(2\,a\,z)\right)}{2\,b^3-8\,a^2\,b}$$

01.20.21.2691.01

$$\int e^{a\,z}\cosh^{2}(a\,z)\,dz == \frac{e^{-a\,z}\left(-3+6\,e^{2\,a\,z}+e^{4\,a\,z}\right)}{12\,a}$$

01.20.21.2692.01

$$\int e^{2\,a\,z}\cosh^{2}(a\,z)\,dz == \frac{4\,a\,z+4\,e^{2\,a\,z}+e^{4\,a\,z}}{16\,a}$$

01.20.21.2693.01

$$\int e^{b\,z}\cosh^{3}(a\,z)\,dz == \left(e^{b\,z}\left(3\,b\left(b^2-9\,a^2\right)\cosh(a\,z)+\left(b^3-a^2\,b\right)\cosh(3\,a\,z)+6\,a\left(5\,a^2-b^2+\left(a^2-b^2\right)\cosh(2\,a\,z)\right)\sinh(a\,z)\right)\right)/\left(4\left(9\,a^4-10\,b^2\,a^2+b^4\right)\right)$$

01.20.21.2694.01

$$\int e^{b\,z}\cosh^{4}(a\,z)\,dz == \frac{1}{8}\,e^{b\,z}\left(\frac{4\,b\cosh(2\,a\,z)}{b^2-4\,a^2}+\frac{b\cosh(4\,a\,z)}{b^2-16\,a^2}+\frac{8\,a\sinh(2\,a\,z)}{4\,a^2-b^2}+\frac{4\,a\sinh(4\,a\,z)}{16\,a^2-b^2}+\frac{3}{b}\right)$$

01.20.21.2695.01

$$\int e^{2\,a\,z}\cosh^{4}(a\,z)\,dz == \frac{e^{-2\,a\,z}\left(24\,a\,e^{2\,a\,z}\,z+18\,e^{4\,a\,z}+6\,e^{6\,a\,z}+e^{8\,a\,z}-3\right)}{96\,a}$$

01.20.21.2696.01

$$\int e^{-2\,a\,z}\cosh^{4}(a\,z)\,dz == -\frac{-24\,a\,z+e^{-6\,a\,z}+6\,e^{-4\,a\,z}+18\,e^{-2\,a\,z}-3\,e^{2\,a\,z}}{96\,a}$$

01.20.21.2697.01

$$\int \frac{\cosh^3(a\,z)}{\sqrt{e^{b\,z}}}\,dz == \left(-3\,b\left(b^2-36\,a^2\right)\cosh(a\,z)-b\left(b^2-4\,a^2\right)\cosh(3\,a\,z)+12\,a\left(20\,a^2-b^2+\left(4\,a^2-b^2\right)\cosh(2\,a\,z)\right)\sinh(a\,z)\right)\Big/$$
$$\left(2\left(144\,a^4-40\,b^2\,a^2+b^4\right)\sqrt{e^{b\,z}}\right)$$

Involving $e^{p\,z+e}\cosh^{\nu}(a\,z)$

01.20.21.2698.01

$$\int e^{e+p\,z}\cosh^{\nu}(a\,z)\,dz == \frac{e^{e+p\,z}\left(1+e^{-2\,a\,z}\right)^{-\nu}}{p+a\,\nu}\,{}_2F_1\left(-\frac{p+a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{p}{a}-\nu+2\right);\,-e^{-2\,a\,z}\right)\cosh^{\nu}(a\,z)$$

01.20.21.2699.01

$$\int e^{e+p\,z}\cosh^{\nu}(a\,z)\,dz == \frac{2^{-\nu}\,e^{e+p\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{p}+2^{-\nu}\,e^{e}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\frac{e^{(-2\,a\,k+p+a\,\nu)\,z}}{p+a\,(\nu-2\,k)}+\frac{e^{(2\,a\,k+p-a\,\nu)\,z}}{2\,a\,k+p-a\,\nu}\right)\binom{\nu}{k}\,/;\,\nu\in\mathbb{N}$$

Involving $e^{p\,z}\cosh^{\nu}(a\,z+b)$

01.20.21.2700.01

$$\int e^{p\,z}\cosh^{\nu}(b+a\,z)\,dz == \frac{e^{p\,z}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}}{p+a\,\nu}\,{}_2F_1\left(-\frac{p+a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{p}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)\cosh^{\nu}(b+a\,z)$$

01.20.21.2701.01

$$\int e^{p\,z}\cosh^{\nu}(b+a\,z)\,dz == \frac{2^{-\nu}\,e^{p\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{p}+2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{b\,(2\,k+\nu)}\left(\frac{e^{(-2\,a\,k+p+a\,\nu)\,z-4\,b\,k}}{p+a\,(\nu-2\,k)}+\frac{e^{(2\,a\,k+p-a\,\nu)\,z-2\,b\,\nu}}{2\,a\,k+p-a\,\nu}\right)\binom{\nu}{k}\,/;\,\nu\in\mathbb{N}$$

Involving $e^{p\,z+e}\cosh^{\nu}(a\,z+b)$

01.20.21.2702.01

$$\int e^{e+p\,z}\cosh^{\nu}(b+a\,z)\,dz == \frac{e^{e+p\,z}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}}{p+a\,\nu}\,{}_2F_1\left(-\frac{p+a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{p}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)\cosh^{\nu}(b+a\,z)$$

01.20.21.2703.01

$$\int e^{e+p\,z}\cosh^{\nu}(b+a\,z)\,dz ==$$
$$\frac{2^{-\nu}\,e^{e+p\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{p}+2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{e+b\,(2\,k+\nu)}\left(\frac{e^{(-2\,a\,k+p+a\,\nu)\,z-4\,b\,k}}{p+a\,(\nu-2\,k)}+\frac{e^{(2\,a\,k+p-a\,\nu)\,z-2\,b\,\nu}}{2\,a\,k+p-a\,\nu}\right)\binom{\nu}{k}\,/;\,\nu\in\mathbb{N}$$

Involving $e^{b\,z^r}\cosh^{\nu}(c\,z)$

01.20.21.2704.01

$$\int e^{b z^2} \cosh^{\nu}(c z)\, dz == \frac{2^{-\nu-1}\sqrt{\pi}}{\sqrt{b}} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right)(1-\nu \bmod 2) +$$

$$\frac{2^{-\nu-1}\sqrt{\pi}}{\sqrt{b}} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} e^{-\frac{c^2(\nu-2s)^2}{4b}} \left(\operatorname{erfi}\left(\frac{2cs-c\nu+2bz}{2\sqrt{b}}\right) + \operatorname{erfi}\left(\frac{c(\nu-2s)+2bz}{2\sqrt{b}}\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.2705.01

$$\int e^{b\sqrt{z}} \cosh^{\nu}(c z)\, dz == \frac{2^{1-\nu} e^{b\sqrt{z}} \left(b\sqrt{z}-1\right)(1-\nu \bmod 2)}{b^2} \binom{\nu}{\frac{\nu}{2}} + 2^{-\nu} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s}$$

$$\left(-\frac{b\, e^{\frac{b^2}{4c\nu-8cs}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b-2c(\nu-2s)\sqrt{z}}{2\sqrt{c(2s-\nu)}}\right)}{2(c(2s-\nu))^{3/2}} + \frac{2e^{b\sqrt{z}} \sinh(c(2s-\nu)z)}{c(2s-\nu)} - \frac{b\, e^{\frac{b^2}{8cs-4c\nu}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b+2c(\nu-2s)\sqrt{z}}{2\sqrt{c(\nu-2s)}}\right)}{2(c(\nu-2s))^{3/2}}\right) /;\ \nu \in \mathbb{N}^+$$

Involving $e^{b z^r+e} \cosh^{\nu}(c z)$

01.20.21.2706.01

$$\int e^{b z^2+e} \cosh^{\nu}(c z)\, dz == \frac{2^{-\nu-1}\sqrt{\pi}}{\sqrt{b}}$$

$$\left(e^e \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right)(1-\nu \bmod 2) + \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-\frac{c^2(\nu-2k)^2-4be}{4b}} \binom{\nu}{k} \left(\operatorname{erfi}\left(\frac{-2ck+c\nu+2bz}{2\sqrt{b}}\right) + \operatorname{erfi}\left(\frac{2ck-c\nu+2bz}{2\sqrt{b}}\right)\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.2707.01

$$\int e^{\sqrt{z}\, b+e} \cosh^{\nu}(c z)\, dz == \frac{2^{1-\nu} e^{\sqrt{z}\, b+e} \left(b\sqrt{z}-1\right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)}{b^2} + 2^{-\nu-1} e^e \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k}$$

$$\left(-\frac{b\, e^{\frac{b^2}{8ck-4c\nu}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b+2(c\nu-2ck)\sqrt{z}}{2\sqrt{c\nu-2ck}}\right)}{(c\nu-2ck)^{3/2}} + \frac{e^{b\sqrt{z}} (4\sinh(c(2k-\nu)z))}{c(2k-\nu)} - \frac{b\, e^{\frac{b^2}{4c\nu-8ck}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b+2(2ck-c\nu)\sqrt{z}}{2\sqrt{2ck-c\nu}}\right)}{(2ck-c\nu)^{3/2}}\right) /;\ \nu \in \mathbb{N}^+$$

Involving $e^{b z^r+d z} \cosh^{\nu}(c z)$

01.20.21.2708.01

$$\int e^{b z^2+d z} \cosh^{\nu}(c z)\, dz == \frac{2^{-\nu-1}\sqrt{\pi}\,(1-\nu \bmod 2)}{\sqrt{b}} e^{-\frac{d^2}{4b}} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right) +$$

$$\frac{2^{-\nu-1}\sqrt{\pi}}{\sqrt{b}} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} e^{-\frac{d^2+2c(2s+\nu)d+c^2(\nu-2s)^2}{4b}} \left(e^{\frac{2cds}{b}} \operatorname{erfi}\left(\frac{d-2cs+c\nu+2bz}{2\sqrt{b}}\right) + e^{\frac{cd\nu}{b}} \operatorname{erfi}\left(\frac{d+2cs-c\nu+2bz}{2\sqrt{b}}\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.2709.01

$$\int e^{\sqrt{z}\,b+d\,z}\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-2}\left(\frac{4\,e^{\sqrt{z}\,b+d\,z}}{d}-\frac{2\,b\,e^{-\frac{b^2}{4\,d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\left(\frac{2\,e^{\sqrt{z}\,b+(d+2\,c\,k-c\,\nu)\,z}}{d+2\,c\,k-c\,\nu}+\frac{2\,e^{\sqrt{z}\,b+(d-2\,c\,k+c\,\nu)\,z}}{d-2\,c\,k+c\,\nu}\right)+\right.$$

$$\left.b\sqrt{\pi}\left(-\frac{2\,e^{\frac{b^2}{-4\,d-8\,c\,k+4\,c\,\nu}}\operatorname{erfi}\left(\frac{b+2\,(d+2\,c\,k-c\,\nu)\,\sqrt{z}}{2\sqrt{d+2\,c\,k-c\,\nu}}\right)}{(d+2\,c\,k-c\,\nu)^{3/2}}-\frac{2\,e^{\frac{b^2}{-4\,d+8\,c\,k-4\,c\,\nu}}\operatorname{erfi}\left(\frac{b+2\,(d-2\,c\,k+c\,\nu)\,\sqrt{z}}{2\sqrt{d+c\,(\nu-2\,k)}}\right)}{(d+c\,(\nu-2\,k))^{3/2}}\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{b\,z^r+d\,z+e}\cosh^{\nu}(c\,z)$

01.20.21.2710.01

$$\int e^{b\,z^2+d\,z+e}\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-1}\,e^{-\frac{d^2-4\,b\,e}{4\,b}}\sqrt{\pi}\ (1-\nu \bmod 2)}{\sqrt{b}}\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right)+$$

$$\frac{2^{-\nu-1}\sqrt{\pi}}{\sqrt{b}}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{(d-2\,c\,k+c\,\nu)^2-4\,b\,e}{4\,b}}\operatorname{erfi}\left(\frac{d-2\,c\,k+c\,\nu+2\,b\,z}{2\sqrt{b}}\right)+e^{-\frac{(d+2\,c\,k-c\,\nu)^2-4\,b\,e}{4\,b}}\operatorname{erfi}\left(\frac{d+2\,c\,k-c\,\nu+2\,b\,z}{2\sqrt{b}}\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2711.01

$$\int e^{\sqrt{z}\,b+d\,z+e}\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-2}\left(\frac{4\,e^{\sqrt{z}\,b+d\,z}}{d}-\frac{2\,b\,e^{-\frac{b^2}{4\,d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\,e^{e}\left(\frac{2\,e^{\sqrt{z}\,b+(d+2\,c\,k-c\,\nu)\,z}}{d+2\,c\,k-c\,\nu}+\frac{2\,e^{\sqrt{z}\,b+(d-2\,c\,k+c\,\nu)\,z}}{d-2\,c\,k+c\,\nu}\right)-\right.$$

$$\left.b\,e^{e}\sqrt{\pi}\left(\frac{2\,e^{\frac{b^2}{-4\,d-8\,c\,k+4\,c\,\nu}}\operatorname{erfi}\left(\frac{b+2\,(d+2\,c\,k-c\,\nu)\,\sqrt{z}}{2\sqrt{d+2\,c\,k-c\,\nu}}\right)}{(d+2\,c\,k-c\,\nu)^{3/2}}+\frac{2\,e^{\frac{b^2}{-4\,d+8\,c\,k-4\,c\,\nu}}\operatorname{erfi}\left(\frac{b+2\,(d-2\,c\,k+c\,\nu)\,\sqrt{z}}{2\sqrt{d+c\,(\nu-2\,k)}}\right)}{(d+c\,(\nu-2\,k))^{3/2}}\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{b\,z^r}\cosh^{\nu}(f\,z+g)$

01.20.21.2712.01

$$\int e^{b z^2} \cosh^{\nu}(g + f z)\, dz == \frac{2^{-\nu-1} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right) (1 - \nu \bmod 2)}{\sqrt{b}} +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{f^2 (\nu-2k)^2}{4b} + g(\nu-2k)} \operatorname{erfi}\left(\frac{-2fk + f\nu + 2bz}{2\sqrt{b}}\right)}{\sqrt{b}} - \frac{e^{\frac{1}{4}\left(-\frac{(2fk-f\nu)^2}{b} + 8gk - 4g\nu\right)} \operatorname{erf}\left(\frac{2fk - f\nu + 2bz}{2\sqrt{-b}}\right)}{\sqrt{-b}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2713.01

$$\int e^{b\sqrt{z}} \cosh^{\nu}(g + f z)\, dz ==$$

$$\frac{2^{1-\nu} e^{b\sqrt{z}} \left(b\sqrt{z} - 1\right) \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)}{b^2} + 2^{-\nu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(- \frac{b\, e^{\frac{b^2}{4f(\nu-2k)} + 2gk - g\nu} \sqrt{\pi} \operatorname{erfi}\left(\frac{b + 2(2fk - f\nu)\sqrt{z}}{2\sqrt{-f(\nu-2k)}}\right)}{2(2fk - f\nu)^{3/2}} + \right.$$

$$\left. \frac{e^{\sqrt{z}\, b - 2gk + g\nu + (f\nu - 2fk)z}}{f\nu - 2fk} - \frac{b\, e^{\frac{b^2}{4f(2k-\nu)} - 2gk + g\nu} \sqrt{\pi} \operatorname{erfi}\left(\frac{b + 2(f\nu - 2fk)\sqrt{z}}{2\sqrt{f\nu - 2fk}}\right)}{2(f\nu - 2fk)^{3/2}} + \frac{e^{\sqrt{z}\, b + 2gk - g\nu + (2fk - f\nu)z}}{2fk - f\nu} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{b z^r + e} \cosh^{\nu}(f z + g)$

01.20.21.2714.01

$$\int e^{b z^2 + e} \cosh^{\nu}(g + f z)\, dz == \frac{2^{-\nu-1} e^{e} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right) (1 - \nu \bmod 2)}{\sqrt{b}} +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{f^2 (\nu-2k)^2}{4b} + g(\nu-2k) + e} \operatorname{erfi}\left(\frac{-2fk + f\nu + 2bz}{2\sqrt{b}}\right)}{\sqrt{b}} - \frac{e^{\frac{1}{4}\left(-\frac{(2fk-f\nu)^2}{b} + 4e + 8gk - 4g\nu\right)} \operatorname{erf}\left(\frac{2fk - f\nu + 2bz}{2\sqrt{-b}}\right)}{\sqrt{-b}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2715.01

$$\int e^{\sqrt{z}\,b+e}\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{1-\nu}\,e^{\sqrt{z}\,b+e}\left(b\sqrt{z}-1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(-\frac{b\,e^{\frac{b^2}{4f(\nu-2k)}+e+2gk-g\nu}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2(2fk-f\nu)\sqrt{z}}{2\sqrt{-f(\nu-2k)}}\right)}{2(2fk-f\nu)^{3/2}}+\right.$$

$$\left.\frac{e^{\sqrt{z}\,b+e-2gk+g\nu+(f\nu-2fk)z}}{f\nu-2fk}-\frac{b\,e^{\frac{b^2}{4f(2k-\nu)}+e-2gk+g\nu}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2(f\nu-2fk)\sqrt{z}}{2\sqrt{f\nu-2fk}}\right)}{2(f\nu-2fk)^{3/2}}+\frac{e^{\sqrt{z}\,b+e+2gk-g\nu+(2fk-f\nu)z}}{2fk-f\nu}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z}\cosh^{\nu}(f\,z+g)$

01.20.21.2716.01

$$\int e^{b\,z^2+d\,z}\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-1}\,e^{-\frac{d^2}{4b}}\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)(1-\nu \bmod 2)}{\sqrt{b}}+$$

$$2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{-\frac{(d+f(\nu-2k))^2}{4b}+g(\nu-2k)}\operatorname{erfi}\left(\frac{d-2fk+f\nu+2bz}{2\sqrt{b}}\right)}{\sqrt{b}}-\frac{e^{\frac{1}{4}\left(-\frac{(d+2fk-f\nu)^2}{b}+8gk-4g\nu\right)}\operatorname{erf}\left(\frac{d+2fk-f\nu+2bz}{2\sqrt{-b}}\right)}{\sqrt{-b}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2717.01

$$\int e^{\sqrt{z}\,b+d\,z}\cosh^{\nu}(g+f\,z)\,dz == \left(\frac{e^{\sqrt{z}\,b+d\,z}}{d}-\frac{b\,e^{-\frac{b^2}{4d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{2d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,2^{-\nu}+$$

$$2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(-\frac{b\,e^{-\frac{b^2}{4(d+2fk-f\nu)}+2gk-g\nu}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2(d+2fk-f\nu)\sqrt{z}}{2\sqrt{d+2fk-f\nu}}\right)}{2(d+2fk-f\nu)^{3/2}}+\frac{e^{\sqrt{z}\,b-2gk+g\nu+(d-2fk+f\nu)z}}{d-2fk+f\nu}-\right.$$

$$\left.\frac{b\,e^{-\frac{b^2}{4(d+f(\nu-2k))}-2gk+g\nu}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2(d-2fk+f\nu)\sqrt{z}}{2\sqrt{d+f(\nu-2k)}}\right)}{2(d-2fk+f\nu)^{3/2}}+\frac{e^{\sqrt{z}\,b+2gk-g\nu+(d+2fk-f\nu)z}}{d+2fk-f\nu}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\cosh^{\nu}(f\,z+g)$

01.20.21.2718.01

$$\int e^{b z^2+d z+e} \cosh^{\nu}(g+f z)\, dz == \frac{2^{-\nu-1}\, e^{e-\frac{d^2}{4b}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\frac{d+2 b z}{2\sqrt{b}}\right)(1-\nu \bmod 2)}{\sqrt{b}} +$$

$$2^{-\nu-1}\sqrt{\pi} \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{(d+f(\nu-2k))^2}{4b}+e+g(\nu-2k)} \operatorname{erfi}\left(\frac{d-2fk+f\nu+2bz}{2\sqrt{b}}\right)}{\sqrt{b}} - \frac{e^{\frac{1}{4}\left(-\frac{(d+2fk-f\nu)^2}{b}+4e+8gk-4g\nu\right)} \operatorname{erf}\left(\frac{d+2fk-f\nu+2bz}{2\sqrt{-b}}\right)}{\sqrt{-b}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2719.01

$$\int e^{\sqrt{z}\ b+e+d z} \cosh^{\nu}(g+f z)\, dz == \left(\frac{e^{\sqrt{z}\ b+e+d z}}{d} - \frac{b\, e^{e-\frac{b^2}{4d}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{2\, d^{3/2}} \right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\, 2^{-\nu} +$$

$$2^{-\nu} \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k} \left(-\frac{b\, e^{-\frac{b^2}{4(d+2fk-f\nu)}+e+2gk-g\nu} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+2fk-f\nu)\sqrt{z}}{2\sqrt{d+2fk-f\nu}}\right)}{2\,(d+2fk-f\nu)^{3/2}} + \frac{e^{\sqrt{z}\ b+e-2gk+g\nu+(d-2fk+f\nu)z}}{d-2fk+f\nu} - \right.$$

$$\left. \frac{b\, e^{-\frac{b^2}{4(d+f(\nu-2k))}+e-2gk+g\nu} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d-2fk+f\nu)\sqrt{z}}{2\sqrt{d+f(\nu-2k)}}\right)}{2\,(d-2fk+f\nu)^{3/2}} + \frac{e^{\sqrt{z}\ b+e+2gk-g\nu+(d+2fk-f\nu)z}}{d+2fk-f\nu} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{b z} \cosh^{\nu}(c z^r)$

01.20.21.2720.01

$$\int e^{b z} \cosh^{\nu}\left(c z^2\right) dz ==$$

$$2^{-\nu-1}\sqrt{\pi} \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{b^2}{4(c\nu-2ck)}} \operatorname{erfi}\left(\frac{b-2(2ck-c\nu)z}{2\sqrt{c\nu-2ck}}\right)}{\sqrt{c\nu-2ck}} + \frac{e^{-\frac{b^2}{4(2ck-c\nu)}} \operatorname{erfi}\left(\frac{b+2(2ck-c\nu)z}{2\sqrt{2ck-c\nu}}\right)}{\sqrt{2ck-c\nu}} \right) - \frac{2^{-\nu}\, e^{bz}\ (\nu \bmod 2-1)}{b} \binom{\nu}{\frac{\nu}{2}} /; \nu \in \mathbb{N}^+$$

01.20.21.2721.01

$$\int e^{b z} \cosh^{\nu}\left(c\sqrt{z}\right) dz == \frac{2^{-\nu}\, e^{bz}\,(1-\nu \bmod 2)}{b} \binom{\nu}{\frac{\nu}{2}} + 2^{-\nu-2} \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k} \left(\frac{8\, e^{bz} \cosh\left(c\,(2k-\nu)\sqrt{z}\right)}{b} - \right.$$

$$\left. \frac{2c\, e^{-\frac{c^2(\nu-2k)^2}{4b}} \sqrt{\pi}\ (2k-\nu)}{b^{3/2}} \left(\operatorname{erfi}\left(\frac{2\sqrt{z}\ b+2ck-c\nu}{2\sqrt{b}}\right) - \operatorname{erfi}\left(\frac{2\sqrt{z}\ b+c(\nu-2k)}{2\sqrt{b}}\right) \right) \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{d z+e} c \operatorname{osh}^{v}(c z^{r})$

01.20.21.2722.01

$$\int e^{e+d z} \cosh^{v}(c z^{2})\, dz == \frac{e^{e+d z}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\, 2^{-v}}{d} +$$

$$2^{-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\frac{e^{\frac{d^2}{4c(v-2k)}+e}\operatorname{erfi}\left(\frac{d+4ckz-2cvz}{2\sqrt{2ck-cv}}\right)}{\sqrt{2ck-cv}} - \frac{e^{\frac{1}{4}\left(-\frac{d^2}{cv-2ck}+4e\right)}\operatorname{erf}\left(\frac{d-4ckz+2cvz}{2\sqrt{2ck-cv}}\right)}{\sqrt{2ck-cv}}\right) /; v \in \mathbb{N}^{+}$$

01.20.21.2723.01

$$\int e^{e+d z} \cosh^{v}(c\sqrt{z})\, dz ==$$

$$\frac{e^{e+d z}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\, 2^{-v}}{d} + 2^{-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(-\frac{c\, e^{e-\frac{(2ck-cv)^2}{4d}}\sqrt{\pi}\,(2k-v)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(2k-v)}{2\sqrt{d}}\right)}{2d^{3/2}} + \frac{e^{e+dz+(cv-2ck)\sqrt{z}}}{d} + \right.$$

$$\left.\frac{e^{e+dz+(2ck-cv)\sqrt{z}}}{d} - \frac{c\, e^{e-\frac{c^2(v-2k)^2}{4d}}\sqrt{\pi}\,(v-2k)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(v-2k)}{2\sqrt{d}}\right)}{2d^{3/2}}\right) /; v \in \mathbb{N}^{+}$$

Involving $e^{b z^{r}} \cosh^{v}(c z^{r})$

01.20.21.2724.01

$$\int e^{b z^{r}} \cosh^{v}(c z^{r})\, dz == -\frac{2^{-v} z (-b z^{r})^{-1/r}(1-v \bmod 2)}{r}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{r}, -b z^{r}\right) - \frac{1}{r} 2^{-v} z$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r}, (c(v-2s)-b) z^{r}\right)((c(v-2s)-b) z^{r})^{-1/r} + ((-b-c(v-2s)) z^{r})^{-1/r}\Gamma\left(\frac{1}{r}, (-b-c(v-2s)) z^{r}\right)\right) /; v \in \mathbb{N}^{+}$$

01.20.21.2725.01

$$\int e^{b z^{2}} \cosh^{v}(c z^{2})\, dz ==$$

$$\frac{2^{-v-1}\sqrt{\pi}\,(1-v \bmod 2)}{\sqrt{b}}\binom{v}{\frac{v}{2}}\operatorname{erfi}\left(\sqrt{b}\, z\right) + 2^{-v-1}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\sqrt{b+2cs-cv}\,(b+c(v-2s))\operatorname{erfi}\left(\sqrt{b+2cs-cv}\, z\right) + \right.$$

$$\left.(b+2cs-cv)\sqrt{b+c(v-2s)}\,\operatorname{erfi}\left(\sqrt{b+c(v-2s)}\, z\right)\right) \Big/ ((b+2cs-cv)(b+c(v-2s))) /; v \in \mathbb{N}^{+}$$

01.20.21.2726.01

$$\int e^{b\sqrt{z}}\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{2^{1-\nu}\,e^{b\sqrt{z}}\left(b\sqrt{z}-1\right)(1-\nu \bmod 2)}{b^2}\binom{\nu}{\frac{\nu}{2}} + 2^{1-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$
$$\left(e^{(b-2ck+c\nu)\sqrt{z}}\left(\frac{\sqrt{z}}{b-2ck+c\nu}-\frac{1}{(b-2ck+c\nu)^2}\right)+e^{(b+2ck-c\nu)\sqrt{z}}\left(\frac{\sqrt{z}}{b+2ck-c\nu}-\frac{1}{(b+2ck-c\nu)^2}\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b z^r+e}\cosh^{\nu}\left(c z^r\right)$

01.20.21.2727.01

$$\int e^{bz^r+e}\cosh^{\nu}(cz^r)\,dz == -\frac{2^{-\nu}\,z\,e^e}{r}$$
$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\Gamma\left(\frac{1}{r},(-b-2ck+c\nu)z^r\right)\left((-b-2ck+c\nu)z^r\right)^{-1/r}+\left((-b-c(\nu-2k))z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},(-b-c(\nu-2k))z^r\right)\right)-$$
$$2^{-\nu}\,\frac{e^e\,z\,(-bz^r)^{-1/r}(1-\nu \bmod 2)}{r}\binom{\nu}{\frac{\nu}{2}}\Gamma\left(\frac{1}{r},-bz^r\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2728.01

$$\int e^{bz^2+e}\cosh^{\nu}\left(cz^2\right)dz ==$$
$$\frac{2^{-\nu-1}\,e^e\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\sqrt{b}\,z\right)(1-\nu \bmod 2)}{\sqrt{b}} + 2^{-\nu-1}\sqrt{\pi}\,e^e\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{\operatorname{erfi}\left(\frac{2bz+4ckz-2c\nu z}{2\sqrt{b+2ck-c\nu}}\right)}{\sqrt{b+2ck-c\nu}}-\frac{\operatorname{erf}\left(\frac{2bz-4ckz+2c\nu z}{2\sqrt{-b+2ck-c\nu}}\right)}{\sqrt{-b+2ck-c\nu}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2729.01

$$\int e^{\sqrt{z}\,b+e}\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{2^{1-\nu}\,e^{\sqrt{z}\,b+e}\left(b\sqrt{z}-1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2} +$$
$$2^{2-\nu}\,e^{\sqrt{z}\,b+e}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\left(b^2-c^2(2k-\nu)^2\right)^2}\left(\binom{\nu}{k}\left(\left(\sqrt{z}\,b^3-b^2-c^2(2k-\nu)^2\sqrt{z}\,b-c^2(2k-\nu)^2\right)\cosh\left(c(2k-\nu)\sqrt{z}\right)-\right.\right.$$
$$\left.\left.c(2k-\nu)\left(\sqrt{z}\,b^2-2b-c^2(2k-\nu)^2\sqrt{z}\right)\sinh\left(c(2k-\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b z^r+d z}\cosh^{\nu}\left(c z^r\right)$

01.20.21.2730.01

$$\int e^{b z^2+d z} \cosh^{\nu}\left(c z^2\right) dz == \frac{2^{-\nu-1} e^{-\frac{d^2}{4 b}} \sqrt{\pi}\ (1-\nu \bmod 2)}{\sqrt{b}} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\frac{d+2 b z}{2 \sqrt{b}}\right) +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{d^2}{4 (b-2 c k+c \nu)}} \operatorname{erfi}\left(\frac{d+2 b z-2 (2 c k-c \nu) z}{2 \sqrt{b-2 c k+c \nu}}\right)}{\sqrt{b-2 c k+c \nu}} + \frac{e^{-\frac{d^2}{4 (b+2 c k-c \nu)}} \operatorname{erfi}\left(\frac{d+2 (b+2 c k-c \nu) z}{2 \sqrt{b+2 c k-c \nu}}\right)}{\sqrt{b+2 c k-c \nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2731.01

$$\int e^{\sqrt{z}\ b+d z} \cosh^{\nu}\left(c \sqrt{z}\right) dz == 2^{-\nu} \left(\frac{e^{\sqrt{z}\ b+d z}}{d} - \frac{b\, e^{-\frac{b^2}{4 d}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2 d \sqrt{z}}{2 \sqrt{d}}\right)}{2 d^{3/2}} \right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$2^{-\nu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{\sqrt{z}\ (b+2 c k-c \nu)+d z} + e^{\sqrt{z}\ (b-2 c k+c \nu)+d z}}{d} - \frac{e^{-\frac{(b+2 c k-c \nu)^2}{4 d}} \sqrt{\pi}\ (b+2 c k-c \nu) \operatorname{erfi}\left(\frac{b+c (2 k-\nu)+2 d \sqrt{z}}{2 \sqrt{d}}\right)}{2 d^{3/2}} - \right.$$

$$\left. \frac{e^{-\frac{(b+c (\nu-2 k))^2}{4 d}} \sqrt{\pi}\ (b+c (\nu-2 k)) \operatorname{erfi}\left(\frac{b+c (\nu-2 k)+2 d \sqrt{z}}{2 \sqrt{d}}\right)}{2 d^{3/2}} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{b z^r+d z+e} \cosh^{\nu}\left(c z^r\right)$

01.20.21.2732.01

$$\int e^{b z^2+d z+e} \cosh^{\nu}\left(c z^2\right) dz == \frac{2^{-\nu-1} e^{-\frac{d^2-4 b e}{4 b}} \sqrt{\pi}\ (1-\nu \bmod 2)}{\sqrt{b}} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\frac{d+2 b z}{2 \sqrt{b}}\right) +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{d^2-4 e (b-2 c k+c \nu)}{4 (b-2 c k+c \nu)}} \operatorname{erfi}\left(\frac{d+2 b z-2 (2 c k-c \nu) z}{2 \sqrt{b-2 c k+c \nu}}\right)}{\sqrt{b-2 c k+c \nu}} + \frac{e^{-\frac{d^2-4 e (b+2 c k-c \nu)}{4 (b+2 c k-c \nu)}} \operatorname{erfi}\left(\frac{d+2 (b+2 c k-c \nu) z}{2 \sqrt{b+2 c k-c \nu}}\right)}{\sqrt{b+2 c k-c \nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2733.01

$$\int e^{\sqrt{z}\ b+d\,z+e}\cosh^{\nu}\left(c\sqrt{z}\right)dz == 2^{-\nu-2}\left(\frac{4\,e^{\sqrt{z}\ b+d\,z}}{d}-\frac{2\,b\,e^{-\frac{b^2}{4\,d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{\left(8\cosh\left(c\,(2\,k-\nu)\sqrt{z}\right)\right)e^{\sqrt{z}\ b+e+d\,z}}{d}+\frac{1}{d^{3/2}}\left(2\,e^{e-\frac{b^2+c^2\,(\nu-2\,k)^2}{2\,d}}\sqrt{\pi}\left(-e^{\frac{(b+c\,(\nu-2\,k))^2}{4\,d}}(b+2\,c\,k-c\,\nu)\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b+2\,c\,k-c\,\nu+2\,d\sqrt{z}}{2\sqrt{d}}\right)-e^{\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}}(b+c\,(\nu-2\,k))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,k)+2\,d\sqrt{z}}{2\sqrt{d}}\right)\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{d\,z}\cosh^{\nu}\left(c\,z^{r}+g\right)$

01.20.21.2734.01

$$\int e^{d\,z}\cosh^{\nu}\left(c\,z^{2}+g\right)dz == \frac{e^{d\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,2^{-\nu}}{d}+$$

$$2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{\frac{d^2}{4\,c\,(\nu-2\,k)}-g\,(\nu-2\,k)}\operatorname{erfi}\left(\frac{d+4\,c\,k\,z-2\,c\,\nu\,z}{2\sqrt{2\,c\,k-c\,\nu}}\right)}{\sqrt{2\,c\,k-c\,\nu}}-\frac{e^{\frac{1}{4}\left(-\frac{d^2}{c\,\nu-2\,c\,k}-8\,g\,k+4\,g\,\nu\right)}\operatorname{erf}\left(\frac{d-4\,c\,k\,z+2\,c\,\nu\,z}{2\sqrt{2\,c\,k-c\,\nu}}\right)}{\sqrt{2\,c\,k-c\,\nu}}\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2735.01

$$\int e^{d\,z}\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz == \frac{e^{d\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,2^{-\nu}}{d}+2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$

$$\left(\frac{e^{2\,g\,k-g\,\nu+(2\,c\,k-c\,\nu)\sqrt{z}+d\,z}}{d}+\frac{e^{-2\,g\,k+g\,\nu+(-2\,c\,k+c\,\nu)\sqrt{z}+d\,z}}{d}-\frac{e^{-\frac{(2\,c\,k-c\,\nu)^2}{4\,d}+2\,g\,k-g\,\nu}\sqrt{\pi}\ (2\,c\,k-c\,\nu)\operatorname{erfi}\left(\frac{2\sqrt{z}\ d+c\,(2\,k-\nu)}{2\sqrt{d}}\right)}{2\,d^{3/2}}-\right.$$

$$\left.\frac{c\,e^{-\frac{c^2\,(\nu-2\,k)^2}{4\,d}-2\,g\,k+g\,\nu}\sqrt{\pi}\ (\nu-2\,k)\operatorname{erfi}\left(\frac{2\sqrt{z}\ d+c\,(\nu-2\,k)}{2\sqrt{d}}\right)}{2\,d^{3/2}}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{d\,z+e}\cosh^{\nu}\left(c\,z^{r}+g\right)$

01.20.21.2736.01

$$\int e^{e+d z} \cosh^{\nu}\left(c z^2+g\right) dz == \frac{e^{e+d z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\, 2^{-\nu}}{d} +$$

$$2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{\frac{d^2}{4c(\nu-2k)}+e-g(\nu-2k)}\operatorname{erfi}\left(\frac{d+4ckz-2c\nu z}{2\sqrt{2ck-c\nu}}\right)}{\sqrt{2ck-c\nu}} - \frac{e^{\frac{1}{4}\left(-\frac{d^2}{c\nu-2ck}+4e-8gk+4g\nu\right)}\operatorname{erf}\left(\frac{d-4ckz+2c\nu z}{2\sqrt{2ck-c\nu}}\right)}{\sqrt{2ck-c\nu}}\right) /; \nu\in\mathbb{N}^+$$

01.20.21.2737.01

$$\int e^{e+d z} \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz == \frac{e^{e+d z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\, 2^{-\nu}}{d} + 2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$

$$\left(\frac{e^{e+2gk-g\nu+(2ck-c\nu)\sqrt{z}+dz}}{d} + \frac{e^{e-2gk+g\nu+(-2ck+c\nu)\sqrt{z}+dz}}{d} - \frac{e^{-\frac{(2ck-c\nu)^2}{4d}+e+2gk-g\nu}\sqrt{\pi}\,(2ck-c\nu)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(2k-\nu)}{2\sqrt{d}}\right)}{2d^{3/2}} -\right.$$

$$\left.\frac{c\,e^{-\frac{c^2(\nu-2k)^2}{4d}+e-2gk+g\nu}\sqrt{\pi}\,(\nu-2k)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(\nu-2k)}{2\sqrt{d}}\right)}{2d^{3/2}}\right) /; \nu\in\mathbb{N}^+$$

Involving $e^{b z^r}\, c\, \text{osh}^{\nu}\left(c z^r+g\right)$

01.20.21.2738.01

$$\int e^{b z^r} \cosh^{\nu}(c z^r+g)\, dz ==$$

$$-\frac{2^{-\nu} z}{r}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-2gk-g\nu}\binom{\nu}{k}\left(e^{4gk}\,\Gamma\left(\frac{1}{r},(-b-2ck+c\nu)z^r\right)\left((-b-2ck+c\nu)z^r\right)^{-1/r} + e^{2g\nu}\left((-b-c(\nu-2k))z^r\right)^{-1/r}\right.$$

$$\left.\Gamma\left(\frac{1}{r},(-b-c(\nu-2k))z^r\right)\right) - 2^{-\nu}\,\frac{z(-bz^r)^{-1/r}(1-\nu \bmod 2)}{r}\binom{\nu}{\frac{\nu}{2}}\Gamma\left(\frac{1}{r},-bz^r\right) /; \nu\in\mathbb{N}^+$$

01.20.21.2739.01

$$\int e^{b z^2} \cosh^{\nu}\left(c z^2+g\right) dz == \frac{2^{-\nu-1}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\sqrt{b}\, z\right)(1-\nu \bmod 2)}{\sqrt{b}} +$$

$$2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{-g(\nu-2k)}\operatorname{erfi}\left(\frac{2bz+4ckz-2c\nu z}{2\sqrt{b+2ck-c\nu}}\right)}{\sqrt{b+2ck-c\nu}} - \frac{e^{-2gk+g\nu}\operatorname{erf}\left(\frac{2bz-4ckz+2c\nu z}{2\sqrt{-b+2ck-c\nu}}\right)}{\sqrt{-b+2ck-c\nu}}\right) /; \nu\in\mathbb{N}^+$$

01.20.21.2740.01

$$\int e^{\sqrt{z}\,b}\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{2^{1-\nu}\,e^{b\sqrt{z}}\left(b\sqrt{z}-1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+2^{2-\nu}\,e^{b\sqrt{z}}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\left(b^2-c^2\,(2\,k-\nu)^2\right)^2}\binom{\nu}{k}\left(\left(\sqrt{z}\,b^3-b^2-c^2\,(2\,k-\nu)^2\,\sqrt{z}\,b-c^2\,(2\,k-\nu)^2\right)\cosh\left(c\,(2\,k-\nu)\,\sqrt{z}-g\,(\nu-2\,k)\right)-\right.$$

$$\left.c\,(2\,k-\nu)\left(\sqrt{z}\,b^2-2\,b-c^2\,(2\,k-\nu)^2\,\sqrt{z}\right)\sinh\left(c\,(2\,k-\nu)\,\sqrt{z}-g\,(\nu-2\,k)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b\,z^r+e}\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2741.01

$$\int e^{b\,z^r+e}\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$-\frac{1}{r}\,2^{-\nu-1}\,z\left(2\,e^{e}\binom{\nu}{\frac{\nu}{2}}\Gamma\left(\frac{1}{r},-b\,z^r\right)(1-\nu \bmod 2)\,(-b\,z^r)^{-1/r}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(2\,e^{e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)\right.\right.$$

$$\left.\left.((-b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}+2\,e^{e-2\,g\,s+g\,\nu}\,((-b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2742.01

$$\int e^{b\,z^2+e}\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu-1}\,e^{e}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\sqrt{b}\,z\right)(1-\nu \bmod 2)}{\sqrt{b}}+$$

$$2^{-\nu-1}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{e-g\,(\nu-2\,k)}\operatorname{erfi}\left(\frac{2\,b\,z+4\,c\,k\,z-2\,c\,\nu\,z}{2\sqrt{b+2\,c\,k-c\,\nu}}\right)}{\sqrt{b+2\,c\,k-c\,\nu}}-\frac{e^{e-2\,g\,k+g\,\nu}\operatorname{erf}\left(\frac{2\,b\,z-4\,c\,k\,z+2\,c\,\nu\,z}{2\sqrt{-b+2\,c\,k-c\,\nu}}\right)}{\sqrt{-b+2\,c\,k-c\,\nu}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2743.01

$$\int e^{\sqrt{z}\,b+e}\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{2^{1-\nu}\,e^{\sqrt{z}\,b+e}\left(b\sqrt{z}-1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+2^{2-\nu}\,e^{\sqrt{z}\,b+e}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\left(b^2-c^2\,(2\,k-\nu)^2\right)^2}\binom{\nu}{k}\left(\left(\sqrt{z}\,b^3-b^2-c^2\,(2\,k-\nu)^2\,\sqrt{z}\,b-c^2\,(2\,k-\nu)^2\right)\cosh\left(c\,(2\,k-\nu)\,\sqrt{z}-g\,(\nu-2\,k)\right)-\right.$$

$$\left.c\,(2\,k-\nu)\left(\sqrt{z}\,b^2-2\,b-c^2\,(2\,k-\nu)^2\,\sqrt{z}\right)\sinh\left(c\,(2\,k-\nu)\,\sqrt{z}-g\,(\nu-2\,k)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z}\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2744.01

$$\int e^{b z^2+d z} \cosh^{\nu}\left(c z^2+g\right) dz == \frac{2^{-\nu-1} e^{-\frac{d^2}{4 b}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\frac{d+2 b z}{2 \sqrt{b}}\right) (1-\nu \bmod 2)}{\sqrt{b}} +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{g(\nu-2k)-\frac{d^2}{4(b+c(\nu-2k))}} \operatorname{erfi}\left(\frac{d+2 b z-4 c k z+2 c \nu z}{2 \sqrt{b-2 c k+c \nu}}\right)}{\sqrt{b-2 c k+c \nu}} - \frac{e^{\frac{1}{4}\left(-\frac{d^2}{b+2 c k-c \nu}+8 g k-4 g \nu\right)} \operatorname{erf}\left(\frac{d+2 b z+4 c k z-2 c \nu z}{2 \sqrt{-b-2 c k+c \nu}}\right)}{\sqrt{-b-2 c k+c \nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2745.01

$$\int e^{\sqrt{z}\, b+d z} \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz ==$$

$$\left(\frac{e^{\sqrt{z}\, b+d z}}{d} - \frac{b\, e^{-\frac{b^2}{4 d}} \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b+2 d \sqrt{z}}{2 \sqrt{d}}\right)}{2 d^{3/2}} \right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\, 2^{-\nu} + 2^{-\nu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-2 g k+g \nu+d z+(b-2 c k+c \nu) \sqrt{z}}}{d} + \right.$$

$$\frac{e^{2 g k-g \nu+d z+(b+2 c k-c \nu) \sqrt{z}}}{d} - \frac{e^{-\frac{(b+2 c k-c \nu)^2}{4 d}+2 g k-g \nu} \sqrt{\pi}\, (b+2 c k-c \nu) \operatorname{erfi}\left(\frac{b+c(2 k-\nu)+2 d \sqrt{z}}{2 \sqrt{d}}\right)}{2 d^{3/2}} -$$

$$\left. \frac{e^{-\frac{(b+c(\nu-2 k))^2}{4 d}-2 g k+g \nu} \sqrt{\pi}\, (b+c(\nu-2 k)) \operatorname{erfi}\left(\frac{b+c(\nu-2 k)+2 d \sqrt{z}}{2 \sqrt{d}}\right)}{2 d^{3/2}} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{b z^r+d z+e} \cosh^{\nu}\left(c z^r+g\right)$

01.20.21.2746.01

$$\int e^{b z^2+d z+e} \cosh^{\nu}\left(c z^2+g\right) dz == \frac{2^{-\nu-1} e^{e-\frac{d^2}{4 b}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\frac{d+2 b z}{2 \sqrt{b}}\right) (1-\nu \bmod 2)}{\sqrt{b}} + 2^{-\nu-1} \sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{d^2}{4(b+c(\nu-2k))}+e+g(\nu-2k)} \operatorname{erfi}\left(\frac{d+2 b z-4 c k z+2 c \nu z}{2 \sqrt{b-2 c k+c \nu}}\right)}{\sqrt{b-2 c k+c \nu}} - \frac{e^{\frac{1}{4}\left(-\frac{d^2}{b+2 c k-c \nu}+4 e+8 g k-4 g \nu\right)} \operatorname{erf}\left(\frac{d+2 b z+4 c k z-2 c \nu z}{2 \sqrt{-b-2 c k+c \nu}}\right)}{\sqrt{-b-2 c k+c \nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2747.01

$$\int e^{\sqrt{z}\ b+e+d\,z}\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz == \left(\frac{e^{\sqrt{z}\ b+e+d\,z}}{d}-\frac{b\,e^{e-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{2\,d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,2^{-\nu}+2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{e+2\,g\,k-g\,\nu+(b+2\,c\,k-c\,\nu)\sqrt{z}+d\,z}}{d}+\right.$$
$$\frac{e^{e-2\,g\,k+g\,\nu+(b-2\,c\,k+c\,\nu)\sqrt{z}+d\,z}}{d}-\frac{e^{-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,d}+e+2\,g\,k-g\,\nu}\sqrt{\pi}\ (b+2\,c\,k-c\,\nu)\operatorname{erfi}\left(\frac{b+c\,(2\,k-\nu)+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{2\,d^{3/2}}-$$
$$\left.\frac{e^{-\frac{(b+c\,(\nu-2\,k))^2}{4\,d}+e-2\,g\,k+g\,\nu}\sqrt{\pi}\ (b+c\,(\nu-2\,k))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,k)+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{2\,d^{3/2}}\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{d\,z}\cosh^{\nu}\left(c\,z^{r}+f\,z\right)$

01.20.21.2748.01

$$\int e^{d\,z}\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu}\,e^{d\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d}+$$
$$2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{\frac{(d-f\,(\nu-2\,k))^2}{4\,c\,(\nu-2\,k)}}\operatorname{erfi}\left(\frac{d+2\,f\,k-f\,\nu+4\,c\,k\,z-2\,c\,\nu\,z}{2\sqrt{2\,c\,k-c\,\nu}}\right)}{\sqrt{2\,c\,k-c\,\nu}}-\frac{e^{-\frac{(d-2\,f\,k+f\,\nu)^2}{4\,(c\,\nu-2\,c\,k)}}\operatorname{erf}\left(\frac{d-2\,f\,k+f\,\nu-4\,c\,k\,z+2\,c\,\nu\,z}{2\sqrt{2\,c\,k-c\,\nu}}\right)}{\sqrt{2\,c\,k-c\,\nu}}\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2749.01

$$\int e^{d\,z}\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz == \frac{e^{d\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,2^{-\nu}}{d}+$$
$$2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{\sqrt{z}\ (c\,\nu-2\,c\,k)+(d-2\,f\,k+f\,\nu)\,z}}{d-2\,f\,k+f\,\nu}-\frac{c\,e^{-\frac{c^2\,(\nu-2\,k)^2}{4\,(d+f\,(\nu-2\,k))}}\sqrt{\pi}\ (\nu-2\,k)\operatorname{erfi}\left(\frac{c\,(\nu-2\,k)+2\,(d-2\,f\,k+f\,\nu)\sqrt{z}}{2\sqrt{d+f\,(\nu-2\,k)}}\right)}{2\,(d-2\,f\,k+f\,\nu)^{3/2}}+\right.$$
$$\left.\frac{e^{\sqrt{z}\ (2\,c\,k-c\,\nu)+(d+2\,f\,k-f\,\nu)\,z}}{d+2\,f\,k-f\,\nu}-\frac{e^{-\frac{(2\,c\,k-c\,\nu)^2}{4\,(d+2\,f\,k-f\,\nu)}}\sqrt{\pi}\ (2\,c\,k-c\,\nu)\operatorname{erfi}\left(\frac{c\,(2\,k-\nu)+2\,(d+2\,f\,k-f\,\nu)\sqrt{z}}{2\sqrt{d+2\,f\,k-f\,\nu}}\right)}{2\,(d+2\,f\,k-f\,\nu)^{3/2}}\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{d\,z+e}\cosh^{\nu}\left(c\,z^{r}+f\,z\right)$

01.20.21.2750.01

$$\int e^{e+d z} \cosh^{\nu}\left(c z^2+f z\right) dz == \frac{2^{-\nu}\, e^{e+d z} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)}{d} +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{\frac{(d-f(\nu-2k))^2}{4c(\nu-2k)}+e} \operatorname{erfi}\left(\frac{d+2fk-f\nu+4ckz-2c\nu z}{2\sqrt{2ck-c\nu}} \right)}{\sqrt{2ck-c\nu}} - \frac{e^{\frac{1}{4}\left(-\frac{(d-2fk+f\nu)^2}{c\nu-2ck}+4e\right)} \operatorname{erf}\left(\frac{d-2fk+f\nu-4ckz+2c\nu z}{2\sqrt{2ck-c\nu}} \right)}{\sqrt{2ck-c\nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2751.01

$$\int e^{e+d z} \cosh^{\nu}\left(\sqrt{z}\, c+f z\right) dz == \frac{e^{e+d z} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\, 2^{-\nu}}{d} +$$

$$2^{-\nu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{e+(d-2fk+f\nu)z+(c\nu-2ck)\sqrt{z}}}{d-2fk+f\nu} - \frac{c\, e^{e-\frac{c^2(\nu-2k)^2}{4(d+f(\nu-2k))}} \sqrt{\pi}\, (\nu-2k) \operatorname{erfi}\left(\frac{c(\nu-2k)+2(d-2fk+f\nu)\sqrt{z}}{2\sqrt{d+f(\nu-2k)}} \right)}{2(d-2fk+f\nu)^{3/2}} + \right.$$

$$\left. \frac{e^{e+(d+2fk-f\nu)z+(2ck-c\nu)\sqrt{z}}}{d+2fk-f\nu} - \frac{e^{e-\frac{(2ck-c\nu)^2}{4(d+2fk-f\nu)}} \sqrt{\pi}\, (2ck-c\nu) \operatorname{erfi}\left(\frac{c(2k-\nu)+2(d+2fk-f\nu)\sqrt{z}}{2\sqrt{d+2fk-f\nu}} \right)}{2(d+2fk-f\nu)^{3/2}} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{b z^r} \cosh^{\nu}\left(c z^r+f z\right)$

01.20.21.2752.01

$$\int e^{b z^2} \cosh^{\nu}\left(c z^2+f z\right) dz == \frac{2^{-\nu-1} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right) (1-\nu \bmod 2)}{\sqrt{b}} +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{f^2(\nu-2k)^2}{4(b+c(\nu-2k))}} \operatorname{erfi}\left(\frac{-2fk-4czk+f\nu+2bz+2c\nu z}{2\sqrt{b-2ck+c\nu}} \right)}{\sqrt{b-2ck+c\nu}} - \frac{e^{-\frac{(2fk-f\nu)^2}{4(b+2ck-c\nu)}} \operatorname{erf}\left(\frac{2fk+4czk-f\nu+2bz-2c\nu z}{2\sqrt{-b-2ck+c\nu}} \right)}{\sqrt{-b-2ck+c\nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2753.01

$$\int e^{b\sqrt{z}}\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz == \frac{2^{1-\nu}\,e^{b\sqrt{z}}\left(b\sqrt{z}-1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2} +$$

$$2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{\sqrt{z}\,(b-2ck+c\nu)+(f\nu-2fk)z}}{f\nu-2fk}-\frac{e^{\frac{(b-c(2k-\nu))^2}{4f(2k-\nu)}}\sqrt{\pi}\,(b-2ck+c\nu)\operatorname{erfi}\left(\frac{b-c(2k-\nu)+2(f\nu-2fk)\sqrt{z}}{2\sqrt{f\nu-2fk}}\right)}{2(f\nu-2fk)^{3/2}}+\right.$$

$$\left.\frac{e^{\sqrt{z}\,(b+2ck-c\nu)+(2fk-f\nu)z}}{2fk-f\nu}-\frac{e^{\frac{(b-c(\nu-2k))^2}{4f(\nu-2k)}}\sqrt{\pi}\,(b-c(\nu-2k))\operatorname{erfi}\left(\frac{b-c(\nu-2k)+2(2fk-f\nu)\sqrt{z}}{2\sqrt{-f(\nu-2k)}}\right)}{2(2fk-f\nu)^{3/2}}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b z^r+e}\cosh^{\nu}\left(c z^r+f z\right)$

01.20.21.2754.01

$$\int e^{bz^2+e}\cosh^{\nu}\left(cz^2+fz\right)dz == \frac{2^{-\nu-1}\,e^{e}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\sqrt{b}\,z\right)(1-\nu \bmod 2)}{\sqrt{b}} +$$

$$2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{-\frac{f^2(\nu-2k)^2}{4(b+c(\nu-2k))}+e}\operatorname{erfi}\left(\frac{-2fk-4czk+f\nu+2bz+2c\nu z}{2\sqrt{b-2ck+c\nu}}\right)}{\sqrt{b-2ck+c\nu}}-\frac{e^{\frac{1}{4}\left(-\frac{(2fk-f\nu)^2}{b+2ck-c\nu}+4e\right)}\operatorname{erf}\left(\frac{2fk+4czk-f\nu+2bz-2c\nu z}{2\sqrt{-b-2ck+c\nu}}\right)}{\sqrt{-b-2ck+c\nu}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2755.01

$$\int e^{\sqrt{z}\,b+e}\cosh^{\nu}\left(\sqrt{z}\,c+fz\right)dz == \frac{2^{1-\nu}\,e^{\sqrt{z}\,b+e}\left(b\sqrt{z}-1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2} +$$

$$2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{e+(f\nu-2fk)z+(b-2ck+c\nu)\sqrt{z}}}{f\nu-2fk}-\frac{e^{\frac{(b-c(2k-\nu))^2}{4f(2k-\nu)}+e}\sqrt{\pi}\,(b-2ck+c\nu)\operatorname{erfi}\left(\frac{b-c(2k-\nu)+2(f\nu-2fk)\sqrt{z}}{2\sqrt{f\nu-2fk}}\right)}{2(f\nu-2fk)^{3/2}}+\right.$$

$$\left.\frac{e^{e+(2fk-f\nu)z+(b+2ck-c\nu)\sqrt{z}}}{2fk-f\nu}-\frac{e^{\frac{(b-c(\nu-2k))^2}{4f(\nu-2k)}+e}\sqrt{\pi}\,(b-c(\nu-2k))\operatorname{erfi}\left(\frac{b-c(\nu-2k)+2(2fk-f\nu)\sqrt{z}}{2\sqrt{-f(\nu-2k)}}\right)}{2(2fk-f\nu)^{3/2}}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b z^r+d z}\cosh^{\nu}\left(c z^r+f z\right)$

01.20.21.2756.01

$$\int e^{b z^2+d z} \cosh^{\nu}\left(c z^2+f z\right) dz == \frac{2^{-\nu-1} \sqrt{\pi}\ (1-\nu \bmod 2)}{\sqrt{b}} \binom{\nu}{\frac{\nu}{2}} e^{-\frac{d^2}{4 b}} \operatorname{erfi}\left(\frac{d+2 b z}{2 \sqrt{b}}\right) +$$

$$2^{-\nu-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{(d+f(\nu-2k))^2}{4(b+c(\nu-2k))}} \operatorname{erfi}\left(\frac{d-2 f k+f \nu+2 b z-4 c k z+2 c \nu z}{2 \sqrt{b-2 c k+c \nu}}\right)}{\sqrt{b-2 c k+c \nu}} - \frac{e^{-\frac{(d+2 f k-f \nu)^2}{4(b+2 c k-c \nu)}} \operatorname{erf}\left(\frac{d+2 f k-f \nu+2 b z+4 c k z-2 c \nu z}{2 \sqrt{-b-2 c k+c \nu}}\right)}{\sqrt{-b-2 c k+c \nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2757.01

$$\int e^{\sqrt{z}\ b+d z} \cosh^{\nu}\left(\sqrt{z}\ c+f z\right) dz == \left(\frac{e^{\sqrt{z}\ b+d z}}{d} - \frac{b\, e^{-\frac{b^2}{4 d}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2 d \sqrt{z}}{2 \sqrt{d}}\right)}{2 d^{3/2}} \right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\, 2^{-\nu} +$$

$$2^{-\nu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(- \frac{\left(\sqrt{\pi}\ (b+2 c k-c \nu)\right) e^{-\frac{(b+2 c k-c \nu)^2}{4(d+2 f k-f \nu)}} \operatorname{erfi}\left(\frac{b+c(2 k-\nu)+2(d+2 f k-f \nu)\sqrt{z}}{2 \sqrt{d+2 f k-f \nu}}\right)}{2 (d+2 f k-f \nu)^{3/2}} - \right.$$

$$\frac{\left(\sqrt{\pi}\ (b+c(\nu-2k))\right) e^{-\frac{(b+c(\nu-2k))^2}{4(d+f(\nu-2k))}} \operatorname{erfi}\left(\frac{b+c(\nu-2k)+2(d-2 f k+f \nu)\sqrt{z}}{2 \sqrt{d+f(\nu-2k)}}\right)}{2 (d-2 f k+f \nu)^{3/2}} +$$

$$\left. \frac{e^{\sqrt{z}\ (b-2 c k+c \nu)+(d-2 f k+f \nu) z}}{d-2 f k+f \nu} + \frac{e^{\sqrt{z}\ (b+2 c k-c \nu)+(d+2 f k-f \nu) z}}{d+2 f k-f \nu} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{b z^r+d z+e} \cosh^{\nu}\left(c z^r+f z\right)$

01.20.21.2758.01

$$\int e^{b z^2+d z+e} \cosh^{\nu}\left(c z^2+f z\right) dz == \frac{2^{-\nu-1} \sqrt{\pi}\ (1-\nu \bmod 2)}{\sqrt{b}} \binom{\nu}{\frac{\nu}{2}} e^{e-\frac{d^2}{4 b}} \operatorname{erfi}\left(\frac{d+2 b z}{2 \sqrt{b}}\right) + 2^{-\nu-1} \sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{e^{-\frac{(d+f(\nu-2k))^2}{4(b+c(\nu-2k))}+e} \operatorname{erfi}\left(\frac{d-2 f k+f \nu+2 b z-4 c k z+2 c \nu z}{2 \sqrt{b-2 c k+c \nu}}\right)}{\sqrt{b-2 c k+c \nu}} - \frac{e^{\frac{1}{4}\left(-\frac{(d+2 f k-f \nu)^2}{b+2 c k-c \nu}+4 e\right)} \operatorname{erf}\left(\frac{d+2 f k-f \nu+2 b z+4 c k z-2 c \nu z}{2 \sqrt{-b-2 c k+c \nu}}\right)}{\sqrt{-b-2 c k+c \nu}} \right) /; \nu \in \mathbb{N}^+$$

01.20.21.2759.01

$$\int e^{\sqrt{z}\ b+e+d\,z}\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz == \left(\frac{e^{\sqrt{z}\ b+e+d\,z}}{d}-\frac{b\,e^{e-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{2\,d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,2^{-\nu}+$$

$$2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(-\frac{\left(\sqrt{\pi}\ (b+2\,c\,k-c\,\nu)\right)e^{e-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,(d+2\,f\,k-f\,\nu)}}\operatorname{erfi}\left(\frac{b+c\,(2\,k-\nu)+2\,(d+2\,f\,k-f\,\nu)\sqrt{z}}{2\sqrt{d+2\,f\,k-f\,\nu}}\right)}{2\,(d+2\,f\,k-f\,\nu)^{3/2}}-\right.$$

$$\frac{\left(\sqrt{\pi}\ (b+c\,(\nu-2\,k))\right)e^{e-\frac{(b+c\,(\nu-2\,k))^2}{4\,(d+f\,(\nu-2\,k))}}\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,k)+2\,(d-2\,f\,k+f\,\nu)\sqrt{z}}{2\sqrt{d+f\,(\nu-2\,k)}}\right)}{2\,(d-2\,f\,k+f\,\nu)^{3/2}}+$$

$$\left.\frac{e^{e+(d-2\,f\,k+f\,\nu)\,z+(b-2\,c\,k+c\,\nu)\sqrt{z}}}{d-2\,f\,k+f\,\nu}+\frac{e^{e+(d+2\,f\,k-f\,\nu)\,z+(b+2\,c\,k-c\,\nu)\sqrt{z}}}{d+2\,f\,k-f\,\nu}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{d\,z}\cosh^{\nu}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.2760.01

$$\int e^{d\,z}\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == \frac{2^{-\nu}\,e^{d\,z}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d}+2^{-\nu-1}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{\frac{(d-f\,(\nu-2\,k))^2}{4\,c\,(\nu-2\,k)}-g\,(\nu-2\,k)}\operatorname{erfi}\left(\frac{d+2\,f\,k-f\,\nu+4\,c\,k\,z-2\,c\,\nu\,z}{2\sqrt{2\,c\,k-c\,\nu}}\right)}{\sqrt{2\,c\,k-c\,\nu}}-\frac{e^{\frac{1}{4}\left(-\frac{(d-2\,f\,k+f\,\nu)^2}{c\,\nu-2\,c\,k}-8\,g\,k+4\,g\,\nu\right)}\operatorname{erf}\left(\frac{d-2\,f\,k+f\,\nu-4\,c\,k\,z+2\,c\,\nu\,z}{2\sqrt{2\,c\,k-c\,\nu}}\right)}{\sqrt{2\,c\,k-c\,\nu}}\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2761.01

$$\int e^{d z} \cosh^{v}\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$\frac{e^{d z}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\, 2^{-v}}{d} + 2^{-v} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{e^{2 g k - g v + (2 c k - c v)\sqrt{z} + (d + 2 f k - f v) z}}{d + 2 f k - f v} + \frac{e^{-2 g k + g v + (-2 c k + c v)\sqrt{z} + (d - 2 f k + f v) z}}{d - 2 f k + f v} - \right.$$

$$\frac{c\, e^{-\frac{c^2 (v-2k)^2}{4 (d + f (v-2k))} - 2 g k + g v} \sqrt{\pi}\, (v - 2 k)\, \operatorname{erfi}\left(\frac{c (v-2k) + 2 (d - 2 f k + f v)\sqrt{z}}{2 \sqrt{d + f (v-2k)}} \right)}{2 (d - 2 f k + f v)^{3/2}} -$$

$$\left. \frac{e^{-\frac{(2 c k - c v)^2}{4 (d + 2 f k - f v)} + 2 g k - g v} \sqrt{\pi}\, (2 c k - c v)\, \operatorname{erfi}\left(\frac{c (2k - v) + 2 (d + 2 f k - f v)\sqrt{z}}{2 \sqrt{d + 2 f k - f v}} \right)}{2 (d + 2 f k - f v)^{3/2}} \right) /;\ v \in \mathbb{N}^{+}$$

Involving $e^{d z + e} \cosh^{v}\left(c z^{r} + f z + g\right)$

01.20.21.2762.01

$$\int e^{e + d z} \cosh^{v}\left(c z^2 + f z + g\right) dz == \frac{2^{-v}\, e^{e + d z}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)}{d} + 2^{-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k}$$

$$\left(\frac{e^{\frac{(d - f (v-2k))^2}{4 c (v-2k)} + e - g (v-2k)} \operatorname{erfi}\left(\frac{d + 2 f k - f v + 4 c k z - 2 c v z}{2 \sqrt{2 c k - c v}} \right)}{\sqrt{2 c k - c v}} - \frac{e^{\frac{1}{4}\left(-\frac{(d - 2 f k + f v)^2}{c v - 2 c k} + 4 e - 8 g k + 4 g v \right)} \operatorname{erf}\left(\frac{d - 2 f k + f v - 4 c k z + 2 c v z}{2 \sqrt{2 c k - c v}} \right)}{\sqrt{2 c k - c v}} \right) /;\ v \in \mathbb{N}^{+}$$

01.20.21.2763.01

$$\int e^{e + d z} \cosh^{v}\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$\frac{e^{e + d z}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\, 2^{-v}}{d} + 2^{-v} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{e^{e + 2 g k - g v + (2 c k - c v)\sqrt{z} + (d + 2 f k - f v) z}}{d + 2 f k - f v} + \frac{e^{e - 2 g k + g v + (-2 c k + c v)\sqrt{z} + (d - 2 f k + f v) z}}{d - 2 f k + f v} - \right.$$

$$\frac{c\, e^{-\frac{c^2 (v-2k)^2}{4 (d + f (v-2k))} + e - 2 g k + g v} \sqrt{\pi}\, (v - 2 k)\, \operatorname{erfi}\left(\frac{c (v-2k) + 2 (d - 2 f k + f v)\sqrt{z}}{2 \sqrt{d + f (v-2k)}} \right)}{2 (d - 2 f k + f v)^{3/2}} -$$

$$\left. \frac{e^{-\frac{(2 c k - c v)^2}{4 (d + 2 f k - f v)} + e + 2 g k - g v} \sqrt{\pi}\, (2 c k - c v)\, \operatorname{erfi}\left(\frac{c (2k - v) + 2 (d + 2 f k - f v)\sqrt{z}}{2 \sqrt{d + 2 f k - f v}} \right)}{2 (d + 2 f k - f v)^{3/2}} \right) /;\ v \in \mathbb{N}^{+}$$

Involving $e^{b z^r} \cosh^v(c z^r + f z + g)$

01.20.21.2764.01

$$\int e^{b z^2} \cosh^v(c z^2 + f z + g)\, dz == \frac{2^{-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right) (1 - v \bmod 2)}{\sqrt{b}} + 2^{-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k}$$

$$\left(\frac{e^{-\frac{f^2 (v-2k)^2}{4(b+c(v-2k))} + g(v-2k)} \operatorname{erfi}\left(\frac{-2fk - 4czk + fv + 2bz + 2cvz}{2\sqrt{b - 2ck + cv}} \right)}{\sqrt{b - 2ck + cv}} - \frac{e^{\frac{1}{4}\left(-\frac{(2fk - fv)^2}{b + 2ck - cv} + 8gk - 4gv \right)} \operatorname{erf}\left(\frac{2fk + 4czk - fv + 2bz - 2cvz}{2\sqrt{-b - 2ck + cv}} \right)}{\sqrt{-b - 2ck + cv}} \right) /;\ v \in \mathbb{N}^+$$

01.20.21.2765.01

$$\int e^{b\sqrt{z}} \cosh^v\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$\frac{2^{1-v} e^{b\sqrt{z}} \left(b\sqrt{z} - 1\right) \binom{v}{\frac{v}{2}} (1 - v \bmod 2)}{b^2} + 2^{-v} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{e^{2gk - gv + (b + 2ck - cv)\sqrt{z} + (2fk - fv)z}}{2fk - fv} + \right.$$

$$\frac{e^{-2gk + gv + (b - 2ck + cv)\sqrt{z} + (-2fk + fv)z}}{-2fk + fv} - \frac{e^{\frac{(b - c(2k-v))^2}{4f(2k-v)} - 2gk + gv} \sqrt{\pi}\, (b - 2ck + cv) \operatorname{erfi}\left(\frac{b - c(2k-v) + 2(fv - 2fk)\sqrt{z}}{2\sqrt{fv - 2fk}} \right)}{2(fv - 2fk)^{3/2}} -$$

$$\left. \frac{e^{\frac{(b - c(v-2k))^2}{4f(v-2k)} + 2gk - gv} \sqrt{\pi}\, (b - c(v - 2k)) \operatorname{erfi}\left(\frac{b - c(v-2k) + 2(2fk - fv)\sqrt{z}}{2\sqrt{-f(v-2k)}} \right)}{2(2fk - fv)^{3/2}} \right) /;\ v \in \mathbb{N}^+$$

Involving $e^{b z^r + e} \cosh^v(c z^r + f z + g)$

01.20.21.2766.01

$$\int e^{b z^2 + e} \cosh^v(c z^2 + f z + g)\, dz ==$$

$$\frac{2^{-v-1} e^e \sqrt{\pi} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right) (1 - v \bmod 2)}{\sqrt{b}} + 2^{-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{e^{-\frac{f^2 (v-2k)^2}{4(b+c(v-2k))} + g(v-2k) + e} \operatorname{erfi}\left(\frac{-2fk - 4czk + fv + 2bz + 2cvz}{2\sqrt{b - 2ck + cv}} \right)}{\sqrt{b - 2ck + cv}} - \right.$$

$$\left. \frac{e^{\frac{1}{4}\left(-\frac{(2fk - fv)^2}{b + 2ck - cv} + 4e + 8gk - 4gv \right)} \operatorname{erf}\left(\frac{2fk + 4czk - fv + 2bz - 2cvz}{2\sqrt{-b - 2ck + cv}} \right)}{\sqrt{-b - 2ck + cv}} \right) /;\ v \in \mathbb{N}^+$$

01.20.21.2767.01

$$\int e^{\sqrt{z}\,b+e}\cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$
$$\frac{2^{1-\nu}\,e^{\sqrt{z}\,b+e}\left(b\sqrt{z}-1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{e+2\,g\,k-g\,\nu+(b+2\,c\,k-c\,\nu)\sqrt{z}+(2\,f\,k-f\,\nu)\,z}}{2\,f\,k-f\,\nu}+\right.$$
$$\frac{e^{e-2\,g\,k+g\,\nu+(b-2\,c\,k+c\,\nu)\sqrt{z}+(-2\,f\,k+f\,\nu)\,z}}{-2\,f\,k+f\,\nu}-\frac{e^{\frac{(b-c\,(2\,k-\nu))^2}{4\,f\,(2\,k-\nu)}+e-2\,g\,k+g\,\nu}\sqrt{\pi}\,(b-2\,c\,k+c\,\nu)\,\operatorname{erfi}\left(\frac{b-c\,(2\,k-\nu)+2\,(f\,\nu-2\,f\,k)\sqrt{z}}{2\sqrt{f\,\nu-2\,f\,k}}\right)}{2\,(f\,\nu-2\,f\,k)^{3/2}}-$$
$$\left.\frac{e^{\frac{(b-c\,(\nu-2\,k))^2}{4\,f\,(\nu-2\,k)}+e+2\,g\,k-g\,\nu}\sqrt{\pi}\,(b-c\,(\nu-2\,k))\,\operatorname{erfi}\left(\frac{b-c\,(\nu-2\,k)+2\,(2\,f\,k-f\,\nu)\sqrt{z}}{2\sqrt{-f\,(\nu-2\,k)}}\right)}{2\,(2\,f\,k-f\,\nu)^{3/2}}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{b\,z^r+d\,z}\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.2768.01

$$\int e^{b\,z^2+d\,z}\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz==\frac{2^{-\nu-1}\sqrt{\pi}\,(1-\nu \bmod 2)}{\sqrt{b}}\binom{\nu}{\frac{\nu}{2}}e^{-\frac{d^2}{4\,b}}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right)+2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$
$$\left(\frac{e^{-\frac{(d+f\,(\nu-2\,k))^2}{4\,(b+c\,(\nu-2\,k))}+g\,(\nu-2\,k)}\operatorname{erfi}\left(\frac{d-2\,f\,k+f\,\nu+2\,b\,z-4\,c\,k\,z+2\,c\,\nu\,z}{2\sqrt{b-2\,c\,k+c\,\nu}}\right)}{\sqrt{b-2\,c\,k+c\,\nu}}-\frac{e^{\frac{1}{4}\left(-\frac{(d+2\,f\,k-f\,\nu)^2}{b+2\,c\,k-c\,\nu}+8\,g\,k-4\,g\,\nu\right)}\operatorname{erf}\left(\frac{d+2\,f\,k-f\,\nu+2\,b\,z+4\,c\,k\,z-2\,c\,\nu\,z}{2\sqrt{-b-2\,c\,k+c\,\nu}}\right)}{\sqrt{-b-2\,c\,k+c\,\nu}}\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.2769.01

$$\int e^{\sqrt{z}\ b+d\,z}\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz == \left(\frac{e^{\sqrt{z}\ b+d\,z}}{d}-\frac{b\,e^{-\frac{b^2}{4\,d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{2\,d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,2^{-\nu}+$$

$$2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(-\left(\left(\sqrt{\pi}\ (b+2\,c\,k-c\,\nu)\right)e^{-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,(d+2\,f\,k-f\,\nu)}+2\,g\,k-g\,\nu}\operatorname{erfi}\left(\frac{b+c\,(2\,k-\nu)+2\,(d+2\,f\,k-f\,\nu)\,\sqrt{z}}{2\sqrt{d+2\,f\,k-f\,\nu}}\right)\right)\Big/\right.$$

$$\left(2\,(d+2\,f\,k-f\,\nu)^{3/2}\right)-\frac{\left(\sqrt{\pi}\ (b+c\,(\nu-2\,k))\right)e^{-\frac{(b+c\,(\nu-2\,k))^2}{4\,(d+f\,(\nu-2\,k))}-2\,g\,k+g\,\nu}\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,k)+2\,(d-2\,f\,k+f\,\nu)\,\sqrt{z}}{2\sqrt{d+f\,(\nu-2\,k)}}\right)}{2\,(d-2\,f\,k+f\,\nu)^{3/2}}+$$

$$\left.\frac{e^{2\,g\,k-g\,\nu+(d+2\,f\,k-f\,\nu)\,z+(b+2\,c\,k-c\,\nu)\,\sqrt{z}}}{d+2\,f\,k-f\,\nu}+\frac{e^{-2\,g\,k+g\,\nu+(d-2\,f\,k+f\,\nu)\,z+(b-2\,c\,k+c\,\nu)\,\sqrt{z}}}{d-2\,f\,k+f\,\nu}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.2770.01

$$\int e^{b\,z^2+d\,z+e}\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{2^{-\nu-1}\,e^{-\frac{d^2-4\,b\,e}{4\,b}}\sqrt{\pi}\ (1-\nu \bmod 2)}{\sqrt{b}}\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right)+2^{-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{k}\left(e^{-\frac{(d-2\,f\,k+f\,\nu)^2-4\,(b-2\,c\,k+c\,\nu)\,(e-2\,g\,k+g\,\nu)}{4\,(b-2\,c\,k+c\,\nu)}}\sqrt{b-2\,c\,k+c\,\nu}\right.\right.$$

$$(b+2\,c\,k-c\,\nu)\operatorname{erfi}\left(\frac{d-2\,f\,k+f\,\nu+2\,b\,z-2\,(2\,c\,k-c\,\nu)\,z}{2\sqrt{b-2\,c\,k+c\,\nu}}\right)+e^{-\frac{(d+2\,f\,k-f\,\nu)^2-4\,(b+2\,c\,k-c\,\nu)\,(e+2\,g\,k-g\,\nu)}{4\,(b+2\,c\,k-c\,\nu)}}(b-2\,c\,k+c\,\nu)$$

$$\left.\left.\sqrt{b+2\,c\,k-c\,\nu}\ \operatorname{erfi}\left(\frac{d+2\,f\,k-f\,\nu+2\,(b+2\,c\,k-c\,\nu)\,z}{2\sqrt{b+2\,c\,k-c\,\nu}}\right)\right)\right)\Big/\left((b+2\,c\,k-c\,\nu)\,(b-2\,c\,k+c\,\nu)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2771.01

$$\int e^{\sqrt{z}\,b+d\,z+e}\cosh^{\nu}\left(\sqrt{z}\,c+f\,z+g\right)dz == 2^{-\nu-2}\left(\frac{4\,e^{\sqrt{z}\,b+d\,z}}{d}-\frac{2\,b\,e^{-\frac{b^2}{4\,d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\,e^{e-2\,g\,k-g\,\nu}\left(\frac{2\,e^{4\,g\,k+(d+2\,f\,k-f\,\nu)\,z+(b+2\,c\,k-c\,\nu)\,\sqrt{z}}}{d+2\,f\,k-f\,\nu}+\frac{2\,e^{2\,g\,\nu+(d-2\,f\,k+f\,\nu)\,z+(b-2\,c\,k+c\,\nu)\,\sqrt{z}}}{d-2\,f\,k+f\,\nu}\right)-\right.$$

$$\left(e^{-\frac{(b-2\,c\,k+c\,\nu)^2}{4\,(d-2\,f\,k+f\,\nu)}+e-2\,g\,k+g\,\nu}\sqrt{\pi}\,(b-2\,c\,k+c\,\nu)\operatorname{erfi}\left(\frac{b-2\,c\,k+c\,\nu+2\,(d-2\,f\,k+f\,\nu)\,\sqrt{z}}{2\sqrt{d-2\,f\,k+f\,\nu}}\right)\right)\Big/(d-2\,f\,k+f\,\nu)^{3/2}-$$

$$\left(2\,e^{-\frac{(b+2\,c\,k-c\,\nu)^2}{4\,(d+2\,f\,k-f\,\nu)}+e+2\,g\,k-g\,\nu}\sqrt{\pi}\,(b+2\,c\,k-c\,\nu)\operatorname{erfi}\left(\frac{b+2\,c\,k-c\,\nu+2\,(d+2\,f\,k-f\,\nu)\,\sqrt{z}}{2\sqrt{d+2\,f\,k-f\,\nu}}\right)\right)\Big/(d+2\,f\,k-f\,\nu)^{3/2}-$$

$$\left.\left(e^{-\frac{(b+c\,(\nu-2\,k))^2}{4\,(d+f\,(\nu-2\,k))}+e-2\,g\,k+g\,\nu}\sqrt{\pi}\,(b+c\,(\nu-2\,k))\operatorname{erfi}\left(\frac{b-2\,c\,k+c\,\nu+2\,(d+f\,(\nu-2\,k))\,\sqrt{z}}{2\sqrt{d+f\,(\nu-2\,k)}}\right)\right)\Big/\right.$$

$$\left.(d+f\,(\nu-2\,k))^{3/2}\right)/;\,\nu\in\mathbb{N}^{+}$$

Involving powers of cosh and rational functions of exp

Involving $\cosh^{\nu}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2772.01

$$\int\frac{\cosh^{\nu}(c\,z)}{\left(a+b\,e^{d\,z}\right)^{n}}dz == \frac{2^{-\nu}\,e^{-d\,n\,z}\,(\nu \bmod 2-1)}{d\,n\,b^{n}}\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(n,\,n;\,n+1;\,-\frac{a\,e^{-d\,z}}{b}\right)+$$

$$\frac{2^{-\nu}\,a^{-n}}{c}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\nu-2\,s}\binom{\nu}{s}\left(e^{c\,(\nu-2\,s)\,z}\,{}_2F_1\left(\frac{c\,(\nu-2\,s)}{d},\,n;\,\frac{d+c\,(\nu-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.e^{-c\,(\nu-2\,s)\,z}\,{}_2F_1\left(-\frac{c\,(\nu-2\,s)}{d},\,n;\,\frac{d-c\,(\nu-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)/;\,n\in\mathbb{N}^{+}\bigwedge\nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\cosh^{\nu}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2773.01

$$\int \frac{e^{p z} \cosh^{\nu}(c z)}{\left(a + b\, e^{d z}\right)^{n}} dz ==$$

$$2^{-\nu}\left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor}\left(\binom{\nu}{s}\left(e^{(p+c(\nu-2s))z}(c(\nu-2s)-p)\,{}_2F_1\left(\frac{p+c(\nu-2s)}{d}, n; \frac{d+p+c(\nu-2s)}{d}; -\frac{b\,e^{d z}}{a}\right) - e^{(p-c(\nu-2s))z}(p+c(\nu-2s))\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{p-c(\nu-2s)}{d}, n; \frac{d+p-c(\nu-2s)}{d}; -\frac{b\,e^{d z}}{a}\right)\right)\right) \Big/ ((c(\nu-2s)-p)(p+c(\nu-2s)))\right) a^{-n} +$$

$$\frac{2^{-\nu}\, e^{p z}\, a^{-n}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(\frac{p}{d}, n; \frac{d+p}{d}; -\frac{b\,e^{d z}}{a}\right)(1 - \nu \bmod 2)}{p} /; n \in \mathbb{Z} \wedge n > 0 \wedge \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving powers of cosh and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^{\beta} \cosh^{\nu}(c z)$

01.20.21.2774.01

$$\int \left(a + b\, e^{d z}\right)^{\beta} \cosh^{\nu}(c z)\, dz == \frac{2^{-\nu}\left(a + b\, e^{d z}\right)^{\beta}}{c}\left(\frac{e^{d z} b}{a} + 1\right)^{-\beta}\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor}\frac{1}{\nu - 2s}\binom{\nu}{s}$$

$$\left(e^{c(\nu-2s)z}\,{}_2F_1\left(\frac{c(\nu-2s)}{d}, -\beta; \frac{d+c(\nu-2s)}{d}; -\frac{b\,e^{d z}}{a}\right) - e^{-c(\nu-2s)z}\,{}_2F_1\left(-\frac{c(\nu-2s)}{d}, -\beta; \frac{d-c(\nu-2s)}{d}; -\frac{b\,e^{d z}}{a}\right)\right) -$$

$$\frac{2^{-\nu}\left(a + b\, e^{d z}\right)^{\beta}(\nu \bmod 2 - 1)}{d\,\beta}\left(\frac{e^{-d z} a}{b} + 1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\beta, -\beta; 1 - \beta; -\frac{a\, e^{-d z}}{b}\right) /; \nu \in \mathbb{N}^{+}$$

Involving $e^{p z}\left(a + b\, e^{d z}\right)^{\beta} \cosh^{\nu}(c z)$

01.20.21.2775.01

$$\int e^{p z} \left(a + b\, e^{d z}\right)^{\beta} \cosh^{\nu}(c z)\, dz == 2^{-\nu} \left(a + b\, e^{d z}\right)^{\beta} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\binom{\nu}{s} \left(e^{(p+c(\nu-2s))z} (c(\nu-2s)-p)\, {}_2F_1\left(\frac{p+c(\nu-2s)}{d}, -\beta; \frac{d+p+c(\nu-2s)}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(p-c(\nu-2s))z} (p+c(\nu-2s))\, {}_2F_1\left(\frac{p-c(\nu-2s)}{d}, -\beta; \frac{d+p-c(\nu-2s)}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\right) \Big/ \left((c(\nu-2s)-p)(p+c(\nu-2s))\right)\right) \left(\left(\frac{e^{d z} b}{a} + 1\right)^{-\beta} + \frac{1}{p}\left(2^{-\nu} e^{p z} \left(a + b\, e^{d z}\right)^{\beta} \left(\frac{e^{d z} b}{a} + 1\right)^{-\beta} \binom{\nu}{\frac{\nu}{2}} {}_2F_1\left(\frac{p}{d}, -\beta; \frac{d+p}{d}; -\frac{b\, e^{d z}}{a}\right) (1 - \nu \bmod 2)\right) \Big/ ; \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving products of the direct function and exponential function

Involving products of two direct functions and exponential function

Involving $e^{b z} \cosh(c z) \cosh(a z)$

01.20.21.2776.01

$$\int e^{b z} \cosh(c z) \cosh(a z)\, dz == \left(e^{b z} \left(a \sinh(a z) \left(\left(a^2 - b^2 - c^2\right) \cosh(c z) + 2 b c \sinh(c z)\right) - \cosh(a z) \left(b \left(a^2 - b^2 + c^2\right) \cosh(c z) + c \left(a^2 + b^2 - c^2\right) \sinh(c z)\right)\right)\right) \Big/ \left((a - b - c)(a + b - c)(a - b + c)(a + b + c)\right)$$

01.20.21.2777.01

$$\int e^{c z} \cosh(c z) \cosh(a z)\, dz == \frac{\left(a^2 \left(1 + e^{2 c z}\right) - 4 c^2\right) \sinh(a z) - 2 a c\, e^{2 c z} \cosh(a z)}{2 \left(a^3 - 4 a c^2\right)}$$

Involving $e^{p z} \cosh(c z) \cosh(a z + b)$

01.20.21.2778.01

$$\int e^{p z} \cosh(c z) \cosh(b + a z)\, dz == \frac{1}{2} e^{p z} \left(-\frac{\cosh((a-c) z) (p \cosh(b) + (c - a) \sinh(b))}{(a - c - p)(a - c + p)} + \frac{\cosh((a+c) z) ((a + c) \sinh(b) - p \cosh(b))}{(a + c - p)(a + c + p)} + \frac{((a - c) \cosh(b) - p \sinh(b)) \sinh((a - c) z)}{(a - c - p)(a - c + p)} + \frac{((a + c) \cosh(b) - p \sinh(b)) \sinh((a + c) z)}{(a + c - p)(a + c + p)}\right)$$

Involving $e^{p z} \cosh(c z + d) \cosh(a z + b)$

01.20.21.2779.01

$$\int e^{p z} \cosh(d + c z) \cosh(b + a z)\, dz ==$$

$$\frac{1}{2} e^{p z}\left(-\frac{\cosh((a-c) z)\,(p \cosh(b-d) + (c-a)\sinh(b-d))}{(a-c-p)(a-c+p)} + \frac{\cosh((a+c) z)\,((a+c)\sinh(b+d) - p\cosh(b+d))}{(a+c-p)(a+c+p)} + \frac{((a-c)\cosh(b-d) - p\sinh(b-d))\sinh((a-c) z)}{(a-c-p)(a-c+p)} + \frac{((a+c)\cosh(b+d) - p\sinh(b+d))\sinh((a+c) z)}{(a+c-p)(a+c+p)}\right)$$

Involving $e^{p z^r} \cosh(b z) \cosh(c z)$

01.20.21.2780.01

$$\int e^{p z^2} \cosh(b z) \cosh(c z)\, dz ==$$

$$\frac{1}{8\sqrt{p}}\left(\sqrt{\pi}\, e^{-\frac{(b+c)^2}{4p}}\left(\operatorname{erfi}\left(\frac{-b-c+2pz}{2\sqrt{p}}\right) + e^{\frac{bc}{p}}\operatorname{erfi}\left(\frac{b-c+2pz}{2\sqrt{p}}\right) + e^{\frac{bc}{p}}\operatorname{erfi}\left(\frac{-b+c+2pz}{2\sqrt{p}}\right) + \operatorname{erfi}\left(\frac{b+c+2pz}{2\sqrt{p}}\right)\right)\right)$$

01.20.21.2781.01

$$\int e^{p\sqrt{z}} \cosh(b z) \cosh(c z)\, dz ==$$

$$\frac{1}{8}\left(-\frac{e^{\frac{p^2}{4(c+b)}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2(c+b)\sqrt{z}}{2\sqrt{-c-b}}\right)}{(-c-b)^{3/2}} + \frac{2e^{\sqrt{z}\,p-cz+bz}}{b-c} + \frac{2e^{\sqrt{z}\,p+(c+b)z}}{c+b} + \frac{2e^{\sqrt{z}\,p+cz-bz}}{c-b} - \frac{e^{\frac{p^2}{4b-4c}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c-b)+p}{2\sqrt{c-b}}\right)}{(c-b)^{3/2}} - \frac{e^{\frac{p^2}{4c-4b}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(b-c)+p}{2\sqrt{b-c}}\right)}{(b-c)^{3/2}} - \frac{2e^{p\sqrt{z}-(c+b)z}}{c+b} - \frac{e^{-\frac{p^2}{4(c+b)}}\, p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\sqrt{z}\,(c+b)+p}{2\sqrt{c+b}}\right)}{(c+b)^{3/2}}\right)$$

Involving $e^{p z} \cosh\left(b z^r\right) \cosh(c z)$

01.20.21.2782.01

$$\int e^{p z} \cosh\left(b z^2\right) \cosh(c z)\, dz ==$$

$$\frac{\sqrt{\pi}}{8\sqrt{b}} e^{-\frac{(c+p)^2}{4b}}\left(e^{\frac{(c+p)^2}{2b}}\operatorname{erf}\left(\frac{-c-p+2bz}{2\sqrt{b}}\right) + e^{\frac{c^2+p^2}{2b}}\operatorname{erf}\left(\frac{c-p+2bz}{2\sqrt{b}}\right) + e^{\frac{cp}{b}}\operatorname{erfi}\left(\frac{-c+p+2bz}{2\sqrt{b}}\right) + \operatorname{erfi}\left(\frac{c+p+2bz}{2\sqrt{b}}\right)\right)$$

01.20.21.2783.01

$$\int e^{p z} \cosh\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$\frac{1}{8}\left(\frac{b\, e^{\frac{b^2}{4c-4p}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(p-c)\sqrt{z}-b}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}} + \frac{b\, e^{-\frac{b^2}{4(c+p)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c+p)\sqrt{z}-b}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}} + \frac{2\, e^{-c z+p z-b\sqrt{z}}}{p-c} + \frac{2\, e^{\sqrt{z}\ b-c z+p z}}{p-c} - \right.$$

$$\left. \frac{b\, e^{\frac{b^2}{4c-4p}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(p-c)\sqrt{z}}{2\sqrt{p-c}}\right)}{(p-c)^{3/2}} + \frac{2\, e^{(c+p)z-b\sqrt{z}}}{c+p} + \frac{2\, e^{\sqrt{z}\ b+(c+p)z}}{c+p} - \frac{b\, e^{-\frac{b^2}{4(c+p)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(c+p)\sqrt{z}}{2\sqrt{c+p}}\right)}{(c+p)^{3/2}}\right)$$

Involving $e^{p z^r} \cosh\left(b z^r\right) \cosh(c z)$

01.20.21.2784.01

$$\int e^{p z^2} \cosh\left(b z^2\right) \cosh(c z)\, dz == \frac{1}{8}\sqrt{\pi}\left(\frac{1}{\sqrt{p-b}}\, e^{\frac{c^2}{4b-4p}}\left(\operatorname{erfi}\left(\frac{-c-2bz+2pz}{2\sqrt{p-b}}\right)+\operatorname{erfi}\left(\frac{c+2(p-b)z}{2\sqrt{p-b}}\right)\right)+\right.$$

$$\left.\frac{1}{\sqrt{b+p}}\, e^{-\frac{c^2}{4(b+p)}}\left(\operatorname{erfi}\left(\frac{2(b+p)z-c}{2\sqrt{b+p}}\right)+\operatorname{erfi}\left(\frac{c+2(b+p)z}{2\sqrt{b+p}}\right)\right)\right)$$

01.20.21.2785.01

$$\int e^{p\sqrt{z}} \cosh\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$\frac{1}{8}\left(\frac{c\, e^{\frac{(b-p)^2}{4c}}(p-b)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-2\sqrt{z}\ c-b+p}{2\sqrt{-c}}\right)}{(-c)^{5/2}} + \frac{2\, e^{\sqrt{z}\ (p-b)+c z}}{c} + \frac{2\, e^{\sqrt{z}\ (b+p)+c z}}{c} + \frac{c\, e^{\frac{(b+p)^2}{4c}}(b+p)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-2\sqrt{z}\ c+b+p}{2\sqrt{-c}}\right)}{(-c)^{5/2}} + \right.$$

$$\left. \frac{e^{-\frac{(b-p)^2}{4c}}(b-p)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\sqrt{z}\ c-b+p}{2\sqrt{c}}\right)}{c^{3/2}} - \frac{2\, e^{(p-b)\sqrt{z}-c z}}{c} - \frac{2\, e^{(b+p)\sqrt{z}-c z}}{c} - \frac{e^{-\frac{(b+p)^2}{4c}}(b+p)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\sqrt{z}\ c+b+p}{2\sqrt{c}}\right)}{c^{3/2}}\right)$$

Involving $e^{p z} \cosh\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.2786.01

$$\int e^{p z} \cosh\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{8}\sqrt{\pi}\left(\frac{e^{\frac{p^2}{4c-4b}}\left(e^{\frac{p^2}{2b-2c}}\operatorname{erf}\left(\frac{-p+2bz-2cz}{2\sqrt{b-c}}\right)+\operatorname{erfi}\left(\frac{p+2(b-c)z}{2\sqrt{b-c}}\right)\right)}{\sqrt{b-c}} + \frac{e^{-\frac{p^2}{4(b+c)}}\left(e^{\frac{p^2}{2(b+c)}}\operatorname{erf}\left(\frac{2(b+c)z-p}{2\sqrt{b+c}}\right)+\operatorname{erfi}\left(\frac{p+2(b+c)z}{2\sqrt{b+c}}\right)\right)}{\sqrt{b+c}}\right)$$

01.20.21.2787.01

$$\int e^{p z} \cosh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$
$$\frac{e^{p z} \cosh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right)}{p} - \frac{1}{8 p^{3/2}} \left(e^{-\frac{(b+c)^2}{4 p}} \sqrt{\pi} \left(b e^{\frac{b c}{p}} \operatorname{erfi}\left(\frac{b - c + 2 p \sqrt{z}}{2 \sqrt{p}}\right) + c e^{\frac{b c}{p}} \operatorname{erfi}\left(\frac{-b + c + 2 p \sqrt{z}}{2 \sqrt{p}}\right) + \right.\right.$$
$$b \operatorname{erfi}\left(\frac{b + c + 2 p \sqrt{z}}{2 \sqrt{p}}\right) + c \operatorname{erfi}\left(\frac{b + c + 2 p \sqrt{z}}{2 \sqrt{p}}\right) + b e^{\frac{b c}{p}} \operatorname{erfi}\left(\frac{b - c - 2 p \sqrt{z}}{2 \sqrt{p}}\right) +$$
$$\left.\left. c e^{\frac{b c}{p}} \operatorname{erfi}\left(\frac{-b + c - 2 p \sqrt{z}}{2 \sqrt{p}}\right) + b \operatorname{erfi}\left(\frac{b + c - 2 p \sqrt{z}}{2 \sqrt{p}}\right) + c \operatorname{erfi}\left(\frac{b + c - 2 p \sqrt{z}}{2 \sqrt{p}}\right)\right)\right)$$

Involving $e^{p z^r} \cosh\left(b z^r\right) \cosh\left(c z^r\right)$

01.20.21.2788.01

$$\int e^{p z^r} \cosh(b z^r) \cosh(c z^r) dz == -\frac{z}{4 r} \left(\Gamma\left(\frac{1}{r}, (c - b - p) z^r\right) ((c - b - p) z^r)^{-1/r} + ((c + b - p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (c + b - p) z^r\right) + \right.$$
$$\left. (-(c - b + p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, -(c - b + p) z^r\right) + (-(c + b + p) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, -(c + b + p) z^r\right)\right)$$

01.20.21.2789.01

$$\int e^{p z^2} \cosh\left(b z^2\right) \cosh\left(c z^2\right) dz == \frac{1}{8} \sqrt{\pi}$$
$$\left(\left((b - c - p) \sqrt{b - c + p}\ \operatorname{erfi}\left(\sqrt{b - c + p}\ z\right) - (b - c + p) \sqrt{-b + c + p}\ \operatorname{erfi}\left(\sqrt{-b + c + p}\ z\right)\right) \Big/ ((b - c - p) (b - c + p)) + \right.$$
$$\left.\left((b + c - p) \sqrt{b + c + p}\ \operatorname{erfi}\left(\sqrt{b + c + p}\ z\right) - \sqrt{-b - c + p}\ (b + c + p) \operatorname{erfi}\left(\sqrt{-b - c + p}\ z\right)\right) \Big/ ((b + c - p) (b + c + p))\right)$$

01.20.21.2790.01

$$\int e^{p \sqrt{z}} \cosh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz == \frac{1}{2} \left(-\frac{e^{-(b+c-p) \sqrt{z}} \left(\sqrt{z}\ (b + c - p) + 1\right)}{(b + c - p)^2} + \right.$$
$$\left. \frac{e^{(b-c+p) \sqrt{z}} \left((b - c + p) \sqrt{z} - 1\right)}{(b - c + p)^2} + \frac{e^{(-b+c+p) \sqrt{z}} \left((-b + c + p) \sqrt{z} - 1\right)}{(-b + c + p)^2} + \frac{e^{(b+c+p) \sqrt{z}} \left((b + c + p) \sqrt{z} - 1\right)}{(b + c + p)^2}\right)$$

Involving $e^{b z^r + e} \cosh\left(a z^r + q\right) \cosh\left(c z^r + g\right)$

01.20.21.2791.01

$$\int e^{b z^r + e} \cosh(a z^r + q) \cosh(c z^r + g) dz ==$$
$$-\frac{z}{4 r} \left(e^{e+g+q} \Gamma\left(\frac{1}{r}, (-a - b - c) z^r\right) ((-a - b - c) z^r)^{-1/r} + e^{e+g-q} ((a - b - c) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (a - b - c) z^r\right) + \right.$$
$$\left. e^{e-g+q} ((-a - b + c) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-a - b + c) z^r\right) + e^{e-g-q} ((a - b + c) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (a - b + c) z^r\right)\right)$$

01.20.21.2792.01

$$\int e^{b z^2+e} \cosh\left(a z^2+q\right) \cosh\left(c z^2+g\right) dz == \frac{1}{8} e^{e-i (i g+i q)} \sqrt{\pi}$$
$$\left(\frac{e^{2 i (i g+i q)} \operatorname{erfi}\left(\sqrt{-a+b-c}\ z\right)}{\sqrt{-a+b-c}} + \frac{e^{-2 g} \operatorname{erfi}\left(\sqrt{a+b-c}\ z\right)}{\sqrt{a+b-c}} + \frac{e^{-2 q} \operatorname{erfi}\left(\sqrt{-a+b+c}\ z\right)}{\sqrt{-a+b+c}} + \frac{\operatorname{erfi}\left(\sqrt{-i (i a+i b+i c)}\ z\right)}{\sqrt{-i (i a+i b+i c)}}\right)$$

01.20.21.2793.01

$$\int e^{\sqrt{z}\ b+e} \cosh\left(\sqrt{z}\ a+q\right) \cosh\left(\sqrt{z}\ c+g\right) dz ==$$
$$\frac{1}{2} e^{-(a-b+c)\sqrt{z}} \left(\frac{e^{e-g-q}\sqrt{z}}{-a+b-c} - \frac{e^{e-g-q}}{(a-b+c)^2}\right) + \frac{1}{2}\left(\frac{e^{e+g-q}\sqrt{z}}{-a+b+c} - \frac{e^{e+g-q}}{(a-b-c)^2}\right) e^{-(a-b-c)\sqrt{z}} +$$
$$\frac{1}{2}\left(\frac{e^{e-g+q}\sqrt{z}}{a+b-c} - \frac{e^{e-g+q}}{(a+b-c)^2}\right) e^{(a+b-c)\sqrt{z}} + \frac{1}{2}\left(\frac{e^{e+g+q}\sqrt{z}}{a+b+c} - \frac{e^{e+g+q}}{(a+b+c)^2}\right) e^{(a+b+c)\sqrt{z}}$$

Involving $e^{b z^r+d z+e} \cosh\left(a z^r+p z+q\right) \cosh\left(c z^r+f z+g\right)$

01.20.21.2794.01

$$\int e^{b z^2+d z+e} \cosh\left(a z^2+p z+q\right) \cosh\left(c z^2+f z+g\right) dz ==$$
$$\frac{1}{8}\sqrt{\pi}\left(\frac{e^{\frac{(d+f-p)^2+4(a-b-c)(e+g-q)}{4(a-b-c)}} \operatorname{erf}\left(\frac{-d-f+p+2 a z-2 b z-2 c z}{2\sqrt{a-b-c}}\right)}{\sqrt{a-b-c}} + \frac{e^{\frac{(-d+f+p)^2+4(a-b+c)(e-g-q)}{4(a-b+c)}} \operatorname{erf}\left(\frac{-d+f+p+2 a z-2 b z+2 c z}{2\sqrt{a-b+c}}\right)}{\sqrt{a-b+c}} + \right.$$
$$\left.\frac{e^{-\frac{(d-f+p)^2-4(a+b-c)(e-g+q)}{4(a+b-c)}} \operatorname{erfi}\left(\frac{d-f+p+2 a z+2 b z-2 c z}{2\sqrt{a+b-c}}\right)}{\sqrt{a+b-c}} + \frac{e^{-\frac{(d+f+p)^2-4(a+b+c)(e+g+q)}{4(a+b+c)}} \operatorname{erfi}\left(\frac{d+f+p+2 a z+2 b z+2 c z}{2\sqrt{a+b+c}}\right)}{\sqrt{a+b+c}}\right)$$

01.20.21.2795.01

$$\int e^{\sqrt{z}\,b+d\,z+e}\cosh\left(\sqrt{z}\,a+p\,z+q\right)\cosh\left(\sqrt{z}\,c+f\,z+g\right)dz ==$$

$$\frac{1}{8}\left(-\frac{1}{(d-f-p)^{3/2}}\left((-a+b-c)\,e^{-\frac{(-a+b-c)^2}{4(d-f-p)}+e-g-q}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-a+b-c+2(d-f-p)\sqrt{z}}{2\sqrt{d-f-p}}\right)\right)-\right.$$

$$\frac{1}{(d+f-p)^{3/2}}\left((-a+b+c)\,e^{-\frac{(-a+b+c)^2}{4(d+f-p)}+e+g-q}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-a+b+c+2(d+f-p)\sqrt{z}}{2\sqrt{d+f-p}}\right)\right)-$$

$$\frac{(a+b-c)\,e^{-\frac{(a+b-c)^2}{4(d-f+p)}+e-g+q}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{a+b-c+2(d-f+p)\sqrt{z}}{2\sqrt{d-f+p}}\right)}{(d-f+p)^{3/2}}-$$

$$\frac{(a+b+c)\,e^{-\frac{(a+b+c)^2}{4(d+f+p)}+e+g+q}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{a+b+c+2(d+f+p)\sqrt{z}}{2\sqrt{d+f+p}}\right)}{(d+f+p)^{3/2}}+\frac{2\,e^{\sqrt{z}\,(-a+b-c)+e-g-q+(d-f-p)z}}{d-f-p}+$$

$$\left.\frac{2\,e^{\sqrt{z}\,(-a+b+c)+e+g-q+(d+f-p)z}}{d+f-p}+\frac{2\,e^{\sqrt{z}\,(a+b-c)+e-g+q+(d-f+p)z}}{d-f+p}+\frac{2\,e^{\sqrt{z}\,(a+b+c)+e+g+q+(d+f+p)z}}{d+f+p}\right)$$

Involving products of two direct functions and rational functions of exp

Involving $\cosh(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2796.01

$$\int\frac{\cosh(e\,z)\cosh(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}dz ==$$

$$\frac{1}{4}a^{-n}\left(\frac{1}{c-e}\left(e^{(c-e)z}\,{}_2F_1\left(\frac{c-e}{d},\,n;\,\frac{c+d-e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(e-c)z}\,{}_2F_1\left(\frac{e-c}{d},\,n;\,\frac{-c+d+e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+\right.$$

$$\left.\frac{1}{c+e}\left(e^{(c+e)z}\left({}_2F_1\left(\frac{c+e}{d},\,n;\,\frac{c+d+e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-2(c+e)z}\,{}_2F_1\left(-\frac{c+e}{d},\,n;\,-\frac{c-d+e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\right)\Big/;\,n\in\mathbb{N}^+$$

Involving $e^{p\,z}\cosh(e\,z)\cosh(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2797.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(c z)}{\left(a + b\, e^{d z}\right)^n} dz ==$$
$$\frac{1}{4} a^{-n} \left(\frac{1}{(c-e-p)(c-e+p)} \left(e^{(c-e+p) z} (c-e-p)\, {}_2F_1\left(\frac{c-e+p}{d}, n; \frac{c+d-e+p}{d}; -\frac{b\, e^{d z}}{a} \right) - e^{(-c+e+p) z} \right.\right.$$
$$\left. (c-e+p)\, {}_2F_1\left(\frac{-c+e+p}{d}, n; \frac{-c+d+e+p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) +$$
$$\frac{1}{(c+e-p)(c+e+p)} \left(e^{(c+e+p) z} (c+e-p)\, {}_2F_1\left(\frac{c+e+p}{d}, n; \frac{c+d+e+p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right.$$
$$\left.\left. e^{-(c+e-p) z} (c+e+p)\, {}_2F_1\left(-\frac{c+e-p}{d}, n; \frac{-c+d-e+p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right) /; n \in \mathbb{N}^+$$

Involving products of two direct functions and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^\beta \cosh(e z) \cosh(c z)$

01.20.21.2798.01

$$\int \left(a + b\, e^{d z}\right)^\beta \cosh(e z) \cosh(c z)\, dz == \frac{1}{4} \left(a + b\, e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta}$$
$$\left(\frac{1}{c-e} \left(e^{(c-e) z}\, {}_2F_1\left(\frac{c-e}{d}, -\beta; \frac{c+d-e}{d}; -\frac{b\, e^{d z}}{a} \right) - e^{(e-c) z}\, {}_2F_1\left(\frac{e-c}{d}, -\beta; \frac{-c+d+e}{d}; -\frac{b\, e^{d z}}{a} \right) \right) + \right.$$
$$\left. \frac{1}{c+e} \left(e^{(c+e) z} \left({}_2F_1\left(\frac{c+e}{d}, -\beta; \frac{c+d+e}{d}; -\frac{b\, e^{d z}}{a} \right) - e^{-2(c+e) z}\, {}_2F_1\left(-\frac{c+e}{d}, -\beta; -\frac{c-d+e}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right) \right)$$

Involving $e^{p z} \left(a + b\, e^{d z}\right)^\beta \cosh(e z) \cosh(c z)$

01.20.21.2799.01

$$\int e^{p z} \left(a + b\, e^{d z}\right)^\beta \cosh(e z) \cosh(c z)\, dz ==$$
$$\frac{1}{4} \left(a + b\, e^{d z}\right)^\beta \left(\frac{e^{d z} b}{a} + 1 \right)^{-\beta} \left(\frac{1}{(c-e-p)(c-e+p)} \left(e^{(c-e+p) z} (c-e-p)\, {}_2F_1\left(\frac{c-e+p}{d}, -\beta; \frac{c+d-e+p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right.\right.$$
$$\left. e^{(-c+e+p) z} (c-e+p)\, {}_2F_1\left(\frac{-c+e+p}{d}, -\beta; \frac{-c+d+e+p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) +$$
$$\frac{1}{(c+e-p)(c+e+p)} \left(e^{(c+e+p) z} (c+e-p)\, {}_2F_1\left(\frac{c+e+p}{d}, -\beta; \frac{c+d+e+p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right.$$
$$\left.\left. e^{(-c-e+p) z} (c+e+p)\, {}_2F_1\left(-\frac{c+e-p}{d}, -\beta; \frac{-c+d-e+p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \right)$$

Involving products of several direct functions and exponential function

Involving $e^{p z} \cosh(a z) \cosh(b z) \cosh(c z)$

01.20.21.2800.01

$$\int e^{p z} \cosh(a z) \cosh(b z) \cosh(c z)\, dz == \frac{1}{4} e^{p z} \left(\frac{p \cosh((a-b-c) z) + (-a+b+c) \sinh((a-b-c) z)}{(a-b-c+p)(-a+b+c+p)} + \frac{p \cosh((a+b-c) z) - (a+b-c) \sinh((a+b-c) z)}{(a+b-c+p)(-a-b+c+p)} + \frac{p \cosh((a-b+c) z) - (a-b+c) \sinh((a-b+c) z)}{(-a+b-c+p)(a-b+c+p)} - \frac{p \cosh((a+b+c) z) - (a+b+c) \sinh((a+b+c) z)}{(a+b+c-p)(a+b+c+p)} \right)$$

Involving $e^{p z} \prod_{k=1}^{n} \cosh(a_k z)$

01.20.21.2801.01

$$\int e^{p z} \prod_{k=1}^{n} \cosh(a_k z)\, dz == 2^{-n} e^{p z} \sum_{\substack{k_1=-1 \\ \Delta k_1=2}}^{1} \sum_{\substack{k_2=-1 \\ \Delta k_2=2}}^{1} \cdots \sum_{\substack{k_n=-1 \\ \Delta k_n=2}}^{1} \left(\frac{\left(p \cosh\left(z \sum_{j=1}^{n} k_j a_j\right) - \sum_{j=1}^{n} k_j a_j \sinh\left(z \sum_{j=1}^{n} k_j a_j\right)\right)}{p^2 - \left(\sum_{j=1}^{n} k_j a_j\right)^2} \right)$$

Involving products of powers of two direct functions and exponential function

Involving product of power of the direct function, the direct function and exponential function

Involving $e^{b z} \cosh(c z) \cosh^{\nu}(a z)$

01.20.21.2802.01

$$\int e^{b z} \cosh(c z) \cosh^{\nu}(a z)\, dz == \frac{1}{2} \left(1 + e^{-2 a z}\right)^{-\nu} \cosh^{\nu}(a z) \left(\frac{e^{(c+b) z}}{c+b+a \nu} {}_2F_1\left(-\frac{c+b+a \nu}{2 a}, -\nu; -\frac{c+b+a (\nu-2)}{2 a}; -e^{-2 a z}\right) - \frac{e^{(b-c) z}}{c-b-a \nu} {}_2F_1\left(-\frac{-c+b+a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{c-b}{a} - \nu + 2\right); -e^{-2 a z}\right) \right)$$

01.20.21.2803.01

$$\int e^{p z} \cosh(c z) \cosh^{\nu}(a z)\, dz == -2^{-\nu-1} \left(\frac{e^{-(c-p) z}}{c-p} - \frac{e^{(c+p) z}}{c+p} \right) \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) - 2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\frac{e^{-(c-p-2 a s+a \nu) z}}{c-p-2 a s+a \nu} + \frac{e^{-(-c-p+2 a s-a \nu) z}}{-c-p+2 a s-a \nu} + \frac{e^{-(c-p+2 a s-a \nu) z}}{c-p+2 a s-a \nu} + \frac{e^{-(-c-p-2 a s+a \nu) z}}{-c-p-2 a s+a \nu} \right) \binom{\nu}{s} /; \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} \cosh(c z + d) \cosh^{\nu}(a z)$

01.20.21.2804.01

$$\int e^{p z} \cosh(d + c z) \cosh^{\nu}(a z)\, dz ==$$

$$\frac{1}{2} e^{-d} \left(1 + e^{-2 a z}\right)^{-\nu} \cosh^{\nu}(a z) \left(\frac{e^{2 d + (c+p) z}}{c + p + a \nu} {}_2F_1\left(-\frac{c + p + a \nu}{2 a}, -\nu; -\frac{c + p + a (\nu - 2)}{2 a}; -e^{-2 a z}\right) - \right.$$

$$\left. \frac{e^{(p-c) z}}{c - p - a \nu} {}_2F_1\left(-\frac{-c + p + a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{c - p}{a} - \nu + 2\right); -e^{-2 a z}\right)\right)$$

01.20.21.2805.01

$$\int e^{p z} \cosh(d + c z) \cosh^{\nu}(a z)\, dz == -2^{-\nu-1} e^{-d} \left(\frac{e^{-(c-p) z}}{c - p} - \frac{e^{2 d - (-c-p) z}}{c + p} \right) \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) -$$

$$2^{-\nu-1} e^{-d} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(e^{2 d} \left(\frac{e^{-(-c-p+2 a s-a \nu) z}}{-c - p + 2 a s - a \nu} + \frac{e^{-(-c-p-2 a s+a \nu) z}}{-c - p - 2 a s + a \nu} \right) + \frac{e^{-(c-p-2 a s+a \nu) z}}{c - p - 2 a s + a \nu} + \frac{e^{-(c-p+2 a s-a \nu) z}}{c - p + 2 a s - a \nu} \right) \binom{\nu}{s} /; \nu \in \mathbb{N}^+$$

Involving $e^{p z} \cosh(c z) \cosh^{\nu}(a z + b)$

01.20.21.2806.01

$$\int e^{p z} \cosh(c z) \cosh^{\nu}(b + a z)\, dz ==$$

$$\frac{1}{2} \left(1 + e^{-2 (b+a z)}\right)^{-\nu} \cosh^{\nu}(b + a z) \left(\frac{e^{(c+p) z}}{c + p + a \nu} {}_2F_1\left(-\frac{c + p + a \nu}{2 a}, -\nu; -\frac{c + p + a (\nu - 2)}{2 a}; -e^{-2 (b+a z)}\right) - \right.$$

$$\left. \frac{e^{(p-c) z}}{c - p - a \nu} {}_2F_1\left(-\frac{-c + p + a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{c - p}{a} - \nu + 2\right); -e^{-2 (b+a z)}\right)\right)$$

01.20.21.2807.01

$$\int e^{p z} \cosh(c z) \cosh^{\nu}(b + a z)\, dz == -2^{-\nu-1} \left(\frac{e^{-(c-p) z}}{c - p} - \frac{e^{(c+p) z}}{c + p} \right) \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) -$$

$$2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2 b s - b \nu} \left(\frac{e^{4 b s - (c-p-2 a s+a \nu) z}}{c - p - 2 a s + a \nu} + \frac{e^{2 b \nu - (-c-p+2 a s-a \nu) z}}{-c - p + 2 a s - a \nu} + \frac{e^{2 b \nu - (c-p+2 a s-a \nu) z}}{c - p + 2 a s - a \nu} + \frac{e^{4 b s - (-c-p-2 a s+a \nu) z}}{-c - p - 2 a s + a \nu} \right) \binom{\nu}{s} /; \nu \in \mathbb{N}^+$$

Involving $e^{p z} \cosh(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.2808.01

$$\int e^{p z} \cosh(d + c z) \cosh^{\nu}(b + a z)\, dz ==$$

$$\frac{1}{2} e^{-d} \left(1 + e^{-2 (b+a z)}\right)^{-\nu} \cosh^{\nu}(b + a z) \left(\frac{e^{2 d + (c+p) z}}{c + p + a \nu} {}_2F_1\left(-\frac{c + p + a \nu}{2 a}, -\nu; -\frac{c + p + a (\nu - 2)}{2 a}; -e^{-2 (b+a z)}\right) - \right.$$

$$\left. \frac{e^{(p-c) z}}{c - p - a \nu} {}_2F_1\left(-\frac{-c + p + a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{c - p}{a} - \nu + 2\right); -e^{-2 (b+a z)}\right)\right)$$

01.20.21.2809.01

$$\int e^{p z} \cosh(c z+d) \cosh^{\nu}(a z+b)\, dz == -2^{-\nu-1} e^{-d}\left(\frac{e^{-(c-p) z}}{c-p}-\frac{e^{2 d-(-c-p) z}}{c+p}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)-2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-d-2 b s-b \nu}$$
$$\left(e^{2 d}\left(\frac{e^{2 b \nu-(-c-p+2 a s-a \nu) z}}{-c-p+2 a s-a \nu}+\frac{e^{4 b s-(-c-p-2 a s+a \nu) z}}{-c-p-2 a s+a \nu}\right)+\frac{e^{4 b s-(c-p-2 a s+a \nu) z}}{c-p-2 a s+a \nu}+\frac{e^{2 b \nu-(c-p+2 a s-a \nu) z}}{c-p+2 a s-a \nu}\right)\binom{\nu}{s} /;\ \nu \in \mathbb{N}^{+}$$

Involving $e^{p z^{r}} \cosh(b z) \cosh^{\nu}(c z)$

01.20.21.2810.01

$$\int e^{p z^2} \cosh(b z) \cosh^{\nu}(c z)\, dz == \frac{1}{\sqrt{p}}\left(2^{-\nu-2} e^{-\frac{b^2}{4 p}} \sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\operatorname{erfi}\left(\frac{2 p z-b}{2 \sqrt{p}}\right)+\operatorname{erfi}\left(\frac{b+2 p z}{2 \sqrt{p}}\right)\right)(1-\nu \bmod 2)\right)+$$
$$\frac{1}{\sqrt{p}}\left(2^{-\nu-2} \sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{(-b-2 c k+c \nu)^2}{4 p}} \operatorname{erfi}\left(\frac{-b-2 c k+c \nu+2 p z}{2 \sqrt{p}}\right)+e^{-\frac{(b-2 c k+c \nu)^2}{4 p}} \operatorname{erfi}\left(\frac{b-2 c k+c \nu+2 p z}{2 \sqrt{p}}\right)+\right.\right.$$
$$\left.\left. e^{-\frac{(-b+2 c k-c \nu)^2}{4 p}} \operatorname{erfi}\left(\frac{-b+2 c k-c \nu+2 p z}{2 \sqrt{p}}\right)+e^{-\frac{(b+2 c k-c \nu)^2}{4 p}} \operatorname{erfi}\left(\frac{b+2 c k-c \nu+2 p z}{2 \sqrt{p}}\right)\right)\right) /;\ \nu \in \mathbb{Z} \wedge \nu>0$$

01.20.21.2811.01

$$\int e^{p \sqrt{z}} \cosh(b z) \cosh^{\nu}(c z)\, dz ==$$
$$2^{-\nu-2}\left(-\frac{e^{\frac{p^2}{4 b}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p-2 b \sqrt{z}}{2 \sqrt{-b}}\right)}{(-b)^{3/2}}+\frac{4 e^{p \sqrt{z}} \sinh(b z)}{b}-\frac{e^{-\frac{p^2}{4 b}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{2 \sqrt{z} b+p}{2 \sqrt{b}}\right)}{b^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$
$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2 e^{p \sqrt{z}}\left(\frac{2 \sinh((b+2 c k-c \nu) z)}{b+2 c k-c \nu}+\frac{2 \sinh((b+c(\nu-2 k)) z)}{b+c(\nu-2 k)}\right)-\right.$$
$$\frac{e^{-\frac{p^2}{4(-b-2 c k+c \nu)}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p+2(-b-2 c k+c \nu) \sqrt{z}}{2 \sqrt{-b-2 c k+c \nu}}\right)}{(-b-2 c k+c \nu)^{3/2}}-\frac{e^{-\frac{p^2}{4(b-2 c k+c \nu)}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p+2(b-2 c k+c \nu) \sqrt{z}}{2 \sqrt{b-2 c k+c \nu}}\right)}{(b-2 c k+c \nu)^{3/2}}-$$
$$\left.\frac{e^{-\frac{p^2}{4(-b+2 c k-c \nu)}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p+2(-b+2 c k-c \nu) \sqrt{z}}{2 \sqrt{-b+2 c k-c \nu}}\right)}{(-b+2 c k-c \nu)^{3/2}}-\frac{e^{-\frac{p^2}{4(b+2 c k-c \nu)}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p+2(b+2 c k-c \nu) \sqrt{z}}{2 \sqrt{b+2 c k-c \nu}}\right)}{(b+2 c k-c \nu)^{3/2}}\right) /;\ \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} \cosh\left(b z^{r}\right) \cosh^{\nu}(c z)$

01.20.21.2812.01

$$\int e^{p z} \cosh\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$\frac{1}{b}\left(\left(2^{-\nu-2}\sqrt{\pi}\right)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(-\sqrt{-b}\; e^{\frac{(-2ck+p+c\nu)^2}{4b}}\operatorname{erfi}\left(\frac{-2ck+p+c\nu-2bz}{2\sqrt{-b}}\right)-\sqrt{-b}\; e^{\frac{(2ck+p-c\nu)^2}{4b}}\operatorname{erfi}\left(\frac{2ck+p-c\nu-2bz}{2\sqrt{-b}}\right)+\right.\right.$$

$$\left.\left.\sqrt{b}\; e^{-\frac{(-2ck+p+c\nu)^2}{4b}}\operatorname{erfi}\left(\frac{-2ck+p+c\nu+2bz}{2\sqrt{b}}\right)+\sqrt{b}\; e^{-\frac{(2ck+p-c\nu)^2}{4b}}\operatorname{erfi}\left(\frac{2ck+p-c\nu+2bz}{2\sqrt{b}}\right)\right)\right)-$$

$$\frac{1}{b}\left(2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\; e^{\frac{p^2}{4b}}\operatorname{erfi}\left(\frac{p-2bz}{2\sqrt{-b}}\right)-\sqrt{b}\; e^{-\frac{p^2}{4b}}\operatorname{erfi}\left(\frac{p+2bz}{2\sqrt{b}}\right)\right)(1-\nu \bmod 2)\right)/;\ \nu\in\mathbb{Z}\wedge\nu>0$$

01.20.21.2813.01

$$\int e^{p z} \cosh\left(b\sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(\frac{4\, e^{p z}\cosh\left(b\sqrt{z}\right)}{p}+\frac{b\, e^{-\frac{b^2}{4p}}\sqrt{\pi}\operatorname{erfi}\left(\frac{2p\sqrt{z}-b}{2\sqrt{p}}\right)}{p^{3/2}}-\frac{b\, e^{-\frac{b^2}{4p}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\left(\frac{2\, e^{(2ck+p-c\nu)z}\cosh\left(b\sqrt{z}\right)}{2ck+p-c\nu}+\frac{2\, e^{(p+c(\nu-2k))z}\cosh\left(b\sqrt{z}\right)}{p+c(\nu-2k)}\right)+\right.$$

$$\frac{b\, e^{-\frac{b^2}{4(-2ck+p+c\nu)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{2(-2ck+p+c\nu)\sqrt{z}-b}{2\sqrt{-2ck+p+c\nu}}\right)}{(-2ck+p+c\nu)^{3/2}}+\frac{b\, e^{-\frac{b^2}{4(2ck+p-c\nu)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{2(2ck+p-c\nu)\sqrt{z}-b}{2\sqrt{2ck+p-c\nu}}\right)}{(2ck+p-c\nu)^{3/2}}-$$

$$\left.\frac{b\, e^{-\frac{b^2}{4(2ck+p-c\nu)}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+2(2ck+p-c\nu)\sqrt{z}}{2\sqrt{2ck+p-c\nu}}\right)}{(2ck+p-c\nu)^{3/2}}-\frac{b\, e^{-\frac{b^2}{4(p+c(\nu-2k))}}\sqrt{\pi}\operatorname{erfi}\left(\frac{b+2(p+c(\nu-2k))\sqrt{z}}{2\sqrt{p+c(\nu-2k)}}\right)}{(p+c(\nu-2k))^{3/2}}\right)/;\ \nu\in\mathbb{Z}\wedge\nu>0$$

Involving $e^{p z}\cosh(b z)\cosh^{\nu}\left(c z^{r}\right)$

01.20.21.2814.01

$$\int e^{p z} \cosh(b z) \cosh^{\nu}\left(c z^2\right) dz == 2^{-\nu-1}\left(\frac{e^{(b+p) z}}{b+p}+\frac{e^{(p-b) z}}{p-b}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2 c k-c \nu)(c \nu-2 c k)}\left(e^{-\frac{(b+p)^2}{4(c \nu-2 c k)}}\sqrt{c \nu-2 c k}\ (2 c k-c \nu)\operatorname{erfi}\left(\frac{b+p-2(2 c k-c \nu) z}{2\sqrt{c \nu-2 c k}}\right)+\right.\right.$$

$$\left.e^{-\frac{(p-b)^2}{4(2 c k-c \nu)}}(c \nu-2 c k)\sqrt{2 c k-c \nu}\ \operatorname{erfi}\left(\frac{-b+p+2(2 c k-c \nu) z}{2\sqrt{2 c k-c \nu}}\right)\right)+$$

$$\frac{1}{(2 c k-c \nu)(c \nu-2 c k)}\left(e^{-\frac{(p-b)^2}{4(c \nu-2 c k)}}\sqrt{c \nu-2 c k}\ (2 c k-c \nu)\operatorname{erfi}\left(\frac{-b+p-2(2 c k-c \nu) z}{2\sqrt{c \nu-2 c k}}\right)+\right.$$

$$\left.\left.e^{-\frac{(b+p)^2}{4(2 c k-c \nu)}}(c \nu-2 c k)\sqrt{2 c k-c \nu}\ \operatorname{erfi}\left(\frac{b+p+2(2 c k-c \nu) z}{2\sqrt{2 c k-c \nu}}\right)\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.2815.01

$$\int e^{p z} \cosh(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz == \frac{2^{-\nu-2}\left(e^{(p-b) z}\left(2 b\left(-1+e^{2 b z}\right)-2\left(1+e^{2 b z}\right) p\right)\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{(b-p)(b+p)}+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(2\left(\frac{2 e^{(p-b) z}\cosh\left(c(\nu-2 s)\sqrt{z}\right)}{p-b}+\frac{2 e^{(b+p) z}\cosh\left(c(\nu-2 s)\sqrt{z}\right)}{b+p}\right)-\right.$$

$$\frac{e^{-\frac{(c \nu-2 c s)^2}{4(p-b)}}\sqrt{\pi}\ (c \nu-2 c s)\operatorname{erfi}\left(\frac{2\sqrt{z}\ (p-b)-2 c s+c \nu}{2\sqrt{p-b}}\right)}{(p-b)^{3/2}}-$$

$$\frac{e^{-\frac{(2 c s-c \nu)^2}{4(p-b)}}\sqrt{\pi}\ (2 c s-c \nu)\operatorname{erfi}\left(\frac{2\sqrt{z}\ (p-b)+2 c s-c \nu}{2\sqrt{p-b}}\right)}{(p-b)^{3/2}}-\frac{c\, e^{-\frac{c^2(\nu-2 s)^2}{4(b+p)}}\sqrt{\pi}\ (\nu-2 s)\operatorname{erfi}\left(\frac{2\sqrt{z}\ (b+p)-2 c s+c \nu}{2\sqrt{b+p}}\right)}{(b+p)^{3/2}}-$$

$$\left.\frac{e^{-\frac{(2 c s-c \nu)^2}{4(b+p)}}\sqrt{\pi}\ (2 c s-c \nu)\operatorname{erfi}\left(\frac{2\sqrt{z}\ (b+p)+2 c s-c \nu}{2\sqrt{b+p}}\right)}{(b+p)^{3/2}}\right) /; \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving $e^{p z}\cosh\left(b z^r\right)\cosh^{\nu}\left(c z^r\right)$

01.20.21.2816.01

$$\int e^{p z} \cosh\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$2^{-\nu-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\left(e^{-\frac{p^2}{4(b-2ck+c\nu)}} \sqrt{b-2ck+c\nu}\ (-b+2ck-c\nu) \operatorname{erfi}\left(\frac{p-2(-b+2ck-c\nu)z}{2\sqrt{b-2ck+c\nu}} \right) + e^{-\frac{p^2}{4(-b+2ck-c\nu)}} \right.\right.$$

$$\left.\left. (b-2ck+c\nu) \sqrt{-b+2ck-c\nu}\ \operatorname{erfi}\left(\frac{p+2(-b+2ck-c\nu)z}{2\sqrt{-b+2ck-c\nu}} \right) \right) \Big/ ((-b+2ck-c\nu)(b-2ck+c\nu)) + \right.$$

$$\left(e^{-\frac{p^2}{4(-b-2ck+c\nu)}} \sqrt{-b-2ck+c\nu}\ (b+2ck-c\nu) \operatorname{erfi}\left(\frac{p-2(b+2ck-c\nu)z}{2\sqrt{-b-2ck+c\nu}} \right) + e^{-\frac{p^2}{4(b+2ck-c\nu)}} \right.$$

$$\left. (-b-2ck+c\nu) \sqrt{b+2ck-c\nu}\ \operatorname{erfi}\left(\frac{p+2(b+2ck-c\nu)z}{2\sqrt{b+2ck-c\nu}} \right) \right) \Big/ ((b+2ck-c\nu)(-b-2ck+c\nu)) \Bigg) -$$

$$\frac{1}{b} \left(2^{-\nu-2} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \left(\sqrt{-b}\ e^{\frac{p^2}{4b}} \operatorname{erfi}\left(\frac{p-2bz}{2\sqrt{-b}} \right) - \sqrt{b}\ e^{-\frac{p^2}{4b}} \operatorname{erfi}\left(\frac{p+2bz}{2\sqrt{b}} \right) \right) (1-\nu \bmod 2) \right) /; \nu \in$$

$\mathbb{Z} \wedge \nu >$
0

01.20.21.2817.01

$$\int e^{p z} \cosh\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-2} \left(\frac{4 e^{p z} \cosh\left(b \sqrt{z}\right)}{p} + \frac{b e^{-\frac{b^2}{4p}} \sqrt{\pi} \operatorname{erfi}\left(\frac{2p\sqrt{z}-b}{2\sqrt{p}} \right)}{p^{3/2}} - \frac{b e^{-\frac{b^2}{4p}} \sqrt{\pi} \operatorname{erfi}\left(\frac{b+2p\sqrt{z}}{2\sqrt{p}} \right)}{p^{3/2}} \right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$2^{-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{4 e^{p z} \left(\cosh\left((-b+2ck-c\nu)\sqrt{z} \right) + \cosh\left((b+2ck-c\nu)\sqrt{z} \right) \right)}{p} + \right.$$

$$\frac{1}{p^{3/2}} \left(\sqrt{\pi} \left(e^{-\frac{(b+c(\nu-2k))^2}{4p}} (b+c(\nu-2k)) \operatorname{erfi}\left(\frac{-b+2ck-c\nu+2p\sqrt{z}}{2\sqrt{p}} \right) - e^{-\frac{(b+2ck-c\nu)^2}{4p}} (b+2ck-c\nu) \right.\right.$$

$$\operatorname{erfi}\left(\frac{b+2ck-c\nu+2p\sqrt{z}}{2\sqrt{p}} \right) + e^{-\frac{(b+c(\nu-2k))^2}{4p}} (b+c(\nu-2k)) \operatorname{erfi}\left(\frac{-b+2ck-c\nu-2p\sqrt{z}}{2\sqrt{p}} \right) -$$

$$\left.\left.\left. e^{-\frac{(b+2ck-c\nu)^2}{4p}} (b+2ck-c\nu) \operatorname{erfi}\left(\frac{b+2ck-c\nu-2p\sqrt{z}}{2\sqrt{p}} \right) \right) \right) \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \cosh(b z) \cosh^{\nu}\left(c z^r\right)$

01.20.21.2818.01

$$\int e^{p z^2} \cosh(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$\frac{1}{\sqrt{p}}\left(2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(e^{-\frac{b^2}{4p}}\operatorname{erfi}\left(\frac{2pz-b}{2\sqrt{p}}\right)+e^{-\frac{b^2}{4p}}\operatorname{erfi}\left(\frac{b+2pz}{2\sqrt{p}}\right)\right)(1-\nu \bmod 2)\right)+2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$

$$\left(\left(e^{-\frac{b^2}{4(-2ck+p+c\nu)}}\sqrt{-2ck+p+c\nu}\;(2ck+p-c\nu)\operatorname{erfi}\left(\frac{b+2pz-2(2ck-c\nu)z}{2\sqrt{-2ck+p+c\nu}}\right)+e^{-\frac{b^2}{4(2ck+p-c\nu)}}(-2ck+p+c\nu)\right.\right.$$

$$\left.\sqrt{2ck+p-c\nu}\;\operatorname{erfi}\left(\frac{2(2ck+p-c\nu)z-b}{2\sqrt{2ck+p-c\nu}}\right)\right)\Big/((2ck+p-c\nu)(-2ck+p+c\nu))+\left(e^{-\frac{b^2}{4(-2ck+p+c\nu)}}\right.$$

$$\sqrt{-2ck+p+c\nu}\;(2ck+p-c\nu)\operatorname{erfi}\left(\frac{-b+2pz-2(2ck-c\nu)z}{2\sqrt{-2ck+p+c\nu}}\right)+e^{-\frac{b^2}{4(2ck+p-c\nu)}}(-2ck+p+c\nu)$$

$$\left.\left.\sqrt{2ck+p-c\nu}\;\operatorname{erfi}\left(\frac{b+2(2ck+p-c\nu)z}{2\sqrt{2ck+p-c\nu}}\right)\right)\Big/((2ck+p-c\nu)(-2ck+p+c\nu))\right);\nu\in\mathbb{Z}\wedge\nu>0$$

01.20.21.2819.01

$$\int e^{p\sqrt{z}} \cosh(b z) \cosh^{\nu}\left(c\sqrt{z}\right) dz ==$$

$$2^{-\nu-2}\left(-\frac{e^{\frac{p^2}{4b}}p\sqrt{\pi}\operatorname{erfi}\left(\frac{p-2b\sqrt{z}}{2\sqrt{-b}}\right)}{(-b)^{3/2}}+\frac{4e^{p\sqrt{z}}\sinh(bz)}{b}-\frac{e^{-\frac{p^2}{4b}}p\sqrt{\pi}\operatorname{erfi}\left(\frac{2\sqrt{z}\,b+p}{2\sqrt{b}}\right)}{b^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-\frac{e^{\frac{(p+2cs-c\nu)^2}{4b}}\sqrt{\pi}\,(p+2cs-c\nu)\operatorname{erfi}\left(\frac{-2\sqrt{z}\,b+p+2cs-c\nu}{2\sqrt{-b}}\right)}{(-b)^{3/2}}-\right.$$

$$\frac{e^{\frac{(p+c(\nu-2s))^2}{4b}}\sqrt{\pi}\,(p+c(\nu-2s))\operatorname{erfi}\left(\frac{-2\sqrt{z}\,b+p+c(\nu-2s)}{2\sqrt{-b}}\right)}{(-b)^{3/2}}-\frac{e^{-\frac{(p+c(\nu-2s))^2}{4b}}\sqrt{\pi}\,(p+c(\nu-2s))\operatorname{erfi}\left(\frac{2\sqrt{z}\,b+p+c(\nu-2s)}{2\sqrt{b}}\right)}{b^{3/2}}-$$

$$\left.\frac{e^{-\frac{(p+2cs-c\nu)^2}{4b}}\sqrt{\pi}\,(c(\nu-2s)-p)\operatorname{erfi}\left(\frac{-2\sqrt{z}\,b-p+c(\nu-2s)}{2\sqrt{b}}\right)}{b^{3/2}}+\frac{8e^{p\sqrt{z}}\cosh\left(c(2s-\nu)\sqrt{z}\right)\sinh(bz)}{b}\right);\nu\in\mathbb{N}^{+}$$

Involving $z^n\, e^{p z^r} \cosh\left(b z^r\right) \cosh^{\nu}(c z)$

01.20.21.2820.01

$$\int e^{p z^2} \cosh\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$\frac{2^{-\nu-2}\sqrt{\pi}}{p^2-b^2}\left(\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{p-b}\ (b+p)\operatorname{erfi}\left(\sqrt{p-b}\ z\right)+(p-b)\sqrt{b+p}\ \operatorname{erfi}\left(\sqrt{b+p}\ z\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2(\nu-2s)^2}{4(b-p)}}\sqrt{p-b}\ (b+p)\left(\operatorname{erfi}\left(\frac{2cs-c\nu-2bz+2pz}{2\sqrt{p-b}}\right)+\operatorname{erfi}\left(\frac{c(\nu-2s)+2(p-b)z}{2\sqrt{p-b}}\right)\right)-\right.$$

$$\left.\left.e^{-\frac{c^2(\nu-2s)^2}{4(b+p)}}(b-p)\sqrt{b+p}\left(\operatorname{erfi}\left(\frac{c(2s-\nu)+2(b+p)z}{2\sqrt{b+p}}\right)+\operatorname{erfi}\left(\frac{c(\nu-2s)+2(b+p)z}{2\sqrt{b+p}}\right)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.2821.01

$$\int e^{p\sqrt{z}} \cosh\left(b\sqrt{z}\right)\cosh^{\nu}(c z)\, dz == \frac{1}{(b-p)^2(b+p)^2}$$

$$\left(2^{1-\nu}e^{p\sqrt{z}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\left(\sqrt{z}\ p^3-p^2-b^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left(b\sqrt{z}\right)+b\left(\sqrt{z}\ b^2+2p-p^2\sqrt{z}\right)\sinh\left(b\sqrt{z}\right)\right)\right)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{2e^{-c(2k+\nu)z}\left(e^{(p-b)\sqrt{z}}+e^{(b+p)\sqrt{z}}\right)\left(e^{4ckz}-e^{2c\nu z}\right)}{c(2k-\nu)}+\right.$$

$$\frac{e^{\frac{(p-b)^2}{c(8k-4\nu)}}(b-p)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-p+2c(2k-\nu)\sqrt{z}}{2\sqrt{c(\nu-2k)}}\right)}{c(2k-\nu)\sqrt{c(\nu-2k)}}+\frac{e^{\frac{(b+p)^2}{c(8k-4\nu)}}(b+p)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+p+2c(\nu-2k)\sqrt{z}}{2\sqrt{c(\nu-2k)}}\right)}{c(2k-\nu)\sqrt{c(\nu-2k)}}-$$

$$\left.\frac{e^{-\frac{(p-b)^2}{c(8k-4\nu)}}(p-b)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-b+p+2c(2k-\nu)\sqrt{z}}{2\sqrt{c(2k-\nu)}}\right)}{(c(2k-\nu))^{3/2}}-\frac{e^{-\frac{(b+p)^2}{c(8k-4\nu)}}(b+p)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+p+2c(2k-\nu)\sqrt{z}}{2\sqrt{c(2k-\nu)}}\right)}{(c(2k-\nu))^{3/2}}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $e^{p z^r}\cosh\left(b z^r\right)\cosh^{\nu}\left(c z^r\right)$

01.20.21.2822.01

$$\int e^{p z^r} \cosh(b z^r) \cosh^v(c z^r)\, dz ==$$

$$-\frac{2^{-v-1} z}{r}\left(\binom{v}{\frac{v}{2}}\left(\Gamma\left(\frac{1}{r}, (-b-p) z^r\right)((-b-p) z^r)^{-1/r} + ((b-p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (b-p) z^r\right)\right)(1 - v \bmod 2) + \right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r}, (-b-p-2cs+cv) z^r\right)((-b-p-2cs+cv) z^r)^{-1/r} + \right.$$

$$((b-p-2cs+cv) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (b-p-2cs+cv) z^r\right) + ((-b-p+2cs-cv) z^r)^{-1/r}$$

$$\left.\left.\Gamma\left(\frac{1}{r}, (-b-p+2cs-cv) z^r\right) + ((b-p+2cs-cv) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (b-p+2cs-cv) z^r\right)\right)\right) /; v \in \mathbb{N}^+$$

01.20.21.2823.01

$$\int e^{p z^2} \cosh\left(b z^2\right) \cosh^v\left(c z^2\right) dz ==$$

$$2^{-v-2}\left(\frac{\operatorname{erfi}\left(\sqrt{p-b}\ z\right)}{\sqrt{p-b}} + \frac{\operatorname{erfi}\left(\sqrt{b+p}\ z\right)}{\sqrt{b+p}}\right)\sqrt{\pi}\binom{v}{\frac{v}{2}}(1 - v \bmod 2) + 2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{\operatorname{erfi}\left(\sqrt{-b+p-2cs+cv}\ z\right)}{\sqrt{-b+p-2cs+cv}} + \right.$$

$$\left.\frac{\operatorname{erfi}\left(\sqrt{b+p-2cs+cv}\ z\right)}{\sqrt{b+p-2cs+cv}} + \frac{\operatorname{erfi}\left(\sqrt{-b+p+2cs-cv}\ z\right)}{\sqrt{-b+p+2cs-cv}} + \frac{\operatorname{erfi}\left(\sqrt{b+p+2cs-cv}\ z\right)}{\sqrt{b+p+2cs-cv}}\right) /; v \in \mathbb{N}^+$$

01.20.21.2824.01

$$\int e^{p\sqrt{z}} \cosh\left(b\sqrt{z}\right) \cosh^v\left(c\sqrt{z}\right) dz == \frac{1}{\left(p^2-b^2\right)^2}\left(2^{1-v} e^{p\sqrt{z}}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\right.$$

$$\left.\left(\left(p^2\left(p\sqrt{z}-1\right)-b^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left(b\sqrt{z}\right) - b\left(-\sqrt{z}\ b^2 - 2p + p^2\sqrt{z}\right)\sinh\left(b\sqrt{z}\right)\right)\right) + 2^{1-v} e^{p\sqrt{z}}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\left(p^2-(-b-2cs+cv)^2\right)^2}\left(\left(p^2\left(p\sqrt{z}-1\right)-(-b-2cs+cv)^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left((-b-2cs+cv)\sqrt{z}\right) - \right.\right.$$

$$(-b-2cs+cv)\left(\sqrt{z}\ p^2 - 2p - (-b-2cs+cv)^2\sqrt{z}\right)\sinh\left((-b-2cs+cv)\sqrt{z}\right)\Big) +$$

$$\frac{1}{\left(p^2-(-b+2cs-cv)^2\right)^2}\left(\left(p^2\left(p\sqrt{z}-1\right)-(-b+2cs-cv)^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left((-b+2cs-cv)\sqrt{z}\right) - \right.$$

$$\left.\left.(-b+2cs-cv)\left(\sqrt{z}\ p^2 - 2p - (-b+2cs-cv)^2\sqrt{z}\right)\sinh\left((-b+2cs-cv)\sqrt{z}\right)\right)\right) /; v \in \mathbb{N}^+$$

Involving $e^{b z^r+e}\cosh\left(a z^r+q\right)\cosh^v\left(c z^r+g\right)$

01.20.21.2825.01

$$\int e^{b z^r+e} \cosh(a z^r+q) \cosh^{\nu}(c z^r+g)\, dz ==$$

$$-\frac{2^{-\nu-1} z}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e+q}\,\Gamma\left(\frac{1}{r},(-a-b)z^r\right)((-a-b)z^r)^{-1/r}+e^{e-q}\,((a-b)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(a-b)z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+q+2gs-g\nu}\,\Gamma\left(\frac{1}{r},(-a-b-2cs+c\nu)z^r\right)((-a-b-2cs+c\nu)z^r)^{-1/r}+e^{e-q+2gs-g\nu}\right.$$

$$((a-b-2cs+c\nu)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(a-b-2cs+c\nu)z^r\right)+e^{e+q-2gs+g\nu}\,((-a-b+2cs-c\nu)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\right.$$

$$\left.\left.\left.(-a-b+2cs-c\nu)z^r\right)+e^{e-q-2gs+g\nu}\,((a-b+2cs-c\nu)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(a-b+2cs-c\nu)z^r\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2826.01

$$\int e^{b z^2+e} \cosh\left(a z^2+q\right) \cosh^{\nu}\left(c z^2+g\right) dz == 2^{-\nu-2}\left(\frac{\operatorname{erfi}\left(\sqrt{b-a}\ z\right)}{\sqrt{b-a}}+\frac{e^{2q}\operatorname{erfi}\left(\sqrt{a+b}\ z\right)}{\sqrt{a+b}}\right)e^{e-q}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+q-g(\nu-2s)}\left(\frac{e^{2(g(\nu-2s)-q)}\operatorname{erfi}\left(\sqrt{-a+b+c(\nu-2s)}\ z\right)}{\sqrt{-a+b+c(\nu-2s)}}+\frac{\operatorname{erfi}\left(\sqrt{a+b-c(\nu-2s)}\ z\right)}{\sqrt{a+b-c(\nu-2s)}}\right)+\right.$$

$$\left.e^{e-q-g(\nu-2s)}\left(\frac{e^{2(q+g(\nu-2s))}\operatorname{erfi}\left(\sqrt{a+b+c(\nu-2s)}\ z\right)}{\sqrt{a+b+c(\nu-2s)}}+\frac{\operatorname{erfi}\left(\sqrt{-a+b-c(\nu-2s)}\ z\right)}{\sqrt{-a+b-c(\nu-2s)}}\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.2827.01

$$\int e^{\sqrt{z}\ b+e} \cosh\left(\sqrt{z}\ a+q\right) \cosh^{\nu}\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-\nu}\left(\frac{e^{\sqrt{z}\ (a+b)+e+q}\left(\sqrt{z}\ a+b\sqrt{z}-1\right)}{(a+b)^2}+\frac{e^{\sqrt{z}\ (b-a)+e-q}\left(-\sqrt{z}\ a+b\sqrt{z}-1\right)}{(a-b)^2}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\frac{e^{e-q+g(\nu-2s)+(-a+b+c(\nu-2s))\sqrt{z}}\left(\sqrt{z}\ b+(c(\nu-2s)-a)\sqrt{z}-1\right)}{(-a+b+c(\nu-2s))^2}+\right.$$

$$\frac{e^{e+q+g(\nu-2s)+(a+b+c(\nu-2s))\sqrt{z}}\left(\sqrt{z}\ b+(a+c(\nu-2s))\sqrt{z}-1\right)}{(a+b+c(\nu-2s))^2}+$$

$$\frac{e^{e+q-g(\nu-2s)+(a+b-c(\nu-2s))\sqrt{z}}\left(\sqrt{z}\ b-(c(\nu-2s)-a)\sqrt{z}-1\right)}{(-a-b+c(\nu-2s))^2}+$$

$$\left.\frac{e^{e-q-g(\nu-2s)+(-a+b-c(\nu-2s))\sqrt{z}}\left(\sqrt{z}\ b-(a+c(\nu-2s))\sqrt{z}-1\right)}{(a-b+c(\nu-2s))^2}\right)\binom{\nu}{s}/;\ \nu\in\mathbb{N}^+$$

Involving $e^{b z^r+d z+e} \cosh(a z^r+p z+q) \cosh^v(c z^r+f z+g)$

01.20.21.2828.01

$$\int e^{b z^2+d z+e} \cosh(a z^2+p z+q) \cosh^v(c z^2+f z+g)\, dz ==$$

$$\frac{1}{(b-a)(a+b)}\left(2^{-v-2}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sqrt{b-a}\,(a+b)\,e^{-\frac{(d-p)^2-4(b-a)(e-q)}{4(b-a)}}\operatorname{erfi}\left(\frac{d-p-2az+2bz}{2\sqrt{b-a}}\right)+\right.\right.$$

$$\left.\left.(b-a)\sqrt{a+b}\,e^{-\frac{(d+p)^2-4(a+b)(e+q)}{4(a+b)}}\operatorname{erfi}\left(\frac{d+p+2(a+b)z}{2\sqrt{a+b}}\right)\right)(1-v \bmod 2)\right)+$$

$$2^{-v-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\left(e^{-\frac{(d-2fk+p+fv)^2-4(a+b-2ck+cv)(e-2gk+q+gv)}{4(a+b-2ck+cv)}}\sqrt{a+b-2ck+cv}\,(-a+b+2ck-cv)\right.\right.$$

$$\left.\operatorname{erfi}\left((d-2fk+p+fv+2bz-2(-a+2ck-cv)z)\Big/\left(2\sqrt{a+b-2ck+cv}\right)\right)+\right.$$

$$e^{-\frac{(d+2fk-p-fv)^2-4(-a+b+2ck-cv)(e+2gk-q-gv)}{4(-a+b+2ck-cv)}}(a+b-2ck+cv)\sqrt{-a+b+2ck-cv}$$

$$\left.\left.\operatorname{erfi}\left(\frac{d+2fk-p-fv+2(-a+b+2ck-cv)z}{2\sqrt{-a+b+2ck-cv}}\right)\right)\Big/((-a+b+2ck-cv)(a+b-2ck+cv))+\right.$$

$$\left(e^{-\frac{(d-2fk-p+fv)^2-4(-a+b-2ck+cv)(e-2gk-q+gv)}{4(-a+b-2ck+cv)}}\sqrt{-a+b-2ck+cv}\,(a+b+2ck-cv)\right.$$

$$\left.\operatorname{erfi}\left((d-2fk-p+fv+2bz-2(a+2ck-cv)z)\Big/\left(2\sqrt{-a+b-2ck+cv}\right)\right)+\right.$$

$$e^{-\frac{(d+2fk+p-fv)^2-4(a+b+2ck-cv)(e+2gk+q-gv)}{4(a+b+2ck-cv)}}(-a+b-2ck+cv)\sqrt{a+b+2ck-cv}$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+2fk+p-fv+2(a+b+2ck-cv)z}{2\sqrt{a+b+2ck-cv}}\right)\right)\Big/((a+b+2ck-cv)(-a+b-2ck+cv))\right)/;\ v\in\mathbb{N}^+$$

01.20.21.2829.01

$$\int e^{\sqrt{z}\ b+d\,z+e}\cosh\left(\sqrt{z}\ a+p\,z+q\right)\cosh^{v}\left(\sqrt{z}\ c+f\,z+g\right)dz =$$

$$2^{-v-2}\,e^{e-q}\left(\frac{(a-b)\,e^{-\frac{(b-a)^2}{4(d-p)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-a+b+2(d-p)\sqrt{z}}{2\sqrt{d-p}}\right)}{(d-p)^{3/2}}+\frac{2\,e^{\sqrt{z}\ (b-a)+(d-p)\,z}}{d-p}+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (a+b)+2\,q+(d+p)\,z}}{d+p}-\frac{(a+b)\,e^{2\,q-\frac{(a+b)^2}{4(d+p)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{a+b+2(d+p)\sqrt{z}}{2\sqrt{d+p}}\right)}{(d+p)^{3/2}}\right)\binom{v}{\frac{v}{2}}(1-v \bmod 2)+$$

$$2^{-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(2\,e^{e-2\,g\,k-q-g\,v}\left(\frac{e^{2\,q+2\,g\,v+(d-2\,f\,k+p+f\,v)\,z+(a+b-2\,c\,k+c\,v)\sqrt{z}}}{d-2\,f\,k+p+f\,v}+\frac{e^{4\,g\,k+(d+2\,f\,k-p-f\,v)\,z+(-a+b+2\,c\,k-c\,v)\sqrt{z}}}{d+2\,f\,k-p-f\,v}+\right.\right.$$

$$\left.\frac{e^{4\,g\,k+2\,q+(d+2\,f\,k+p-f\,v)\,z+(a+b+2\,c\,k-c\,v)\sqrt{z}}}{d+2\,f\,k+p-f\,v}+\frac{e^{2\,g\,v+(d-2\,f\,k-p+f\,v)\,z+(-a+b-2\,c\,k+c\,v)\sqrt{z}}}{d-2\,f\,k-p+f\,v}\right)-$$

$$\frac{1}{(d-2\,f\,k-p+f\,v)^{3/2}}\left(e^{-\frac{(-a+b-2\,c\,k+c\,v)^2}{4(d-2\,f\,k-p+f\,v)}+e-2\,g\,k-q+g\,v}\sqrt{\pi}\ (-a+b-2\,c\,k+c\,v)\right.$$

$$\left.\operatorname{erfi}\left(\left(-a+b-2\,c\,k+c\,v+2\,(d-2\,f\,k-p+f\,v)\sqrt{z}\right)\Big/\left(2\sqrt{d-2\,f\,k-p+f\,v}\right)\right)\right)-$$

$$\frac{1}{(d+2\,f\,k-p-f\,v)^{3/2}}\left(e^{-\frac{(-a+b+2\,c\,k-c\,v)^2}{4(d+2\,f\,k-p-f\,v)}+e+2\,g\,k-q-g\,v}\sqrt{\pi}\ (-a+b+2\,c\,k-c\,v)\right.$$

$$\left.\operatorname{erfi}\left(\left(-a+b+2\,c\,k-c\,v+2\,(d+2\,f\,k-p-f\,v)\sqrt{z}\right)\Big/\left(2\sqrt{d+2\,f\,k-p-f\,v}\right)\right)\right)-$$

$$\left(e^{-\frac{(a+b+2\,c\,k-c\,v)^2}{4(d+2\,f\,k+p-f\,v)}+e+2\,g\,k+q-g\,v}\sqrt{\pi}\ (a+b+2\,c\,k-c\,v)\operatorname{erfi}\left(\frac{a+b+2\,c\,k-c\,v+2\,(d+2\,f\,k+p-f\,v)\sqrt{z}}{2\sqrt{d+2\,f\,k+p-f\,v}}\right)\right)\Big/$$

$$(d+2\,f\,k+p-f\,v)^{3/2}-\left(e^{-\frac{(a+b+c\,(v-2\,k))^2}{4(d+p+f\,(v-2\,k))}+e-2\,g\,k+q+g\,v}\sqrt{\pi}\ (a+b+c\,(v-2\,k))\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{a+b-2\,c\,k+c\,v+2\,(d+p+f\,(v-2\,k))\sqrt{z}}{2\sqrt{d+p+f\,(v-2\,k)}}\right)\right)\Big/(d+p+f\,(v-2\,k))^{3/2}\right)/;\ v\in\mathbb{N}^{+}$$

Involving product of power of the direct function, the direct function and rational functions of exp

Involving $\cosh(e\,z)\cosh^{v}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2830.01

$$\int \frac{\cosh(e\,z)\cosh^{v}(c\,z)}{\left(a+b\,e^{d\,z}\right)^{n}}\,dz ==$$

$$2^{-v-1}\,a^{-n}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-e-2\,c\,s+c\,v}\left(e^{(-e-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{-e-2\,c\,s+c\,v}{d},\,n;\,\frac{d-e-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.e^{(e+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{e+2\,c\,s-c\,v}{d},\,n;\,\frac{d+e+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-e+2\,c\,s-c\,v}\left(e^{(-e+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{-e+2\,c\,s-c\,v}{d},\,n;\,\frac{d-e+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.\left.e^{(e-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{e-2\,c\,s+c\,v}{d},\,n;\,\frac{d+e-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)+$$

$$\frac{2^{-v-1}\,a^{-n}\,(1-v\bmod 2)}{e}\binom{v}{\frac{v}{2}}\left(e^{e\,z}\,{}_2F_1\left(\frac{e}{d},\,n;\,\frac{d+e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-e\,z}\,{}_2F_1\left(-\frac{e}{d},\,n;\,\frac{d-e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/;\,n\in$$

$$\mathbb{N}^{+}\bigwedge v\in$$

$$\mathbb{N}^{+}$$

Involving $e^{p\,z}\cosh(e\,z)\cosh^{v}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2831.01

$$\int \frac{e^{p\,z}\cosh(e\,z)\cosh^{v}(c\,z)}{\left(a+b\,e^{d\,z}\right)^{n}}\,dz ==$$

$$2^{-v-1}\,a^{-n}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(e^{(-e+p-2\,c\,s+c\,v)\,z}\,(-e-p-2\,c\,s+c\,v)\,{}_2F_1\left(\frac{-e+p-2\,c\,s+c\,v}{d},\,n;\,\frac{d-e+p-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.e^{(e+p+2\,c\,s-c\,v)\,z}\,(-e+p-2\,c\,s+c\,v)\,{}_2F_1\left(\frac{e+p+2\,c\,s-c\,v}{d},\,n;\,\frac{d+e+p+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$

$$((-e-p-2\,c\,s+c\,v)\,(-e+p-2\,c\,s+c\,v))+$$

$$\left(e^{(-e+p+2\,c\,s-c\,v)\,z}\,(-e-p+2\,c\,s-c\,v)\,{}_2F_1\left(\frac{-e+p+2\,c\,s-c\,v}{d},\,n;\,\frac{d-e+p+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.e^{(e+p-2\,c\,s+c\,v)\,z}\,(-e+p+2\,c\,s-c\,v)\,{}_2F_1\left(\frac{e+p-2\,c\,s+c\,v}{d},\,n;\,\frac{d+e+p-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$

$$\left.((-e-p+2\,c\,s-c\,v)\,(-e+p+2\,c\,s-c\,v))\right)+\frac{1}{(e-p)\,(e+p)}$$

$$\left(2^{-v-1}\,a^{-n}\binom{v}{\frac{v}{2}}\left(e^{(e+p)\,z}\,(e-p)\,{}_2F_1\left(\frac{e+p}{d},\,n;\,\frac{d+e+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(p-e)\,z}\,(e+p)\,{}_2F_1\left(\frac{p-e}{d},\,n;\,\frac{d-e+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right.$$

$$\left.(1-v\bmod 2)\right)\Big/;\,n\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving product of power of the direct function, the direct function and algebraic functions of exp

Involving $\left(a+b\,e^{d\,z}\right)^{\beta}\cosh(e\,z)\cosh^{\nu}(c\,z)$

01.20.21.2832.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta}\cosh(e\,z)\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{-e-2\,c\,s+c\,\nu}\left(e^{(-e-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{-e-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d-e-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.e^{(e+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{e+2\,c\,s-c\,\nu}{d},\,-\beta;\,\frac{d+e+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-e+2\,c\,s-c\,\nu}\left(e^{(-e+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{-e+2\,c\,s-c\,\nu}{d},\,-\beta;\,\frac{d-e+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.\left.e^{(e-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{e-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d+e-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)+$$

$$\frac{1}{e}\left(2^{-\nu-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\left(e^{e\,z}\,{}_2F_1\left(\frac{e}{d},\,-\beta;\,\frac{d+e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-e\,z}\,{}_2F_1\left(-\frac{e}{d},\,-\beta;\,\frac{d-e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right.$$

$$\left.(1-\nu \bmod 2)\right)/;\,\nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cosh(e\,z)\cosh^{\nu}(c\,z)$

01.20.21.2833.01

$$\int e^{p z}\left(a+b\,e^{d z}\right)^{\beta}\cosh(e z)\cosh^{\nu}(c z)\,dz == 2^{-\nu-1}\left(a+b\,e^{d z}\right)^{\beta}\left(\frac{e^{d z}\,b}{a}+1\right)^{-\beta}$$
$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(e^{(-e+p-2cs+c\nu)z}\,(-e-p-2cs+c\nu)\,{}_2F_1\left(\frac{-e+p-2cs+c\nu}{d},-\beta;\frac{d-e+p-2cs+c\nu}{d};-\frac{b\,e^{d z}}{a}\right)-\right.\right.$$
$$\left.\left.e^{(e+p+2cs-c\nu)z}\,(-e+p-2cs+c\nu)\,{}_2F_1\left(\frac{e+p+2cs-c\nu}{d},-\beta;\frac{d+e+p+2cs-c\nu}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$
$$((-e-p-2cs+c\nu)(-e+p-2cs+c\nu))+$$
$$\left(e^{(-e+p+2cs-c\nu)z}\,(-e-p+2cs-c\nu)\,{}_2F_1\left(\frac{-e+p+2cs-c\nu}{d},-\beta;\frac{d-e+p+2cs-c\nu}{d};-\frac{b\,e^{d z}}{a}\right)-\right.$$
$$\left.e^{(e+p-2cs+c\nu)z}\,(-e+p+2cs-c\nu)\,{}_2F_1\left(\frac{e+p-2cs+c\nu}{d},-\beta;\frac{d+e+p-2cs+c\nu}{d};-\frac{b\,e^{d z}}{a}\right)\right)\Big/$$
$$\left.((-e-p+2cs-c\nu)(-e+p+2cs-c\nu))\right)+\frac{1}{(e-p)(e+p)}$$
$$\left(2^{-\nu-1}\left(a+b\,e^{d z}\right)^{\beta}\left(\frac{e^{d z}\,b}{a}+1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\left(e^{(e+p)z}\,(e-p)\,{}_2F_1\left(\frac{e+p}{d},-\beta;\frac{d+e+p}{d};-\frac{b\,e^{d z}}{a}\right)-\right.\right.$$
$$\left.\left.e^{(p-e)z}\,(e+p)\,{}_2F_1\left(\frac{p-e}{d},-\beta;\frac{d-e+p}{d};-\frac{b\,e^{d z}}{a}\right)\right)(1-\nu\bmod 2)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving products of powers of two direct functions and exponential function

Involving $e^{b z}\cosh^{\mu}(c z)\cosh^{\nu}(a z)$

01.20.21.2834.01

$$\int e^{b z}\cosh^{\mu}(c z)\cosh^{\nu}(a z)\,dz == 2^{-\nu}\cosh^{\mu}(c z)\left(1+e^{-2cz}\right)^{-\mu}$$
$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{(b+a(\nu-2s))z}}{b+a(\nu-2s)+c\mu}\,{}_2F_1\left(-\frac{b+a(\nu-2s)+c\mu}{2c},-\mu;1-\frac{b+a(\nu-2s)+c\mu}{2c};-e^{-2cz}\right)+\right.$$
$$\left.\frac{e^{(b-a(\nu-2s))z}}{b-a(\nu-2s)+c\mu}\,{}_2F_1\left(-\frac{b-a(\nu-2s)+c\mu}{2c},-\mu;1-\frac{b-a(\nu-2s)+c\mu}{2c};-e^{-2cz}\right)\right)+$$
$$\frac{2^{-\nu}\,e^{bz}\left(1+e^{-2cz}\right)^{-\mu}\cosh^{\mu}(c z)\,(1-\nu\bmod 2)}{b+c\mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{b+c\mu}{2c},-\mu;1-\frac{b+c\mu}{2c};-e^{-2cz}\right)/;\ \nu\in\mathbb{N}$$

01.20.21.2835.01

$$\int e^{b z} \cosh^{m}(c z) \cosh^{\nu}(a z)\, dz ==$$

$$2^{-m-\nu}\left(\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\frac{(m \bmod 2-1)(\nu \bmod 2-1)}{b} e^{b z}-\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{e^{(b+c(m-2 s)) z}}{b+c(m-2 s)}+\frac{e^{(b-c m+2 c s) z}}{b-c m+2 c s}\right)-\right.$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{(b+a(\nu-2 s)) z}}{b+a(\nu-2 s)}+\frac{e^{(b+2 a s-a \nu) z}}{b+2 a s-a \nu}\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{(b+2 c k-c m-2 a s+a \nu) z}}{b+2 c k-c m-2 a s+a \nu}+\frac{e^{(b-2 c k+c m+2 a s-a \nu) z}}{b-2 c k+c m+2 a s-a \nu}+\right.$$

$$\left.\left.\frac{e^{(b+2 c k-c m+2 a s-a \nu) z}}{b+2 c k-c m+2 a s-a \nu}+\frac{e^{(b-2 c k+c m-2 a s+a \nu) z}}{b-2 c k+c m-2 a s+a \nu}\right)\right) /;\ m \in \mathbb{N}^{+} \bigwedge \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} \cosh^{\mu}(c z) \cosh^{\nu}(a z+b)$

01.20.21.2836.01

$$\int e^{p z} \cosh^{\mu}(c z) \cosh^{\nu}(b+a z)\, dz ==$$

$$\frac{2^{-\nu} e^{p z} \cosh^{\mu}(c z)\left(1+e^{2 c z}\right)^{-\mu}(1-\nu \bmod 2)}{p-c \mu}\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(\frac{p-c \mu}{2 c},-\mu;\frac{1}{2}\left(\frac{p}{c}-\mu+2\right);-e^{2 c z}\right)+$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s} e^{-b(\nu-2 s)}\left(1+e^{-2 c z}\right)^{-\mu}\cosh^{\mu}(c z)$$

$$\left(\frac{e^{2 b(\nu-2 s)+(p+a(\nu-2 s)) z}}{p+a(\nu-2 s)+c \mu}{}_2F_1\left(-\frac{p+a(\nu-2 s)+c \mu}{2 c},-\mu;-\frac{p+a(\nu-2 s)+c(\mu-2)}{2 c};-e^{-2 c z}\right)-\right.$$

$$\left.\frac{e^{(p-a(\nu-2 s)) z}}{-p+a(\nu-2 s)-c \mu}{}_2F_1\left(-\frac{p-a(\nu-2 s)+c \mu}{2 c},-\mu;\frac{1}{2}\left(\frac{a(\nu-2 s)-p}{c}-\mu+2\right);-e^{-2 c z}\right)\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.2837.01

$$\int e^{p z} \cosh^{m}(c z) \cosh^{\nu}(b+a z)\, dz ==$$

$$\frac{2^{-m} e^{p z}}{p+a \nu}\binom{m}{\frac{m}{2}}\cosh^{\nu}(b+a z)\,{}_2F_1\left(-\frac{p+a \nu}{2 a},-\nu;\frac{1}{2}\left(-\frac{p}{a}-\nu+2\right);-e^{-2(b+a z)}\right)(1-m \bmod 2)\left(1+e^{-2(b+a z)}\right)^{-\nu}+$$

$$2^{-m}\cosh^{\nu}(b+a z)\left(1+e^{-2(b+a z)}\right)^{-\nu}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{e^{(2 c k-c m+p) z}}{2 c k-c m+p+a \nu}{}_2F_1\left(-\frac{2 c k-c m+p+a \nu}{2 a},-\nu;-\frac{2 c k-c m+p+a(\nu-2)}{2 a};-e^{-2(b+a z)}\right)+\right.$$

$$\left.\left.\frac{e^{(c(m-2 k)+p) z}}{c(m-2 k)+p+a \nu}{}_2F_1\left(-\frac{c(m-2 k)+p+a \nu}{2 a},-\nu;-\frac{-2 c k+c m+p+a(\nu-2)}{2 a};-e^{-2(b+a z)}\right)\right)\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.2838.01

$$\int e^{p z} \cosh^m(c z) \cosh^\nu(b + a z)\, dz == -2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\frac{e^{(p+c(m-2s))z}}{-p-c(m-2s)} + \frac{e^{-(c(m-2s)-p)z}}{c(m-2s)-p} \right) \binom{m}{s} +$$

$$\frac{2^{-m-\nu} e^{p z} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1 - m \bmod 2)(1 - \nu \bmod 2)}{p} -$$

$$2^{-m-\nu} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b(2s+\nu)} \left(\frac{e^{2b\nu+(p+a(-2s+\nu))z}}{-p-a(\nu-2s)} + \frac{e^{4bs-(-p-2as+a\nu)z}}{-p-2as+a\nu} \right) \binom{\nu}{s} -$$

$$2^{-m-\nu} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2bs-b\nu} \left(\frac{e^{4bs-(c(m-2k)-p-2as+a\nu)z}}{c(m-2k)-p-2as+a\nu} + \frac{e^{2b\nu-(-2ck+cm-p+2as-a\nu)z}}{-2ck+cm-p+2as-a\nu} + \right.$$

$$\left. \frac{e^{2b\nu-(2ck-cm-p+2as-a\nu)z}}{2ck-cm-p+2as-a\nu} + \frac{e^{4bs-(2ck-cm-p-2as+a\nu)z}}{2ck-cm-p-2as+a\nu} \right) \binom{\nu}{s} /;\ m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

Involving $e^{p z} \cosh^\mu(c z + d) \cosh^\nu(a z + b)$

01.20.21.2839.01

$$\int e^{p z} \cosh^\mu(d + c z) \cosh^\nu(b + a z)\, dz ==$$

$$\frac{2^{-\nu} e^{p z} \cosh^\mu(d + c z) \left(1 + e^{2(d+c z)}\right)^{-\mu} (1 - \nu \bmod 2)}{p - c\mu} \binom{\nu}{\frac{\nu}{2}} {}_2F_1\left(\frac{p - c\mu}{2c}, -\mu; \frac{1}{2}\left(\frac{p}{c} - \mu + 2 \right); -e^{2(d+c z)} \right) +$$

$$2^{-\nu} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} e^{-b(\nu-2s)} \left(1 + e^{-2(d+c z)}\right)^{-\mu} \cosh^\mu(d + c z)$$

$$\left(\frac{e^{2b(\nu-2s)+(p+a(\nu-2s))z}}{p + a(\nu-2s) + c\mu} {}_2F_1\left(-\frac{p + a(\nu-2s) + c\mu}{2c}, -\mu; -\frac{p + a(\nu-2s) + c(\mu-2)}{2c}; -e^{-2(d+c z)} \right) - \right.$$

$$\left. \frac{e^{(p-a(\nu-2s))z}}{-p + a(\nu-2s) - c\mu} {}_2F_1\left(-\frac{p - a(\nu-2s) + c\mu}{2c}, -\mu; \frac{1}{2}\left(\frac{a(\nu-2s) - p}{c} - \mu + 2 \right); -e^{-2(d+c z)} \right) \right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.2840.01

$$\int e^{p z} \cosh^m(d + c z) \cosh^v(b + a z)\, dz ==$$

$$-2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-d(m-2s)}\left(\frac{e^{2d(m-2s)-(-p-c(m-2s))z}}{-p-c(m-2s)}+\frac{e^{-(c(m-2s)-p)z}}{c(m-2s)-p}\right)\binom{m}{s}\right)(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\, e^{p z}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{p}-$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-b(2s+v)}\left(\frac{e^{2bv-(-p-a(v-2s))z}}{-p-a(v-2s)}+\frac{e^{4bs-(-p-2as+av)z}}{-p-2as+av}\right)\binom{v}{s}-$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-2dk-dm-2bs-bv}\left(e^{2dm}\left(\frac{e^{2bv-(2ck-cm-p+2as-av)z}}{2ck-cm-p+2as-av}+\frac{e^{4bs-(2ck-cm-p-2as+av)z}}{2ck-cm-p-2as+av}\right)+\right.$$
$$\left.e^{4dk}\left(\frac{e^{2bv-(-2ck+cm-p+2as-av)z}}{-2ck+cm-p+2as-av}+\frac{e^{4bs-(c(m-2k)-p-2as+av)z}}{c(m-2k)-p-2as+av}\right)\right)\binom{v}{s} /;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p z^r} \cosh^m(b z) \cosh^v(c z)$

01.20.21.2841.01

$$\int e^{p z^2} \cosh^m(b z) \cosh^v(c z)\, dz ==$$

$$\frac{1}{\sqrt{p}}\left(\left(2^{-m-v-1}\sqrt{\pi}\right)\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}e^{-\frac{b^2(m-2s)^2}{4p}}\left(\operatorname{erfi}\left(\frac{2pz-b(m-2s)}{2\sqrt{p}}\right)+\operatorname{erfi}\left(\frac{b(m-2s)+2pz}{2\sqrt{p}}\right)\right)\right)(1-v \bmod 2)\right)+$$

$$\frac{1}{\sqrt{p}}\left(2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\operatorname{erfi}\left(\sqrt{p}\ z\right)(1-m \bmod 2)(1-v \bmod 2)\right)+$$

$$\frac{1}{\sqrt{p}}\left(\left(2^{-m-v-1}\sqrt{\pi}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}e^{-\frac{c^2(v-2s)^2}{4p}}\left(\operatorname{erfi}\left(\frac{2pz-c(v-2s)}{2\sqrt{p}}\right)+\operatorname{erfi}\left(\frac{c(v-2s)+2pz}{2\sqrt{p}}\right)\right)\right)+$$

$$\frac{1}{\sqrt{p}}\left(\left(2^{-m-v-1}\sqrt{\pi}\right)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{(-2ck-bm+2bs+cv)^2}{4p}}\operatorname{erfi}\left(\frac{-2ck-bm+2bs+cv+2pz}{2\sqrt{p}}\right)+e^{-\frac{(-2ck+bm-2bs+cv)^2}{4p}}\right.\right.$$
$$\operatorname{erfi}\left(\frac{-2ck+bm-2bs+cv+2pz}{2\sqrt{p}}\right)+e^{-\frac{(2ck-bm+2bs-cv)^2}{4p}}\operatorname{erfi}\left(\frac{2ck-bm+2bs-cv+2pz}{2\sqrt{p}}\right)+$$
$$\left.\left.e^{-\frac{(2ck+bm-2bs-cv)^2}{4p}}\operatorname{erfi}\left(\frac{2ck+bm-2bs-cv+2pz}{2\sqrt{p}}\right)\right)\right) /;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2842.01

$$\int e^{p\sqrt{z}}\cosh^m(b\,z)\cosh^v(c\,z)\,dz ==$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(-\frac{e^{\frac{p^2}{4b(m-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2b(m-2s)\sqrt{z}}{2\sqrt{-b(m-2s)}}\right)}{(-b(m-2s))^{3/2}}+\frac{2e^{\sqrt{z}\,p+b(m-2s)z}}{b(m-2s)}-\frac{2e^{p\sqrt{z}-b(m-2s)z}}{b(m-2s)}-\right.\right.$$

$$\left.\left.\frac{e^{-\frac{p^2}{4b(m-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2b(m-2s)\sqrt{z}}{2\sqrt{b(m-2s)}}\right)}{(b(m-2s))^{3/2}}\right)\right)(1-v\bmod 2)+$$

$$\frac{1}{p^2}\left(2^{-m-v+1}e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)\right)+2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{e^{\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\,p+c(v-2s)z}}{c(v-2s)}-\right.$$

$$\left.\frac{2e^{p\sqrt{z}-c(v-2s)z}}{c(v-2s)}-\frac{e^{-\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)+2^{-m-v-1}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\frac{2e^{\sqrt{z}\,p+(-2ck-bm+2bs+cv)z}}{-2ck-bm+2bs+cv}-\left(e^{-\frac{p^2}{4(-2ck-bm+2bs+cv)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(-2ck-bm+2bs+cv)\sqrt{z}}{2\sqrt{-2ck-bm+2bs+cv}}\right)\right)\Big/\right.$$

$$(-2ck-bm+2bs+cv)^{3/2}+\frac{2e^{\sqrt{z}\,p+(-2ck+bm-2bs+cv)z}}{-2ck+bm-2bs+cv}-$$

$$\left(e^{-\frac{p^2}{4(-2ck+bm-2bs+cv)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(-2ck+bm-2bs+cv)\sqrt{z}}{2\sqrt{-2ck+bm-2bs+cv}}\right)\right)\Big/(-2ck+bm-2bs+cv)^{3/2}+$$

$$\frac{2e^{\sqrt{z}\,p+(2ck-bm+2bs-cv)z}}{2ck-bm+2bs-cv}-\left(e^{-\frac{p^2}{4(2ck-bm+2bs-cv)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(2ck-bm+2bs-cv)\sqrt{z}}{2\sqrt{2ck-bm+2bs-cv}}\right)\right)\Big/$$

$$(2ck-bm+2bs-cv)^{3/2}+\frac{2e^{\sqrt{z}\,p+(2ck+bm-2bs-cv)z}}{2ck+bm-2bs-cv}-\left(e^{-\frac{p^2}{4(2ck+bm-2bs-cv)}}\,p\sqrt{\pi}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{p+2(2ck+bm-2bs-cv)\sqrt{z}}{2\sqrt{2ck+bm-2bs-cv}}\right)\right)\Big/(2ck+bm-2bs-cv)^{3/2}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p\,z}\cosh^m(b\,z^r)\cosh^v(c\,z)$

01.20.21.2843.01

$$\int e^{p z} \cosh^m\left(b z^2\right) \cosh^v(c z)\, dz ==$$

$$-\frac{1}{b}\left(2^{-m-v-1}\binom{v}{\frac{v}{2}}\sqrt{\pi}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2s}\left(\binom{m}{s}\left(e^{\frac{p^2}{4b(m-2s)}}\sqrt{-b(m-2s)}\ \operatorname{erfi}\left(\frac{p-2b(m-2s)z}{2\sqrt{-b(m-2s)}}\right)-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.e^{-\frac{p^2}{4b(m-2s)}}\sqrt{b(m-2s)}\ \operatorname{erfi}\left(\frac{p+2b(m-2s)z}{2\sqrt{b(m-2s)}}\right)\right)\right)\right)(1-v \bmod 2)\right)+$$

$$\frac{2^{-m-v}\, e^{p z}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{p}+2^{-m-v+1}\, e^{p z}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}(c(v-2s)\sinh(c(v-2s)z)-p\cosh(c(v-2s)z))}{(c(v-2s)-p)(p+c(v-2s))}+2^{-m-v-1}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\left(e^{-\frac{(2ck+p-cv)^2}{4(2bs-bm)}}\sqrt{2bs-bm}\ (bm-2bs)\operatorname{erfi}\left(\frac{2ck+p-cv+2(2bs-bm)z}{2\sqrt{2bs-bm}}\right)+e^{-\frac{(-2ck+p+cv)^2}{4(bm-2bs)}}\right.\right.$$

$$\left.(2bs-bm)\sqrt{bm-2bs}\ \operatorname{erfi}\left(\frac{-2ck+p+cv-2(2bs-bm)z}{2\sqrt{bm-2bs}}\right)\right)\Big/((bm-2bs)(2bs-bm))+$$

$$\left(e^{-\frac{(-2ck+p+cv)^2}{4(2bs-bm)}}\sqrt{2bs-bm}\ (bm-2bs)\operatorname{erfi}\left(\frac{-2ck+p+cv-2(bm-2bs)z}{2\sqrt{2bs-bm}}\right)+\right.$$

$$\left.e^{-\frac{(2ck+p-cv)^2}{4(bm-2bs)}}(2bs-bm)\sqrt{bm-2bs}\ \operatorname{erfi}\left(\frac{2ck+p-cv+2(bm-2bs)z}{2\sqrt{bm-2bs}}\right)\right)\Big/$$

$$\left.((bm-2bs)(2bs-bm))\right)/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

01.20.21.2844.01

$$\int e^{p z} \cosh^m\left(b \sqrt{z}\right) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\frac{4 e^{p z} \cosh\left(b (m-2 s) \sqrt{z}\right)}{p} + \frac{b e^{-\frac{(2 b s - b m)^2}{4 p}} \sqrt{\pi}\, (m-2 s) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - b (m-2 s)}{2 \sqrt{p}} \right)}{p^{3/2}} - \right.\right.$$

$$\left.\left. \frac{b e^{-\frac{b^2 (m-2 s)^2}{4 p}} \sqrt{\pi}\, (m-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z}\, p + b (m-2 s)}{2 \sqrt{p}} \right)}{p^{3/2}} \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} + 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\frac{e^{(p - c (v-2 s)) z}}{p - c (v-2 s)} + \frac{e^{(p + c (v-2 s)) z}}{p + c (v-2 s)} \right) \binom{v}{s} +$$

$$2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(2 \left(\frac{2 e^{(2 c k + p - c v) z} \cosh\left(b (m-2 s) \sqrt{z}\right)}{2 c k + p - c v} + \frac{2 e^{(p + c (v-2 k)) z} \cosh\left(b (m-2 s) \sqrt{z}\right)}{p + c (v-2 k)} \right) - \right.$$

$$\left(e^{-\frac{(2 b s - b m)^2}{4 (-2 c k + p + c v)}} \sqrt{\pi}\, (2 b s - b m) \operatorname{erfi}\left(\frac{-b m + 2 b s + 2 (-2 c k + p + c v) \sqrt{z}}{2 \sqrt{-2 c k + p + c v}} \right) \right) \Big/ (-2 c k + p + c v)^{3/2} -$$

$$\left(e^{-\frac{(2 b s - b m)^2}{4 (2 c k + p - c v)}} \sqrt{\pi}\, (2 b s - b m) \operatorname{erfi}\left(\frac{-b m + 2 b s + 2 (2 c k + p - c v) \sqrt{z}}{2 \sqrt{2 c k + p - c v}} \right) \right) \Big/ (2 c k + p - c v)^{3/2} -$$

$$\left(e^{-\frac{(b m - 2 b s)^2}{4 (2 c k + p - c v)}} \sqrt{\pi}\, (b m - 2 b s) \operatorname{erfi}\left(\frac{b m - 2 b s + 2 (2 c k + p - c v) \sqrt{z}}{2 \sqrt{2 c k + p - c v}} \right) \right) \Big/ (2 c k + p - c v)^{3/2} -$$

$$\left(b e^{-\frac{b^2 (m-2 s)^2}{4 (p + c (v-2 k))}} \sqrt{\pi}\, (m-2 s) \operatorname{erfi}\left(\frac{b m - 2 b s + 2 (p + c (v-2 k)) \sqrt{z}}{2 \sqrt{p + c (v-2 k)}} \right) \right) \Big/$$

$$\left. (p + c (v-2 k))^{3/2} \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

Involving $e^{p z^r} \cosh^m\left(b z^r\right) \cosh^v(c z)$

01.20.21.2845.01

$$\int e^{p z^2} \cosh^m\left(b z^2\right) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\binom{m}{s} \left((p + b(m-2s)) \sqrt{p - b(m-2s)}\ \operatorname{erfi}\left(\frac{2pz - 2b(m-2s)z}{2\sqrt{p - b(m-2s)}} \right) + \right. \right. \right.$$

$$\left. \left. \left. \sqrt{p + b(m-2s)}\ (p - b(m-2s)) \operatorname{erfi}\left(\sqrt{p + b(m-2s)}\ z \right) \right) \right) \Big/ ((p - b(m-2s))(p + b(m-2s))) \right)$$

$$(1 - v \bmod 2) + \frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\ z \right) (1 - m \bmod 2)(1 - v \bmod 2) \right) + \frac{1}{\sqrt{p}}$$

$$\left(\left(2^{-m-v-1} \sqrt{\pi} \right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{2pz - c(v-2s)}{2\sqrt{p}} \right) + e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{c(v-2s) + 2pz}{2\sqrt{p}} \right) \right) \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\left(e^{-\frac{(2ck - cv)^2}{4(-bm + p + 2bs)}} \sqrt{-bm + p + 2bs}\ (bm + p - 2bs) \right. \right.$$

$$\operatorname{erfi}\left(\frac{2ck - cv + 2(-bm + p + 2bs)z}{2\sqrt{-bm + p + 2bs}} \right) + e^{-\frac{(cv - 2ck)^2}{4(bm + p - 2bs)}} (-bm + p + 2bs) \sqrt{bm + p - 2bs}$$

$$\left. \operatorname{erfi}\left(\frac{-2ck + cv + 2pz - 2(2bs - bm)z}{2\sqrt{bm + p - 2bs}} \right) \right) \Big/ ((bm + p - 2bs)(-bm + p + 2bs)) +$$

$$\left(e^{-\frac{(cv - 2ck)^2}{4(-bm + p + 2bs)}} \sqrt{-bm + p + 2bs}\ (bm + p - 2bs) \operatorname{erfi}\left(\frac{-2ck + cv + 2pz - 2(bm - 2bs)z}{2\sqrt{-bm + p + 2bs}} \right) + \right.$$

$$\left. e^{-\frac{(2ck - cv)^2}{4(bm + p - 2bs)}} (-bm + p + 2bs) \sqrt{bm + p - 2bs}\ \operatorname{erfi}\left(\frac{2ck - cv + 2(bm + p - 2bs)z}{2\sqrt{bm + p - 2bs}} \right) \right) \Big/$$

$$\left. ((bm + p - 2bs)(-bm + p + 2bs)) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.2846.01

$$\int e^{p\sqrt{z}}\cosh^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz ==$$

$$2^{-m-v+2}\,e^{p\sqrt{z}}\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\binom{m}{s}\left(\left(\sqrt{z}\;p^3-p^2-b^2\,(m-2\,s)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left(b\,(m-2\,s)\sqrt{z}\right)+b\,(m-2\,s)\right.\right.\right.$$

$$\left.\left.\left.\left(-\sqrt{z}\;p^2+2\,p+b^2\,(m-2\,s)^2\sqrt{z}\right)\sinh\left(b\,(m-2\,s)\sqrt{z}\right)\right)\right)\Big/\left((b\,(m-2\,s)-p)^2\,(p+b\,(m-2\,s))^2\right)\right)$$

$$(1-v\bmod 2)+\frac{1}{p^2}\left(2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\right)+$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{e^{\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\;\operatorname{erfi}\left(\frac{p-2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}+\frac{2\,e^{\sqrt{z}\;p+c(v-2s)z}}{c(v-2s)}-\right.$$

$$\left.\frac{2\,e^{p\sqrt{z}-c(v-2s)z}}{c(v-2s)}-\frac{e^{-\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\;\operatorname{erfi}\left(\frac{p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)+2^{-m-v-1}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(-\left(e^{-\frac{(-b\,m+p+2\,b\,s)^2}{c(8k-4v)}}\sqrt{\pi}\;(-b\,m+p+2\,b\,s)\operatorname{erfi}\left(\frac{-b\,m+p+2\,b\,s+2\,c\,(2\,k-v)\sqrt{z}}{2\sqrt{c\,(2\,k-v)}}\right)\right)\Big/(c\,(2\,k-v))^{3/2}+\right.$$

$$\left(e^{\frac{(-b\,m+p+2\,b\,s)^2}{c(8k-4v)}}\sqrt{\pi}\;(b\,(m-2\,s)-p)\operatorname{erfi}\left(\frac{-p+b\,(m-2\,s)+2\,c\,(2\,k-v)\sqrt{z}}{2\sqrt{c\,(v-2\,k)}}\right)\right)\Big/\left(c\,(2\,k-v)\sqrt{c\,(v-2\,k)}\right)+$$

$$\left(e^{\frac{(p+b\,(m-2\,s))^2}{c(8k-4v)}}\sqrt{\pi}\;(p+b\,(m-2\,s))\operatorname{erfi}\left(\frac{p+b\,(m-2\,s)+2\,c\,(v-2\,k)\sqrt{z}}{2\sqrt{c\,(v-2\,k)}}\right)\right)\Big/\left(c\,(2\,k-v)\sqrt{c\,(v-2\,k)}\right)-$$

$$\left(e^{-\frac{(p+b\,(m-2\,s))^2}{c(8k-4v)}}\sqrt{\pi}\;(p+b\,(m-2\,s))\operatorname{erfi}\left(\frac{p+b\,(m-2\,s)+2\,c\,(2\,k-v)\sqrt{z}}{2\sqrt{c\,(2\,k-v)}}\right)\right)\Big/(c\,(2\,k-v))^{3/2}+$$

$$\frac{2\,e^{\sqrt{z}\;(-b\,m+p+2\,b\,s)+(c\,v-2\,c\,k)\,z}}{c\,v-2\,c\,k}+\frac{2\,e^{\sqrt{z}\;(b\,m+p-2\,b\,s)+(c\,v-2\,c\,k)\,z}}{c\,v-2\,c\,k}+\frac{2\,e^{\sqrt{z}\;(-b\,m+p+2\,b\,s)+(2\,c\,k-c\,v)\,z}}{2\,c\,k-c\,v}+$$

$$\left.\frac{2\,e^{\sqrt{z}\;(b\,m+p-2\,b\,s)+(2\,c\,k-c\,v)\,z}}{2\,c\,k-c\,v}\right)/;\;m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p\,z}\cosh^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.2847.01

$$\int e^{p z} \cosh^{m}\left(b z^2\right) \cosh^{v}\left(c z^2\right) dz ==$$

$$-\frac{1}{b}\left(2^{-m-v-1}\binom{v}{\frac{v}{2}}\sqrt{\pi}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2s}\left(\binom{m}{s}\left(e^{\frac{p^2}{4b(m-2s)}}\sqrt{-b(m-2s)}\ \operatorname{erfi}\left(\frac{p-2b(m-2s)z}{2\sqrt{-b(m-2s)}}\right)-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.e^{-\frac{p^2}{4b(m-2s)}}\sqrt{b(m-2s)}\ \operatorname{erfi}\left(\frac{p+2b(m-2s)z}{2\sqrt{b(m-2s)}}\right)\right)\right)\right)(1-v \bmod 2)\right)+$$

$$\frac{2^{-m-v}e^{p z}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{p}-\frac{1}{c}\left(2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sqrt{\pi}\right.$$

$$\left.\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(\binom{v}{s}\left(e^{\frac{p^2}{4c(v-2s)}}\sqrt{-c(v-2s)}\ \operatorname{erfi}\left(\frac{p-2c(v-2s)z}{2\sqrt{-c(v-2s)}}\right)-e^{-\frac{p^2}{4c(v-2s)}}\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{p+2c(v-2s)z}{2\sqrt{c(v-2s)}}\right)\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\left(e^{-\frac{p^2}{4(-2ck+bm-2bs+cv)}}\sqrt{-2ck+bm-2bs+cv}\ (2ck-bm+2bs-cv)\right.\right.$$

$$\operatorname{erfi}\left(\frac{p-2(2ck-bm+2bs-cv)z}{2\sqrt{-2ck+bm-2bs+cv}}\right)+e^{-\frac{p^2}{4(2ck-bm+2bs-cv)}}(-2ck+bm-2bs+cv)$$

$$\left.\sqrt{2ck-bm+2bs-cv}\ \operatorname{erfi}\left(\frac{p+2(2ck-bm+2bs-cv)z}{2\sqrt{2ck-bm+2bs-cv}}\right)\right)\Big/$$

$$((2ck-bm+2bs-cv)(-2ck+bm-2bs+cv))+\left(e^{-\frac{p^2}{4(-2ck-bm+2bs+cv)}}\sqrt{-2ck-bm+2bs+cv}\right.$$

$$(2ck+bm-2bs-cv)\operatorname{erfi}\left(\frac{p-2(2ck+bm-2bs-cv)z}{2\sqrt{-2ck-bm+2bs+cv}}\right)+e^{-\frac{p^2}{4(2ck+bm-2bs-cv)}}$$

$$\left.(-2ck-bm+2bs+cv)\sqrt{2ck+bm-2bs-cv}\ \operatorname{erfi}\left(\frac{p+2(2ck+bm-2bs-cv)z}{2\sqrt{2ck+bm-2bs-cv}}\right)\right)\Big/$$

$$\left.((2ck+bm-2bs-cv)(-2ck-bm+2bs+cv))\right);\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

01.20.21.2848.01

$$\int e^{p z} \cosh^m\left(b \sqrt{z}\right) \cosh^v\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\frac{4 e^{p z} \cosh\left(b (m-2 s) \sqrt{z}\right)}{p} + \frac{b e^{-\frac{b^2 (m-2 s)^2}{4 p}} \sqrt{\pi}\ (m-2 s) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - b (m-2 s)}{2 \sqrt{p}} \right)}{p^{3/2}} - \right.\right.$$

$$\left.\left. \frac{b e^{-\frac{(b m-2 b s)^2}{4 p}} \sqrt{\pi}\ (m-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z}\ p + b (m-2 s)}{2 \sqrt{p}} \right)}{p^{3/2}} \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} + 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{4 e^{p z} \cosh\left(c (2 k - v) \sqrt{z}\right)}{p} - \right.$$

$$\left. \frac{c e^{-\frac{(c v-2 c k)^2}{4 p}} \sqrt{\pi}\ (v-2 k) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - c (2 k-v)}{2 \sqrt{p}} \right)}{p^{3/2}} + \frac{c e^{-\frac{c^2 (v-2 k)^2}{4 p}} \sqrt{\pi}\ (v-2 k) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - c (v-2 k)}{2 \sqrt{p}} \right)}{p^{3/2}} \right) +$$

$$2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{1}{p} \left(4 e^{p z} \left(\cosh\left((2 c k - b m + 2 b s - c v) \sqrt{z} \right) + \cosh\left((2 c k + b m - 2 b s - c v) \sqrt{z} \right) \right) \right) + \right.$$

$$\frac{1}{p^{3/2}} \left(\sqrt{\pi} \left(e^{-\frac{(b (m-2 s) + c (v-2 k))^2}{4 p}} (b (m-2 s) + c (v-2 k)) \operatorname{erfi}\left(\frac{2 c k - b m + 2 b s - c v + 2 p \sqrt{z}}{2 \sqrt{p}} \right) - \right.\right.$$

$$e^{-\frac{(2 c k + b m - 2 b s - c v)^2}{4 p}} (2 c k + b m - 2 b s - c v) \operatorname{erfi}\left(\frac{2 c k + b m - 2 b s - c v + 2 p \sqrt{z}}{2 \sqrt{p}} \right) + e^{-\frac{(b (m-2 s) + c (v-2 k))^2}{4 p}}$$

$$(b (m-2 s) + c (v-2 k)) \operatorname{erfi}\left(\frac{2 c k - b m + 2 b s - c v - 2 p \sqrt{z}}{2 \sqrt{p}} \right) - e^{-\frac{(2 c k + b m - 2 b s - c v)^2}{4 p}}$$

$$\left.\left.\left.\left. (2 c k + b m - 2 b s - c v) \operatorname{erfi}\left(\frac{2 c k + b m - 2 b s - c v - 2 p \sqrt{z}}{2 \sqrt{p}} \right) \right) \right) \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $e^{p z^r} \cosh^m\left(b z^r\right) \cosh^v\left(c z^r\right)$

01.20.21.2849.01

$$\int e^{p\,z^r}\cosh^m(b\,z^r)\cosh^v(c\,z^r)\,dz == -\frac{2^{-m-v}\,z}{r}$$

$$\left(\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{r},\,-p\,z^r\right)(m \bmod 2-1)\,(v \bmod 2-1)\,(-p\,z^r)^{-1/r}-\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m-p)\,z^r\right)\right.\right.$$

$$\left.((2\,b\,k-b\,m-p)\,z^r)^{-1/r}+(-(2\,b\,k-b\,m+p)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,-(2\,b\,k-b\,m+p)\,z^r\right)\right)-\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,-(p+2\,c\,s-c\,v)\,z^r\right)(-(p+2\,c\,s-c\,v)\,z^r)^{-1/r}+(-(p+c\,(v-2\,s))\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,-(p+c\,(v-2\,s))\,z^r\right)\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m-p-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-p-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$((2\,b\,k-b\,m-p-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m-p-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-(2\,b\,k-b\,m+p-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,-(2\,b\,k-b\,m+p-2\,c\,s+c\,v)\,z^r\right)+$$

$$\left.\left.((2\,b\,k-b\,m-p+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m-p+2\,c\,s-c\,v)\,z^r\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.2850.01

$$\int e^{p z^2} \cosh^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz ==$$

$$2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\frac{\operatorname{erfi}\left(\sqrt{p-b\,(m-2\,k)}\ z\right)}{\sqrt{p-b\,(m-2\,k)}} + \frac{\operatorname{erfi}\left(\sqrt{b\,(m-2\,k)+p}\ z\right)}{\sqrt{b\,(m-2\,k)+p}} \right) \right) (1 - v \bmod 2) +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\ z\right) (1 - m \bmod 2)\, (1 - v \bmod 2) \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{\operatorname{erfi}\left(\sqrt{p+c\,(v-2\,s)}\ z\right)}{\sqrt{p+c\,(v-2\,s)}} + \frac{\operatorname{erfi}\left(\sqrt{p-c\,(v-2\,s)}\ z\right)}{\sqrt{p-c\,(v-2\,s)}} \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{\operatorname{erfi}\left(\sqrt{-2\,b\,k+b\,m+p-2\,c\,s+c\,v}\ z\right)}{\sqrt{-2\,b\,k+b\,m+p-2\,c\,s+c\,v}} + \right.$$

$$\frac{\operatorname{erfi}\left(\sqrt{2\,b\,k-b\,m+p-2\,c\,s+c\,v}\ z\right)}{\sqrt{2\,b\,k-b\,m+p-2\,c\,s+c\,v}} + \frac{\operatorname{erfi}\left(\sqrt{-2\,b\,k+b\,m+p+2\,c\,s-c\,v}\ z\right)}{\sqrt{-2\,b\,k+b\,m+p+2\,c\,s-c\,v}} +$$

$$\left. \frac{\operatorname{erfi}\left(\sqrt{2\,b\,k-b\,m+p+2\,c\,s-c\,v}\ z\right)}{\sqrt{2\,b\,k-b\,m+p+2\,c\,s-c\,v}} \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.2851.01

$$\int e^{p\sqrt{z}}\cosh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$2^{-m-v+2}\,e^{p\sqrt{z}}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\left(p^2-b^2(m-2k)^2\right)^2}\left(\binom{m}{k}\left(\left(p^2\left(p\sqrt{z}-1\right)-b^2(m-2k)^2\left(\sqrt{z}\,p+1\right)\right)\cosh\left(b(m-2k)\sqrt{z}\right)-\right.\right.\right.$$

$$\left.\left.\left.b(m-2k)\left(-b^2\sqrt{z}\,(m-2k)^2-2p+p^2\sqrt{z}\right)\sinh\left(b(m-2k)\sqrt{z}\right)\right)\right)\right)(1-v \bmod 2)+$$

$$\frac{1}{p^2}\left(2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)\right)+2^{-m-v+2}\,e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\left(p^2-c^2(v-2s)^2\right)^2}\left(\binom{v}{s}\left(\left(p^2\left(p\sqrt{z}-1\right)-c^2(v-2s)^2\left(\sqrt{z}\,p+1\right)\right)\cosh\left(c(v-2s)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.c(v-2s)\left(\sqrt{z}\,p^2-2p-c^2(v-2s)^2\sqrt{z}\right)\sinh\left(c(v-2s)\sqrt{z}\right)\right)\right)+2^{-m-v+2}\,e^{p\sqrt{z}}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(p^2\left(p\sqrt{z}-1\right)-(2bk-bm-2cs+cv)^2\left(\sqrt{z}\,p+1\right)\right)\cosh\left((2bk-bm-2cs+cv)\sqrt{z}\right)-\right.\right.$$

$$(2bk-bm-2cs+cv)\left(\sqrt{z}\,p^2-2p-(2bk-bm-2cs+cv)^2\sqrt{z}\right)$$

$$\left.\sinh\left((2bk-bm-2cs+cv)\sqrt{z}\right)\right)\Big/\left(p^2-(2bk-bm-2cs+cv)^2\right)^2+$$

$$\left(\left(p^2\left(p\sqrt{z}-1\right)-(2bk-bm+2cs-cv)^2\left(\sqrt{z}\,p+1\right)\right)\cosh\left((2bk-bm+2cs-cv)\sqrt{z}\right)-\right.$$

$$(2bk-bm+2cs-cv)\left(\sqrt{z}\,p^2-2p-(2bk-bm+2cs-cv)^2\sqrt{z}\right)\sinh\left((2bk-bm+2cs-cv)\right.$$

$$\left.\left.\left.\sqrt{z}\right)\right)\Big/\left(p^2-(2bk-bm+2cs-cv)^2\right)^2\right)/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{bz^r+e}\cosh^m(az^r+q)\cosh^v(cz^r+g)$

01.20.21.2852.01

$$\int e^{b z^r+e} \cosh^m(a z^r+q) \cosh^v(c z^r+g)\, dz ==$$

$$-\frac{2^{-m-v} z}{r}\left(e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{1}{r}, -b z^r\right)(1-m \bmod 2)(1-v \bmod 2)(-b z^r)^{-1/r} + \binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}\left(e^{e+2kq-mq}\Gamma\left(\frac{1}{r}, (-b-2ak+am) z^r\right)((-b-2ak+am) z^r)^{-1/r} + e^{e-2kq+mq}((-b+2ak-am) z^r)^{-1/r}\right.$$

$$\left.\Gamma\left(\frac{1}{r}, (-b+2ak-am) z^r\right)\right) + \binom{m}{\frac{m}{2}}(1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2gs-gv}\Gamma\left(\frac{1}{r}, (-b-2cs+cv) z^r\right)\right.$$

$$\left.((-b-2cs+cv) z^r)^{-1/r} + e^{e-2gs+gv}((-b+2cs-cv) z^r)^{-1/r}\Gamma\left(\frac{1}{r}, (-b+2cs-cv) z^r\right)\right) +$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2kq-mq+2gs-gv}\Gamma\left(\frac{1}{r}, (-b-2ak+am-2cs+cv) z^r\right)((-b-2ak+am-2cs+cv) z^r)^{-1/r} +\right.$$

$$e^{e-2kq+mq+2gs-gv}((-b+2ak-am-2cs+cv) z^r)^{-1/r}\Gamma\left(\frac{1}{r}, (-b+2ak-am-2cs+cv) z^r\right) +$$

$$e^{e+2kq-mq-2gs+gv}((-b-2ak+am+2cs-cv) z^r)^{-1/r}\Gamma\left(\frac{1}{r}, (-b-2ak+am+2cs-cv) z^r\right) +$$

$$\left.\left.e^{e-2kq+mq-2gs+gv}((-b+2ak-am+2cs-cv) z^r)^{-1/r}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{r}, (-b+2ak-am+2cs-cv) z^r\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.2853.01

$$\int e^{b z^2+e} \cosh^m\left(a z^2+q\right) \cosh^v\left(c z^2+g\right) dz ==$$

$$2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{e-(m-2k)q} \binom{m}{k} \left(\frac{e^{2(m-2k)q} \operatorname{erfi}\left(\sqrt{b+a(m-2k)}\, z\right)}{\sqrt{b+a(m-2k)}} + \frac{\operatorname{erfi}\left(\sqrt{b-a(m-2k)}\, z\right)}{\sqrt{b-a(m-2k)}} \right) \right) (1-v \bmod 2) +$$

$$\frac{2^{-m-v-1} e^e \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right) (1-m \bmod 2)(1-v \bmod 2)}{\sqrt{b}} +$$

$$2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{e-g(v-2k)} \binom{v}{k} \left(\frac{e^{2g(v-2k)} \operatorname{erfi}\left(\sqrt{b+c(v-2k)}\, z\right)}{\sqrt{b+c(v-2k)}} + \frac{\operatorname{erfi}\left(\sqrt{b-c(v-2k)}\, z\right)}{\sqrt{b-c(v-2k)}} \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-(m-2k)q-g(v-2s)} \right.$$

$$\left(\frac{e^{2((m-2k)q+g(v-2s))} \operatorname{erfi}\left(\sqrt{b+a(m-2k)+c(v-2s)}\, z\right)}{\sqrt{b+a(m-2k)+c(v-2s)}} + \frac{\operatorname{erfi}\left(\sqrt{b-a(m-2k)-c(v-2s)}\, z\right)}{\sqrt{b-a(m-2k)-c(v-2s)}} \right) +$$

$$e^{e+(m-2k)q-g(v-2s)} \left(\frac{e^{2(g(v-2s)-(m-2k)q)} \operatorname{erfi}\left(\sqrt{b-a(m-2k)+c(v-2s)}\, z\right)}{\sqrt{b-a(m-2k)+c(v-2s)}} + \right.$$

$$\left. \left. \frac{\operatorname{erfi}\left(\sqrt{b+a(m-2k)-c(v-2s)}\, z\right)}{\sqrt{b+a(m-2k)-c(v-2s)}} \right) \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.2854.01

$$\int e^{\sqrt{z}\,b+e}\cosh^m\left(\sqrt{z}\,a+q\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz == 2^{-m-v+1}\binom{v}{\frac{v}{2}}$$
$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\frac{e^{e+(m-2k)q+(b+a(m-2k))\sqrt{z}}\left(\sqrt{z}\,b+a(m-2k)\sqrt{z}-1\right)}{(b+a(m-2k))^2}+\frac{e^{e-(m-2k)q+(b-a(m-2k))\sqrt{z}}\left(\sqrt{z}\,b-a(m-2k)\sqrt{z}-1\right)}{(a(m-2k)-b)^2}\right)\right.$$
$$\left.\binom{m}{k}\right)(1-v \bmod 2)+\frac{2^{-m-v+1}e^{\sqrt{z}\,b+e}\left(b\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{b^2}+$$
$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\frac{e^{e+g(v-2k)+(b+c(v-2k))\sqrt{z}}\left(\sqrt{z}\,b+c(v-2k)\sqrt{z}-1\right)}{(b+c(v-2k))^2}+\right.$$
$$\left.\frac{e^{e-g(v-2k)+(b-c(v-2k))\sqrt{z}}\left(\sqrt{z}\,b-c(v-2k)\sqrt{z}-1\right)}{(c(v-2k)-b)^2}\right)\binom{v}{k}+$$
$$2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\left(e^{e-(m-2k)q+g(v-2s)+(b-a(m-2k)+c(v-2s))\sqrt{z}}\left(\sqrt{z}\,b+(c(v-2s)-a(m-2k))\sqrt{z}-1\right)\right)\Big/\right.$$
$$(b-a(m-2k)+c(v-2s))^2+\left(e^{e+(m-2k)q+g(v-2s)+(b+a(m-2k)+c(v-2s))\sqrt{z}}\right.$$
$$\left.\left(\sqrt{z}\,b+(a(m-2k)+c(v-2s))\sqrt{z}-1\right)\right)\Big/(b+a(m-2k)+c(v-2s))^2+$$
$$\left(e^{e+(m-2k)q-g(v-2s)+(b+a(m-2k)-c(v-2s))\sqrt{z}}\left(\sqrt{z}\,b-(c(v-2s)-a(m-2k))\sqrt{z}-1\right)\right)\Big/$$
$$(-b-a(m-2k)+c(v-2s))^2+\left(e^{e-(m-2k)q-g(v-2s)+(b-a(m-2k)-c(v-2s))\sqrt{z}}\right.$$
$$\left.\left.\left(\sqrt{z}\,b-(a(m-2k)+c(v-2s))\sqrt{z}-1\right)\right)\Big/(-b+a(m-2k)+c(v-2s))^2\right)\binom{v}{s}\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{b z^r+d z+e}\cosh^m\left(a z^r+p z+q\right)\cosh^v\left(c z^r+f z+g\right)$

01.20.21.2855.01

$$\int e^{b z^2+d z+e}\cosh^m\left(a z^2+p z+q\right)\cosh^v\left(c z^2+f z+g\right)dz ==$$
$$2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\binom{m}{s}\left(e^{-\frac{(d+p(m-2s))^2-4(b+a(m-2s))(e+q(m-2s))}{4(b+a(m-2s))}}\sqrt{b+a(m-2s)}\,(b-a(m-2s))\right.\right.\right.$$
$$\left.\mathrm{erfi}\left(\frac{d+p(m-2s)+2(b+a(m-2s))z}{2\sqrt{b+a(m-2s)}}\right)+e^{-\frac{(d-p(m-2s))^2-4(b-a(m-2s))(e-q(m-2s))}{4(b-a(m-2s))}}(b+a(m-2s))\right.$$
$$\left.\left.\left.\sqrt{b-a(m-2s)}\,\mathrm{erfi}\left(\frac{d-p(m-2s)+2bz-2a(m-2s)z}{2\sqrt{b-a(m-2s)}}\right)\right)\right)\Big/((b-a(m-2s))(b+a(m-2s)))\right)$$

$$(1-v \bmod 2)+\frac{2^{-m-v-1}\, e^{-\frac{d^2-4be}{4b}}\sqrt{\pi}\ (1-m \bmod 2)\,(1-v \bmod 2)}{\sqrt{b}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)+2^{-m-v-1}$$

$$\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\binom{v}{s}\left(e^{-\frac{(d+f(v-2s))^2-4(b+c(v-2s))(e+g(v-2s))}{4(b+c(v-2s))}}\sqrt{b+c(v-2s)}\ (b-c(v-2s))\operatorname{erfi}\left(\frac{d+f(v-2s)+2(b+c(v-2s))z}{2\sqrt{b+c(v-2s)}}\right)+\right.\right.$$

$$e^{-\frac{(d-f(v-2s))^2-4(b-c(v-2s))(e-g(v-2s))}{4(b-c(v-2s))}}(b+c(v-2s))\sqrt{b-c(v-2s)}$$

$$\left.\left.\operatorname{erfi}\left(\frac{d-f(v-2s)+2bz-2c(v-2s)z}{2\sqrt{b-c(v-2s)}}\right)\right)\right)\Big/((b-c(v-2s))(b+c(v-2s)))+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\left(e^{-\frac{(d-2fk+mp-2ps+fv)^2-4(b-2ck+am-2as+cv)(e-2gk+mq-2qs+gv)}{4(b-2ck+am-2as+cv)}}\sqrt{b-2ck+am-2as+cv}\right.\right.$$

$$(b+2ck-am+2as-cv)\operatorname{erfi}\left((d-2fk+mp-2ps+fv+2bz-2(2ck-am+2as-cv)z)\Big/\left(2\sqrt{b-2ck+am-2as+cv}\right)\right)+e^{-\frac{(d+2fk-mp+2ps-fv)^2-4(b+2ck-am+2as-cv)(e+2gk-mq+2qs-gv)}{4(b+2ck-am+2as-cv)}}$$

$$(b-2ck+am-2as+cv)\sqrt{b+2ck-am+2as-cv}\ \operatorname{erfi}\left((d+2fk-mp+\right.$$

$$\left.\left.2ps-fv+2(b+2ck-am+2as-cv)z)\Big/\left(2\sqrt{b+2ck-am+2as-cv}\right)\right)\right)\Big/$$

$$((b+2ck-am+2as-cv)(b-2ck+am-2as+cv))+$$

$$\left(e^{-\frac{(d-2fk-mp+2ps+fv)^2-4(b-2ck-am+2as+cv)(e-2gk-mq+2qs+gv)}{4(b-2ck-am+2as+cv)}}\sqrt{b-2ck-am+2as+cv}\right.$$

$$(b+2ck+am-2as-cv)\operatorname{erfi}\left((d-2fk-mp+2ps+fv+2bz-2(2ck+am-2as-cv)z)\Big/\left(2\sqrt{b-2ck-am+2as+cv}\right)\right)+e^{-\frac{(d+2fk+mp-2ps-fv)^2-4(b+2ck+am-2as-cv)(e+2gk+mq-2qs-gv)}{4(b+2ck+am-2as-cv)}}$$

$$(b-2ck-am+2as+cv)\sqrt{b+2ck+am-2as-cv}\ \operatorname{erfi}\left((d+2fk+mp-\right.$$

$$\left.\left.\left.2ps-fv+2(b+2ck+am-2as-cv)z)\Big/\left(2\sqrt{b+2ck+am-2as-cv}\right)\right)\right)\Big/$$

$$\left.((b+2ck+am-2as-cv)(b-2ck-am+2as+cv))\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.2856.01

$$\int e^{\sqrt{z}\ b+e+dz}\cosh^m\left(\sqrt{z}\ a+q+pz\right)\cosh^v\left(\sqrt{z}\ c+g+fz\right)dz==$$

$$2^{-m-v-2}\left(\frac{4e^{\sqrt{z}\ b+dz}}{d}-\frac{2be^{-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^e\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{e-q(m-2s)}\binom{m}{s}\left(\left(e^{-\frac{(b-a\,m+2\,a\,s)^2}{4(d-m\,p+2\,p\,s)}}\sqrt{\pi}\,(a(m-2s)-b)\operatorname{erfi}\left(\frac{b-a(m-2s)+2(d-m\,p+2\,p\,s)\sqrt{z}}{2\sqrt{d-m\,p+2\,p\,s}}\right)\right)\Big/\right.\right.$$

$$(d-m\,p+2\,p\,s)^{3/2}+\frac{2\,e^{2q(m-2s)+(d+p(m-2s))z+(b+a(m-2s))\sqrt{z}}}{d+p(m-2s)}-$$

$$\frac{1}{(d+p(m-2s))^{3/2}}\left(e^{2q(m-2s)-\frac{(b+a(m-2s))^2}{4(d+p(m-2s))}}\sqrt{\pi}\,(b+a(m-2s))\operatorname{erfi}\left(\frac{b+a(m-2s)+2(d+m\,p-2\,p\,s)\sqrt{z}}{2\sqrt{d+p(m-2s)}}\right)\right)+$$

$$\left.\left.\frac{2\,e^{\sqrt{z}\,(b-a(m-2s))+(d-p(m-2s))z}}{d-p(m-2s)}\right)(1-v \bmod 2)+2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{e-g(v-2s)}\binom{v}{s}\left(-\left(e^{-\frac{(b+2cs-cv)^2}{4(d+2fs-fv)}}\sqrt{\pi}\,(b+2cs-cv)\operatorname{erfi}\left(\frac{b+c(2s-v)+2(d+2fs-fv)\sqrt{z}}{2\sqrt{d+2fs-fv}}\right)\right)\Big/\right.$$

$$(d+2fs-fv)^{3/2}+\frac{2\,e^{2g(v-2s)+(d+f(v-2s))z+(b+c(v-2s))\sqrt{z}}}{d+f(v-2s)}-\left(e^{2g(v-2s)-\frac{(b+c(v-2s))^2}{4(d+f(v-2s))}}\sqrt{\pi}\,(b+c(v-2s))\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b+c(v-2s)+2(d-2fs+fv)\sqrt{z}}{2\sqrt{d+f(v-2s)}}\right)\right)\Big/(d+f(v-2s))^{3/2}+\frac{2\,e^{\sqrt{z}\,(b-c(v-2s))+(d-f(v-2s))z}}{d-f(v-2s)}\right)+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(2\,e^{e-2gk-mq-2qs-gv}\left(e^{2mq+2gv+(d-2fk+mp-2ps+fv)z+(b-2ck+am-2as+cv)\sqrt{z}}\Big/(d-2fk+mp-\right.\right.$$

$$2ps+fv)+e^{4gk+4qs+(d+2fk-mp+2ps-fv)z+(b+2ck-am+2as-cv)\sqrt{z}}\Big/(d+2fk-mp+2ps-fv)+$$

$$e^{4gk+2mq+(d+2fk+mp-2ps-fv)z+(b+2ck+am-2as-cv)\sqrt{z}}\Big/(d+2fk+mp-2ps-fv)+$$

$$\left.e^{4qs+2gv+(d-2fk-mp+2ps+fv)z+(b-2ck-am+2as+cv)\sqrt{z}}\Big/(d-2fk-mp+2ps+fv)\right)-$$

$$\left(e^{-\frac{(b-2ck-am+2as+cv)^2}{4(d-2fk-mp+2ps+fv)}+e-2gk-mq+2qs+gv}\sqrt{\pi}\,(b-2ck-am+2as+cv)\operatorname{erfi}\left((b-2ck-am+\right.\right.$$

$$\left.\left.2as+cv+2(d-2fk-mp+2ps+fv)\sqrt{z}\right)\Big/\left(2\sqrt{d-2fk-mp+2ps+fv}\right)\right)\Big/$$

$$(d-2fk-mp+2ps+fv)^{3/2}-\left(e^{-\frac{(b+2ck-am+2as-cv)^2}{4(d+2fk-mp+2ps-fv)}+e+2gk-mq+2qs-gv}\sqrt{\pi}\right.$$

$$(b+2ck-am+2as-cv)\operatorname{erfi}\left((b+2ck-am+2as-cv+2(d+2fk-mp+2ps-fv)\sqrt{z}\right)\Big/$$

$$\left.\left.\left(2\sqrt{d+2fk-mp+2ps-fv}\right)\right)\Big/(d+2fk-mp+2ps-fv)^{3/2}-\right.$$

$$\left(e^{-\frac{(b+2ck+am-2as-cv)^2}{4(d+2fk+mp-2ps-fv)}+e+2gk+mq-2qs-gv}\sqrt{\pi}\,(b+2ck+am-2as-cv)\operatorname{erfi}\left((b+2ck+am-\right.\right.$$

$$\left.\left.2as-cv+2(d+2fk+mp-2ps-fv)\sqrt{z}\right)\Big/\left(2\sqrt{d+2fk+mp-2ps-fv}\right)\right)\Big/$$

$$(d+2\,f\,k+m\,p-2\,p\,s-f\,v)^{3/2}-\left(e^{-\frac{(b+a\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d+p\,(m-2\,s)+f\,(v-2\,k))}+e-2\,g\,k+m\,q-2\,q\,s+g\,v}\sqrt{\pi}\right.$$
$$(b+a\,(m-2\,s)+c\,(v-2\,k))\,\text{erfi}\left(\left(b-2\,c\,k+a\,m-2\,a\,s+c\,v+2\,(d+p\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)\Big/\right.$$
$$\left.\left.\left(2\,\sqrt{d+p\,(m-2\,s)+f\,(v-2\,k)}\right)\right)\Big/(d+p\,(m-2\,s)+f\,(v-2\,k))^{3/2}\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving product of powers of two direct functions and rational functions of exp

Involving $\cosh^m(e\,z)\cosh^v(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2857.01

$$\int \frac{\cosh^m(e\,z)\cosh^v(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}\,dz ==$$

$$2^{-m-v}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(e^{(2\,e\,k-e\,m+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{2\,e\,k-e\,m+2\,c\,s-c\,v}{d},\,n;\,\frac{d+2\,e\,k-e\,m+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{(-2\,e\,k+e\,m-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{-2\,e\,k+e\,m-2\,c\,s+c\,v}{d},\,n;\,\frac{d-2\,e\,k+e\,m-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/\right.$$

$$(2\,e\,k-e\,m+2\,c\,s-c\,v)+\left(e^{(2\,e\,k-e\,m-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{2\,e\,k-e\,m-2\,c\,s+c\,v}{d},\,n;\right.\right.$$

$$\left.\frac{d+2\,e\,k-e\,m-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(-2\,e\,k+e\,m+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{-2\,e\,k+e\,m+2\,c\,s-c\,v}{d},\right.$$

$$\left.\left.\left.n;\,\frac{d-2\,e\,k+e\,m+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/(2\,e\,k-e\,m-2\,c\,s+c\,v)\right)a^{-n}-$$

$$\frac{1}{d\,n}\left(2^{-m-v}\,b^{-n}\,e^{-d\,n\,z}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\,{}_2F_1\left(n,\,n;\,n+1;\,-\frac{a\,e^{-d\,z}}{b}\right)(1-m\bmod 2)\,(1-v\bmod 2)\right)+$$

$$\frac{1}{e}$$

$$\left(2^{-m-v}\,a^{-n}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left(\binom{m}{k}\left(e^{e\,(m-2\,k)\,z}\,{}_2F_1\left(\frac{e\,(m-2\,k)}{d},\,n;\,\frac{d+e\,(m-2\,k)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.\left.\left.e^{-e\,(m-2\,k)\,z}\,{}_2F_1\left(-\frac{e\,(m-2\,k)}{d},\,n;\,\frac{d-e\,(m-2\,k)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\right)+$$

$$\frac{1}{c}\left(2^{-m-v}\,a^{-n}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(\binom{v}{s}\left(e^{c\,(v-2\,s)\,z}\,{}_2F_1\left(\frac{c\,(v-2\,s)}{d},\,n;\,\frac{d+c\,(v-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-c\,(v-2\,s)\,z}\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(-\frac{c\,(v-2\,s)}{d},\,n;\,\frac{d-c\,(v-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\right);\,n\in\mathbb{Z}\wedge n>0\wedge m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p\,z}\cosh^m(e\,z)\cosh^v(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.2858.01

$$\int \frac{e^{p z} \cosh^m(e z) \cosh^v(c z)}{\left(a + b e^{d z}\right)^n} dz ==$$

$$2^{-m-v} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\binom{m}{k} \left(e^{(e(m-2k)+p) z} (e(m-2k) - p) {}_2F_1\left(\frac{e(m-2k)+p}{d}, n; \frac{d + e(m-2k) + p}{d}; -\frac{b e^{d z}}{a} \right) - \right. \right.$$

$$\left. \left. e^{(p - e(m-2k)) z} (e(m-2k) + p) {}_2F_1\left(\frac{p - e(m-2k)}{d}, n; \frac{d - e(m-2k) + p}{d}; -\frac{b e^{d z}}{a} \right) \right) \right) \Big/$$

$$\left. ((e(m-2k) - p)(e(m-2k) + p)) \right) a^{-n} + 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\binom{v}{s} \left(e^{(p + c(v-2s)) z} (c(v-2s) - p) {}_2F_1\left(\frac{p + c(v-2s)}{d}, n; \frac{d + p + c(v-2s)}{d}; -\frac{b e^{d z}}{a} \right) - e^{(p - c(v-2s)) z} (p + c(v-2s)) \right. \right. \right.$$

$$\left. \left. \left. {}_2F_1\left(\frac{p - c(v-2s)}{d}, n; \frac{d + p - c(v-2s)}{d}; -\frac{b e^{d z}}{a} \right) \right) \right) \Big/ ((c(v-2s) - p)(p + c(v-2s))) \right) a^{-n} +$$

$$2^{-m-v} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{(2ek - em + p + 2cs - cv) z} (2ek - em - p + 2cs - cv) {}_2F_1\left(\frac{2ek - em + p + 2cs - cv}{d}, \right. \right. \right. \right.$$

$$\left. \left. \left. \left. n; \frac{d + 2ek - em + p + 2cs - cv}{d}; -\frac{b e^{d z}}{a} \right) - e^{(-2ek + em + p - 2cs + cv) z} (2ek - em + p + 2cs - cv) \right. \right. \right.$$

$$\left. \left. \left. {}_2F_1\left(\frac{-2ek + em + p - 2cs + cv}{d}, n; \frac{d - 2ek + em + p - 2cs + cv}{d}; -\frac{b e^{d z}}{a} \right) \right) \right) \Big/$$

$$\left. ((2ek - em - p + 2cs - cv)(2ek - em + p + 2cs - cv)) + \right.$$

$$\left(e^{(2ek - em + p - 2cs + cv) z} (2ek - em - p - 2cs + cv) {}_2F_1\left(\frac{2ek - em + p - 2cs + cv}{d}, n; \right. \right.$$

$$\left. \left. \frac{d + 2ek - em + p - 2cs + cv}{d}; -\frac{b e^{d z}}{a} \right) - e^{(-2ek + em + p + 2cs - cv) z} (2ek - em + p - 2cs + cv) \right.$$

$$\left. {}_2F_1\left(\frac{-2ek + em + p + 2cs - cv}{d}, n; \frac{d - 2ek + em + p + 2cs - cv}{d}; -\frac{b e^{d z}}{a} \right) \right) \Big/$$

$$\left. ((2ek - em - p - 2cs + cv)(2ek - em + p - 2cs + cv)) \right) a^{-n} +$$

$$\frac{1}{p} \left(2^{-m-v} a^{-n} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} {}_2F_1\left(\frac{p}{d}, n; \frac{d + p}{d}; -\frac{b e^{d z}}{a} \right) (1 - m \bmod 2)(1 - v \bmod 2) \right) /; n \in$$

$$\mathbb{Z} \wedge$$

$$n >$$

$$0 \wedge$$

$$m \in$$

$\mathbb{Z} \wedge$
$m >$
$0 \wedge v \in$
$\mathbb{Z} \wedge v >$
0

Involving product of powers of two direct functions and algebraic functions of exp

Involving $(a + b\, e^{d\, z})^{\beta} \cosh^{m}(e\, z) \cosh^{v}(c\, z)$

01.20.21.2859.01

$$\int (a + b\, e^{d\, z})^{\beta} \cosh^{m}(e\, z) \cosh^{v}(c\, z)\, dz == \frac{2^{-m-v}}{e} (a + b\, e^{d\, z})^{\beta} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\frac{e^{d\, z}\, b}{a} + 1\right)^{-\beta} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m - 2\, k} \left(\binom{m}{k} \left(e^{e\, (m-2\, k)\, z}\, {}_2F_1\left(\frac{e\, (m-2\, k)}{d}, -\beta; \frac{d + e\, (m-2\, k)}{d}; -\frac{b\, e^{d\, z}}{a}\right) - \right.\right.$$
$$\left.\left. e^{-e\, (m-2\, k)\, z}\, {}_2F_1\left(-\frac{e\, (m-2\, k)}{d}, -\beta; \frac{d - e\, (m-2\, k)}{d}; -\frac{b\, e^{d\, z}}{a}\right)\right)\right) +$$
$$\frac{2^{-m-v}}{c} (a + b\, e^{d\, z})^{\beta} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \left(\frac{e^{d\, z}\, b}{a} + 1\right)^{-\beta} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v - 2\, s} \binom{v}{s}$$
$$\left(e^{c\, (v-2\, s)\, z}\, {}_2F_1\left(\frac{c\, (v-2\, s)}{d}, -\beta; \frac{d + c\, (v-2\, s)}{d}; -\frac{b\, e^{d\, z}}{a}\right) - e^{-c\, (v-2\, s)\, z}\, {}_2F_1\left(-\frac{c\, (v-2\, s)}{d}, -\beta; \frac{d - c\, (v-2\, s)}{d}; -\frac{b\, e^{d\, z}}{a}\right)\right) +$$
$$2^{-m-v} (a + b\, e^{d\, z})^{\beta} \left(\frac{e^{d\, z}\, b}{a} + 1\right)^{-\beta} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{1}{2\, e\, k - e\, m + 2\, c\, s - c\, v} \left(e^{(2\, e\, k - e\, m + 2\, c\, s - c\, v)\, z}\right.\right.$$
$${}_2F_1\left(\frac{2\, e\, k - e\, m + 2\, c\, s - c\, v}{d}, -\beta; \frac{d + 2\, e\, k - e\, m + 2\, c\, s - c\, v}{d}; -\frac{b\, e^{d\, z}}{a}\right) - e^{(-2\, e\, k + e\, m - 2\, c\, s + c\, v)\, z}$$
$$\left.{}_2F_1\left(\frac{-2\, e\, k + e\, m - 2\, c\, s + c\, v}{d}, -\beta; \frac{d - 2\, e\, k + e\, m - 2\, c\, s + c\, v}{d}; -\frac{b\, e^{d\, z}}{a}\right)\right) + \frac{1}{2\, e\, k - e\, m - 2\, c\, s + c\, v}$$
$$\left(e^{(2\, e\, k - e\, m - 2\, c\, s + c\, v)\, z}\, {}_2F_1\left(\frac{2\, e\, k - e\, m - 2\, c\, s + c\, v}{d}, -\beta; \frac{d + 2\, e\, k - e\, m - 2\, c\, s + c\, v}{d}; -\frac{b\, e^{d\, z}}{a}\right) - \right.$$
$$\left.\left. e^{(-2\, e\, k + e\, m + 2\, c\, s - c\, v)\, z}\, {}_2F_1\left(\frac{-2\, e\, k + e\, m + 2\, c\, s - c\, v}{d}, -\beta; \frac{d - 2\, e\, k + e\, m + 2\, c\, s - c\, v}{d}; -\frac{b\, e^{d\, z}}{a}\right)\right)\right) +$$
$$\frac{2^{-m-v}\ (1 - m \bmod 2)\, (1 - v \bmod 2)}{d\, \beta} \left(\frac{e^{-d\, z}\, a}{b} + 1\right)^{-\beta} (a + b\, e^{d\, z})^{\beta} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} {}_2F_1\left(-\beta, -\beta; 1 - \beta; -\frac{a\, e^{-d\, z}}{b}\right) /; m \in$$
$\mathbb{N}^+ \bigwedge v \in$
$\mathbb{N}^+$

Involving $e^{p\, z} (a + b\, e^{d\, z})^{\beta} \cosh^{m}(e\, z) \cosh^{v}(c\, z)$

01.20.21.2860.01

$$\int e^{p z} \left(a+b\, e^{d z}\right)^{\beta} \cosh^{m}(e z) \cosh^{\nu}(c z)\, dz == 2^{-m-\nu} \left(a+b\, e^{d z}\right)^{\beta} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\binom{m}{k} \left(e^{(e (m-2 k)+p) z} (e (m-2 k)-p)\, {}_2F_1\left(\frac{e (m-2 k)+p}{d}, -\beta; \frac{d+e (m-2 k)+p}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(p-e (m-2 k)) z} (e (m-2 k)+p)\, {}_2F_1\left(\frac{p-e (m-2 k)}{d}, -\beta; \frac{d-e (m-2 k)+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\right) \Big/ \left((e (m-2 k)-p) (e (m-2 k)+p)\right)\right) \left(\frac{e^{d z} b}{a}+1\right)^{-\beta} + 2^{-m-\nu} \left(a+b\, e^{d z}\right)^{\beta} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\binom{\nu}{s} \left(e^{(p+c (\nu-2 s)) z} (c (\nu-2 s)-p)\, {}_2F_1\left(\frac{p+c (\nu-2 s)}{d}, -\beta; \frac{d+p+c (\nu-2 s)}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(p-c (\nu-2 s)) z} (p+c (\nu-2 s))\, {}_2F_1\left(\frac{p-c (\nu-2 s)}{d}, -\beta; \frac{d+p-c (\nu-2 s)}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\right) \Big/ \left((c (\nu-2 s)-p) (p+c (\nu-2 s))\right)\right) \left(\frac{e^{d z} b}{a}+1\right)^{-\beta} + 2^{-m-\nu} \left(a+b\, e^{d z}\right)^{\beta}$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\left(e^{(2 e k-e m+p+2 c s-c \nu) z} (2 e k-e m-p+2 c s-c \nu)\, {}_2F_1\left(\frac{2 e k-e m+p+2 c s-c \nu}{d}, -\beta; \frac{d+2 e k-e m+p+2 c s-c \nu}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(-2 e k+e m+p-2 c s+c \nu) z} (2 e k-e m+p+2 c s-c \nu)\, {}_2F_1\left(\frac{-2 e k+e m+p-2 c s+c \nu}{d}, -\beta; \frac{d-2 e k+e m+p-2 c s+c \nu}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/ \left((2 e k-e m-p+2 c s-c \nu) (2 e k-e m+p+2 c s-c \nu)\right) + \left(e^{(2 e k-e m+p-2 c s+c \nu) z} (2 e k-e m-p-2 c s+c \nu)\, {}_2F_1\left(\frac{2 e k-e m+p-2 c s+c \nu}{d}, -\beta; \frac{d+2 e k-e m+p-2 c s+c \nu}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(-2 e k+e m+p+2 c s-c \nu) z} (2 e k-e m+p-2 c s+c \nu)\, {}_2F_1\left(\frac{-2 e k+e m+p+2 c s-c \nu}{d}, -\beta; \frac{d-2 e k+e m+p+2 c s-c \nu}{d}; -\frac{b\, e^{d z}}{a}\right)\right) \Big/ \left((2 e k-e m-p-2 c s+c \nu) (2 e k-e m+p-2 c s+c \nu)\right)\right) \left(\frac{e^{d z} b}{a}+1\right)^{-\beta} +$$

$$\frac{1}{p}\left(2^{-m-\nu} e^{p z} \left(a+b\, e^{d z}\right)^{\beta} \left(\frac{e^{d z} b}{a}+1\right)^{-\beta} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} {}_2F_1\left(\frac{p}{d}, -\beta; \frac{d+p}{d}; -\frac{b\, e^{d z}}{a}\right) (1-m \bmod 2)\right.$$

$$\left.\right)$$

Involving rational functions of the direct function and exponential function

Involving exp

Involving $\frac{e^{p z}}{a+b \cosh(c z)}$

01.20.21.2861.01

$$\int \frac{e^{p z}}{a+b \cosh(c z)}\, dz == \frac{1}{b \sqrt{a^2-b^2}\ (c+p)} e^{(c+p) z} \left(\left(a+\sqrt{a^2-b^2}\right) {}_2F_1\left(\frac{c+p}{c}, 1; \frac{p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right) {}_2F_1\left(\frac{c+p}{c}, 1; \frac{p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)$$

01.20.21.2862.01

$$\int \frac{e^{c z}}{a+b \cosh(c z)}\, dz == \frac{1}{b c}\left(\log\left(2 e^{c z} a+b e^{2 c z}+b\right)-\frac{2 a}{\sqrt{b^2-a^2}} \tan^{-1}\left(\frac{a+b e^{c z}}{\sqrt{b^2-a^2}}\right)\right)$$

01.20.21.2863.01

$$\int \frac{e^{c z}}{\cosh(c z)+1}\, dz == \frac{2\left(\left(1+e^{c z}\right) \log\left(1+e^{c z}\right)+1\right)}{c\left(1+e^{c z}\right)}$$

01.20.21.2864.01

$$\int \frac{e^{c z}}{1-\cosh(c z)}\, dz == \frac{2}{c\left(-1+e^{c z}\right)}-\frac{2 \log\left(-1+e^{c z}\right)}{c}$$

Involving $e^{p z}(a+b \cosh(c z))^{-n}$

01.20.21.2865.01

$$\int \frac{e^{p z}}{(a+b \cosh(c z))^2}\, dz == \frac{1}{b\left(a^2-b^2\right)^{3/2}(c+p)}\left(e^{(c+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right) {}_2F_1\left(\frac{c+p}{c}, 1; \frac{p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right) {}_2F_1\left(\frac{c+p}{c}, 1; \frac{p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)-a \sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+p}{c}, 2; \frac{p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+p}{c}, 2; \frac{p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+p}{c}, 2; \frac{p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+p}{c}, 2; \frac{p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

01.20.21.2866.01

$$\int \frac{e^{c z}}{(a+b\cosh(c z))^2}\,dz == -\frac{2\left(-2\,e^{c z}\,a^2+b^2\,e^{c z}-a\,b\right)}{b\left(b^2-a^2\right)c\left(2\,e^{c z}\,a+b\,e^{2 c z}+b\right)}-\frac{2\,b}{\left(a^2-b^2\right)\sqrt{b^2-a^2}\;c}\tan^{-1}\left(\frac{a+b\,e^{c z}}{\sqrt{b^2-a^2}}\right)$$

Involving $\frac{e^{p z}}{a+b\cosh^2(c z)}$

01.20.21.2867.01

$$\int \frac{e^{p z}}{a+b\cosh^2(c z)}\,dz == -\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2c+p)}\left(e^{(2c+p)z}\left(\left(2a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{p}{2c}+1,1;\frac{p}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{p}{2c}+1,1;\frac{p}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)$$

01.20.21.2868.01

$$\int \frac{e^{c z}}{a+b\cosh^2(c z)}\,dz == \frac{1}{c\sqrt{a}\;\sqrt{b}\;\sqrt{a+b}}\left(\sqrt{2a+2\sqrt{a+b}\;\sqrt{a}+b}\;\tan^{-1}\left(\frac{\sqrt{b}\;e^{cz}}{\sqrt{2a+2\sqrt{a+b}\;\sqrt{a}+b}}\right)-\sqrt{2a-2\sqrt{a+b}\;\sqrt{a}+b}\;\tan^{-1}\left(\frac{\sqrt{b}\;e^{cz}}{\sqrt{2a-2\sqrt{a+b}\;\sqrt{a}+b}}\right)\right)$$

Involving $e^{p z}\left(a+b\cosh^2(c z)\right)^{-n}$

01.20.21.2869.01

$$\int \frac{e^{p z}}{\left(a+b\cosh^2(c z)\right)^2}\,dz == -\frac{1}{2a^{3/2}\,b\,(a+b)^{3/2}\,(2c+p)}\left(e^{(2c+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(\frac{p}{2c}+1,1;\frac{p}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-(2a+b)\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{p}{2c}+1,1;\frac{p}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{p}{2c}+1,2;\frac{p}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\;a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{p}{2c}+1,2;\frac{p}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)$$

01.20.21.2870.01

$$\int \frac{e^{c z}}{\left(a+b \cosh^2(c z)\right)^2} dz == \frac{1}{2 a^{3/2} c}\left(\frac{2\sqrt{a}\ e^{c z}\left(2 e^{2 c z} a + b e^{2 c z} + b\right)}{(a+b)\left(b\left(1+e^{2 c z}\right)^2 + 4 a e^{2 c z}\right)} + \right.$$
$$\frac{\left(2\sqrt{a+b}\ a^{3/2} + 2a^2 + 2ba + b\sqrt{a+b}\ \sqrt{a} + b^2\right)}{\sqrt{b}\ (a+b)^{3/2}\sqrt{2a + 2\sqrt{a+b}\ \sqrt{a} + b}} \tan^{-1}\left(\frac{\sqrt{b}\ e^{c z}}{\sqrt{2a + 2\sqrt{a+b}\ \sqrt{a} + b}}\right) +$$
$$\left.\frac{\left(2\sqrt{a+b}\ a^{3/2} - 2a^2 - 2ba + b\sqrt{a+b}\ \sqrt{a} - b^2\right)}{\sqrt{b}\ (a+b)^{3/2}\sqrt{2a - 2\sqrt{a+b}\ \sqrt{a} + b}} \tan^{-1}\left(\frac{\sqrt{b}\ e^{c z}}{\sqrt{2a - 2\sqrt{a+b}\ \sqrt{a} + b}}\right)\right)$$

Involving $\frac{e^{p z}\cosh(d z)}{a+b\cosh(c z)}$

01.20.21.2871.01

$$\int \frac{e^{p z}\cosh(d z)}{a+b\cosh(c z)} dz ==$$
$$\frac{1}{2b\sqrt{a^2-b^2}}\left(\frac{1}{c-d+p}\left(e^{(c-d+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+p}{c}, 1; \frac{p-d}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right) + \left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c-d+p}{c}, 1; \frac{p-d}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right) +$$
$$\frac{1}{c+d+p}\left(e^{(c+d+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+p}{c}, 1; \frac{d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right) + \right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+p}{c}, 1; \frac{d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

01.20.21.2872.01

$$\int \frac{e^{p z}\cosh(c z)}{a+b\cosh(c z)} dz ==$$
$$\frac{1}{2b\sqrt{a^2-b^2}}\left(\frac{1}{2c+p}\left(e^{(2c+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{p}{c}+2, 1; \frac{p}{c}+3; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right) + \left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{p}{c}+2, 1; \frac{p}{c}+3; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right) +$$
$$\frac{1}{p}\left(e^{p z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{p}{c}, 1; \frac{c+p}{c}; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right) + \left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{p}{c}, 1; \frac{c+p}{c}; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

01.20.21.2873.01

$$\int \frac{e^{cz}\cosh(cz)}{a+b\cosh(cz)}\,dz == \frac{2\,a^2}{b^2\sqrt{b^2-a^2}\,c}\tan^{-1}\left(\frac{a+b\,e^{cz}}{\sqrt{b^2-a^2}}\right)-\frac{\log\left(2\,e^{cz}a+b\,e^{2cz}+b\right)a}{b^2\,c}+\frac{e^{cz}}{b\,c}$$

Involving $e^{pz}(a+b\cosh(cz))^{-n}\cosh(dz)$

01.20.21.2874.01

$$\int \frac{e^{pz}\cosh(dz)}{(a+b\cosh(cz))^2}\,dz ==$$

$$\frac{1}{2}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+p)}\left(e^{(c-d+p)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+p}{c},1;\frac{p-d}{c}+2;\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$${}_2F_1\left(\frac{c-d+p}{c},1;\frac{p-d}{c}+2;-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+p}{c},2;\frac{p-d}{c}+2;\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\left.{}_2F_1\left(\frac{c-d+p}{c},2;\frac{p-d}{c}+2;-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$
$$\left.\left({}_2F_1\left(\frac{c-d+p}{c},2;\frac{p-d}{c}+2;\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-d+p}{c},2;\frac{p-d}{c}+2;-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$
$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+p)}\left(e^{(c+d+p)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+p}{c},1;\frac{d+p}{c}+2;\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+p}{c},1;\frac{d+p}{c}+2;-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+p}{c},2;\frac{d+p}{c}+2;\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+d+p}{c},2;\frac{d+p}{c}+2;-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d+p}{c},2;\frac{d+p}{c}+2;\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c+d+p}{c},2;\frac{d+p}{c}+2;-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)$$

Involving $\frac{e^{pz}\cosh(dz)}{a+b\cosh^2(cz)}$

01.20.21.2875.01

$$\int \frac{e^{p z}\cosh(d z)}{a+b\cosh^2(c z)}\,dz == \frac{1}{2\sqrt{a}\,b\sqrt{a+b}}$$
$$\left(-\frac{1}{2c-d+p}\left(e^{(2c-d+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{p-d}{2c}+1,1;\frac{p-d}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{p-d}{2c}+1,1;\frac{p-d}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{2c+d+p}\left(e^{(2c+d+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+p}{2c}+1,1;\frac{d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+p}{2c}+1,1;\frac{d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

01.20.21.2876.01

$$\int \frac{e^{p z}\cosh(c z)}{a+b\cosh^2(c z)}\,dz ==$$
$$\frac{1}{2\sqrt{a}\,b\sqrt{a+b}}\left(-\frac{1}{c+p}\left(e^{(c+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c+p}{2c},1;\frac{3c+p}{2c};-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.\right.$$
$$\left.\left.\left.\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{c+p}{2c},1;\frac{3c+p}{2c};-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{3c+p}\left(e^{(3c+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{3c+p}{2c},1;\frac{5c+p}{2c};-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.$$
$$\left.\left.\left.\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{3c+p}{2c},1;\frac{5c+p}{2c};-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $e^{p z}\left(a+b\cosh^2(c z)\right)^{-n}\cosh(d z)$

01.20.21.2877.01

$$\int \frac{e^{p z}\cosh(d z)}{\left(a+b\cosh^2(c z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left(e^{(2c-d+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{p-d}{2c}+1,\,1;\,\frac{p-d}{2c}+2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{p-d}{2c}+1,\,1;\,\frac{p-d}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right)\right.$$

$${}_2F_1\left(\frac{p-d}{2c}+1,\,2;\,\frac{p-d}{2c}+2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+\right.$$

$$\left.\left.\left.\left.\left.2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{p-d}{2c}+1,\,2;\,\frac{p-d}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/$$

$$\left(2a^{3/2}b(a+b)^{3/2}(2c-d+p)\right)-\frac{1}{2a^{3/2}b(a+b)^{3/2}(2c+d+p)}\left(e^{(2c+d+p)z}\right.$$

$$\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+p}{2c}+1,\,1;\,\frac{d+p}{2c}+2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+p}{2c}+1,\,1;\,\frac{d+p}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$

$$\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d+p}{2c}+1,\,2;\,\frac{d+p}{2c}+2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$

$$\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$

$$\left.\left.\left.\left.{}_2F_1\left(\frac{d+p}{2c}+1,\,2;\,\frac{d+p}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\right)$$

Involving $\frac{e^{p z}\cosh(e z)\cosh(d z)}{a+b\cosh(c z)}$

01.20.21.2878.01

$$\int \frac{e^{p z}\cosh(e z)\cosh(d z)}{a+b\cosh(c z)}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\,(c-d-e+p)}\left(e^{(c-d-e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e+p}{c},1;\frac{-d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-e+p}{c},1;\frac{-d-e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d-e+p)}\left(e^{(c+d-e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-e+p}{c},1;\frac{d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-e+p}{c},1;\frac{d-e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d+e+p)}\left(e^{(c-d+e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+e+p}{c},1;\frac{-d+e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+e+p}{c},1;\frac{-d+e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d+e+p)}\left(e^{(c+d+e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+e+p}{c},1;\frac{d+e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+e+p}{c},1;\frac{d+e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $e^{p z}\cosh(e z)\cosh(d z)(a+b\cosh(c z))^{-n}$

01.20.21.2879.01

$$\int \frac{e^{p z}\cosh(e z)\cosh(d z)}{(a+b\cosh(c z))^2}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-e+p)}\left(e^{(c-d-e+p)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e+p}{c},1;\frac{-d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-e+p}{c},1;\frac{-d-e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-e+p}{c},2;\frac{-d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)-\right.\right.\right.\right.$$

$$ {}_2F_1\left(\frac{c-d-e+p}{c},\,2;\,\frac{-d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d-e+p}{c},\,2;\,\frac{-d-e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-d-e+p}{c},\,2;\,\frac{-d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)+$$

$$ \frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-e+p)}\left(e^{(c+d-e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-e+p}{c},\,1;\,\frac{d-e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-e+p}{c},\,1;\,\frac{d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-e+p}{c},\,2;\,\frac{d-e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+d-e+p}{c},\,2;\,\frac{d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d-e+p}{c},\,2;\,\frac{d-e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+d-e+p}{c},\,2;\,\frac{d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$ \frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+e+p)}\left(e^{(c-d+e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+e+p}{c},\,1;\,\frac{-d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+e+p}{c},\,1;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$ \frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+e+p)}\left(e^{(c+d+e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+e+p}{c},\,1;\,\frac{d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right. $$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+e+p}{c},\,1;\,\frac{d+e+p}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+e+p}{c},\,2;\,\frac{d+e+p}{c}+2;\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)-\right.$$

$$\left.{}_2F_1\left(\frac{c+d+e+p}{c},\,2;\,\frac{d+e+p}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d+e+p}{c},\,2;\right.\right.$$

$$\left.\left.\frac{d+e+p}{c}+2;\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+d+e+p}{c},\,2;\,\frac{d+e+p}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\Big)\Big)$$

Involving $\frac{e^{pz}\cosh(ez)\cosh(dz)}{a+b\cosh^2(cz)}$

01.20.21.2880.01

$$\int\frac{e^{pz}\cosh(ez)\cosh(dz)}{a+b\cosh^2(cz)}\,dz=$$

$$\frac{1}{4}\left(-\left(e^{(2c-d-e+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,\,1;\,\frac{-d-e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,\,1;\,\frac{-d-e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$

$$\left(\sqrt{a}\,b\sqrt{a+b}\,(2c-d-e+p)\right)-\left(e^{(2c+d-e+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$

$${}_2F_1\left(\frac{d-e+p}{2c}+1,\,1;\,\frac{d-e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$\left.\left.{}_2F_1\left(\frac{d-e+p}{2c}+1,\,1;\,\frac{d-e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c+d-e+p)\right)-$$

$$\left(e^{(2c-d+e+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d+e+p}{2c}+1,\,1;\,\frac{-d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$\left.\left.\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d+e+p}{2c}+1,\,1;\,\frac{-d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$

$$\left(\sqrt{a}\,b\sqrt{a+b}\,(2c-d+e+p)\right)-\left(e^{(2c+d+e+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$

$${}_2F_1\left(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$\left.\left.{}_2F_1\left(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c+d+e+p)\right)\Big)$$

Involving $e^{p z} \cosh(e z) \cosh(d z) \left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.2881.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(d z)}{\left(a + b \cosh^2(c z)\right)^2} dz == \frac{1}{4}\left(-\left(e^{(2c-d-e+p)z}\right.\right.$$
$$\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,\,1;\,\frac{-d-e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,\,1;\,\frac{-d-e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,\,2;\,\frac{-d-e+p}{2c}+2;\right.\right.$$
$$\left.-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,\right.$$
$$\left.\left.\left.\left.2;\,\frac{-d-e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-d-e+p)\right)-$$
$$\left(e^{(2c+d-e+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-e+p}{2c}+1,\,1;\,\frac{d-e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-e+p}{2c}+1,\,1;\,\frac{d-e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d-e+p}{2c}+1,\,2;\,\frac{d-e+p}{2c}+\right.\right.$$
$$\left.2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{d-e+p}{2c}+1,\,2;\,\frac{d-e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(2c+d-e+p)\right)-\left(e^{(2c-d+e+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right)\right.\right.$$
$${}_2F_1\left(\frac{-d+e+p}{2c}+1,\,1;\,\frac{-d+e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d+e+p}{2c}+1,\,1;\,\frac{-d+e+p}{2c}+2;\,-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d+e+p}{2c}+1,\,2;\,\frac{-d+e+p}{2c}+\right.\right.$$
$$\left.2;\,-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$

$$ {}_2F_1\left(\frac{-d+e+p}{2c}+1,\,2;\,\frac{-d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c-d+e+p)\right)-\Bigg(e^{(2c+d+e+p)z}\Bigg(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right)$$

$${}_2F_1\left(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\sqrt{a}\,\Bigg(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d+e+p}{2c}+1,\,2;\,\frac{d+e+p}{2c}+2;\right.$$

$$\left.-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d+e+p}{2c}+\right.$$

$$\left.1,\,2;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c+d+e+p)\right)\Bigg)$$

Involving algebraic functions of the direct function and exponential function

Involving exp

Involving $e^{pz}\,(a+b\cosh(cz))^{\beta}$

01.20.21.2882.01

$$\int e^{pz}\,(a+b\cosh(cz))^{\beta}\,dz == \frac{1}{p-c\beta}\,e^{pz}\left(1-\frac{2\,b\,e^{cz}}{\sqrt{4a^2-4b^2}-2a}\right)^{-\beta}\left(\frac{2\,e^{cz}\,b}{2a+\sqrt{4a^2-4b^2}}+1\right)^{-\beta}$$

$$\left(a+\frac{1}{2}\,b\,e^{-cz}\left(1+e^{2cz}\right)\right)^{\beta}\,F_1\left(\frac{p-c\beta}{c};\,-\beta,\,-\beta;\,\frac{p-c\beta}{c}+1;\,-\frac{2\,b\,e^{cz}}{2a+\sqrt{4a^2-4b^2}},\,\frac{2\,b\,e^{cz}}{\sqrt{4a^2-4b^2}-2a}\right)$$

Involving $e^{pz}\left(a+b\cosh^2(cz)\right)^{\beta}$

01.20.21.2883.01

$$\int e^{pz}\left(a+b\cosh^2(cz)\right)^{\beta}\,dz ==$$

$$\frac{1}{p-2c\beta}\Bigg(e^{pz}\left(\frac{e^{2cz}\,b}{2a+b-2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2cz}\,b}{2a+b+2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2cz}\left(1+e^{2cz}\right)^2+a\right)^{\beta}$$

$$F_1\left(\frac{p}{2c}-\beta;\,-\beta,\,-\beta;\,\frac{p}{2c}-\beta+1;\,-\frac{b\,e^{2cz}}{2a+b+2\sqrt{a(a+b)}},\,-\frac{b\,e^{2cz}}{2a+b-2\sqrt{a(a+b)}}\right)\Bigg)$$

Involving $e^{p z}(a + b \cosh(d z))^{\beta} \cosh(c z)$

01.20.21.2884.01

$$\int e^{p z} (a + b \cosh(d z))^{\beta} \cosh(c z)\, dz ==$$

$$\frac{1}{2 (c + p - d \beta) (c - p + d \beta)} \left(\left(\frac{e^{d z} b}{a - \sqrt{a^2 - b^2}} + 1 \right)^{-\beta} \left(\frac{e^{d z} b}{a + \sqrt{a^2 - b^2}} + 1 \right)^{-\beta} \left(a + \frac{1}{2} b e^{-d z} \left(1 + e^{2 d z} \right) \right)^{\beta} \right.$$

$$\left(e^{(c+p) z} (c - p + d \beta) F_1 \left(\frac{c + p - d \beta}{d}; -\beta, -\beta; \frac{c + d + p - d \beta}{d}; -\frac{b e^{d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{d z}}{\sqrt{a^2 - b^2} - a} \right) - \right.$$

$$\left. \left. e^{(p-c) z} (c + p - d \beta) F_1 \left(-\frac{c - p + d \beta}{d}; -\beta, -\beta; \frac{-c + d + p - d \beta}{d}; -\frac{b e^{d z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{d z}}{\sqrt{a^2 - b^2} - a} \right) \right) \right)$$

Involving $e^{p z} \left(a + b \cosh^2(d z)\right)^{\beta} \cosh(c z)$

01.20.21.2885.01

$$\int e^{p z} \left(a + b \cosh^2(d z) \right)^{\beta} \cosh(c z)\, dz == \frac{1}{2 (c + p - 2 d \beta) (c - p + 2 d \beta)}$$

$$\left(\left(\frac{e^{2 d z} b}{2 a + b - 2 \sqrt{a (a + b)}} + 1 \right)^{-\beta} \left(\frac{e^{2 d z} b}{2 a + b + 2 \sqrt{a (a + b)}} + 1 \right)^{-\beta} \left(\frac{1}{4} b e^{-2 d z} \left(1 + e^{2 d z} \right)^2 + a \right)^{\beta} \right. \left(e^{(c+p) z} (c - p + 2 d \beta) \right.$$

$$F_1 \left(\frac{c + p - 2 d \beta}{2 d}; -\beta, -\beta; \frac{c + p}{2 d} - \beta + 1; -\frac{b e^{2 d z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 d z}}{2 a + b - 2 \sqrt{a (a + b)}} \right) - e^{(p-c) z}$$

$$\left. \left. (c + p - 2 d \beta) F_1 \left(-\frac{c - p + 2 d \beta}{2 d}; -\beta, -\beta; \frac{p - c}{2 d} - \beta + 1; -\frac{b e^{2 d z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 d z}}{2 a + b - 2 \sqrt{a (a + b)}} \right) \right) \right)$$

Involving $e^{p z} \cosh(e z) \cosh(d z) (a + b \cosh(c z))^{\beta}$

01.20.21.2886.01

$$\int e^{p z} \cosh(e z) \cosh(d z) (a + b \cosh(c z))^{\beta} dz == \frac{1}{4}\left(\frac{e^{c z} b}{a - \sqrt{a^2 - b^2}} + 1\right)^{-\beta}\left(\frac{e^{c z} b}{a + \sqrt{a^2 - b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(d-e+p) z}}{d - e + p - c \beta} F_1\left(\frac{d - e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d - e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) -\right.$$
$$\frac{e^{(-d+e+p) z}}{d - e - p + c \beta} F_1\left(\frac{-d + e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - d + e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) +$$
$$\frac{e^{(d+e+p) z}}{d + e + p - c \beta} F_1\left(\frac{d + e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d + e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) -$$
$$\left.\frac{e^{-(d+e-p) z}}{d + e - p + c \beta} F_1\left(-\frac{d + e - p + c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - d - e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right)\right)$$

Involving $e^{p z} \cosh(e z) \cosh(d z) \left(a + b \cosh^2(c z)\right)^{\beta}$

01.20.21.2887.01

$$\int e^{p z} \cosh(e z) \cosh(d z) \left(a + b \cosh^2(c z)\right)^{\beta} dz ==$$
$$\frac{1}{4}\left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(d-e+p) z}}{d - e + p - 2 c \beta} F_1\left(\frac{d - e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{d - e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right) +\right.$$
$$\frac{e^{(-d+e+p) z}}{-d + e + p - 2 c \beta} F_1\left(\frac{-d + e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{-d + e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}},\right.$$
$$\left.-\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right) + \frac{e^{(d+e+p) z}}{d + e + p - 2 c \beta} F_1\left(\frac{d + e + p - 2 c \beta}{2 c}; -\beta, -\beta;\right.$$
$$\left.\frac{d + e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right) - \frac{e^{-(d+e-p) z}}{d + e - p + 2 c \beta}$$
$$\left.F_1\left(-\frac{d + e - p + 2 c \beta}{2 c}; -\beta, -\beta; -\frac{d + e - p + 2 c (\beta - 1)}{2 c}; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right)\right)$$

Involving functions of the direct function, exponential and a power functions

Involving powers of the direct function, exponential and a power functions

Involving powers of cosh, exp and power

Involving $z^{\alpha-1}\, e^{p\,z} \cosh^{\nu}(a\,z)$

01.20.21.2888.01

$$\int z^{\alpha-1}\, e^{p\,z} \cosh^{\nu}(a\,z)\, dz ==$$

$$-2^{-\nu}\binom{\nu}{\frac{\nu}{2}} E_{1-\alpha}(-p\,z)\,(1-\nu \bmod 2)\, z^{\alpha} - 2^{-\nu}\, z^{\alpha} \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(E_{1-\alpha}((a\,(\nu-2\,k)-p)\,z) + E_{1-\alpha}((-p-a\,(\nu-2\,k))\,z)\right) /;\ \nu \in \mathbb{N}$$

01.20.21.2889.01

$$\int z^{n}\, e^{p\,z} \cosh^{\nu}(a\,z)\, dz == n!\, e^{p\,z} \cosh^{\nu}(a\,z)\left(1+e^{-2\,a\,z}\right)^{-\nu}$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}}{(n-j)!\,(p+a\,\nu)^{j+1}}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\,\nu}{2\,a}, \ldots, -\frac{p+a\,\nu}{2\,a}, -\nu; 1-\frac{p+a\,\nu}{2\,a}, \ldots, 1-\frac{p+a\,\nu}{2\,a}; -e^{-2\,a\,z}\right) /;\ n \in \mathbb{N}^{+}$$

01.20.21.2890.01

$$\int z^{n}\, e^{p\,z} \cosh^{\nu}(a\,z)\, dz ==$$

$$-2^{-\nu}\binom{\nu}{\frac{\nu}{2}} E_{-n}(-p\,z)\,(1-\nu \bmod 2)\, z^{n+1} - 2^{-\nu}\, z^{n+1} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(E_{-n}((a\,(\nu-2\,s)-p)\,z) + E_{-n}((-p-a\,(\nu-2\,s))\,z)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2891.01

$$\int z^{n}\, e^{p\,z} \cosh^{\nu}(a\,z)\, dz == -2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\frac{(-1)^n\,\mathrm{Ei}(p\,z)}{(-n-1)!} + e^{p\,z}\sum_{k=0}^{n}\frac{(-p\,z)^k}{(n+1)_{k-n}} - e^{p\,z}\sum_{k=n+1}^{-1}\frac{(-p\,z)^k}{(n+1)_{k-n}}\right)(-p)^{-n-1} - 2^{-\nu}\, z^{n+1}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\frac{(-1)^n\,\mathrm{Ei}((p-a\,(\nu-2\,s))\,z)}{(-n-1)!} + e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((a\,(\nu-2\,s)-p)\,z)^k}{(n+1)_{k-n}} - e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((a\,(\nu-2\,s)-p)\,z)^k}{(n+1)_{k-n}}\right)\right.$$

$$((a\,(\nu-2\,s)-p)\,z)^{-n-1} + ((-p-a\,(\nu-2\,s))\,z)^{-n-1}\left(\frac{(-1)^n\,\mathrm{Ei}((p+a\,(\nu-2\,s))\,z)}{(-n-1)!} + \right.$$

$$\left.\left. e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((-p-a\,(\nu-2\,s))\,z)^k}{(n+1)_{k-n}} - e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((-p-a\,(\nu-2\,s))\,z)^k}{(n+1)_{k-n}}\right)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2892.01

$$\int z^{n+\frac{1}{2}}\, e^{p\,z} \cosh^{\nu}(a\,z)\, dz == -2^{-\nu}\binom{\nu}{\frac{\nu}{2}} E_{-n-\frac{1}{2}}(-p\,z)\,(1-\nu \bmod 2)\, z^{n+\frac{3}{2}} -$$

$$2^{-\nu}\, z^{n+\frac{3}{2}} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(E_{-n-\frac{1}{2}}((a\,(\nu-2\,s)-p)\,z) + E_{-n-\frac{1}{2}}((-p-a\,(\nu-2\,s))\,z)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2893.01

$$\int z^{n+\frac{1}{2}}\, e^{p\,z} \cosh^{\nu}(a\,z)\, dz ==$$

$$\frac{1}{\sqrt{z}}\left(2^{-\nu}\,(-1)\,\sqrt{-p\,z}\,\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\operatorname{erfc}\left(\sqrt{-p\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{p\,z}\sum_{k=0}^{n}\frac{(-p\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{p\,z}\sum_{k=n+1}^{-1}\frac{(-p\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)(-p)^{-n-2}\right)-$$

$$2^{-\nu}\,z^{n+\frac{3}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\operatorname{erfc}\left(\sqrt{(a\,(\nu-2\,s)-p)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((a\,(\nu-2\,s)-p)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\right.\right.$$

$$\left.e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((a\,(\nu-2\,s)-p)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)((a\,(\nu-2\,s)-p)\,z)^{-n-\frac{3}{2}}+$$

$$((-p-a\,(\nu-2\,s))\,z)^{-n-\frac{3}{2}}\left(\operatorname{erfc}\left(\sqrt{(-p-a\,(\nu-2\,s))\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((-p-a\,(\nu-2\,s))\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\right.$$

$$\left.\left.e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((-p-a\,(\nu-2\,s))\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)\Big/;\ n\in\mathbb{Z}\wedge\nu\in\mathbb{N}$$

01.20.21.2894.01

$$\int z\, e^{b\,z}\cosh^{2}(a\,z)\, dz ==$$

$$\frac{1}{2\left(b^3-4\,a^2\,b\right)^2}\left(e^{b\,z}\left(-\left(-z\,b^3+b^2+4\,a^2\,(b\,z+1)\right)\cosh(2\,a\,z)\,b^2+2\,a\left(4\,z\,a^2+2\,b-b^2\,z\right)\sinh(2\,a\,z)\,b^2+\left(b^2-4\,a^2\right)^2(b\,z-1)\right)\right)$$

Involving $z^{\alpha-1}\, e^{p\,z+e}\cosh^{\nu}(a\,z)$

01.20.21.2895.01

$$\int z^{n}\, e^{e+p\,z}\cosh^{\nu}(a\,z)\, dz == n!\, e^{e+p\,z}\cosh^{\nu}(a\,z)\left(1+e^{-2\,a\,z}\right)^{-\nu}$$

$$\sum_{j=0}^{n}\frac{(-1)^j\, z^{n-j}}{(n-j)!\,(p+a\,\nu)^{j+1}}\,{}_{j+2}F_{j+1}\left(-\frac{p+a\,\nu}{2\,a},\ \ldots,\ -\frac{p+a\,\nu}{2\,a},\ -\nu;\ 1-\frac{p+a\,\nu}{2\,a},\ \ldots,\ 1-\frac{p+a\,\nu}{2\,a};\ -e^{-2\,a\,z}\right)\Big/;\ n\in\mathbb{N}^{+}$$

01.20.21.2896.01

$$\int z^{\alpha-1}\, e^{e+p\,z}\cosh^{\nu}(a\,z)\, dz ==$$

$$-2^{-\nu}\, e^{e}\binom{\nu}{\frac{\nu}{2}}E_{1-\alpha}(-p\,z)\,(1-\nu \bmod 2)\,z^{\alpha}-2^{-\nu}\, e^{e}\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(E_{1-\alpha}((a\,(\nu-2\,k)-p)\,z)+E_{1-\alpha}((-p-a\,(\nu-2\,k))\,z)\right)\right)z^{\alpha}\Big/;\ \nu\in\mathbb{N}$$

01.20.21.2897.01

$$\int z^n\, e^{e+p\,z} \cosh^{\nu}(a\,z)\, dz == -e^e\, 2^{-\nu} \binom{\nu}{\frac{\nu}{2}} E_{-n}(-p\,z)\,(1-\nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu}\, z^{n+1}\, e^e \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(E_{-n}((a\,(\nu-2\,s)-p)\,z) + E_{-n}((-p-a\,(\nu-2\,s))\,z)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2898.01

$$\int z^n\, e^{e+p\,z} \cosh^{\nu}(a\,z)\, dz ==$$

$$-2^{-\nu}\, e^e \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\frac{(-1)^n\, \mathrm{Ei}(p\,z)}{(-n-1)!} + e^{p\,z} \sum_{k=0}^{n} \frac{(-p\,z)^k}{(n+1)_{k-n}} - e^{p\,z} \sum_{k=n+1}^{-1} \frac{(-p\,z)^k}{(n+1)_{k-n}} \right) (-p)^{-n-1} - 2^{-\nu}\, z^{n+1}\, e^e$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\left(\frac{(-1)^n\, \mathrm{Ei}((p-a\,(\nu-2\,s))\,z)}{(-n-1)!} + e^{(p-a\,(\nu-2\,s))\,z} \sum_{k=0}^{n} \frac{((a\,(\nu-2\,s)-p)\,z)^k}{(n+1)_{k-n}} - e^{(p-a\,(\nu-2\,s))\,z} \sum_{k=n+1}^{-1} \frac{((a\,(\nu-2\,s)-p)\,z)^k}{(n+1)_{k-n}} \right) \right.$$

$$((a\,(\nu-2\,s)-p)\,z)^{-n-1} + ((-p-a\,(\nu-2\,s))\,z)^{-n-1} \left(\frac{(-1)^n\, \mathrm{Ei}((p+a\,(\nu-2\,s))\,z)}{(-n-1)!} + \right.$$

$$\left. \left. e^{(p+a\,(\nu-2\,s))\,z} \sum_{k=0}^{n} \frac{((-p-a\,(\nu-2\,s))\,z)^k}{(n+1)_{k-n}} - e^{(p+a\,(\nu-2\,s))\,z} \sum_{k=n+1}^{-1} \frac{((-p-a\,(\nu-2\,s))\,z)^k}{(n+1)_{k-n}} \right) \right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2899.01

$$\int z^{n+\frac{1}{2}}\, e^{e+p\,z} \cosh^{\nu}(a\,z)\, dz == -2^{-\nu}\, e^e \binom{\nu}{\frac{\nu}{2}} E_{-n-\frac{1}{2}}(-p\,z)\,(1-\nu \bmod 2)\, z^{n+\frac{3}{2}} -$$

$$2^{-\nu}\, z^{n+\frac{3}{2}}\, e^e \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(E_{-n-\frac{1}{2}}((a\,(\nu-2\,s)-p)\,z) + E_{-n-\frac{1}{2}}((-p-a\,(\nu-2\,s))\,z) \right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2900.01

$$\int z^{n+\frac{1}{2}}\, e^{e+p\,z}\cosh^{\nu}(a\,z)\,dz == \frac{1}{\sqrt{z}}$$

$$\left(2^{-\nu}\, e^{e}\,(-1)^{\sqrt{-p\,z}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\operatorname{erfc}\left(\sqrt{-p\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{p\,z}\sum_{k=0}^{n}\frac{(-p\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{p\,z}\sum_{k=n+1}^{-1}\frac{(-p\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)(-p)^{-n-2}-\right.$$

$$2^{-\nu}\, z^{n+\frac{3}{2}}\, e^{e}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\operatorname{erfc}\left(\sqrt{(a\,(\nu-2\,s)-p)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((a\,(\nu-2\,s)-p)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\right.\right.$$

$$\left.e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((a\,(\nu-2\,s)-p)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)((a\,(\nu-2\,s)-p)\,z)^{-n-\frac{3}{2}}+$$

$$((-p-a\,(\nu-2\,s))\,z)^{-n-\frac{3}{2}}\left(\operatorname{erfc}\left(\sqrt{(-p-a\,(\nu-2\,s))\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((-p-a\,(\nu-2\,s))\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\right.$$

$$\left.\left.\left.e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((-p-a\,(\nu-2\,s))\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)\right/;\ n\in\mathbb{Z}\wedge\nu\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z}\cosh^{\nu}(a\,z+b)$

01.20.21.2901.01

$$\int z^{n}\, e^{p\,z}\cosh^{\nu}(b+a\,z)\,dz == n!\, e^{p\,z}\cosh^{\nu}(b+a\,z)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}$$

$$\sum_{j=0}^{n}\frac{(-1)^{j}\, z^{n-j}}{(n-j)!\,(p+a\,\nu)^{j+1}}\ {}_{j+2}F_{j+1}\left(-\frac{p+a\,\nu}{2\,a},\ \ldots,\ -\frac{p+a\,\nu}{2\,a},\ -\nu;\ 1-\frac{p+a\,\nu}{2\,a},\ \ldots,\ 1-\frac{p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right)/;\ n\in\mathbb{N}^{+}$$

01.20.21.2902.01

$$\int z^{\alpha-1}\, e^{p\,z}\cosh^{\nu}(b+a\,z)\,dz == -2^{-\nu}\binom{\nu}{\frac{\nu}{2}}E_{1-\alpha}(-p\,z)\,(1-\nu \bmod 2)\,z^{\alpha}-$$

$$2^{-\nu}\, z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{b\,(2\,k+\nu)}\binom{\nu}{k}\left(e^{-2\,b\,\nu}\,E_{1-\alpha}((a\,(\nu-2\,k)-p)\,z)+e^{-4\,b\,k}\,E_{1-\alpha}((-p-a\,(\nu-2\,k))\,z)\right)/;\ \nu\in\mathbb{N}$$

01.20.21.2903.01

$$\int z^{n}\, e^{p\,z}\cosh^{\nu}(b+a\,z)\,dz == -2^{-\nu}\binom{\nu}{\frac{\nu}{2}}E_{-n}(-p\,z)\,(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{b\,(2\,s+\nu)}\binom{\nu}{s}\left(e^{-2\,b\,\nu}\,E_{-n}((a\,(\nu-2\,s)-p)\,z)+e^{-4\,b\,s}\,E_{-n}((-p-a\,(\nu-2\,s))\,z)\right)\right)z^{n+1}\ /;\ n\in\mathbb{Z}\wedge\nu\in\mathbb{N}$$

01.20.21.2904.01

$$\int z^n e^{p z} \cosh^{\nu}(b + a z)\, dz ==$$

$$-2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1 - \nu \bmod 2)\left(\frac{(-1)^n \operatorname{Ei}(p z)}{(-n-1)!} + e^{p z}\sum_{k=0}^{n}\frac{(-p z)^k}{(n+1)_{k-n}} - e^{p z}\sum_{k=n+1}^{-1}\frac{(-p z)^k}{(n+1)_{k-n}}\right)(-p)^{-n-1} - 2^{-\nu} z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{b(2s+\nu)}\binom{\nu}{s}$$

$$\left(e^{-2b\nu}\left(\frac{(-1)^n \operatorname{Ei}((p - a(\nu-2s))z)}{(-n-1)!} + e^{(p-a(\nu-2s))z}\sum_{k=0}^{n}\frac{((a(\nu-2s)-p)z)^k}{(n+1)_{k-n}} - e^{(p-a(\nu-2s))z}\sum_{k=n+1}^{-1}\frac{((a(\nu-2s)-p)z)^k}{(n+1)_{k-n}}\right)\right.$$

$$((a(\nu-2s)-p)z)^{-n-1} + e^{-4bs}((-p-a(\nu-2s))z)^{-n-1}\left(\frac{(-1)^n \operatorname{Ei}((p+a(\nu-2s))z)}{(-n-1)!} + \right.$$

$$\left.\left. e^{(p+a(\nu-2s))z}\sum_{k=0}^{n}\frac{((-p-a(\nu-2s))z)^k}{(n+1)_{k-n}} - e^{(p+a(\nu-2s))z}\sum_{k=n+1}^{-1}\frac{((-p-a(\nu-2s))z)^k}{(n+1)_{k-n}}\right)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2905.01

$$\int z^{n+\frac{1}{2}} e^{p z} \cosh^{\nu}(b + a z)\, dz == -2^{-\nu}\binom{\nu}{\frac{\nu}{2}} E_{-n-\frac{1}{2}}(-p z)(1 - \nu \bmod 2)\, z^{n+\frac{3}{2}} -$$

$$2^{-\nu} z^{n+\frac{3}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{b(2s+\nu)}\binom{\nu}{s}\left(e^{-2b\nu} E_{-n-\frac{1}{2}}((a(\nu-2s)-p)z) + e^{-4bs} E_{-n-\frac{1}{2}}((-p-a(\nu-2s))z)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2906.01

$$\int z^{n+\frac{1}{2}} e^{p z} \cosh^{\nu}(b + a z)\, dz ==$$

$$\frac{1}{\sqrt{z}}\left(2^{-\nu}(-1)\sqrt{-p z}\binom{\nu}{\frac{\nu}{2}}(1 - \nu \bmod 2)\left(\operatorname{erfc}\left(\sqrt{-p z}\right)\Gamma\left(n+\frac{3}{2}\right) + e^{p z}\sum_{k=0}^{n}\frac{(-p z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - e^{p z}\sum_{k=n+1}^{-1}\frac{(-p z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)(-p)^{-n-2}\right) -$$

$$2^{-\nu} z^{n+\frac{3}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{b(2s+\nu)}\binom{\nu}{s}\left(e^{-2b\nu}\left(\operatorname{erfc}\left(\sqrt{(a(\nu-2s)-p)z}\right)\Gamma\left(n+\frac{3}{2}\right) + e^{(p-a(\nu-2s))z}\sum_{k=0}^{n}\frac{((a(\nu-2s)-p)z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - \right.\right.$$

$$\left.\left. e^{(p-a(\nu-2s))z}\sum_{k=n+1}^{-1}\frac{((a(\nu-2s)-p)z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)((a(\nu-2s)-p)z)^{-n-\frac{3}{2}} + \right.$$

$$e^{-4bs}((-p-a(\nu-2s))z)^{-n-\frac{3}{2}}\left(\operatorname{erfc}\left(\sqrt{(-p-a(\nu-2s))z}\right)\Gamma\left(n+\frac{3}{2}\right) + \right.$$

$$\left.\left. e^{(p+a(\nu-2s))z}\sum_{k=0}^{n}\frac{((-p-a(\nu-2s))z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}} - e^{(p+a(\nu-2s))z}\sum_{k=n+1}^{-1}\frac{((-p-a(\nu-2s))z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z+e} \cosh^{\nu}(a z + b)$

01.20.21.2907.01

$$\int z^n e^{e+p z} \cosh^{\nu}(b+a z)\, dz == n!\, e^{e+p z} \cosh^{\nu}(b+a z) \left(1+e^{-2(b+a z)}\right)^{-\nu}$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j}}{(n-j)!\,(p+a\nu)^{j+1}}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\nu}{2a}, \ldots, -\frac{p+a\nu}{2a}, -\nu; 1-\frac{p+a\nu}{2a}, \ldots, 1-\frac{p+a\nu}{2a}; -e^{-2(b+a z)}\right) /;\ n \in \mathbb{N}^+$$

01.20.21.2908.01

$$\int z^{\alpha-1} e^{e+p z} \cosh^{\nu}(b+a z)\, dz == -2^{-\nu} e^{e} \binom{\nu}{\frac{\nu}{2}} E_{1-\alpha}(-p z)\,(1-\nu \bmod 2)\, z^{\alpha} -$$

$$2^{-\nu} z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{e+b(2k+\nu)} \binom{\nu}{k} \left(e^{-2b\nu} E_{1-\alpha}((a(\nu-2k)-p) z) + e^{-4bk} E_{1-\alpha}((-p-a(\nu-2k)) z)\right) /;\ \nu \in \mathbb{N}$$

01.20.21.2909.01

$$\int z^n e^{e+p z} \cosh^{\nu}(b+a z)\, dz == -2^{-\nu} e^{e} \binom{\nu}{\frac{\nu}{2}} E_{-n}(-p z)\,(1-\nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu} z^{n+1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{e+b(2s+\nu)} \binom{\nu}{s} \left(e^{-2b\nu} E_{-n}((a(\nu-2s)-p) z) + e^{-4bs} E_{-n}((-p-a(\nu-2s)) z)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2910.01

$$\int z^n e^{e+p z} \cosh^{\nu}(b+a z)\, dz ==$$

$$-2^{-\nu} e^{e} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\frac{(-1)^n \operatorname{Ei}(p z)}{(-n-1)!} + e^{p z} \sum_{k=0}^{n} \frac{(-p z)^k}{(n+1)_{k-n}} - e^{p z} \sum_{k=n+1}^{-1} \frac{(-p z)^k}{(n+1)_{k-n}}\right) (-p)^{-n-1} - 2^{-\nu} z^{n+1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{e+b(2s+\nu)} \binom{\nu}{s}$$

$$\left(e^{-2b\nu} \left(\frac{(-1)^n \operatorname{Ei}((p-a(\nu-2s)) z)}{(-n-1)!} + e^{(p-a(\nu-2s)) z} \sum_{k=0}^{n} \frac{((a(\nu-2s)-p) z)^k}{(n+1)_{k-n}} - e^{(p-a(\nu-2s)) z} \sum_{k=n+1}^{-1} \frac{((a(\nu-2s)-p) z)^k}{(n+1)_{k-n}}\right)\right.$$

$$((a(\nu-2s)-p) z)^{-n-1} + e^{-4bs} ((-p-a(\nu-2s)) z)^{-n-1} \left(\frac{(-1)^n \operatorname{Ei}((p+a(\nu-2s)) z)}{(-n-1)!} + \right.$$

$$\left.\left. e^{(p+a(\nu-2s)) z} \sum_{k=0}^{n} \frac{((-p-a(\nu-2s)) z)^k}{(n+1)_{k-n}} - e^{(p+a(\nu-2s)) z} \sum_{k=n+1}^{-1} \frac{((-p-a(\nu-2s)) z)^k}{(n+1)_{k-n}}\right)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2911.01

$$\int z^{n+\frac{1}{2}} e^{e+p z} \cosh^{\nu}(b+a z)\, dz == -2^{-\nu} e^{e} \binom{\nu}{\frac{\nu}{2}} E_{-n-\frac{1}{2}}(-p z)\,(1-\nu \bmod 2)\, z^{n+\frac{3}{2}} -$$

$$2^{-\nu} z^{n+\frac{3}{2}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{e+b(2s+\nu)} \binom{\nu}{s} \left(e^{-2b\nu} E_{-n-\frac{1}{2}}((a(\nu-2s)-p) z) + e^{-4bs} E_{-n-\frac{1}{2}}((-p-a(\nu-2s)) z)\right) /;\ n \in \mathbb{Z} \wedge \nu \in \mathbb{N}$$

01.20.21.2912.01

$$\int z^{n+\frac{1}{2}}\, e^{e+p\,z}\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{\sqrt{z}}$$

$$\left(2^{-\nu}\, e^{e}\,(-1)\sqrt{-p\,z}\,\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\operatorname{erfc}\left(\sqrt{-p\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{p\,z}\sum_{k=0}^{n}\frac{(-p\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{p\,z}\sum_{k=n+1}^{-1}\frac{(-p\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)(-p)^{-n-2}-\right.$$

$$2^{-\nu}\, z^{n+\frac{3}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{e+b\,(2\,s+\nu)}\binom{\nu}{s}\left(e^{-2\,b\,\nu}\left(\operatorname{erfc}\left(\sqrt{(a\,(\nu-2\,s)-p)\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((a\,(\nu-2\,s)-p)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-\right.\right.$$

$$\left.e^{(p-a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((a\,(\nu-2\,s)-p)\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)((a\,(\nu-2\,s)-p)\,z)^{-n-\frac{3}{2}}+$$

$$e^{-4\,b\,s}\,((-p-a\,(\nu-2\,s))\,z)^{-n-\frac{3}{2}}\left(\operatorname{erfc}\left(\sqrt{(-p-a\,(\nu-2\,s))\,z}\right)\Gamma\left(n+\frac{3}{2}\right)+\right.$$

$$\left.\left.e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=0}^{n}\frac{((-p-a\,(\nu-2\,s))\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}-e^{(p+a\,(\nu-2\,s))\,z}\sum_{k=n+1}^{-1}\frac{((-p-a\,(\nu-2\,s))\,z)^{k+\frac{1}{2}}}{\left(n+\frac{3}{2}\right)_{k-n}}\right)\right)/;\, n\in\mathbb{Z}\wedge\nu\in\mathbb{N}$$

Involving $z^n\, e^{b\,z^r}\cosh^{\nu}(c\,z)$

01.20.21.2913.01

$$\int z^{n}\, e^{b\,z^{2}}\cosh^{\nu}(c\,z)\,dz ==$$

$$-2^{-\nu-1}\,b^{-n-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(c\,\nu-2\,c\,s)^2}{4\,b}}\sum_{q=0}^{n}2^{q-n}\,(2\,c\,s-c\,\nu)^{n-q}\,(-2\,c\,s+c\,\nu+2\,b\,z)^{q+1}\left(-\frac{(-2\,c\,s+c\,\nu+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2\,c\,s+c\,\nu+2\,b\,z)^2}{4\,b}\right)+e^{-\frac{(2\,c\,s-c\,\nu)^2}{4\,b}}\sum_{q=0}^{n}2^{q-n}\,(c\,\nu-2\,c\,s)^{n-q}$$

$$\left.(2\,b\,z-c\,(\nu-2\,s))^{q+1}\left(-\frac{(2\,b\,z-c\,(\nu-2\,s))^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,b\,z-c\,(\nu-2\,s))^2}{4\,b}\right)\right)-$$

$$2^{-\nu-1}\,z^{n+1}\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}\binom{\nu}{\frac{\nu}{2}}\Gamma\left(\frac{n+1}{2},-b\,z^2\right)(1-\nu \bmod 2)\,/;\, n\in\mathbb{N}\wedge\nu\in\mathbb{N}^{+}$$

01.20.21.2914.01

$$\int z^n e^{\sqrt{z}\, b} \cosh^{\nu}(c\, z)\, dz == 2^{-2\, n-\nu-1}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (c\,(\nu-2\,s))^{-2\, n-2} \left(e^{\frac{b^2}{4\, c\, (2\, s-\nu)}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\, n} \left(b-2\, c\, (2\, s-\nu)\, \sqrt{z}\right)^{h+k} \left(\frac{\left(b-2\, c\, (2\, s-\nu)\, \sqrt{z}\right)^2}{c\, (2\, s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b \left(b-2\, c\, (2\, s-\nu)\, \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-2\, c\, (2\, s-\nu)\, \sqrt{z}\right)^2}{4\, c\, (2\, s-\nu)} \right) - \right.$$

$$\left. \left. 2\, c\, (2\, s-\nu) \sqrt{\frac{\left(b-2\, c\, (2\, s-\nu)\, \sqrt{z}\right)^2}{c\, (2\, s-\nu)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-2\, c\, (2\, s-\nu)\, \sqrt{z}\right)^2}{4\, c\, (2\, s-\nu)} \right) \right) +$$

$$e^{\frac{b^2}{4\, c\, (\nu-2\, s)}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\, n} \left(b-2\, c\, (\nu-2\, s)\, \sqrt{z}\right)^{h+k} \left(\frac{\left(b-2\, c\, (\nu-2\, s)\, \sqrt{z}\right)^2}{c\, (\nu-2\, s)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(b \left(b-2\, c\, (\nu-2\, s)\, \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-2\, c\, (\nu-2\, s)\, \sqrt{z}\right)^2}{4\, c\, (\nu-2\, s)} \right) - \right.$$

$$\left. \left. 2\, c\, (\nu-2\, s) \sqrt{\frac{\left(b-2\, c\, (\nu-2\, s)\, \sqrt{z}\right)^2}{c\, (\nu-2\, s)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-2\, c\, (\nu-2\, s)\, \sqrt{z}\right)^2}{4\, c\, (\nu-2\, s)} \right) \right) \right) -$$

$$2^{1-\nu}\, b^{-2\,(n+1)} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2\,(n+1),\ -b\, \sqrt{z}\right) (1-\nu \bmod 2)\ /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n\, e^{b\, z^r+e} \cosh^{\nu}(c\, z)$

01.20.21.2915.01

$$\int z^n e^{b z^2+e} \cosh^v(c z)\, dz ==$$

$$-2^{-v-1}\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e-\frac{(c v-2 c s)^2}{4 b}}\sum_{q=0}^{n}2^{q-n}(2 c s-c v)^{n-q}(-2 c s+c v+2 b z)^{q+1}\left(-\frac{(-2 c s+c v+2 b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(-2 c s+c v+2 b z)^2}{4 b}\right)+e^{e-\frac{(2 c s-c v)^2}{4 b}}\sum_{q=0}^{n}2^{q-n}(c v-2 c s)^{n-q}(2 b z-c(v-2 s))^{q+1}\right.$$

$$\left.\left.\left(-\frac{(2 b z-c(v-2 s))^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2 b z-c(v-2 s))^2}{4 b}\right)\right)\right)b^{-n-1}-$$

$$2^{-v-1} e^e z^{n+1}\left(-b z^2\right)^{\frac{1}{2}(-n-1)}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{n+1}{2},-b z^2\right)(1-v \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.2916.01

$$\int z^n e^{\sqrt{z}\,b+e} \cosh^{\nu}(c\,z)\,dz == 2^{-2\,n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (c\,(\nu-2\,s))^{-2\,n-2}$$

$$\left(e^{\frac{b^2}{4\,c\,(2\,s-\nu)}+e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b-2\,c\,(2\,s-\nu)\,\sqrt{z}\right)^{h+k} \left(\frac{\left(b-2\,c\,(2\,s-\nu)\,\sqrt{z}\right)^2}{c\,(2\,s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b\left(b-2\,c\,(2\,s-\nu)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-2\,c\,(2\,s-\nu)\,\sqrt{z}\right)^2}{4\,c\,(2\,s-\nu)} \right) - \right.$$

$$\left. \left. 2\,c\,(2\,s-\nu) \sqrt{\frac{\left(b-2\,c\,(2\,s-\nu)\,\sqrt{z}\right)^2}{c\,(2\,s-\nu)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-2\,c\,(2\,s-\nu)\,\sqrt{z}\right)^2}{4\,c\,(2\,s-\nu)} \right) \right) +$$

$$e^{\frac{b^2}{4\,c\,(\nu-2\,s)}+e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^{h+k} \left(\frac{\left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(b\left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(\nu-2\,s)} \right) - \right.$$

$$\left. \left. 2\,c\,(\nu-2\,s) \sqrt{\frac{\left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{c\,(\nu-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-2\,c\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(\nu-2\,s)} \right) \right) \right) -$$

$$2^{1-\nu}\, b^{-2\,(n+1)}\, e^e \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2\,(n+1),\ -b\,\sqrt{z}\right) (1-\nu \bmod 2)\ /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n\, e^{b\,z^r+d\,z} \cosh^{\nu}(c\,z)$

01.20.21.2917.01

$$\int z^n e^{b z^2+d z} \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz)^{q+1} \left(-\frac{(d+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b} \right) - \right.$$

$$e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(d-2cs+c\nu)^2}{4b}} \sum_{q=0}^{n} 2^{q-n} (-d+2cs-c\nu)^{n-q} (d-2cs+c\nu+2bz)^{q+1} \right.$$

$$\left(-\frac{(d-2cs+c\nu+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-2cs+c\nu+2bz)^2}{4b} \right) +$$

$$e^{-\frac{(d+2cs-c\nu)^2}{4b}} \sum_{q=0}^{n} 2^{q-n} (-d-2cs+c\nu)^{n-q} (d+2cs-c\nu+2bz)^{q+1} \left(-\frac{(d+2cs-c\nu+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2cs-c\nu+2bz)^2}{4b} \right) \right) \right) \Big/; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2918.01

$$\int z^n e^{\sqrt{z}\, b+d z} \cosh^{\nu}(c z)\, dz ==$$

$$2^{-2n-\nu-1} e^{-\frac{b^2}{4d}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2d\sqrt{z} \right)^{h+k} \left(-\frac{\left(b+2d\sqrt{z} \right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b \left(b+2d\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2d\sqrt{z} \right)^2}{4d} \right) + \right.$$

$$\left. \left. 2\sqrt{-\frac{\left(b+2d\sqrt{z} \right)^2}{d}}\, d\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2d\sqrt{z} \right)^2}{4d} \right) \right) \right) d^{-2n-2} + 2^{-2n-\nu-1}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{b^2}{4(d+c(\nu-2s))}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2(d+c(\nu-2s))\sqrt{z} \right)^{h+k} \left(-\frac{\left(b+2(d+c(\nu-2s))\sqrt{z} \right)^2}{d+c(\nu-2s)} \right)^{\frac{1}{2}(-h-k-1)} \right. \right.$$

$$\left. \left. \binom{k}{h} \binom{n}{k} \left(b \left(b+2(d+c(\nu-2s))\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2(d+c(\nu-2s))\sqrt{z} \right)^2}{4(d+c(\nu-2s))} \right) + 2 \right. \right. \right.$$

$$\sqrt{-\frac{\left(b+2\left(d+c\left(v-2s\right)\right)\sqrt{z}\right)^2}{d+c\left(v-2s\right)}}\ \left(d+c\left(v-2s\right)\right)$$

$$\Gamma\left(\frac{1}{2}\left(h+k+2\right),\ -\frac{\left(b+2\left(d+c\left(v-2s\right)\right)\sqrt{z}\right)^2}{4\left(d+c\left(v-2s\right)\right)}\right)\Bigg)\left(d+c\left(v-2s\right)\right)^{-2n-2}+$$

$$e^{-\frac{b^2}{4\left(d-c\left(v-2s\right)\right)}}\left(d-c\left(v-2s\right)\right)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}\left(-1\right)^{k-h}4^k\,b^{-h-k+2n}\left(b+2\left(d-c\left(v-2s\right)\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\left(d-c\left(v-2s\right)\right)\sqrt{z}\right)^2}{d-c\left(v-2s\right)}\right)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\left(d-c\left(v-2s\right)\right)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+k+1\right),\ -\frac{\left(b+2\left(d-c\left(v-2s\right)\right)\sqrt{z}\right)^2}{4\left(d-c\left(v-2s\right)\right)}\Bigg)+2\sqrt{-\frac{\left(b+2\left(d-c\left(v-2s\right)\right)\sqrt{z}\right)^2}{d-c\left(v-2s\right)}}$$

$$\left(d-c\left(v-2s\right)\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),\ -\frac{\left(b+2\left(d-c\left(v-2s\right)\right)\sqrt{z}\right)^2}{4\left(d-c\left(v-2s\right)\right)}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh^v(c\,z)$

01.20.21.2919.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cosh^v(c\,z)\,dz==2^{-v-1}\,b^{-n-1}\,e^{-\frac{d^2}{4b}}$$

$$\Bigg(e^e\binom{v}{\frac{v}{2}}\left(v\bmod 2-1\right)\sum_{q=0}^{n}2^{q-n}\left(-d\right)^{n-q}\left(d+2\,b\,z\right)^{q+1}\left(-\frac{\left(d+2\,b\,z\right)^2}{b}\right)^{\frac{1}{2}\left(-q-1\right)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{\left(d+2\,b\,z\right)^2}{4\,b}\right)-e^{\frac{d^2}{4b}+e}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{\left(d-2\,c\,s+c\,v\right)^2}{4\,b}}\sum_{q=0}^{n}2^{q-n}\left(-d+2\,c\,s-c\,v\right)^{n-q}\left(d-2\,c\,s+c\,v+2\,b\,z\right)^{q+1}\left(-\frac{\left(d-2\,c\,s+c\,v+2\,b\,z\right)^2}{b}\right)^{\frac{1}{2}\left(-q-1\right)}\binom{n}{q}\Gamma\Bigg($$

$$\frac{q+1}{2},\ -\frac{\left(d-2\,c\,s+c\,v+2\,b\,z\right)^2}{4\,b}\Bigg)+e^{-\frac{\left(d+2\,c\,s-c\,v\right)^2}{4\,b}}\sum_{q=0}^{n}2^{q-n}\left(-d-2\,c\,s+c\,v\right)^{n-q}\left(d+2\,c\,s-c\,v+2\,b\,z\right)^{q+1}$$

$$\left(-\frac{\left(d+2\,c\,s-c\,v+2\,b\,z\right)^2}{b}\right)^{\frac{1}{2}\left(-q-1\right)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{\left(d+2\,c\,s-c\,v+2\,b\,z\right)^2}{4\,b}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.2920.01

$$\int z^n\, e^{\sqrt{z}\,b+e+d\,z}\cosh^{\nu}(c\,z)\,dz == 2^{-2\,n-\nu-1}\, e^{e-\frac{b^2}{4\,d}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2\,n-2}+$$

$$2^{-2\,n-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e-\frac{b^2}{4\,(d+c\,(\nu-2\,s))}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d+c\,(\nu-2\,s))\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(b+2\,(d+c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{d+c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d+c\,(\nu-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,(d+c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{4\,(d+c\,(\nu-2\,s))}\right)+2\sqrt{-\frac{\left(b+2\,(d+c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{d+c\,(\nu-2\,s)}}$$

$$\left.\left.\left.(d+c\,(\nu-2\,s))\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,(d+c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{4\,(d+c\,(\nu-2\,s))}\right)\right)\right)(d+c\,(\nu-2\,s))^{-2\,n-2}+\right.$$

$$e^{e-\frac{b^2}{4\,(d-c\,(\nu-2\,s))}}\,(d-c\,(\nu-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d-c\,(\nu-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\,(d-c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{d-c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d-c\,(\nu-2\,s))\,\sqrt{z}\right)\Gamma\right.\left(\right.$$

$$\left.\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,(d-c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{4\,(d-c\,(\nu-2\,s))}\right)+2\sqrt{-\frac{\left(b+2\,(d-c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{d-c\,(\nu-2\,s)}}$$

$$\left.\left.(d-c\,(\nu-2\,s))\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,(d-c\,(\nu-2\,s))\,\sqrt{z}\right)^2}{4\,(d-c\,(\nu-2\,s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^n e^{b z^r} \cosh^\nu(f z+g)$

01.20.21.2921.01

$$\int z^n e^{b z^2} \cosh^\nu(g+f z)\, dz ==$$

$$-2^{-\nu-1} b^{-n-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(f\nu-2fs)^2}{4b}-g(2s-\nu)} \sum_{q=0}^{n} 2^{q-n} (2fs-f\nu)^{n-q} (-2fs+f\nu+2bz)^{q+1} \left(-\frac{(-2fs+f\nu+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2fs+f\nu+2bz)^2}{4b} \right) + e^{-\frac{(2fs-f\nu)^2}{4b}-g(\nu-2s)} \sum_{q=0}^{n} 2^{q-n} (f\nu-2fs)^{n-q}$$

$$\left. (2bz-f(\nu-2s))^{q+1} \left(-\frac{(2bz-f(\nu-2s))^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2bz-f(\nu-2s))^2}{4b} \right) \right) -$$

$$2^{-\nu-1} z^{n+1} \left(-bz^2\right)^{\frac{1}{2}(-n-1)} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -bz^2 \right) (1-\nu \bmod 2) \; /; \; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2922.01

$$\int z^n e^{\sqrt{z}\, b} \cosh^{\nu}(g + f\, z)\, dz == 2^{-2n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (f\,(2s-\nu))^{-2n-2}$$

$$\left(e^{\frac{b^2}{4 f (2s-\nu)} - g(2s-\nu)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b - 2 f (2s-\nu)\sqrt{z}\right)^{h+k} \left(\frac{\left(b - 2 f (2s-\nu)\sqrt{z}\right)^2}{f(2s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h}\binom{n}{k} \left(b \left(b - 2 f (2s-\nu)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b - 2 f (2s-\nu)\sqrt{z}\right)^2}{4 f (2s-\nu)} \right) - \right.$$

$$\left. \left. 2 f (2s-\nu) \sqrt{\frac{\left(b - 2 f (2s-\nu)\sqrt{z}\right)^2}{f(2s-\nu)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b - 2 f (2s-\nu)\sqrt{z}\right)^2}{4 f (2s-\nu)} \right) \right) +$$

$$e^{\frac{b^2}{4 f (\nu-2s)} - g(\nu-2s)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b - 2 f (\nu-2s)\sqrt{z}\right)^{h+k} \left(\frac{\left(b - 2 f (\nu-2s)\sqrt{z}\right)^2}{f(\nu-2s)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left(b \left(b - 2 f (\nu-2s)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b - 2 f (\nu-2s)\sqrt{z}\right)^2}{4 f (\nu-2s)} \right) - \right.$$

$$\left. \left. \left. 2 f (\nu-2s) \sqrt{\frac{\left(b - 2 f (\nu-2s)\sqrt{z}\right)^2}{f(\nu-2s)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b - 2 f (\nu-2s)\sqrt{z}\right)^2}{4 f (\nu-2s)} \right) \right) \right) -$$

$$2^{1-\nu} b^{-2(n+1)} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2(n+1), -b\sqrt{z}\right) (1 - \nu \bmod 2) \; /; \; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n\, e^{b z^r + e} \cosh^{\nu}(f z + g)$

01.20.21.2923.01

$$\int z^n \, e^{b z^2+e} \cosh^{\nu}(g+f z)\, dz ==$$

$$-2^{-\nu-1} b^{-n-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(f\nu-2fs)^2}{4b}+e-g(2s-\nu)} \sum_{q=0}^{n} 2^{q-n} (2fs-f\nu)^{n-q} (-2fs+f\nu+2bz)^{q+1} \left(-\frac{(-2fs+f\nu+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2fs+f\nu+2bz)^2}{4b} \right) + e^{-\frac{(2fs-f\nu)^2}{4b}+e-g(\nu-2s)} \sum_{q=0}^{n} 2^{q-n} (f\nu-2fs)^{n-q}$$

$$\left. (2bz-f(\nu-2s))^{q+1} \left(-\frac{(2bz-f(\nu-2s))^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2bz-f(\nu-2s))^2}{4b} \right) \right) -$$

$$2^{-\nu-1} e^e \; z^{n+1} \left(-bz^2\right)^{\frac{1}{2}(-n-1)} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -bz^2 \right) (1-\nu \bmod 2) \; /; \; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2924.01

$$\int z^n\, e^{\sqrt{z}\ b+e} \cosh^{\nu}(g+f\,z)\, dz == 2^{-2\,n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (f\,(\nu-2\,s))^{-2\,n-2}$$

$$\left(e^{\frac{b^2}{4\,f\,(2\,s-\nu)}+e-g\,(2\,s-\nu)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^{h+k} \left(\frac{\left(b-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b \left(b-2\,f\,(2\,s-\nu)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{4\,f\,(2\,s-\nu)} \right) - \right.$$

$$\left. \left. 2\,f\,(2\,s-\nu) \sqrt{\frac{\left(b-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{4\,f\,(2\,s-\nu)} \right) \right) +$$

$$e^{\frac{b^2}{4\,f\,(\nu-2\,s)}+e-g\,(\nu-2\,s)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^{h+k} \left(\frac{\left(b-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{f\,(\nu-2\,s)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(b \left(b-2\,f\,(\nu-2\,s)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(\nu-2\,s)} \right) - \right.$$

$$\left. \left. 2\,f\,(\nu-2\,s) \sqrt{\frac{\left(b-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{f\,(\nu-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(\nu-2\,s)} \right) \right) \right) -$$

$$2^{1-\nu}\, b^{-2\,(n+1)}\, e^e \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2\,(n+1),\ -b\,\sqrt{z}\right) (1-\nu \bmod 2)\ /;\ n \in$$

$$\mathbb{N} \bigwedge$$

$$\nu \in$$

$$\mathbb{N}^+$$

Involving $z^n\, e^{b\,z^r+d\,z} \cosh^{\nu}(f\,z+g)$

01.20.21.2925.01

$$\int z^n e^{b z^2+d z} \cosh^{\nu}(g+f z)\, dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz)^{q+1} \left(-\frac{(d+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b} \right) - \right.$$

$$e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(d-2fs+f\nu)^2}{4b} - g(2s-\nu)} \sum_{q=0}^{n} 2^{q-n} (-d+2fs-f\nu)^{n-q} (d-2fs+f\nu+2bz)^{q+1} \right.$$

$$\left(-\frac{(d-2fs+f\nu+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-2fs+f\nu+2bz)^2}{4b} \right) +$$

$$e^{-\frac{(d+2fs-f\nu)^2}{4b} - g(\nu-2s)} \sum_{q=0}^{n} 2^{q-n} (-d-2fs+f\nu)^{n-q} (d-f(\nu-2s)+2bz)^{q+1}$$

$$\left. \left. \left(-\frac{(d-f(\nu-2s)+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-f(\nu-2s)+2bz)^2}{4b} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2926.01

$$\int z^n e^{\sqrt{z}\, b+d z} \cosh^{\nu}(g+f z)\, dz == 2^{-2n-\nu-1} e^{-\frac{b^2}{4d}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b\left(b+2d\sqrt{z}\right) \right. \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d} \right) + 2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\, d\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d} \right) \right) \right) d^{-2n-2} +$$

$$2^{-2n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{b^2}{4(d-f(2s-\nu))} - g(2s-\nu)} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2(d-f(2s-\nu))\sqrt{z}\right)^{h+k} \right. \right.$$

$$\left(-\frac{\left(b+2(d-f(2s-\nu))\sqrt{z}\right)^2}{d-f(2s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b\left(b+2(d-f(2s-\nu))\sqrt{z}\right) \right.$$

$$\left. \left. \left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2(d-f(2s-\nu))\sqrt{z}\right)^2}{4(d-f(2s-\nu))} \right) + 2\sqrt{-\frac{\left(b+2(d-f(2s-\nu))\sqrt{z}\right)^2}{d-f(2s-\nu)}} \right. \right. \right.$$

$$(d-f(2s-v))\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-f(2s-v))\sqrt{z}\right)^2}{4(d-f(2s-v))}\right)\Bigg)(d-f(2s-v))^{-2n-2}+$$

$$e^{-\frac{b^2}{4(d-f(v-2s))}-g(v-2s)}(d-f(v-2s))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(d-f(v-2s))\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2(d-f(v-2s))\sqrt{z}\right)^2}{d-f(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(d-f(v-2s))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),-\frac{\left(b+2(d-f(v-2s))\sqrt{z}\right)^2}{4(d-f(v-2s))}\Bigg)+2\sqrt{-\frac{\left(b+2(d-f(v-2s))\sqrt{z}\right)^2}{d-f(v-2s)}}$$

$$(d-f(v-2s))\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-f(v-2s))\sqrt{z}\right)^2}{4(d-f(v-2s))}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh^v(f\,z+g)$

01.20.21.2927.01

$$\int z^n\,e^{b\,z^2+d\,z+e}\cosh^v(g+f\,z)\,dz==$$

$$2^{-v-1}\,b^{-n-1}\,e^{-\frac{d^2}{4b}}\Bigg(e^e\binom{v}{\frac{v}{2}}(v\bmod 2-1)\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$

$$e^{\frac{d^2}{4b}}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d-2\,f\,s+f\,v)^2}{4\,b}+e-g(2s-v)}\sum_{q=0}^{n}2^{q-n}(-d+2\,f\,s-f\,v)^{n-q}(d-2\,f\,s+f\,v+2\,b\,z)^{q+1}$$

$$\left(-\frac{(d-2\,f\,s+f\,v+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-2\,f\,s+f\,v+2\,b\,z)^2}{4\,b}\right)+$$

$$e^{-\frac{(d+2\,f\,s-f\,v)^2}{4\,b}+e-g(v-2s)}\sum_{q=0}^{n}2^{q-n}(-d-2\,f\,s+f\,v)^{n-q}(d-f(v-2s)+2\,b\,z)^{q+1}$$

$$\left(-\frac{(d-f(v-2s)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d-f(v-2s)+2\,b\,z)^2}{4\,b}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.2928.01

$$\int z^n e^{\sqrt{z}\,b+e+d\,z}\cosh^{\nu}(g+f\,z)\,dz == 2^{-2\,n-\nu-1}\,e^{e-\frac{b^2}{4\,d}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2\,n-2}+$$

$$2^{-2\,n-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{b^2}{4\,(d-f\,(2\,s-\nu))}+e-g\,(2\,s-\nu)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(b+2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\right)^2}{d-f\,(2\,s-\nu)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\right)^2}{4\,(d-f\,(2\,s-\nu))}\right)+2\sqrt{-\frac{\left(b+2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\right)^2}{d-f\,(2\,s-\nu)}}$$

$$\left.\left.\left.(d-f\,(2\,s-\nu))\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\right)^2}{4\,(d-f\,(2\,s-\nu))}\right)\right)\right)(d-f\,(2\,s-\nu))^{-2\,n-2}+\right.$$

$$e^{-\frac{b^2}{4\,(d-f\,(\nu-2\,s))}+e-g\,(\nu-2\,s)}\,(d-f\,(\nu-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d-f\,(\nu-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\,(d-f\,(\nu-2\,s))\,\sqrt{z}\right)^2}{d-f\,(\nu-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d-f\,(\nu-2\,s))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),-\frac{\left(b+2\,(d-f\,(\nu-2\,s))\,\sqrt{z}\right)^2}{4\,(d-f\,(\nu-2\,s))}\right)+2\sqrt{-\frac{\left(b+2\,(d-f\,(\nu-2\,s))\,\sqrt{z}\right)^2}{d-f\,(\nu-2\,s)}}$$

$$\left.\left.(d-f\,(\nu-2\,s))\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2\,(d-f\,(\nu-2\,s))\,\sqrt{z}\right)^2}{4\,(d-f\,(\nu-2\,s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^n\, e^{b\,z}\, \cosh^{\nu}(c\,z^r)$

01.20.21.2929.01

$$\int z^n\, e^{b\,z} \cosh^{\nu}\left(c\,z^2\right) dz == 2^{-\nu}\,(-b)^{-n-1} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1,\,-b\,z)\,(\nu \bmod 2 - 1) -$$

$$2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{b^2}{8\,c\,s-4\,c\,\nu}} \left(\sum_{q=0}^{n} 2^{q-n}\,(-b)^{n-q}\,(b-4\,c\,s\,z+2\,c\,\nu\,z)^{q+1} \left(-\frac{(b-4\,c\,s\,z+2\,c\,\nu\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.\right.$$

$$\left.\left. \Gamma\left(\frac{q+1}{2}, -\frac{(b-4\,c\,s\,z+2\,c\,\nu\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right) (-c\,(2\,s-\nu))^{-n-1} + e^{\frac{b^2}{4\,c\,\nu-8\,c\,s}}\,(-c\,(\nu-2\,s))^{-n-1} \sum_{q=0}^{n} 2^{q-n}\,(-b)^{n-q} \right.$$

$$\left. (b-2\,c\,(\nu-2\,s)\,z)^{q+1} \left(\frac{(b-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2\,c\,(\nu-2\,s)\,z)^2}{c\,(8\,s-4\,\nu)} \right) \right) /;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2930.01

$$\int z^n e^{b z} \cosh^{\nu}\left(c \sqrt{z}\right) dz == 2^{-2 n-\nu-1} b^{-2 n-2}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{c^2 (\nu-2 s)^2}{4 b}} \binom{\nu}{s} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c (\nu-2 s))^{-h-k+2 n} \left(2 b \sqrt{z} - c (\nu-2 s)\right)^{h+k} \left(-\frac{\left(2 b \sqrt{z} - c (\nu-2 s)\right)^2}{b} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(2 b \sqrt{-\frac{\left(2 b \sqrt{z} - c (\nu-2 s)\right)^2}{b}} \; \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 b \sqrt{z} - c (\nu-2 s)\right)^2}{4 b}\right) - \right.$$

$$\left. c (\nu-2 s) \left(2 b \sqrt{z} - c (\nu-2 s)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 b \sqrt{z} - c (\nu-2 s)\right)^2}{4 b}\right) \right) +$$

$$\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c (\nu-2 s))^{-h-k+2 n} \left(2 \sqrt{z}\, b + c (\nu-2 s)\right)^{h+k} \left(-\frac{\left(2 \sqrt{z}\, b + c (\nu-2 s)\right)^2}{b} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(c (\nu-2 s) \left(2 \sqrt{z}\, b + c (\nu-2 s)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 \sqrt{z}\, b + c (\nu-2 s)\right)^2}{4 b}\right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(2 \sqrt{z}\, b + c (\nu-2 s)\right)^2}{b}} \; b \, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 \sqrt{z}\, b + c (\nu-2 s)\right)^2}{4 b}\right) \right) \right) -$$

$$2^{-\nu} (-b)^{-n-1} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1, -b z) (1 - \nu \bmod 2) \; /; \; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n e^{d z+e} \cosh^{\nu}\left(c z^r\right)$

01.20.21.2931.01

$$\int z^n \, e^{e+d\,z} \cosh^{\nu}\left(c\,z^2\right) dz == -e^e \, 2^{-\nu} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1,\,-d\,z)\,(1-\nu \bmod 2)\,(-d)^{-n-1} -$$

$$2^{-\nu-1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{1}{\sqrt{-c\,(\nu-2\,k)}} \left(e^{\frac{d^2}{4\,c\,(\nu-2\,k)}+e} \sum_{q=0}^{n} 2^{q-n}\,(-d)^{n-q}\,(-c\,(\nu-2\,k))^{-n-\frac{1}{2}}\,(d-2\,c\,(\nu-2\,k)\,z)^{q+1} \right.\right.$$

$$\left.\left(\frac{(d-2\,c\,(\nu-2\,k)\,z)^2}{c\,(\nu-2\,k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, \frac{(d-2\,c\,(\nu-2\,k)\,z)^2}{4\,c\,(\nu-2\,k)} \right) \right) +$$

$$\frac{1}{\sqrt{c\,(\nu-2\,k)}} \left(e^{-\frac{d^2}{4\,c\,(\nu-2\,k)}+e} \sum_{q=0}^{n} 2^{q-n}\,(-d)^{n-q}\,(c\,(\nu-2\,k))^{-n-\frac{1}{2}}\,(d+2\,c\,(\nu-2\,k)\,z)^{q+1} \right.$$

$$\left.\left. \left(-\frac{(d+2\,c\,(\nu-2\,k)\,z)^2}{c\,(\nu-2\,k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, -\frac{(d+2\,c\,(\nu-2\,k)\,z)^2}{4\,c\,(\nu-2\,k)} \right) \right) \right) /;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2932.01

$$\int z^n e^{e+d z} \cosh^{\nu}\left(\sqrt{z}\, c\right) dz == 2^{-2n-\nu-1} d^{-2n-2}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{c^2 (2s-\nu)^2}{4d}+e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c(2s-\nu))^{-h-k+2n} \left(2d\sqrt{z} - c(2s-\nu)\right)^{h+k} \left(-\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h}\binom{n}{k} \left(2d \sqrt{-\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{4d}\right) - \right.$$

$$\left. \left. c(2s-\nu)\left(2d\sqrt{z} - c(2s-\nu)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{4d}\right) \right) + \right.$$

$$e^{-\frac{c^2 (\nu-2s)^2}{4d}+e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c(\nu-2s))^{-h-k+2n} \left(2d\sqrt{z} - c(\nu-2s)\right)^{h+k} \left(-\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left(2d \sqrt{-\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{4d}\right) - \right.$$

$$\left. \left. \left. c(\nu-2s)\left(2d\sqrt{z} - c(\nu-2s)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{4d}\right) \right) \right) \right) -$$

$$2^{-\nu} (-d)^{-n-1} e^e \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1, -dz) (1 - \nu \bmod 2) \,/;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1} e^{b z^r} \cosh^{\nu}(c z^r)$

01.20.21.2933.01

$$\int z^{\alpha-1} e^{b z^r} \cosh^{\nu}(c z^r)\, dz == \frac{1}{r} 2^{-\nu} z^{\alpha} \left((-b z^r)^{-\frac{\alpha}{r}} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{\alpha}{r}, -b z^r\right) (\nu \bmod 2 - 1) - \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \right.$$

$$\left. \left(\Gamma\left(\frac{\alpha}{r}, -(b + 2cs - c\nu) z^r\right) (-(b + 2cs - c\nu) z^r)^{-\frac{\alpha}{r}} + (-(b + c(\nu-2s)) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, -(b + c(\nu-2s)) z^r\right) \right) \right) /;\, \nu \in \mathbb{N}^+$$

01.20.21.2934.01

$$\int z^n e^{b z^2} \cosh^{\nu}\left(c z^2\right) dz == -2^{-\nu-1} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1 - \nu \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-\nu-1} z^{n+1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\Gamma\left(\frac{n+1}{2}, -(b + 2 c s - c \nu) z^2\right) \left(-(b + 2 c s - c \nu) z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. \left(-(b + c (\nu - 2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -(b + c (\nu - 2 s)) z^2\right)\right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2935.01

$$\int z^n e^{\sqrt{z}\, b} \cosh^{\nu}\left(\sqrt{z}\, c\right) dz == -2^{1-\nu} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2 (n+1), -b \sqrt{z}\right) (1 - \nu \bmod 2)\, b^{-2(n+1)} -$$

$$2^{1-\nu} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\Gamma\left(2 (n+1), (c (\nu - 2 k) - b) \sqrt{z}\right) \left((c (\nu - 2 k) - b) \sqrt{z}\right)^{-2(n+1)} + \right.$$

$$\left. \left((-b - c (\nu - 2 k)) \sqrt{z}\right)^{-2(n+1)} \Gamma\left(2 (n+1), (-b - c (\nu - 2 k)) \sqrt{z}\right)\right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1} e^{b z^r + e} \cosh^{\nu}\left(c z^r\right)$

01.20.21.2936.01

$$\int z^{\alpha-1} e^{b z^r + e} \cosh^{\nu}\left(c z^r\right) dz == -\frac{2^{-\nu} e^e z^{\alpha} (-b z^r)^{-\frac{\alpha}{r}} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{\alpha}{r}, -b z^r\right) (1 - \nu \bmod 2)}{r} - \frac{2^{-\nu} z^{\alpha} e^e}{r}$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\Gamma\left(\frac{\alpha}{r}, (c (\nu - 2 k) - b) z^r\right) \left((c (\nu - 2 k) - b) z^r\right)^{-\frac{\alpha}{r}} + \left((-b - c (\nu - 2 k)) z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b - c (\nu - 2 k)) z^r\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.2937.01

$$\int z^n e^{b z^2 + e} \cosh^{\nu}\left(c z^2\right) dz == -2^{-\nu-1} e^e z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1 - \nu \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-\nu-1} z^{n+1} e^e \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\Gamma\left(\frac{n+1}{2}, (c (\nu - 2 k) - b) z^2\right) \left((c (\nu - 2 k) - b) z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. \left((-b - c (\nu - 2 k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b - c (\nu - 2 k)) z^2\right)\right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2938.01

$$\int z^n e^{\sqrt{z}\, b + e} \cosh^{\nu}\left(c \sqrt{z}\right) dz == -2^{1-\nu} e^e \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2 (n+1), -b \sqrt{z}\right) (1 - \nu \bmod 2)\, b^{-2(n+1)} -$$

$$2^{1-\nu} z^{n+1} e^e \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\Gamma\left(2 (n+1), (c (\nu - 2 k) - b) \sqrt{z}\right) \left((c (\nu - 2 k) - b) \sqrt{z}\right)^{-2(n+1)} + \right.$$

$$\left. \left((-b - c (\nu - 2 k)) \sqrt{z}\right)^{-2(n+1)} \Gamma\left(2 (n+1), (-b - c (\nu - 2 k)) \sqrt{z}\right)\right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n e^{b z^r + d z} \cosh^\nu(c z^r)$

01.20.21.2939.01

$$\int z^n e^{b z^2 + d z} \cosh^\nu(c z^2)\, dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2 b z)^{q+1} \left(-\frac{(d + 2 b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d + 2 b z)^2}{4 b} \right) - \right.$$

$$b^{n+1} e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{d^2}{4(b-2cs+c\nu)}} \left(\sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2 b z - 4 c s z + 2 c \nu z)^{q+1} \left(-\frac{(d + 2 b z - 4 c s z + 2 c \nu z)^2}{b - 2 c s + c \nu} \right)^{\frac{1}{2}(-q-1)} \right. \right.$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d + 2 b z - 4 c s z + 2 c \nu z)^2}{4 (b - 2 c s + c \nu)} \right) \right) (b - 2 c s + c \nu)^{-n-1} +$$

$$e^{-\frac{d^2}{4(b+2cs-c\nu)}} (b + 2 c s - c \nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2 (b + 2 c s - c \nu) z)^{q+1}$$

$$\left. \left. \left(-\frac{(d + 2 (b + 2 c s - c \nu) z)^2}{b + 2 c s - c \nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d + 2 (b + 2 c s - c \nu) z)^2}{4 (b + 2 c s - c \nu)} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2940.01

$$\int z^n e^{\sqrt{z}\, b + d z} \cosh^\nu\left(c \sqrt{z}\right) dz == 2^{-2n-\nu-1} e^{-\frac{b^2}{4d}} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b + 2 d \sqrt{z}\right)^{h+k} \left(-\frac{\left(b + 2 d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b + 2 d \sqrt{z}\right) \right. \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b + 2 d \sqrt{z}\right)^2}{4 d} \right) + 2 \sqrt{-\frac{\left(b + 2 d \sqrt{z}\right)^2}{d}}\, d\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b + 2 d \sqrt{z}\right)^2}{4 d} \right) \right) \right) d^{-2n-2} +$$

$$2^{-2n-\nu-1} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(b - c(2s-\nu))^2}{4d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b - c(2s-\nu))^{-h-k+2n} \left(b - c(2s-\nu) + 2 d \sqrt{z}\right)^{h+k} \right. \right.$$

$$\left. \left. \left(-\frac{\left(b - c(2s-\nu) + 2 d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \right. \right.$$

$$\left((b-c\,(2\,s-v))\left(b-c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b-c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(b-c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\;\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b-c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{(b-c\,(v-2\,s))^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c\,(v-2\,s))^{-h-k+2\,n}\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b-c\,(v-2\,s))\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Bigg)\,d^{-2\,n-2}\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh^v\left(c\,z^r\right)$

01.20.21.2941.01

$$\int z^n e^{b z^2+d z+e} \cosh^{\nu}\left(c z^2\right) dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(e^{e} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz)^{q+1} \left(-\frac{(d+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b} \right) - \right.$$

$$b^{n+1} e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{d^2}{4(b-2cs+c\nu)}+e} \left(\sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz-4csz+2c\nu z)^{q+1} \right.\right.$$

$$\left. \left(-\frac{(d+2bz-4csz+2c\nu z)^2}{b-2cs+c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz-4csz+2c\nu z)^2}{4(b-2cs+c\nu)} \right) \right)$$

$$(b-2cs+c\nu)^{-n-1} + e^{-\frac{d^2}{4(b+2cs-c\nu)}+e} (b+2cs-c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2(b+2cs-c\nu)z)^{q+1}$$

$$\left. \left. \left(-\frac{(d+2(b+2cs-c\nu)z)^2}{b+2cs-c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2(b+2cs-c\nu)z)^2}{4(b+2cs-c\nu)} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2942.01

$$\int z^n e^{\sqrt{z}\, b+e+d z} \cosh^{\nu}\left(c\sqrt{z}\right) dz == 2^{-2n-\nu-1} e^{e-\frac{b^2}{4d}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b+2d\sqrt{z}\right) \right.\right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d} \right) + 2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\, d\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d} \right) \right) \right) d^{-2n-2} +$$

$$2^{-2n-\nu-1} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{e-\frac{(b-c(2s-\nu))^2}{4d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c(2s-\nu))^{-h-k+2n} \left(b-c(2s-\nu)+2d\sqrt{z}\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(b-c(2s-\nu)+2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left. \left. (b-c(2s-\nu)) \left(b-c(2s-\nu)+2d\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b-c(2s-\nu)+2d\sqrt{z}\right)^2}{4d} \right) + 2 \right. \right.$$

$$\sqrt{-\frac{\left(b-c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b-c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{e-\frac{(b-c\,(v-2\,s))^2}{4\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-c\,(v-2\,s))^{-h-k+2\,n}\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((b-c\,(v-2\,s))\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}$$

$$d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b-c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)\,d^{-2\,n-2}\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{d\,z}\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.2943.01

$$\int z^n\,e^{d\,z}\cosh^{\nu}\left(c\,z^2+g\right)dz==-2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\Gamma(n+1,\,-d\,z)\,(1-\nu\bmod 2)\,(-d)^{-n-1}-$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\Bigg(\frac{1}{\sqrt{-c\,(\nu-2\,k)}}\Bigg(e^{\frac{d^2}{4\,c\,(\nu-2\,k)}-g\,(\nu-2\,k)}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(-c\,(\nu-2\,k))^{-n-\frac{1}{2}}$$

$$(d-2\,c\,(\nu-2\,k)\,z)^{q+1}\left(\frac{(d-2\,c\,(\nu-2\,k)\,z)^2}{c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d-2\,c\,(\nu-2\,k)\,z)^2}{4\,c\,(\nu-2\,k)}\right)\Bigg)+$$

$$\frac{1}{\sqrt{c\,(\nu-2\,k)}}\Bigg(e^{-\frac{d^2}{4\,c\,(\nu-2\,k)}+g\,(\nu-2\,k)}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(c\,(\nu-2\,k))^{-n-\frac{1}{2}}\,(d+2\,c\,(\nu-2\,k)\,z)^{q+1}$$

$$\left(-\frac{(d+2\,c\,(\nu-2\,k)\,z)^2}{c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+2\,c\,(\nu-2\,k)\,z)^2}{4\,c\,(\nu-2\,k)}\right)\Bigg)\Bigg)\;/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.2944.01

$$\int z^n e^{d z} \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz == 2^{-2 n-\nu-1} d^{-2 n-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s}$$

$$\left(e^{-\frac{c^2 (2 s-\nu)^2}{4 d}-g (2 s-\nu)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c (2 s-\nu))^{-h-k+2 n} \left(2 d \sqrt{z}-c (2 s-\nu)\right)^{h+k} \left(-\frac{\left(2 d \sqrt{z}-c (2 s-\nu)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(2 d \sqrt{-\frac{\left(2 d \sqrt{z}-c (2 s-\nu)\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 d \sqrt{z}-c (2 s-\nu)\right)^2}{4 d}\right) - \right.$$

$$\left. \left. c (2 s-\nu) \left(2 d \sqrt{z}-c (2 s-\nu)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 d \sqrt{z}-c (2 s-\nu)\right)^2}{4 d}\right) \right) + e^{-\frac{c^2 (\nu-2 s)^2}{4 d}-g (\nu-2 s)} \right.$$

$$\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c (\nu-2 s))^{-h-k+2 n} \left(2 d \sqrt{z}-c (\nu-2 s)\right)^{h+k} \left(-\frac{\left(2 d \sqrt{z}-c (\nu-2 s)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(2 d \sqrt{-\frac{\left(2 d \sqrt{z}-c (\nu-2 s)\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2 d \sqrt{z}-c (\nu-2 s)\right)^2}{4 d}\right) - \right.$$

$$\left. \left. \left. c (\nu-2 s) \left(2 d \sqrt{z}-c (\nu-2 s)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2 d \sqrt{z}-c (\nu-2 s)\right)^2}{4 d}\right) \right) \right) \right) -$$

$$2^{-\nu} (-d)^{-n-1} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1, -d z) (1-\nu \bmod 2) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n\, e^{d z+e} \cosh^{\nu}\left(c z^r+g\right)$

01.20.21.2945.01

$$\int z^n e^{e+d z} \cosh^{\nu}\left(c z^2+g\right) dz == -e^{e} 2^{-\nu} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1,\ -d z)\,(1-\nu \bmod 2)\,(-d)^{-n-1} -$$

$$2^{-\nu-1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{1}{\sqrt{-c\,(\nu-2k)}} \left(e^{\frac{d^2}{4c(\nu-2k)}+e-g(\nu-2k)} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (-c\,(\nu-2k))^{-n-\frac{1}{2}} \right.\right.$$

$$(d-2c(\nu-2k)z)^{q+1} \left(\frac{(d-2c(\nu-2k)z)^2}{c(\nu-2k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\ \frac{(d-2c(\nu-2k)z)^2}{4c(\nu-2k)} \right) \Bigg) +$$

$$\frac{1}{\sqrt{c\,(\nu-2k)}} \left(e^{-\frac{d^2}{4c(\nu-2k)}+e+g(\nu-2k)} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (c\,(\nu-2k))^{-n-\frac{1}{2}} (d+2c(\nu-2k)z)^{q+1} \right.$$

$$\left.\left. \left(-\frac{(d+2c(\nu-2k)z)^2}{c(\nu-2k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\ -\frac{(d+2c(\nu-2k)z)^2}{4c(\nu-2k)} \right) \right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^{+}$$

01.20.21.2946.01

$$\int z^n e^{e+d z} \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz ==$$

$$2^{-2n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{c^2 (2s-\nu)^2}{4d} - g(2s-\nu)+e} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c(2s-\nu))^{-h-k+2n} \left(2d\sqrt{z} - c(2s-\nu)\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(2d \sqrt{-\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{d}} \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{4d} \right) - c(2s-\nu)\left(2d\sqrt{z} - c(2s-\nu)\right)$$

$$\left.\left.\left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2d\sqrt{z} - c(2s-\nu)\right)^2}{4d} \right) \right) \right) d^{-2n-2} + e^{-\frac{c^2 (\nu-2s)^2}{4d} - g(\nu-2s)+e} \right.$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c(\nu-2s))^{-h-k+2n} \left(2d\sqrt{z} - c(\nu-2s)\right)^{h+k} \left(-\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(2d \sqrt{-\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{4d} \right) - c \right.$$

$$\left.\left.\left. (\nu-2s)\left(2d\sqrt{z} - c(\nu-2s)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2d\sqrt{z} - c(\nu-2s)\right)^2}{4d} \right) \right) \right) d^{-2n-2} \right) -$$

$$2^{-\nu} (-d)^{-n-1} e^{e} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1, -dz) (1 - \nu \bmod 2) \,/;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1} e^{b z^r} \cosh^{\nu}\left(c z^r + g\right)$

01.20.21.2947.01

$$\int z^{\alpha-1}\, e^{b\, z^r} \cosh^{\nu}(c\, z^r + g)\, dz == -\frac{2^{-\nu}\, z^{\alpha}\, (-b\, z^r)^{-\frac{\alpha}{r}} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{\alpha}{r}, -b\, z^r\right) (1 - \nu \bmod 2)}{r} -$$

$$\frac{2^{-\nu}\, z^{\alpha}}{r} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-g\,(\nu-2\,k)}\, \Gamma\left(\frac{\alpha}{r}, (c\,(\nu-2\,k)-b)\, z^r\right) ((c\,(\nu-2\,k)-b)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$\left. e^{g\,(\nu-2\,k)}\, ((-b-c\,(\nu-2\,k))\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-c\,(\nu-2\,k))\, z^r\right) \right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.2948.01

$$\int z^n\, e^{b\, z^2} \cosh^{\nu}\left(c\, z^2 + g\right) dz == -2^{-\nu-1}\, z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b\, z^2\right) (1 - \nu \bmod 2)\, \left(-b\, z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-\nu-1}\, z^{n+1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-g\,(\nu-2\,k)}\, \Gamma\left(\frac{n+1}{2}, (c\,(\nu-2\,k)-b)\, z^2\right) \left((c\,(\nu-2\,k)-b)\, z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. e^{g\,(\nu-2\,k)}\, \left((-b-c\,(\nu-2\,k))\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-b-c\,(\nu-2\,k))\, z^2\right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2949.01

$$\int z^n\, e^{\sqrt{z}\, b} \cosh^{\nu}\left(\sqrt{z}\ c + g\right) dz == -2^{1-\nu} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2\,(n+1), -b\,\sqrt{z}\right) (1 - \nu \bmod 2)\, (-b)^{-2\,(n+1)} -$$

$$2^{1-\nu}\, z^{n+1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-g\,(\nu-2\,k)}\, \Gamma\left(2\,(n+1), (c\,(\nu-2\,k)-b)\,\sqrt{z}\right) \left((c\,(\nu-2\,k)-b)\,\sqrt{z}\right)^{-2\,(n+1)} + \right.$$

$$\left. e^{g\,(\nu-2\,k)}\, \left((-b-c\,(\nu-2\,k))\,\sqrt{z}\right)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (-b-c\,(\nu-2\,k))\,\sqrt{z}\right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1}\, e^{b\, z^r + e} \cosh^{\nu}\left(c\, z^r + g\right)$

01.20.21.2950.01

$$\int z^{\alpha-1}\, e^{b\, z^r + e} \cosh^{\nu}(c\, z^r + g)\, dz == -\frac{2^{-\nu}\, e^{e}\, z^{\alpha}\, (-b\, z^r)^{-\frac{\alpha}{r}} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{\alpha}{r}, -b\, z^r\right) (1 - \nu \bmod 2)}{r} -$$

$$\frac{2^{-\nu}\, z^{\alpha}}{r} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{e-g\,(\nu-2\,k)}\, \Gamma\left(\frac{\alpha}{r}, (c\,(\nu-2\,k)-b)\, z^r\right) ((c\,(\nu-2\,k)-b)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$\left. e^{e+g\,(\nu-2\,k)}\, ((-b-c\,(\nu-2\,k))\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-c\,(\nu-2\,k))\, z^r\right) \right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.2951.01

$$\int z^n e^{b z^2+e} \cosh^{\nu}\left(c z^2+g\right) dz == -2^{-\nu-1} e^{e} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1-\nu \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-\nu-1} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{e-g(\nu-2k)} \Gamma\left(\frac{n+1}{2}, (c(\nu-2k)-b) z^2\right) \left((c(\nu-2k)-b) z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. e^{e+g(\nu-2k)} \left((-b-c(\nu-2k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-c(\nu-2k)) z^2\right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2952.01

$$\int z^n e^{\sqrt{z}\, b+e} \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz == -2^{1-\nu} e^{e} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2(n+1), -b\sqrt{z}\right) (1-\nu \bmod 2) (-b)^{-2(n+1)} -$$

$$2^{1-\nu} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{e-g(\nu-2k)} \Gamma\left(2(n+1), (c(\nu-2k)-b)\sqrt{z}\right) \left((c(\nu-2k)-b)\sqrt{z}\right)^{-2(n+1)} + \right.$$

$$\left. e^{e+g(\nu-2k)} \left((-b-c(\nu-2k))\sqrt{z}\right)^{-2(n+1)} \Gamma\left(2(n+1), (-b-c(\nu-2k))\sqrt{z}\right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n e^{b z^r+d z} \cosh^{\nu}\left(c z^r+g\right)$

01.20.21.2953.01

$$\int z^n e^{b z^2+d z} \cosh^{\nu}\left(c z^2+g\right) dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz)^{q+1} \left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b}\right) - \right.$$

$$b^{n+1} e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{d^2}{4(b-2cs+c\nu)}-g(2s-\nu)} \left(\sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz-4csz+2c\nu z)^{q+1} \right. \right.$$

$$\left. \left(-\frac{(d+2bz-4csz+2c\nu z)^2}{b-2cs+c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz-4csz+2c\nu z)^2}{4(b-2cs+c\nu)}\right) \right)$$

$$(b-2cs+c\nu)^{-n-1} + e^{-\frac{d^2}{4(b+2cs-c\nu)}-g(\nu-2s)} (b+2cs-c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2(b+2cs-c\nu)z)^{q+1}$$

$$\left. \left. \left(-\frac{(d+2(b+2cs-c\nu)z)^2}{b+2cs-c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2(b+2cs-c\nu)z)^2}{4(b+2cs-c\nu)}\right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2954.01

$$\int z^n e^{\sqrt{z}\,b+d\,z}\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-2n-\nu-1}e^{-\frac{b^2}{4d}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)d^{-2n-2}+2^{-2n-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(b-c(2s-\nu))^2}{4d}-g(2s-\nu)}\right.$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b-c(2s-\nu))^{-h-k+2n}\left(b-c(2s-\nu)+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c(2s-\nu)+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c(2s-\nu))\left(b-c(2s-\nu)+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c(2s-\nu)+2d\sqrt{z}\right)^2}{4d}\right)+2\right.$$

$$\left.\left.\sqrt{-\frac{\left(b-c(2s-\nu)+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c(2s-\nu)+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)d^{-2n-2}+$$

$$e^{-\frac{(b-c(\nu-2s))^2}{4d}-g(\nu-2s)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b-c(\nu-2s))^{-h-k+2n}\left(b-c(\nu-2s)+2d\sqrt{z}\right)^{h+k}\right.$$

$$\left(-\frac{\left(b-c(\nu-2s)+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b-c(\nu-2s))\left(b-c(\nu-2s)+2d\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c(\nu-2s)+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b-c(\nu-2s)+2d\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\left.d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c(\nu-2s)+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)d^{-2n-2}\right)\Big/;\ n\in\mathbb{N}\wedge\nu\in\mathbb{N}^+$$

Involving $z^n\, e^{b\, z^r+d\, z+e} \cosh^{\nu}\left(c\, z^r+g\right)$

01.20.21.2955.01

$$\int z^n\, e^{b\, z^2+d\, z+e} \cosh^{\nu}\left(c\, z^2+g\right) dz ==$$

$$2^{-\nu-1}\, b^{-n-1}\, e^{-\frac{d^2}{4\, b}} \left(e^{e} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n}\, (-d)^{n-q}\, (d+2\, b\, z)^{q+1} \left(-\frac{(d+2\, b\, z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2\, b\, z)^2}{4\, b}\right) -\right.$$

$$b^{n+1}\, e^{\frac{d^2}{4\, b}} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} \left(e^{-\frac{d^2}{4\,(b-2\, c\, s+c\, \nu)}+e-g\,(2\, s-\nu)} \left(\sum_{q=0}^{n} 2^{q-n}\, (-d)^{n-q}\, (d+2\, b\, z-4\, c\, s\, z+2\, c\, \nu\, z)^{q+1} \right.\right.$$

$$\left.\left(-\frac{(d+2\, b\, z-4\, c\, s\, z+2\, c\, \nu\, z)^2}{b-2\, c\, s+c\, \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2\, b\, z-4\, c\, s\, z+2\, c\, \nu\, z)^2}{4\,(b-2\, c\, s+c\, \nu)}\right)\right)$$

$$(b-2\, c\, s+c\, \nu)^{-n-1} + e^{-\frac{d^2}{4\,(b+2\, c\, s-c\, \nu)}+e-g\,(\nu-2\, s)}\, (b+2\, c\, s-c\, \nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n}\, (-d)^{n-q}\, (d+2\,(b+2\, c\, s-c\, \nu)\, z)^{q+1}$$

$$\left.\left.\left.\left(-\frac{(d+2\,(b+2\, c\, s-c\, \nu)\, z)^2}{b+2\, c\, s-c\, \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2\,(b+2\, c\, s-c\, \nu)\, z)^2}{4\,(b+2\, c\, s-c\, \nu)}\right)\right)\right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2956.01

$$\int z^n\, e^{\sqrt{z}\ b+e+d\, z} \cosh^{\nu}\left(\sqrt{z}\ c+g\right) dz ==$$

$$2^{-2\, n-\nu-1}\, e^{e-\frac{b^2}{4\, d}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\, n} \left(b+2\, d\, \sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2\, d\, \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b \left(b+2\, d\, \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2\, d\, \sqrt{z}\right)^2}{4\, d}\right) + 2 \sqrt{-\frac{\left(b+2\, d\, \sqrt{z}\right)^2}{d}}\ d \right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2\, d\, \sqrt{z}\right)^2}{4\, d}\right)\right)\right) d^{-2\, n-2} + 2^{-2\, n-\nu-1} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(b-c\,(2\, s-\nu))^2}{4\, d}+e-g\,(2\, s-\nu)} \right.$$

$$\left. \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b-c\,(2\, s-\nu))^{-h-k+2\, n} \left(b-c\,(2\, s-\nu)+2\, d\, \sqrt{z}\right)^{h+k} \left(-\frac{\left(b-c\,(2\, s-\nu)+2\, d\, \sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left((b-c(2s-v))\left(b-c(2s-v)+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c(2s-v)+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b-c(2s-v)+2d\sqrt{z}\right)^2}{d}}\,d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c(2s-v)+2d\sqrt{z}\right)^2}{4d}\right)\right)d^{-2n-2}+$$

$$e^{-\frac{(b-c(v-2s))^2}{4d}+e-g(v-2s)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b-c(v-2s))^{-h-k+2n}\left(b-c(v-2s)+2d\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b-c(v-2s))\left(b-c(v-2s)+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{d}}\,d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-c(v-2s)+2d\sqrt{z}\right)^2}{4d}\right)\right)d^{-2n-2}\right)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{d\,z}\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2957.01

$$\int z^n e^{d z} \cosh^{\nu}\left(c z^2 + f z\right) dz == -2^{-\nu} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1, -d z) (1 - \nu \bmod 2) (-d)^{-n-1} - 2^{-\nu-1}$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{1}{\sqrt{-c (\nu - 2 k)}} \left(e^{\frac{(d - f (\nu-2 k))^2}{4 c (\nu-2 k)}} \sum_{q=0}^{n} 2^{q-n} (-c (\nu - 2 k))^{-n-\frac{1}{2}} (f (\nu - 2 k) - d)^{n-q} (d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^{q+1} \right.\right.$$

$$\left(\frac{(d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^2}{c (\nu - 2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^2}{4 c (\nu - 2 k)} \right) +$$

$$\frac{1}{\sqrt{c (\nu - 2 k)}} \left(e^{-\frac{(d + f (\nu-2 k))^2}{4 c (\nu-2 k)}} \sum_{q=0}^{n} 2^{q-n} (c (\nu - 2 k))^{-n-\frac{1}{2}} (-d - f (\nu - 2 k))^{n-q} (d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^{q+1} \right.$$

$$\left(-\frac{(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^2}{c (\nu - 2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left.\left. \Gamma\left(\frac{q+1}{2}, -\frac{(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^2}{4 c (\nu - 2 k)} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2958.01

$$\int z^n e^{d z} \cosh^{\nu}\left(\sqrt{z}\, c + f z\right) dz ==$$

$$2^{-2 n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{c^2 (2 s-\nu)^2}{4 (d - f (2 s-\nu))}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c (2 s - \nu))^{-h-k+2 n} \left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{d - f (2 s - \nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(2 (d - f (2 s - \nu)) \sqrt{-\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{d - f (2 s - \nu)}} \right.$$

$$\Gamma\left(\frac{1}{2} (h + k + 2), -\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{4 (d - f (2 s - \nu))} \right) - c (2 s - \nu)$$

$$\left.\left.\left. \left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right) \Gamma\left(\frac{1}{2} (h + k + 1), -\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{4 (d - f (2 s - \nu))} \right) \right) \right)$$

$$(d - f\,(2\,s - v))^{-2\,n-2} + e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d-f\,(v-2\,s))}}\,(d - f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left(2\,(d - f\,(v-2\,s))\,\sqrt{z} - c\,(v-2\,s)\right)^{h+k}\left(-\frac{\left(2\,(d - f\,(v-2\,s))\,\sqrt{z} - c\,(v-2\,s)\right)^2}{d - f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(d - f\,(v-2\,s))\sqrt{-\frac{\left(2\,(d - f\,(v-2\,s))\,\sqrt{z} - c\,(v-2\,s)\right)^2}{d - f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.-\frac{\left(2\,(d - f\,(v-2\,s))\,\sqrt{z} - c\,(v-2\,s)\right)^2}{4\,(d - f\,(v-2\,s))}\right) - c\,(v-2\,s)\left(2\,(d - f\,(v-2\,s))\,\sqrt{z} - c\,(v-2\,s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,(d - f\,(v-2\,s))\,\sqrt{z} - c\,(v-2\,s)\right)^2}{4\,(d - f\,(v-2\,s))}\right)\right)\Bigg) -$$

$$2^{-v}\,(-d)^{-n-1}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-d\,z)\,(1 - v \bmod 2)\;/;\;n \in \mathbb{N} \bigwedge$$

$$v \in \mathbb{N}^+$$

Involving $z^n\,e^{d\,z+e}\,\cosh^v\left(c\,z^r + f\,z\right)$

01.20.21.2959.01

$$\int z^n\, e^{e+d\,z} \cosh^{\nu}\left(c\,z^2+f\,z\right) dz == -2^{-\nu}\, e^{e} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1,\,-d\,z)\,(1-\nu \bmod 2)\,(-d)^{-n-1} - 2^{-\nu-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k} \left(\frac{1}{\sqrt{-c\,(\nu-2\,k)}} \left(e^{\frac{(d-f\,(\nu-2\,k))^2}{4\,c\,(\nu-2\,k)}+e} \sum_{q=0}^{n} 2^{q-n}\,(-c\,(\nu-2\,k))^{-n-\frac{1}{2}}\,(f\,(\nu-2\,k)-d)^{n-q}\,(d-f\,(\nu-2\,k)-2\,c\,(\nu-2\,k)\,z)^{q+1} \right.\right.$$

$$\left(\frac{(d-f\,(\nu-2\,k)-2\,c\,(\nu-2\,k)\,z)^2}{c\,(\nu-2\,k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, \frac{(d-f\,(\nu-2\,k)-2\,c\,(\nu-2\,k)\,z)^2}{4\,c\,(\nu-2\,k)} \right) +$$

$$\frac{1}{\sqrt{c\,(\nu-2\,k)}} \left(e^{-\frac{(d+f\,(\nu-2\,k))^2}{4\,c\,(\nu-2\,k)}+e} \sum_{q=0}^{n} 2^{q-n}\,(c\,(\nu-2\,k))^{-n-\frac{1}{2}}\,(-d-f\,(\nu-2\,k))^{n-q} \right.$$

$$(d+f\,(\nu-2\,k)+2\,c\,(\nu-2\,k)\,z)^{q+1} \left(-\frac{(d+f\,(\nu-2\,k)+2\,c\,(\nu-2\,k)\,z)^2}{c\,(\nu-2\,k)} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2},\, -\frac{(d+f\,(\nu-2\,k)+2\,c\,(\nu-2\,k)\,z)^2}{4\,c\,(\nu-2\,k)} \right) \right) \right) \right) /;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2960.01

$$\int z^n\, e^{e+d\,z} \cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right) dz ==$$

$$2^{-2\,n-\nu-1} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} \left(e^{-\frac{c^2\,(2\,s-\nu)^2}{4\,(d-f\,(2\,s-\nu))}+e} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\,4^k\,(-c\,(2\,s-\nu))^{-h-k+2\,n} \left(2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\;-c\,(2\,s-\nu)\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\;-c\,(2\,s-\nu)\right)^2}{d-f\,(2\,s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(2\,(d-f\,(2\,s-\nu)) \sqrt{-\frac{\left(2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\;-c\,(2\,s-\nu)\right)^2}{d-f\,(2\,s-\nu)}} \right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\, -\frac{\left(2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\;-c\,(2\,s-\nu)\right)^2}{4\,(d-f\,(2\,s-\nu))} \right) - c\,(2\,s-\nu)$$

$$\left.\left.\left.\left(2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\;-c\,(2\,s-\nu)\right) \Gamma\left(\frac{1}{2}\,(h+k+1),\, -\frac{\left(2\,(d-f\,(2\,s-\nu))\,\sqrt{z}\;-c\,(2\,s-\nu)\right)^2}{4\,(d-f\,(2\,s-\nu))} \right) \right) \right)$$

$$(d - f\,(2\,s - v))^{-2\,n-2} + e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d-f\,(v-2\,s))}+e}\,(d - f\,(v - 2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c\,(v - 2\,s))^{-h-k+2\,n}$$

$$\left(2\,(d - f\,(v - 2\,s))\,\sqrt{z} - c\,(v - 2\,s)\right)^{h+k}\left(-\frac{\left(2\,(d - f\,(v - 2\,s))\,\sqrt{z} - c\,(v - 2\,s)\right)^2}{d - f\,(v - 2\,s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(d - f\,(v - 2\,s))\sqrt{-\frac{\left(2\,(d - f\,(v - 2\,s))\,\sqrt{z} - c\,(v - 2\,s)\right)^2}{d - f\,(v - 2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h + k + 2),\right.\right.$$

$$\left.-\frac{\left(2\,(d - f\,(v - 2\,s))\,\sqrt{z} - c\,(v - 2\,s)\right)^2}{4\,(d - f\,(v - 2\,s))}\right) - c\,(v - 2\,s)\left(2\,(d - f\,(v - 2\,s))\,\sqrt{z} - c\,(v - 2\,s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\,(h + k + 1),\,-\frac{\left(2\,(d - f\,(v - 2\,s))\,\sqrt{z} - c\,(v - 2\,s)\right)^2}{4\,(d - f\,(v - 2\,s))}\right)\right)\Bigg) -$$

$$2^{-v}\,(-d)^{-n-1}\,e^e\binom{v}{\frac{v}{2}}\Gamma(n + 1,\,-d\,z)\,(1 - v \bmod 2)\;/;\;n \in$$

$$\mathbb{N}\bigwedge$$

$$v \in$$

$$\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r}\,\cosh^v\left(c\,z^r + f\,z\right)$

01.20.21.2961.01

$$\int z^n e^{b z^2} \cosh^{\nu}\left(c z^2 + f z\right) dz == -2^{-\nu-1} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1 - \nu \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(f\nu - 2fs)^2}{4(b-2cs+c\nu)}} \left(\sum_{q=0}^{n} 2^{q-n} (2fs - f\nu)^{n-q} (f(\nu-2s) + 2(b-2cs+c\nu)z)^{q+1} \right.\right.$$

$$\left. \left(-\frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{b-2cs+c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{4(b-2cs+c\nu)}\right) \right)$$

$$(b-2cs+c\nu)^{-n-1} + e^{-\frac{(2fs-f\nu)^2}{4(b+2cs-c\nu)}} (b+2cs-c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (f\nu - 2fs)^{n-q}$$

$$(2fs + 4czs - f\nu + 2bz - 2c\nu z)^{q+1} \left(-\frac{(2fs + 4czs - f\nu + 2bz - 2c\nu z)^2}{b+2cs-c\nu} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2fs + 4czs - f\nu + 2bz - 2c\nu z)^2}{4(b+2cs-c\nu)}\right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2962.01

$$\int z^n e^{\sqrt{z}\, b} \cosh^v\left(\sqrt{z}\, c + f z\right) dz = 2^{-2n-v-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{(b-c(2s-v))^2}{4 f (2s-v)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b - c(2s-v))^{-h-k+2n} \left(b - c(2s-v) - 2 f (2s-v) \sqrt{z}\right)^{h+k} \left(\left(b - c(2s-v) - 2 f (2s-v) \sqrt{z}\right)^2 \Big/ (f(2s-v)) \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b - c(2s-v)) \left(b - c(2s-v) - 2 f (2s-v) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \left(b - c(2s-v) - 2 f (2s-v) \sqrt{z}\right)^2 \Big/ (4 f (2s-v))\right) - 2 f (2s-v) \sqrt{\left(\left(b - c(2s-v) - 2 f (2s-v) \sqrt{z}\right)^2 \Big/ (f(2s-v))\right)} \Gamma\left(\frac{1}{2}(h+k+2), \left(b - c(2s-v) - 2 f (2s-v) \sqrt{z}\right)^2 \Big/ (4 f (2s-v))\right) \right) \right) (-f(2s-v))^{-2n-2} + e^{\frac{(b-c(v-2s))^2}{4 f (v-2s)}} (-f(v-2s))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b - c(v-2s))^{-h-k+2n} \left(b - c(v-2s) - 2 f (v-2s) \sqrt{z}\right)^{h+k} \left(\left(b - c(v-2s) - 2 f (v-2s) \sqrt{z}\right)^2 \Big/ (f(v-2s)) \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b - c(v-2s)) \left(b - c(v-2s) - 2 f (v-2s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \left(b - c(v-2s) - 2 f (v-2s) \sqrt{z}\right)^2 \Big/ (4 f (v-2s))\right) - 2 f (v-2s) \sqrt{\left(\left(b - c(v-2s) - 2 f (v-2s) \sqrt{z}\right)^2 \Big/ (f(v-2s))\right)} \Gamma\left(\frac{1}{2}(h+k+2), \left(b - c(v-2s) - 2 f (v-2s) \sqrt{z}\right)^2 \Big/ (4 f (v-2s))\right) \right) \right) - 2^{1-v} b^{-2(n+1)} \binom{v}{\frac{v}{2}} \Gamma\left(2(n+1), -b\sqrt{z}\right) (1 - v \bmod 2) \;/;\; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n e^{b z^r + e} \cosh^v\left(c z^r + f z\right)$

01.20.21.2963.01

$$\int z^n e^{b z^2+e} \cosh^{\nu}\left(c z^2+f z\right) dz ==$$

$$-2^{-\nu-1} e^e z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1-\nu \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} - 2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(f \nu-2 f s)^2}{4(b-2 c s+c \nu)}+e} \right.$$

$$\left(\sum_{q=0}^{n} 2^{q-n} (2 f s-f \nu)^{n-q} (f (\nu-2 s)+2 (b-2 c s+c \nu) z)^{q+1} \left(-\frac{(f (\nu-2 s)+2 (b-2 c s+c \nu) z)^2}{b-2 c s+c \nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.$$

$$\left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(f (\nu-2 s)+2 (b-2 c s+c \nu) z)^2}{4 (b-2 c s+c \nu)}\right) \right) (b-2 c s+c \nu)^{-n-1} + e^{-\frac{(2 f s-f \nu)^2}{4 (b+2 c s-c \nu)}+e} (b+2 c s-c \nu)^{-n-1} \right.$$

$$\sum_{q=0}^{n} 2^{q-n} (f \nu-2 f s)^{n-q} (2 f s+4 c z s-f \nu+2 b z-2 c \nu z)^{q+1} \left(-\frac{(2 f s+4 c z s-f \nu+2 b z-2 c \nu z)^2}{b+2 c s-c \nu} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2 f s+4 c z s-f \nu+2 b z-2 c \nu z)^2}{4 (b+2 c s-c \nu)}\right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2964.01

$$\int z^n\, e^{\sqrt{z}\ b+e} \cosh^{\nu}\left(\sqrt{z}\ c+f\ z\right) dz ==$$

$$2^{-2\,n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{(b-c\,(2\,s-\nu))^2}{4\,f\,(2\,s-\nu)}+e} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b-c\,(2\,s-\nu))^{-h-k+2\,n} \left(b-c\,(2\,s-\nu)-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^{h+k} \right.\right.$$

$$\left(\frac{\left(b-c\,(2\,s-\nu)-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b-c\,(2\,s-\nu)) \left(b-c\,(2\,s-\nu)- \right.\right.$$

$$\left.\left. 2\,f\,(2\,s-\nu)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b-c\,(2\,s-\nu)-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{4\,f\,(2\,s-\nu)} \right) - 2\,f\,(2\,s-\nu) \right.$$

$$\left.\left. \sqrt{\frac{\left(b-c\,(2\,s-\nu)-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b-c\,(2\,s-\nu)-2\,f\,(2\,s-\nu)\,\sqrt{z}\right)^2}{4\,f\,(2\,s-\nu)} \right) \right) \right)$$

$$(-f\,(2\,s-\nu))^{-2\,n-2} + e^{\frac{(b-c\,(\nu-2\,s))^2}{4\,f\,(\nu-2\,s)}+e} (-f\,(\nu-2\,s))^{-2\,n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b-c\,(\nu-2\,s))^{-h-k+2\,n}$$

$$\left(b-c\,(\nu-2\,s)-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^{h+k} \left(\frac{\left(b-c\,(\nu-2\,s)-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{f\,(\nu-2\,s)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((b-c\,(\nu-2\,s)) \left(b-c\,(\nu-2\,s)-2\,f\,(\nu-2\,s)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+k+1), \right.\right.$$

$$\left. \frac{\left(b-c\,(\nu-2\,s)-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(\nu-2\,s)} \right) - 2\,f\,(\nu-2\,s) \sqrt{\frac{\left(b-c\,(\nu-2\,s)-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{f\,(\nu-2\,s)}}\ \Gamma\left(\right.$$

$$\left.\left.\left. \frac{1}{2}\,(h+k+2),\ \frac{\left(b-c\,(\nu-2\,s)-2\,f\,(\nu-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(\nu-2\,s)} \right) \right) \right) -$$

$$2^{1-\nu}\, b^{-2\,(n+1)}\, e^{e} \begin{pmatrix} \nu \\ \frac{\nu}{2} \end{pmatrix} \Gamma\left(2\,(n+1),\ -b\,\sqrt{z}\right) (1-\nu \bmod 2)\ /;\ n \in$$

$$\mathbb{N} \bigwedge$$

$$\nu \in$$

$$\mathbb{N}^+$$

Involving $z^n\, e^{b\, z^r + d\, z}\, \cosh^\nu(c\, z^r + f\, z)$

01.20.21.2965.01

$$\int z^n\, e^{b\, z^2 + d\, z}\, \cosh^\nu\left(c\, z^2 + f\, z\right) dz ==$$

$$2^{-\nu-1}\, b^{-n-1}\, e^{-\frac{d^2}{4\, b}} \left(\begin{pmatrix} \nu \\ \frac{\nu}{2} \end{pmatrix} (\nu \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n}\, (-d)^{n-q}\, (d + 2\, b\, z)^{q+1} \left(-\frac{(d + 2\, b\, z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \begin{pmatrix} n \\ q \end{pmatrix} \Gamma\left(\frac{q+1}{2}, -\frac{(d + 2\, b\, z)^2}{4\, b} \right) -$$

$$b^{n+1}\, e^{\frac{d^2}{4\, b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \begin{pmatrix} \nu \\ s \end{pmatrix} \left(e^{-\frac{(d - 2\, f\, s + f\, \nu)^2}{4\, (b - 2\, c\, s + c\, \nu)}} \left(\sum_{q=0}^{n} 2^{q-n}\, (-d + 2\, f\, s - f\, \nu)^{n-q}\, (d + f\, (\nu - 2\, s) + 2\, (b - 2\, c\, s + c\, \nu)\, z)^{q+1} \right.\right.$$

$$\left(-\frac{(d + f\, (\nu - 2\, s) + 2\, (b - 2\, c\, s + c\, \nu)\, z)^2}{b - 2\, c\, s + c\, \nu} \right)^{\frac{1}{2}(-q-1)} \begin{pmatrix} n \\ q \end{pmatrix}$$

$$\left.\left. \Gamma\left(\frac{q+1}{2}, -\frac{(d + f\, (\nu - 2\, s) + 2\, (b - 2\, c\, s + c\, \nu)\, z)^2}{4\, (b - 2\, c\, s + c\, \nu)} \right) \right) (b - 2\, c\, s + c\, \nu)^{-n-1} +$$

$$e^{-\frac{(d + 2\, f\, s - f\, \nu)^2}{4\, (b + 2\, c\, s - c\, \nu)}}\, (b + 2\, c\, s - c\, \nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n}\, (-d - 2\, f\, s + f\, \nu)^{n-q}\, (d + 2\, f\, s - f\, \nu + 2\, b\, z + 4\, c\, s\, z - 2\, c\, \nu\, z)^{q+1}$$

$$\left(-\frac{(d + 2\, f\, s - f\, \nu + 2\, b\, z + 4\, c\, s\, z - 2\, c\, \nu\, z)^2}{b + 2\, c\, s - c\, \nu} \right)^{\frac{1}{2}(-q-1)} \begin{pmatrix} n \\ q \end{pmatrix}$$

$$\left.\left. \Gamma\left(\frac{q+1}{2}, -\frac{(d + 2\, f\, s - f\, \nu + 2\, b\, z + 4\, c\, s\, z - 2\, c\, \nu\, z)^2}{4\, (b + 2\, c\, s - c\, \nu)} \right) \right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2966.01

$$\int z^n\, e^{\sqrt{z}\ b + d\, z}\, \cosh^\nu\left(\sqrt{z}\ c + f\, z\right) dz == 2^{-2\, n - \nu - 1}\, e^{-\frac{b^2}{4\, d}} \begin{pmatrix} \nu \\ \frac{\nu}{2} \end{pmatrix} (1 - \nu \bmod 2)$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\, n} \left(b + 2\, d\, \sqrt{z} \right)^{h+k} \left(-\frac{\left(b + 2\, d\, \sqrt{z} \right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \begin{pmatrix} k \\ h \end{pmatrix} \begin{pmatrix} n \\ k \end{pmatrix} \left(b \left(b + 2\, d\, \sqrt{z} \right) \right.\right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}\, (h + k + 1), -\frac{\left(b + 2\, d\, \sqrt{z} \right)^2}{4\, d} \right) + 2 \sqrt{-\frac{\left(b + 2\, d\, \sqrt{z} \right)^2}{d}}\ d\, \Gamma\left(\frac{1}{2}\, (h + k + 2), -\frac{\left(b + 2\, d\, \sqrt{z} \right)^2}{4\, d} \right) \right) \right) d^{-2\, n - 2} +$$

$$2^{-2\, n - \nu - 1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \begin{pmatrix} \nu \\ s \end{pmatrix} \left(e^{-\frac{(b + c\, (2\, s - \nu))^2}{4\, (d + f\, (2\, s - \nu))}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b + c\, (2\, s - \nu))^{-h-k+2\, n} \left(b + c\, (2\, s - \nu) + 2\, (d + f\, (2\, s - \nu))\, \sqrt{z} \right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b+c\,(2\,s-v))\left(b+c\,(2\,s-v)+\right.\right.$$

$$\left.2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)+2$$

$$(d+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)$$

$$\left.\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}}\right)\Bigg)(d+f\,(2\,s-v))^{-2\,n-2}+e^{-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}}$$

$$(d+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c\,(v-2\,s))^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b+c\,(v-2\,s))\left(b+c\,(v-2\,s)+\right.\right.$$

$$\left.2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+$$

$$2\,(d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.2967.01

$$\int z^n e^{b z^2+d z+e} \cosh^{\nu}\left(c z^2+f z\right) dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(e^e \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz)^{q+1} \left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b}\right) - \right.$$

$$b^{n+1} e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(d-2fs+fv)^2}{4(b-2cs+cv)}+e} (b-2cs+cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d+2fs-fv)^{n-q} \right.$$

$$(d+f(\nu-2s)+2(b-2cs+c\nu)z)^{q+1} \left(-\frac{(d+f(\nu-2s)+2(b-2cs+c\nu)z)^2}{b-2cs+c\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f(\nu-2s)+2(b-2cs+c\nu)z)^2}{4(b-2cs+c\nu)}\right) +$$

$$e^{-\frac{(d+2fs-fv)^2}{4(b+2cs-c\nu)}+e} (b+2cs-c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d-2fs+fv)^{n-q} (d+2fs-fv+2bz+4csz-2c\nu z)^{q+1}$$

$$\left(-\frac{(d+2fs-fv+2bz+4csz-2c\nu z)^2}{b+2cs-c\nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(d+2fs-fv+2bz+4csz-2c\nu z)^2}{4(b+2cs-c\nu)}\right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2968.01

$$\int z^n e^{\sqrt{z}\, b+e+d z} \cosh^{\nu}\left(\sqrt{z}\, c+f z\right) dz == 2^{-2n-\nu-1} e^{e-\frac{b^2}{4d}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b+2d\sqrt{z}\right) \right. \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right) + 2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\, d\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right) \right) \right) d^{-2n-2} +$$

$$2^{-2n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{e-\frac{(b+c(2s-\nu))^2}{4(d+f(2s-\nu))}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c(2s-\nu))^{-h-k+2n} \left(b+c(2s-\nu)+2(d+f(2s-\nu))\sqrt{z}\right)^{h+k} \right. \right.$$

$$\left(-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b+c\,(2\,s-v))\left(b+c\,(2\,s-v)+\right.\right.$$

$$\left.2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)+2$$

$$(d+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)$$

$$\left.\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}}\right)\Big)(d+f\,(2\,s-v))^{-2\,n-2}+e^{e^{-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}}}$$

$$(d+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c\,(v-2\,s))^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b+c\,(v-2\,s))\left(b+c\,(v-2\,s)+\right.\right.$$

$$\left.2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+$$

$$2\,(d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}\right)\Big)\,/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{d\,z}\,\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.2969.01

$$\int z^n e^{d z} \cosh^{\nu}\left(c z^2 + f z + g\right) dz == -2^{-\nu} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1, -d z) (1 - \nu \bmod 2) (-d)^{-n-1} - 2^{-\nu-1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k}$$

$$\left(\frac{1}{\sqrt{-c (\nu - 2 k)}} \left(e^{\frac{(d - f (\nu-2k))^2}{4 c (\nu-2k)} - g (\nu - 2 k)} \sum_{q=0}^{n} 2^{q-n} (-c (\nu - 2 k))^{-n-\frac{1}{2}} (f (\nu - 2 k) - d)^{n-q} (d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^{q+1} \right.\right.$$

$$\left(\frac{(d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^2}{c (\nu - 2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^2}{4 c (\nu - 2 k)} \right) +$$

$$\frac{1}{\sqrt{c (\nu - 2 k)}} \left(e^{g (\nu - 2 k) - \frac{(d + f (\nu-2k))^2}{4 c (\nu-2k)}} \sum_{q=0}^{n} 2^{q-n} (c (\nu - 2 k))^{-n-\frac{1}{2}} (-d - f (\nu - 2 k))^{n-q} \right.$$

$$(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^{q+1} \left(-\frac{(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^2}{c (\nu - 2 k)} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^2}{4 c (\nu - 2 k)} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2970.01

$$\int z^n e^{d z} \cosh^{\nu}\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$2^{-2n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{c^2 (2s-\nu)^2}{4 (d - f (2s-\nu))} - g (2 s - \nu)} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c (2 s - \nu))^{-h-k+2n} \left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{d - f (2 s - \nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(2 (d - f (2 s - \nu)) \sqrt{-\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{d - f (2 s - \nu)}}\ \Gamma\left(\frac{1}{2} (h + k + 2), \right.\right.$$

$$\left. -\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{4 (d - f (2 s - \nu))} \right) - c (2 s - \nu) \left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)$$

$$\left.\left.\left. \Gamma\left(\frac{1}{2} (h + k + 1), -\frac{\left(2 (d - f (2 s - \nu)) \sqrt{z} - c (2 s - \nu)\right)^2}{4 (d - f (2 s - \nu))} \right) \right) \right) (d - f (2 s - \nu))^{-2n-2} +$$

$$e^{-\frac{c^2 (v-2 s)^2}{4 (d-f (v-2 s))}-g (v-2 s)} (d-f (v-2 s))^{-2 n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c (v-2 s))^{-h-k+2 n}$$

$$\left(2 (d-f (v-2 s)) \sqrt{z}-c (v-2 s)\right)^{h+k} \left(-\frac{\left(2 (d-f (v-2 s)) \sqrt{z}-c (v-2 s)\right)^2}{d-f (v-2 s)}\right)^{\frac{1}{2} (-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(2 (d-f (v-2 s)) \sqrt{-\frac{\left(2 (d-f (v-2 s)) \sqrt{z}-c (v-2 s)\right)^2}{d-f (v-2 s)}}\ \Gamma\left(\frac{1}{2} (h+k+2),\right.\right.$$

$$\left.-\frac{\left(2 (d-f (v-2 s)) \sqrt{z}-c (v-2 s)\right)^2}{4 (d-f (v-2 s))}\right)-c (v-2 s) \left(2 (d-f (v-2 s)) \sqrt{z}-c (v-2 s)\right) \Gamma\left(\right.$$

$$\left.\left.\frac{1}{2} (h+k+1), -\frac{\left(2 (d-f (v-2 s)) \sqrt{z}-c (v-2 s)\right)^2}{4 (d-f (v-2 s))}\right)\right)\Bigg)-$$

$$2^{-v} (-d)^{-n-1} \binom{v}{\frac{v}{2}} \Gamma(n+1, -d z) (1-v \bmod 2) /; n \in \mathbb{N} \bigwedge$$

$v \in \mathbb{N}^+$

Involving $z^n e^{d z+e} \cosh^v\left(c z^r+f z+g\right)$

01.20.21.2971.01

$$\int z^n e^{e+d z} \cosh^{\nu}\left(c z^2 + f z + g\right) dz ==$$

$$-2^{-\nu} e^{e} \binom{\nu}{\frac{\nu}{2}} \Gamma(n+1, -d z) (1 - \nu \bmod 2) (-d)^{-n-1} - 2^{-\nu-1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\frac{1}{\sqrt{-c (\nu - 2 k)}} \left(e^{\frac{(d - f (\nu-2 k))^2}{4 c (\nu-2 k)} + e - g (\nu-2 k)} \right.\right.$$

$$\sum_{q=0}^{n} 2^{q-n} (-c (\nu - 2 k))^{-n-\frac{1}{2}} (f (\nu - 2 k) - d)^{n-q} (d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^{q+1}$$

$$\left(\frac{(d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^2}{c (\nu - 2 k)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d - f (\nu - 2 k) - 2 c (\nu - 2 k) z)^2}{4 c (\nu - 2 k)} \right) +$$

$$\frac{1}{\sqrt{c (\nu - 2 k)}} \left(e^{-\frac{(d + f (\nu-2 k))^2}{4 c (\nu-2 k)} + e + g (\nu-2 k)} \sum_{q=0}^{n} 2^{q-n} (c (\nu - 2 k))^{-n-\frac{1}{2}} (-d - f (\nu - 2 k))^{n-q} \right.$$

$$(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^{q+1} \left(- \frac{(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^2}{c (\nu - 2 k)} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, - \frac{(d + f (\nu - 2 k) + 2 c (\nu - 2 k) z)^2}{4 c (\nu - 2 k)} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2972.01

$$\int z^n e^{e+d z} \cosh^{\nu}\left(\sqrt{z}\ c + g + f z\right) dz ==$$

$$2^{-2 n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{c^2 (2 s-\nu)^2}{4 (d - f (2 s-\nu))} - g (2 s-\nu) + e} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c (2 s - \nu))^{-h-k+2 n} \left(2 (d - f (2 s - \nu)) \sqrt{z}\ - c (2 s - \nu)\right)^{h+k} \right.\right.$$

$$\left(- \frac{\left(2 (d - f (2 s - \nu)) \sqrt{z}\ - c (2 s - \nu)\right)^2}{d - f (2 s - \nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(2 (d - f (2 s - \nu)) \sqrt{- \frac{\left(2 (d - f (2 s - \nu)) \sqrt{z}\ - c (2 s - \nu)\right)^2}{d - f (2 s - \nu)}} \ \Gamma\left(\frac{1}{2} (h + k + 2), \right.\right.$$

$$\left.\left. \left. - \frac{\left(2 (d - f (2 s - \nu)) \sqrt{z}\ - c (2 s - \nu)\right)^2}{4 (d - f (2 s - \nu))} \right) - c (2 s - \nu) \left(2 (d - f (2 s - \nu)) \sqrt{z}\ - c (2 s - \nu)\right) \right) \right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(2(d-f(2s-v))\sqrt{z}-c(2s-v)\right)^2}{4(d-f(2s-v))}\right)\Bigg)(d-f(2s-v))^{-2n-2}+$$

$$e^{-\frac{c^2(v-2s)^2}{4(d-f(v-2s))}-g(v-2s)+e}(d-f(v-2s))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-c(v-2s))^{-h-k+2n}$$

$$\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+k}\left(-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{d-f(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(2(d-f(v-2s))\sqrt{-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(d-f(v-2s))}\right)-c(v-2s)\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\Bigg($$

$$\left.\frac{1}{2}(h+k+1),-\frac{\left(2(d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(d-f(v-2s))}\right)\Bigg)\Bigg)-$$

$$2^{-v}(-d)^{-n-1}e^e\binom{v}{\frac{v}{2}}\Gamma(n+1,-dz)(1-v \bmod 2)\,/;\,n\in$$

$$\mathbb{N}\bigwedge$$

$$v\in$$

$$\mathbb{N}^+$$

Involving $z^n e^{b z^r} \cosh^v(c z^r + f z + g)$

01.20.21.2973.01

$$\int z^n e^{b z^2} \cosh^{\nu}\left(c z^2 + f z + g\right) dz == -2^{-\nu-1} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1 - \nu \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(f\nu - 2fs)^2}{4(b-2cs+c\nu)} + g(\nu-2s)} \left(\sum_{q=0}^{n} 2^{q-n} (2fs - f\nu)^{n-q} (f(\nu-2s) + 2(b-2cs+c\nu)z)^{q+1} \right.\right.$$

$$\left. \left(-\frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{b-2cs+c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{4(b-2cs+c\nu)}\right) \right)$$

$$(b-2cs+c\nu)^{-n-1} + e^{-\frac{(2fs-f\nu)^2}{4(b+2cs-c\nu)} + g(2s-\nu)} (b+2cs-c\nu)^{-n-1}$$

$$\sum_{q=0}^{n} 2^{q-n} (f\nu - 2fs)^{n-q} (2fs + 4czs - f\nu + 2bz - 2c\nu z)^{q+1} \left(-\frac{(2fs + 4czs - f\nu + 2bz - 2c\nu z)^2}{b+2cs-c\nu} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2fs + 4czs - f\nu + 2bz - 2c\nu z)^2}{4(b+2cs-c\nu)}\right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2974.01

$$\int z^n e^{\sqrt{z}\,b} \cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right) dz ==$$

$$2^{-2n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{(b-c(2s-\nu))^2}{4f(2s-\nu)} - g(2s-\nu)} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c(2s-\nu))^{-h-k+2n} \left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^{h+k} \right.\right.$$
$$\left(\left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2 \Big/ (f(2s-\nu)) \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b-c(2s-\nu)) \left(b-c(2s-\nu)-\right.\right.$$
$$\left.\left. 2f(2s-\nu)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2 \Big/ (4f(2s-\nu))\right) - 2$$
$$f(2s-\nu) \sqrt{\left(\left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2 \Big/ (f(2s-\nu))\right)} \Gamma\left(\frac{1}{2}(h+k+2),\right.$$
$$\left.\left.\left.\left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2 \Big/ (4f(2s-\nu))\right)\right)\right) (-f(2s-\nu))^{-2n-2} + e^{\frac{(b-c(\nu-2s))^2}{4f(\nu-2s)} - g(\nu-2s)}$$
$$(-f(\nu-2s))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c(\nu-2s))^{-h-k+2n} \left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^{h+k}$$
$$\left(\left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2 \Big/ (f(\nu-2s)) \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$
$$\left((b-c(\nu-2s)) \left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2 \Big/ \right.\right.$$
$$\left.\left. (4f(\nu-2s))\right) - 2f(\nu-2s) \sqrt{\left(\left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2 \Big/ (f(\nu-2s))\right)} \Gamma\left(\right.\right.$$
$$\left.\left.\frac{1}{2}(h+k+2), \left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2 \Big/ (4f(\nu-2s))\right)\right) -$$
$$2^{1-\nu} b^{-2(n+1)} \binom{\nu}{\frac{\nu}{2}} \Gamma(2(n+1), -b\sqrt{z}) (1-\nu \bmod 2) /; n \in$$
$$\mathbb{N} \bigwedge$$
$$\nu \in$$
$$\mathbb{N}^+$$

Involving $z^n e^{b z^r + e} \cosh^{\nu}(c z^r + f z + g)$

01.20.21.2975.01

$$\int z^n e^{b z^2+e} \cosh^{\nu}\left(c z^2+f z+g\right) dz == -2^{-\nu-1} e^{e} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1-\nu \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(f \nu-2 f s)^2}{4 (b-2 c s+c \nu)}+e+g (\nu-2 s)} \left(\sum_{q=0}^{n} 2^{q-n} (2 f s-f \nu)^{n-q} (f (\nu-2 s)+2 (b-2 c s+c \nu) z)^{q+1} \right.\right.$$

$$\left.\left(-\frac{(f (\nu-2 s)+2 (b-2 c s+c \nu) z)^2}{b-2 c s+c \nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f (\nu-2 s)+2 (b-2 c s+c \nu) z)^2}{4 (b-2 c s+c \nu)}\right) \right)$$

$$(b-2 c s+c \nu)^{-n-1} + e^{-\frac{(2 f s-f \nu)^2}{4 (b+2 c s-c \nu)}+e+g (2 s-\nu)} (b+2 c s-c \nu)^{-n-1}$$

$$\sum_{q=0}^{n} 2^{q-n} (f \nu-2 f s)^{n-q} (2 f s+4 c z s-f \nu+2 b z-2 c \nu z)^{q+1} \left(-\frac{(2 f s+4 c z s-f \nu+2 b z-2 c \nu z)^2}{b+2 c s-c \nu} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2 f s+4 c z s-f \nu+2 b z-2 c \nu z)^2}{4 (b+2 c s-c \nu)}\right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2976.01

$$\int z^n e^{\sqrt{z}\,b+e} \cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right) dz ==$$

$$2^{-2n-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{(b-c(2s-\nu))^2}{4f(2s-\nu)}+e-g(2s-\nu)} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c(2s-\nu))^{-h-k+2n} \left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^{h+k} \right.\right.$$

$$\left(\frac{\left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2}{f(2s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b-c(2s-\nu)) \left(b-c(2s-\nu)- \right.\right.$$

$$\left.\left. 2f(2s-\nu)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2}{4f(2s-\nu)} \right) - 2f(2s-\nu) \right.$$

$$\left.\left. \sqrt{\frac{\left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2}{f(2s-\nu)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b-c(2s-\nu)-2f(2s-\nu)\sqrt{z}\right)^2}{4f(2s-\nu)} \right) \right) \right) \right)$$

$$(-f(2s-\nu))^{-2n-2} + e^{\frac{(b-c(\nu-2s))^2}{4f(\nu-2s)}+e-g(\nu-2s)} (-f(\nu-2s))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b-c(\nu-2s))^{-h-k+2n}$$

$$\left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^{h+k} \left(\frac{\left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2}{f(\nu-2s)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((b-c(\nu-2s)) \left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \right.\right.$$

$$\left. \frac{\left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2}{4f(\nu-2s)} \right) - 2f(\nu-2s) \sqrt{\frac{\left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2}{f(\nu-2s)}}\ \Gamma\left(\right.$$

$$\left.\left.\left. \frac{1}{2}(h+k+2), \frac{\left(b-c(\nu-2s)-2f(\nu-2s)\sqrt{z}\right)^2}{4f(\nu-2s)} \right) \right) \right) -$$

$$2^{1-\nu} b^{-2(n+1)} e^e \binom{\nu}{\frac{\nu}{2}} \Gamma\left(2(n+1), -b\sqrt{z}\right) (1-\nu \bmod 2) /; n \in$$

$$\mathbb{N} \bigwedge$$

$$\nu \in$$

$$\mathbb{N}^+$$

Involving $z^n e^{b z^r + d z} \cosh^\nu(c z^r + f z + g)$

01.20.21.2977.01

$$\int z^n e^{b z^2 + d z} \cosh^\nu(c z^2 + f z + g)\, dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2 b z)^{q+1} \left(-\frac{(d + 2 b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d + 2 b z)^2}{4 b} \right) - \right.$$

$$b^{n+1} e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(d-2fs+fv)^2}{4(b-2cs+cv)} + g(\nu-2s)} (b - 2 c s + c \nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d + 2 f s - f \nu)^{n-q} \right.$$

$$(d + f(\nu - 2 s) + 2(b - 2 c s + c \nu) z)^{q+1} \left(-\frac{(d + f(\nu - 2 s) + 2(b - 2 c s + c \nu) z)^2}{b - 2 c s + c \nu} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d + f(\nu - 2 s) + 2(b - 2 c s + c \nu) z)^2}{4(b - 2 c s + c \nu)} \right) + e^{-\frac{(d+2fs-fv)^2}{4(b+2cs-cv)} + g(2s-\nu)}$$

$$(b + 2 c s - c \nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d - 2 f s + f \nu)^{n-q} (d + 2 f s - f \nu + 2 b z + 4 c s z - 2 c \nu z)^{q+1}$$

$$\left. \left. \left(-(d + 2 f s - f \nu + 2 b z + 4 c s z - 2 c \nu z)^2 / (b + 2 c s - c \nu) \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.\right.$$

$$\left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(d + 2 f s - f \nu + 2 b z + 4 c s z - 2 c \nu z)^2}{4(b + 2 c s - c \nu)} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2978.01

$$\int z^n e^{\sqrt{z}\,b+d\,z}\cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right)dz == 2^{-2\,n-\nu-1}\,e^{-\frac{b^2}{4\,d}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2\,n-2}+$$

$$2^{-2\,n-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(b+c\,(2\,s-\nu))^2}{4\,(d+f\,(2\,s-\nu))}+g\,(2\,s-\nu)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c\,(2\,s-\nu))^{-h-k+2\,n}\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(-\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)^2\Big/\left(d+f\,(2\,s-\nu)\right)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c\,(2\,s-\nu))\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(2\,s-\nu))\right)\right)+2$$

$$\sqrt{\left(-\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)^2\Big/\left(d+f\,(2\,s-\nu)\right)\right)}\left(d+f\,(2\,s-\nu)\right)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(2\,s-\nu))\right)\right)\right)\right)$$

$$\left(d+f\,(2\,s-\nu)\right)^{-2\,n-2}+e^{-\frac{(b+c\,(\nu-2\,s))^2}{4\,(d+f\,(\nu-2\,s))}+g\,(\nu-2\,s)}\left(d+f\,(\nu-2\,s)\right)^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c\,(\nu-2\,s))^{-h-k+2\,n}\left(b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}\right)^2\Big/\left(d+f\,(\nu-2\,s)\right)\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left(\left(b+c\,(\nu-2\,s)\right)\left(b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.-\left(b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(\nu-2\,s))\right)\right)+$$

$$2\sqrt{\left(-\left(b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}\right)^2\Big/\left(d+f\,(\nu-2\,s)\right)\right)}\left(d+f\,(\nu-2\,s)\right)\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\left(b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(\nu-2\,s))\right)\right)\right)\right)\Big/;\; n\in\mathbb{N}\wedge\nu\in\mathbb{Z}\wedge\nu>0$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.2979.01

$$\int z^n e^{b z^2+d z+e} \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$2^{-\nu-1} b^{-n-1} e^{-\frac{d^2}{4b}} \left(e^{e} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2 b z)^{q+1} \left(-\frac{(d+2 b z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2 b z)^2}{4 b}\right) - \right.$$

$$b^{n+1} e^{\frac{d^2}{4b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(d-2 f s+f \nu)^2}{4 (b-2 c s+c \nu)}+e+g (\nu-2 s)} (b-2 c s+c \nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d+2 f s-f \nu)^{n-q} \right.$$

$$(d+f (\nu-2 s)+2 (b-2 c s+c \nu) z)^{q+1} \left(-\frac{(d+f (\nu-2 s)+2 (b-2 c s+c \nu) z)^2}{b-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+f (\nu-2 s)+2 (b-2 c s+c \nu) z)^2}{4 (b-2 c s+c \nu)}\right) + e^{-\frac{(d+2 f s-f \nu)^2}{4 (b+2 c s-c \nu)}+e+g (2 s-\nu)}$$

$$(b+2 c s-c \nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-d-2 f s+f \nu)^{n-q} (d+2 f s-f \nu+2 b z+4 c s z-2 c \nu z)^{q+1}$$

$$\left(-(d+2 f s-f \nu+2 b z+4 c s z-2 c \nu z)^2 / (b+2 c s-c \nu)\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(d+2 f s-f \nu+2 b z+4 c s z-2 c \nu z)^2}{4 (b+2 c s-c \nu)}\right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.2980.01

$$\int z^n e^{\sqrt{z}\,(b+e+d\,z)} \cosh^{\nu}\left(\sqrt{z}\,(c+g+f\,z)\right) dz =$$

$$2^{-2n-\nu-1} e^{e-\frac{b^2}{4d}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2d\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b\left(b+2d\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d} \right) + \right.$$

$$\left. \left. 2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\; d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2d\sqrt{z}\right)^2}{4d} \right) \right) \right) d^{-2n-2} + 2^{-2n-\nu-1}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(b+c(2s-\nu))^2}{4(d+f(2s-\nu))}+e+g(2s-\nu)} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c(2s-\nu))^{-h-k+2n} \left(b+c(2s-\nu)+2(d+f(2s-\nu))\sqrt{z}\right)^{h+k} \right. \right.$$

$$\left(-\left(b+c(2s-\nu)+2(d+f(2s-\nu))\sqrt{z}\right)^2 \Big/ (d+f(2s-\nu)) \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((b+c(2s-\nu)) \left(b+c(2s-\nu)+2(d+f(2s-\nu))\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\left(b+c(2s-\nu)+2(d+f(2s-\nu))\sqrt{z}\right)^2 \Big/ (4(d+f(2s-\nu))) \right) + 2$$

$$\sqrt{\left(-\left(b+c(2s-\nu)+2(d+f(2s-\nu))\sqrt{z}\right)^2 \Big/ (d+f(2s-\nu)) \right)} (d+f(2s-\nu))$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+2), -\left(b+c(2s-\nu)+2(d+f(2s-\nu))\sqrt{z}\right)^2 \Big/ (4(d+f(2s-\nu))) \right) \right) \right)$$

$$(d+f(2s-\nu))^{-2n-2} + e^{-\frac{(b+c(\nu-2s))^2}{4(d+f(\nu-2s))}+e+g(\nu-2s)} (d+f(\nu-2s))^{-2n-2}$$

$$\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c(\nu-2s))^{-h-k+2n} \left(b+c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b+c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}\right)^2 \Big/ (d+f(\nu-2s)) \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}$$

$$\binom{n}{k} \left((b+c(\nu-2s)) \left(b+c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \right. \right.$$

$$\left. -\left(b+c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}\right)^2 \Big/ (4(d+f(\nu-2s))) \right) +$$

$$2\sqrt{\left(-\left(b+c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}\right)^2 \Big/ (d+f(\nu-2s)) \right)} (d+f(\nu-2s)) \Gamma\left(\frac{1}{2}(h+k+2), \right.$$

$$\left. \left. \left. -\left(b+c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}\right)^2 \Big/ (4(d+f(\nu-2s))) \right) \right) \right) \Big/ ; n \in \mathbb{N} \wedge \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving products of the direct functions, exponential and a power functions

Involving products of two direct functions, exponential and a power functions

Involving $z^{\alpha-1}\, e^{p\,z}\, \cosh(c\,z)\, \cosh(a\,z)$

01.20.21.2981.01

$$\int z^{\alpha-1}\, e^{b\,z}\, \cosh(c\,z)\, \cosh(a\,z)\, dz ==$$
$$-\frac{1}{4}\, z^{\alpha}\, (E_{1-\alpha}(-(a+b-c)\,z) + E_{1-\alpha}((a-b+c)\,z) + E_{1-\alpha}(-(-a+b+c)\,z) + E_{1-\alpha}(-(a+b+c)\,z))$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \cosh(c\,z)\, \cosh(a\,z+b)$

01.20.21.2982.01

$$\int z^{\alpha-1}\, e^{p\,z}\, \cosh(c\,z)\, \cosh(b+a\,z)\, dz ==$$
$$-\frac{1}{4}\, e^{-b}\, z^{\alpha}\, \left(E_{1-\alpha}((a-c-p)\,z) + E_{1-\alpha}((a+c-p)\,z) + e^{2\,b}\, (E_{1-\alpha}(-(a-c+p)\,z) + E_{1-\alpha}(-(a+c+p)\,z))\right)$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \cosh(c\,z+d)\, \cosh(a\,z+b)$

01.20.21.2983.01

$$\int z^{\alpha-1}\, e^{p\,z}\, \cosh(d+c\,z)\, \cosh(b+a\,z)\, dz ==$$
$$-\frac{1}{4}\, e^{-b-d}\, z^{\alpha}\, \left(e^{2\,d}\, E_{1-\alpha}((a-c-p)\,z) + E_{1-\alpha}((a+c-p)\,z) + e^{2\,b}\, \left(E_{1-\alpha}(-(a-c+p)\,z) + e^{2\,d}\, E_{1-\alpha}(-(a+c+p)\,z)\right)\right)$$

Involving $z^{n}\, e^{p\,z^{r}}\, \cosh(b\,z)\, \cosh(c\,z)$

01.20.21.2984.01

$$\int z^n e^{p z^2} \cosh(b z) \cosh(c z)\, dz == -\frac{1}{8} e^{-\frac{b^2+c^2}{2p}} p^{-n-1}$$

$$\left(e^{\frac{(b+c)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (b-c)^{n-q} (-b+c+2pz)^{q+1} \left(-\frac{(-b+c+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-b+c+2pz)^2}{4p} \right) + \right.$$

$$e^{\frac{(b+c)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (c-b)^{n-q} (b-c+2pz)^{q+1} \left(-\frac{(b-c+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-c+2pz)^2}{4p} \right) +$$

$$e^{\frac{(c-b)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (-b-c)^{n-q} (b+c+2pz)^{q+1} \left(-\frac{(b+c+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+c+2pz)^2}{4p} \right) +$$

$$\left. e^{\frac{(c-b)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (b+c)^{n-q} \left(-\frac{(b+c-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} (-b-c+2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+c-2pz)^2}{4p} \right) \right) /;\ n \in \mathbb{N}$$

01.20.21.2985.01

$$\int z^n e^{p\sqrt{z}} \cosh(b z) \cosh(c z)\, dz ==$$

$$2^{-2n-3} \left(e^{\frac{p^2}{4c+4b}} (-c-b)^{-2(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p - 2(c+b)\sqrt{z} \right)^{h+k} \left(\frac{\left(p - 2(c+b)\sqrt{z} \right)^2}{c+b} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(p \left(p - 2(c+b)\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(p - 2(c+b)\sqrt{z} \right)^2}{4(c+b)} \right) - \right.$$

$$\left. \left. 2(c+b) \sqrt{\frac{\left(p - 2(c+b)\sqrt{z} \right)^2}{c+b}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(p - 2(c+b)\sqrt{z} \right)^2}{4(c+b)} \right) \right) +$$

$$(c+b)^{-2(n+1)} e^{\frac{p^2}{-4c-4b}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(2\sqrt{z}\ (c+b) + p \right)^{h+k} \left(-\frac{\left(2\sqrt{z}\ (c+b) + p \right)^2}{c+b} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(p \left(2\sqrt{z}\ (c+b) + p \right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(2\sqrt{z}\ (c+b) + p \right)^2}{4(c+b)} \right) + \right.$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\ (c+b)+p\right)^2}{c+b}}\ (c+b)\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(2\sqrt{z}\ (c+b)+p\right)^2}{4\,(c+b)}\right)\Bigg)+$$

$$(c-b)^{-2\,(n+1)}\ e^{\frac{p^2}{4\,b-4\,c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(2\sqrt{z}\ (c-b)+p\right)^{h+k}\left(\frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{b-c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(p\left(2\sqrt{z}\ (c-b)+p\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{4\,b-4\,c}\right)+$$

$$2\,(c-b)\sqrt{\frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{b-c}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2\sqrt{z}\ (c-b)+p\right)^2}{4\,b-4\,c}\right)\Bigg)+$$

$$(b-c)^{-2\,(n+1)}\ e^{\frac{p^2}{4\,c-4\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(2\sqrt{z}\ (b-c)+p\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\ (b-c)+p\right)^2}{b-c}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(p\left(2\sqrt{z}\ (b-c)+p\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(2\sqrt{z}\ (b-c)+p\right)^2}{4\,b-4\,c}\right)+$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\ (b-c)+p\right)^2}{b-c}}\ (b-c)\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(2\sqrt{z}\ (b-c)+p\right)^2}{4\,b-4\,c}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}$$

Involving $z^n\ e^{p\,z}\ \cosh\left(b\,z^r\right)\cosh(c\,z)$

01.20.21.2986.01

$$\int z^n e^{p z} \cosh\left(b z^2\right) \cosh(c z)\, dz == \frac{1}{8} (-1)^n b^{-n-1} e^{-\frac{3(c+p)^2}{4b}}$$

$$\left(e^{\frac{c^2+p\,c+p^2}{b}} \sum_{q=0}^{n} 2^{q-n} (c-p)^{n-q} (-c+p-2\,b\,z)^{q+1} \left(\frac{(c-p+2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c-p+2\,b\,z)^2}{4\,b} \right) + \right.$$

$$e^{\frac{(c+p)^2}{b}} \sum_{q=0}^{n} 2^{q-n} (-c-p)^{n-q} (c+p-2\,b\,z)^{q+1} \left(\frac{(c+p-2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c+p-2\,b\,z)^2}{4\,b} \right) -$$

$$(-1)^n \left(e^{\frac{c^2+4\,p\,c+p^2}{2\,b}} \sum_{q=0}^{n} 2^{q-n} (c-p)^{n-q} (-c+p+2\,b\,z)^{q+1} \left(-\frac{(-c+p+2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-c+p+2\,b\,z)^2}{4\,b} \right) + \right.$$

$$\left. \left. e^{\frac{(c+p)^2}{2\,b}} \sum_{q=0}^{n} 2^{q-n} (-c-p)^{n-q} (c+p+2\,b\,z)^{q+1} \left(-\frac{(c+p+2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+p+2\,b\,z)^2}{4\,b} \right) \right) \right) /; n \in \mathbb{N}$$

01.20.21.2987.01

$$\int z^n e^{p z} \cosh\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$

$$2^{-2n-3} \left(e^{-\frac{b^2}{4(p-c)}} (p-c)^{-2(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b + 2(p-c)\sqrt{z} \right)^{h+k} \left(-\frac{\left(b + 2(p-c)\sqrt{z} \right)^2}{p-c} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b \left(b + 2(p-c)\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b + 2(p-c)\sqrt{z} \right)^2}{4(p-c)} \right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(b + 2(p-c)\sqrt{z} \right)^2}{p-c}}\ (p-c)\, \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b + 2(p-c)\sqrt{z} \right)^2}{4(p-c)} \right) \right) +$$

$$e^{-\frac{b^2}{4(p-c)}} (p-c)^{-2(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b)^{-h-k+2n} \left(-\frac{\left(b - 2(p-c)\sqrt{z} \right)^2}{p-c} \right)^{\frac{1}{2}(-h-k-1)} \left(2(p-c)\sqrt{z} - b \right)^{h+k}$$

$$\binom{k}{h} \binom{n}{k} \left(2(p-c) \sqrt{-\frac{\left(b - 2(p-c)\sqrt{z} \right)^2}{p-c}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b - 2(p-c)\sqrt{z} \right)^2}{4(p-c)} \right) - \right.$$

$$b\left(2(p-c)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-2(p-c)\sqrt{z}\right)^2}{4(p-c)}\right)\Bigg)+$$

$$e^{-\frac{b^2}{4(c+p)}}(c+p)^{-2(n+1)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2(c+p)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2(c+p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{c+p}}\,(c+p)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(-\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{c+p}\right)^{\frac{1}{2}(-h-k-1)}\left(2(c+p)\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(2(c+p)\sqrt{-\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{c+p}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)-\right.$$

$$\left.\left.\left.b\left(2(c+p)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-2(c+p)\sqrt{z}\right)^2}{4(c+p)}\right)\right)\right)\right)\Bigg)\;/;\;n\in\mathbb{N}$$

Involving $z^n e^{p z^r}\cosh(b z^r)\cosh(c z)$

01.20.21.2988.01

$$\int z^n e^{p z^2} \cosh\left(b z^2\right) \cosh(c z)\, dz == -\frac{1}{8}\left(p^2-b^2\right)^{-n-1} e^{\frac{c^2 p}{2 b^2-2 p^2}}$$
$$\left(e^{\frac{c^2}{4 p-4 b}} (p-b)^{n+1}\left(\sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (c+2 (b+p) z)^{q+1}\left(-\frac{(c+2 (b+p) z)^2}{b+p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c+2 (b+p) z)^2}{4 (b+p)}\right)+\right.\right.$$
$$\left.\sum_{q=0}^{n} 2^{q-n} c^{n-q}\left(-\frac{(c-2 (b+p) z)^2}{b+p}\right)^{\frac{1}{2}(-q-1)} (2 (b+p) z-c)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c-2 (b+p) z)^2}{4 (b+p)}\right)\right)+$$
$$e^{\frac{c^2}{4 (b+p)}} (b+p)^{n+1}\left(\sum_{q=0}^{n} 2^{q-n} c^{n-q}\left(\frac{(c+2 (b-p) z)^2}{b-p}\right)^{\frac{1}{2}(-q-1)} (-c-2 b z+2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c+2 (b-p) z)^2}{4 (b-p)}\right)+\right.$$
$$\left.\left.\sum_{q=0}^{n} 2^{q-n} (-c)^{n-q} (c+2 (p-b) z)^{q+1}\left(\frac{(c+2 (p-b) z)^2}{b-p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c+2 (p-b) z)^2}{4 (b-p)}\right)\right)\right) /; n \in \mathbb{N}$$

01.20.21.2989.01

$$\int z^n e^{p \sqrt{z}} \cosh\left(b \sqrt{z}\right) \cosh(c z)\, dz ==$$
$$2^{-2 n-3} c^{-2 (n+1)} e^{-\frac{3 b^2+2 p b+3 p^2}{4 c}}\left(e^{\frac{b^2+p^2}{c}} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k (p-b)^{-h-k+2 n}\left(-2 \sqrt{z}\, c-b+p\right)^{h+k}\right.$$
$$\left(\frac{\left(2 \sqrt{z}\, c+b-p\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}\left((b-p)\left(2 \sqrt{z}\, c+b-p\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(2 \sqrt{z}\, c+b-p\right)^2}{4 c}\right)-\right.$$
$$\left.\left.2 c \sqrt{\frac{\left(2 \sqrt{z}\, c+b-p\right)^2}{c}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(2 \sqrt{z}\, c+b-p\right)^2}{4 c}\right)\right)+$$
$$e^{\frac{b^2+p b+p^2}{c}} \sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k (b+p)^{-h-k+2 n}\left(-2 \sqrt{z}\, c+b+p\right)^{h+k}\left(\frac{\left(-2 \sqrt{z}\, c+b+p\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\left((b+p)\left(-2 \sqrt{z}\, c+b+p\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(-2 \sqrt{z}\, c+b+p\right)^2}{4 c}\right)-\right.$$

$$2\,c\,\sqrt{\frac{\left(-2\,\sqrt{z}\;c+b+p\right)^2}{c}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(-2\,\sqrt{z}\;c+b+p\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{\frac{(b+p)^2}{2c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p-b)^{-h-k+2\,n}\left(2\,\sqrt{z}\;c-b+p\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\;c-b+p\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg((p-b)\left(2\,\sqrt{z}\;c-b+p\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\,\sqrt{z}\;c-b+p\right)^2}{4\,c}\right)+$$

$$2\,\sqrt{-\frac{\left(2\,\sqrt{z}\;c-b+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\,\sqrt{z}\;c-b+p\right)^2}{4\,c}\right)\Bigg)+$$

$$e^{\frac{b^2+p^2}{2c}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+p)^{-h-k+2\,n}\left(2\,\sqrt{z}\;c+b+p\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\;c+b+p\right)^2}{c}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg((b+p)\left(2\,\sqrt{z}\;c+b+p\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\,\sqrt{z}\;c+b+p\right)^2}{4\,c}\right)+$$

$$2\,\sqrt{-\frac{\left(2\,\sqrt{z}\;c+b+p\right)^2}{c}}\;c\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\,\sqrt{z}\;c+b+p\right)^2}{4\,c}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cosh\left(b\,z^r\right)\cosh\left(c\,z^r\right)$

01.20.21.2990.01

$$\int z^n e^{p z} \cosh\left(b z^2\right) \cosh\left(c z^2\right) dz ==$$

$$\frac{1}{8}\left(-e^{\frac{p^2}{4(c+b)}} (-c-b)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p-2(c+b)z)^{q+1} \left(\frac{(p-2(c+b)z)^2}{c+b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2(c+b)z)^2}{4(c+b)}\right) -\right.$$

$$(c-b)^{-n-1} e^{\frac{p^2}{4b-4c}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p+2(c-b)z)^{q+1} \left(-\frac{(p+2(c-b)z)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(c-b)z)^2}{4(c-b)}\right) -$$

$$(c+b)^{-n-1} e^{-\frac{p^2}{4(c+b)}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p+2(c+b)z)^{q+1} \left(-\frac{(p+2(c+b)z)^2}{c+b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(c+b)z)^2}{4(c+b)}\right) -$$

$$(b-c)^{-n-1} e^{\frac{p^2}{4c-4b}}$$

$$\left.\sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p-2cz+2bz)^{q+1} \left(\frac{(p-2cz+2bz)^2}{c-b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2(b-c)z)^2}{4c-4b}\right)\right) /; n \in \mathbb{N}$$

01.20.21.2991.01

$$\int z^n e^{p z} \cosh\left(b \sqrt{z}\right) \cosh\left(c \sqrt{z}\right) dz ==$$

$$2^{-2n-3} p^{-2n-2} \left(e^{-\frac{(-b-c)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-b-c)^{-h-i+2n} \left(-b-c+2p\sqrt{z}\right)^{h+i} \left(-\frac{\left(-b-c+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left((-b-c)\left(-b-c+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-b-c+2p\sqrt{z}\right)^2}{4p}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(-b-c+2p\sqrt{z}\right)^2}{p}}\; p\,\Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(-b-c+2p\sqrt{z}\right)^2}{4p}\right)\right)+\right.$$

$$e^{-\frac{(b-c)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (b-c)^{-h-i+2n} \left(b-c+2p\sqrt{z}\right)^{h+i} \left(-\frac{\left(b-c+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}$$

$$\left.\binom{n}{i}\left((b-c)\left(b-c+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(b-c+2p\sqrt{z}\right)^2}{4p}\right)+\right.\right.$$

$$2\sqrt{-\frac{\left(b-c+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b-c+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)+$$

$$e^{-\frac{(c-b)^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c-b)^{-h-i+2n}\left(-b+c+2\,p\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(-b+c+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Bigg((c-b)\left(-b+c+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(-b+c+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+$$

$$2\sqrt{-\frac{\left(-b+c+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(-b+c+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)+$$

$$e^{-\frac{(b+c)^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c)^{-h-i+2n}\left(b+c+2\,p\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Bigg((b+c)\left(b+c+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b+c+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+$$

$$2\sqrt{-\frac{\left(b+c+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b+c+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\cosh(b\,z^r)\cosh(c\,z^r)$

01.20.21.2992.01

$$\int z^{\alpha-1}\,e^{p\,z^r}\cosh(b\,z^r)\cosh(c\,z^r)\,dz == -\frac{1}{4\,r}\,z^{\alpha}\left(\Gamma\left(\frac{\alpha}{r},\,(c-b-p)\,z^r\right)((c-b-p)\,z^r)^{-\frac{\alpha}{r}}+((c+b-p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(c+b-p)\,z^r\right)+\right.$$
$$\left.(-(c-b+p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(c-b+p)\,z^r\right)+(-(c+b+p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(c+b+p)\,z^r\right)\right)$$

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\cosh(a\,z^r+q)\cosh(c\,z^r+g)$

01.20.21.2993.01

$$\int z^{\alpha-1}\, e^{b z^r+e} \cosh(a z^r+q) \cosh(c z^r+g)\, dz ==$$
$$-\frac{z^\alpha}{4r}\left(e^{e+g+q}\,\Gamma\left(\frac{\alpha}{r}, (-a-b-c) z^r\right)((-a-b-c) z^r)^{-\frac{\alpha}{r}} + e^{e+g-q}\,((a-b-c) z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, (a-b-c) z^r\right) + \right.$$
$$\left. e^{e-g+q}\,((-a-b+c) z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, (-a-b+c) z^r\right) + e^{e-g-q}\,((a-b+c) z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, (a-b+c) z^r\right)\right)$$

Involving $z^n\, e^{b z^r+d z+e} \cosh(a z^r+p z+q) \cosh(c z^r+f z+g)$

01.20.21.2994.01

$$\int z^n\, e^{b z^2+d z+e} \cosh(a z^2+p z+q) \cosh(c z^2+f z+g)\, dz ==$$
$$-\frac{1}{8}\left((-a+b-c)^{-n-1}\, e^{-\frac{(d-f-p)^2}{4(-a+b-c)}+e-g-q} \sum_{j=0}^{n} 2^{j-n}\,(-d+f+p)^{n-j}\,(d-f-p+2(-a+b-c) z)^{j+1}\right.$$
$$\left(-\frac{(d-f-p+2(-a+b-c) z)^2}{-a+b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f-p+2(-a+b-c) z)^2}{4(-a+b-c)}\right) +$$
$$(a+b-c)^{-n-1}\, e^{-\frac{(d-f+p)^2}{4(a+b-c)}+e-g+q} \sum_{j=0}^{n} 2^{j-n}\,(-d+f-p)^{n-j}\,(d-f+p+2(a+b-c) z)^{j+1}$$
$$\left(-\frac{(d-f+p+2(a+b-c) z)^2}{a+b-c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-f+p+2(a+b-c) z)^2}{4(a+b-c)}\right) +$$
$$(-a+b+c)^{-n-1}\, e^{-\frac{(d+f-p)^2}{4(-a+b+c)}+e+g-q} \sum_{j=0}^{n} 2^{j-n}\,(-d-f+p)^{n-j}\,(d+f-p+2(-a+b+c) z)^{j+1}$$
$$\left(-\frac{(d+f-p+2(-a+b+c) z)^2}{-a+b+c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f-p+2(-a+b+c) z)^2}{4(-a+b+c)}\right) +$$
$$(a+b+c)^{-n-1}\, e^{-\frac{(d+f+p)^2}{4(a+b+c)}+e+g+q} \sum_{j=0}^{n} 2^{j-n}\,(-d-f-p)^{n-j}\,(d+f+p+2(a+b+c) z)^{j+1}$$
$$\left.\left(-\frac{(d+f+p+2(a+b+c) z)^2}{a+b+c}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+f+p+2(a+b+c) z)^2}{4(a+b+c)}\right)\right) /;\ n \in \mathbb{N}$$

01.20.21.2995.01

$$\int z^n\, e^{\sqrt{z}\, b+d z+e} \cosh\left(\sqrt{z}\, a+p z+q\right) \cosh\left(\sqrt{z}\, c+f z+g\right) dz ==$$
$$2^{-2n-3}\left(e^{-\frac{(-a+b-c)^2}{4(d-f-p)}+e-g-q}\,(d-f-p)^{-2n-2} \sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h}\, 4^i\,(-a+b-c)^{-h-i+2n}\left(-a+b-c+2(d-f-p)\sqrt{z}\right)^{h+i}\right.$$

$$\left(-\frac{\left(-a+b-c+2\,(d-f-p)\,\sqrt{z}\right)^2}{d-f-p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((-a+b-c)\left(-a+b-c+2\,(d-f-p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(-a+b-c+2\,(d-f-p)\,\sqrt{z}\right)^2}{4\,(d-f-p)}\right)+2\sqrt{-\frac{\left(-a+b-c+2\,(d-f-p)\,\sqrt{z}\right)^2}{d-f-p}}$$

$$\left.(d-f-p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-a+b-c+2\,(d-f-p)\,\sqrt{z}\right)^2}{4\,(d-f-p)}\right)\right)+$$

$$e^{-\frac{(-a+b+c)^2}{4\,(d+f-p)}+e+g-q}\,(d+f-p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-a+b+c)^{-h-i+2\,n}\left(-a+b+c+2\,(d+f-p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-a+b+c+2\,(d+f-p)\,\sqrt{z}\right)^2}{d+f-p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((-a+b+c)\left(-a+b+c+2\,(d+f-p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(-a+b+c+2\,(d+f-p)\,\sqrt{z}\right)^2}{4\,(d+f-p)}\right)+2\sqrt{-\frac{\left(-a+b+c+2\,(d+f-p)\,\sqrt{z}\right)^2}{d+f-p}}$$

$$\left.(d+f-p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-a+b+c+2\,(d+f-p)\,\sqrt{z}\right)^2}{4\,(d+f-p)}\right)\right)+e^{-\frac{(a+b-c)^2}{4\,(d-f+p)}+e-g+q}\,(d-f+p)^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(a+b-c)^{-h-i+2\,n}\left(a+b-c+2\,(d-f+p)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(a+b-c+2\,(d-f+p)\,\sqrt{z}\right)^2}{d-f+p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((a+b-c)\left(a+b-c+2\,(d-f+p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(a+b-c+2\,(d-f+p)\,\sqrt{z}\right)^2}{4\,(d-f+p)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(a+b-c+2\,(d-f+p)\,\sqrt{z}\right)^2}{d-f+p}}\;(d-f+p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(a+b-c+2\,(d-f+p)\,\sqrt{z}\right)^2}{4\,(d-f+p)}\right)\right)+$$

$$e^{-\frac{(a+b+c)^2}{4\,(d+f+p)}+e+g+q}\,(d+f+p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(a+b+c)^{-h-i+2\,n}\left(a+b+c+2\,(d+f+p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(a+b+c+2\,(d+f+p)\,\sqrt{z}\right)^2}{d+f+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((a+b+c)\left(a+b+c+2\,(d+f+p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(a+b+c+2\,(d+f+p)\,\sqrt{z}\right)^2}{4\,(d+f+p)}\right)+2\sqrt{-\frac{\left(a+b+c+2\,(d+f+p)\,\sqrt{z}\right)^2}{d+f+p}}$$

$$\left.(d+f+p)\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(a+b+c+2\,(d+f+p)\,\sqrt{z}\right)^2}{4\,(d+f+p)}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving products of several direct functions, exponential and a power functions

Involving $z^{\alpha-1}\,e^{p\,z}\,\cosh(a\,z)\cosh(b\,z)\cosh(c\,z)$

01.20.21.2996.01

$$\int z^{\alpha-1}\,e^{p\,z}\cosh(a\,z)\cosh(b\,z)\cosh(c\,z)\,dz==$$

$$\frac{1}{8}\,z^{\alpha}\left(-((a+b-c-p)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+b-c-p)\,z)-((a-b+c-p)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a-b+c-p)\,z)-\right.$$
$$((a+b+c-p)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a+b+c-p)\,z)-(-(a-b-c+p)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a-b-c+p)\,z)-$$
$$(-(a+b-c+p)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a+b-c+p)\,z)-(-(a-b+c+p)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a-b+c+p)\,z)-$$
$$\left.(-(-a+b+c+p)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(-a+b+c+p)\,z)-(-(a+b+c+p)\,z)^{-\alpha}\,\Gamma(\alpha,\,-(a+b+c+p)\,z)\right)$$

Involving $z^{\alpha-1}\,e^{p\,z}\prod_{k=1}^{n}\cosh(a_k\,z)$

01.20.21.2997.01

$$\int z^{\alpha-1}\,e^{p\,z}\prod_{k=1}^{n}\cosh(a_k\,z)\,dz==$$

$$-2^{-n-1}\,z^{\alpha}\sum_{\substack{k_1=-1\\ \Delta k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta k_n=2}}^{1}\left(\left(\left(\left(\sum_{j=1}^{n}k_j\,a_j-p\right)z\right)^{-\alpha}\,\Gamma\left(\alpha,\,\left(\sum_{j=1}^{n}k_j\,a_j-p\right)z\right)+\left(-\left(p+\sum_{j=1}^{n}k_j\,a_j\right)z\right)^{-\alpha}\,\Gamma\left(\alpha,\,-\left(p+\sum_{j=1}^{n}k_j\,a_j\right)z\right)\right)\right)$$

01.20.21.2998.01

$$\int\frac{1}{z}\,e^{p\,z}\prod_{k=1}^{n}\cosh(a_k\,z)\,dz==\frac{1}{2^{n+1}}\sum_{\substack{k_1=-1\\ \Delta k_1=2}}^{1}\sum_{\substack{k_2=-1\\ \Delta k_2=2}}^{1}\cdots\sum_{\substack{k_n=-1\\ \Delta k_n=2}}^{1}\left(\mathrm{Ei}\left(\left(p-\sum_{j=1}^{n}k_j\,a_j\right)z\right)+\mathrm{Ei}\left(\left(p+\sum_{j=1}^{n}k_j\,a_j\right)z\right)\right)$$

Involving products of powers of the direct function, exponential and a power functions

Involving product of power of the direct function, the direct function, exponential and a power functions

Involving $z^{\alpha-1}\, e^{b\,z}\, \cosh(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.2999.01

$$\int z^{\alpha-1}\, e^{b\,z} \cosh(c\,z) \cosh^{\nu}(a\,z)\, dz ==$$

$$-2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(E_{1-\alpha}((-b-c)\,z)+E_{1-\alpha}((c-b)\,z))\,(1-\nu \bmod 2)\,z^{\alpha}-2^{-\nu-1}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}((-b-c-2\,a\,s+a\,\nu)\,z)+$$

$$E_{1-\alpha}((-b+c-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-b-c+2\,a\,s-a\,\nu)\,z)+E_{1-\alpha}((-b+c+2\,a\,s-a\,\nu)\,z))\;/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.3000.01

$$\int z^{n}\, e^{b\,z} \cosh(c\,z) \cosh^{\nu}(a\,z)\, dz ==$$

$$\frac{1}{2}\,e^{b\,z}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\,n!\left(e^{-c\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}\,(b-c-a\,\nu)^{-p-1}}{(n-p)!}\;{}_{p+2}F_{p+1}\left(\frac{b-c-a\,\nu}{2\,a},\ldots,\frac{b-c-a\,\nu}{2\,a},\right.\right.$$

$$\left.-\nu;\frac{b-c-a\,\nu}{2\,a}+1,\ldots,\frac{b-c-a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)+e^{c\,z}\sum_{p=0}^{n}\frac{(-1)^{p}\,z^{n-p}\,(b+c-a\,\nu)^{-p-1}}{(n-p)!}$$

$$\left.{}_{p+2}F_{p+1}\left(\frac{b+c-a\,\nu}{2\,a},\ldots,\frac{b+c-a\,\nu}{2\,a},-\nu;\frac{b+c-a\,\nu}{2\,a}+1,\ldots,\frac{b+c-a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)\right)\;/;\;n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \cosh(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3001.01

$$\int z^{\alpha-1}\, e^{p\,z} \cosh(c\,z+d) \cosh^{\nu}(a\,z)\, dz == -2^{-\nu-1}\,e^{-d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,d}\,E_{1-\alpha}((-c-p)\,z)+E_{1-\alpha}((c-p)\,z)\right)(1-\nu \bmod 2)\,z^{\alpha}-$$

$$2^{-\nu-1}\,z^{\alpha}\,e^{-d}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,d}\,(E_{1-\alpha}((-c-p-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-c-p+2\,a\,s-a\,\nu)\,z))+\right.$$

$$\left.E_{1-\alpha}((c-p-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((c-p+2\,a\,s-a\,\nu)\,z)\right)\;/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.3002.01

$$\int z^{n}\, e^{p\,z} \cosh(d+c\,z) \cosh^{\nu}(a\,z)\, dz ==$$

$$\frac{1}{2}\left(1+e^{-2\,a\,z}\right)^{-\nu}n!\cosh^{\nu}(a\,z)\left(e^{(p-c)\,z-d}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-c+p+a\,\nu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(-\frac{-c+p+a\,\nu}{2\,a},\ldots,-\frac{-c+p+a\,\nu}{2\,a},\right.\right.$$

$$\left.-\nu;1-\frac{-c+p+a\,\nu}{2\,a},\ldots,1-\frac{-c+p+a\,\nu}{2\,a};-e^{-2\,a\,z}\right)+e^{d+(c+p)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(c+p+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(-\frac{c+p+a\,\nu}{2\,a},\ldots,-\frac{c+p+a\,\nu}{2\,a},-\nu;1-\frac{c+p+a\,\nu}{2\,a},\ldots,1-\frac{c+p+a\,\nu}{2\,a};-e^{-2\,a\,z}\right)\right)\;/;\;n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \cosh(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.3003.01

$$\int z^{\alpha-1}\, e^{p\,z} \cosh(c\,z) \cosh^{\nu}(a\,z+b)\, dz == -2^{-\nu-1} \binom{\nu}{\frac{\nu}{2}} (E_{1-\alpha}((-c-p)\,z) + E_{1-\alpha}((c-p)\,z))\,(1-\nu \bmod 2)\, z^{\alpha} -$$

$$2^{-\nu-1}\, z^{\alpha} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2\,b\,s-b\,\nu} \binom{\nu}{s} \left(e^{4\,b\,s}\, E_{1-\alpha}((-c-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((-c-p+2\,a\,s-a\,\nu)\,z) + \right.$$

$$\left. e^{4\,b\,s}\, E_{1-\alpha}((c-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((c-p+2\,a\,s-a\,\nu)\,z)\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.3004.01

$$\int z^{n}\, e^{p\,z} \cosh(c\,z) \cosh^{\nu}(b+a\,z)\, dz ==$$

$$\frac{1}{2}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu} n!\, \cosh^{\nu}(b+a\,z) \left(e^{(c+p)\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (c+p+a\,\nu)^{-j-1}}{(n-j)!}\ {}_{j+2}F_{j+1}\left(-\frac{c+p+a\,\nu}{2\,a}, \ldots, -\frac{c+p+a\,\nu}{2\,a}, \right.\right.$$

$$\left. -\nu;\ 1-\frac{c+p+a\,\nu}{2\,a}, \ldots, 1-\frac{c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right) + e^{(p-c)\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (-c+p+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left. {}_{j+2}F_{j+1}\left(-\frac{-c+p+a\,\nu}{2\,a}, \ldots, -\frac{-c+p+a\,\nu}{2\,a}, -\nu;\ 1-\frac{-c+p+a\,\nu}{2\,a}, \ldots, 1-\frac{-c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right)\right) /;\ n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z} \cosh(c\,z+d) \cosh^{\nu}(a\,z+b)$

01.20.21.3005.01

$$\int z^{\alpha-1}\, e^{p\,z} \cosh(c\,z+d) \cosh^{\nu}(a\,z+b)\, dz == -2^{-\nu-1}\, e^{-d} \binom{\nu}{\frac{\nu}{2}} \left(e^{2\,d}\, E_{1-\alpha}((-c-p)\,z) + E_{1-\alpha}((c-p)\,z)\right)(1-\nu \bmod 2)\, z^{\alpha} -$$

$$2^{-\nu-1}\, z^{\alpha} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-d-2\,b\,s-b\,\nu} \binom{\nu}{s} \left(e^{2\,d} \left(e^{4\,b\,s}\, E_{1-\alpha}((-c-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((-c-p+2\,a\,s-a\,\nu)\,z)\right) + \right.$$

$$\left. e^{4\,b\,s}\, E_{1-\alpha}((c-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((c-p+2\,a\,s-a\,\nu)\,z)\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.3006.01

$$\int z^{n}\, e^{p\,z} \cosh(d+c\,z) \cosh^{\nu}(b+a\,z)\, dz ==$$

$$\frac{1}{2}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu} n!\, \cosh^{\nu}(b+a\,z) \left(e^{d+(c+p)\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (c+p+a\,\nu)^{-j-1}}{(n-j)!}\ {}_{j+2}F_{j+1}\left(-\frac{c+p+a\,\nu}{2\,a}, \ldots, -\frac{c+p+a\,\nu}{2\,a}, \right.\right.$$

$$\left. -\nu;\ 1-\frac{c+p+a\,\nu}{2\,a}, \ldots, 1-\frac{c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right) + e^{(p-c)\,z-d} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (-c+p+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left. {}_{j+2}F_{j+1}\left(-\frac{-c+p+a\,\nu}{2\,a}, \ldots, -\frac{-c+p+a\,\nu}{2\,a}, -\nu;\ 1-\frac{-c+p+a\,\nu}{2\,a}, \ldots, 1-\frac{-c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right)\right) /;\ n \in \mathbb{N}$$

Involving $z^{n}\, e^{p\,z^{r}} \cosh(b\,z) \cosh^{\nu}(c\,z)$

01.20.21.3007.01

$$\int z^n e^{p z^2} \cosh(b z) \cosh^{\nu}(c z)\, dz ==$$

$$-2^{-\nu-2} e^{-\frac{b^2}{4p}} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(\sum_{q=0}^{n} 2^{q-n} (-b)^{n-q} (b + 2 p z)^{q+1} \left(-\frac{(b+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2pz)^2}{4p} \right) + \right.$$

$$\left. \sum_{q=0}^{n} 2^{q-n} b^{n-q} \left(-\frac{(b-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} (2pz - b)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2pz)^2}{4p} \right) \right) p^{-n-1} -$$

$$2^{-\nu-2} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{b^2+c^2(\nu-2s)^2}{2p}} \binom{\nu}{s} \left(e^{\frac{(b-2cs+c\nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (b + 2cs - c\nu)^{n-q} (-b - 2cs + c\nu + 2pz)^{q+1} \right. \right.$$

$$\left(-\frac{(-b-2cs+c\nu+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-b-2cs+c\nu+2pz)^2}{4p} \right) +$$

$$e^{\frac{(-b-2cs+c\nu)^2}{4p}} \sum_{q=0}^{n} \left(c\left(s - \frac{\nu}{2}\right) - \frac{b}{2} \right)^{n-q} (b - 2cs + c\nu + 2pz)^{q+1} \left(-\frac{(b-2cs+c\nu+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2cs+c\nu+2pz)^2}{4p} \right) + e^{\frac{(b-2cs+c\nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (-b - 2cs + c\nu)^{n-q}$$

$$(b + 2cs - c\nu + 2pz)^{q+1} \left(-\frac{(b+2cs-c\nu+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2cs-c\nu+2pz)^2}{4p} \right) +$$

$$e^{\frac{(-b-2cs+c\nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} (b + c(\nu - 2s))^{n-q} \left(-\frac{(b-2cs+c\nu-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} (-b + 2cs - c\nu + 2pz)^{q+1}$$

$$\left. \left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2cs+c\nu-2pz)^2}{4p} \right) \right) \right) p^{-n-1} /; \nu \in \mathbb{Z} \wedge \nu > 0 \wedge n \in \mathbb{N}$$

01.20.21.3008.01

$$\int z^n e^{p\sqrt{z}} \cosh(b z) \cosh^{\nu}(c z)\, dz == \frac{2^{-2n-\nu-2}}{b^{2n+2}} e^{-\frac{p^2}{4b}} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left(e^{\frac{p^2}{2b}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p - 2b\sqrt{z} \right)^{h+k} \left(\frac{\left(p - 2b\sqrt{z} \right)^2}{b} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \right.$$

$$\left. p \left(p - 2b\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(p - 2b\sqrt{z} \right)^2}{4b} \right) - 2b \sqrt{\frac{\left(p - 2b\sqrt{z} \right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(p - 2b\sqrt{z} \right)^2}{4b} \right) \right) +$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,p^{-h-k+2\,n}\left(2\,\sqrt{z}\;b+p\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\;b+p\right)^{2}}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(2\,\sqrt{z}\;b+p\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,\sqrt{z}\;b+p\right)^{2}}{4\,b}\right)+2\,\sqrt{-\frac{\left(2\,\sqrt{z}\;b+p\right)^{2}}{b}}\;b\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\,\sqrt{z}\;b+p\right)^{2}}{4\,b}\right)\right)+$$

$$2^{-2\,n-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{p^{2}}{4\,b+8\,c\,s-4\,c\,v}}\left(-b-2\,c\,s+c\,v\right)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,p^{-h-k+2\,n}\left(p+2\,(-b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(p+2\,(-b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{b+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,(-b-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.\frac{\left(p+2\,(-b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{4\,b+8\,c\,s-4\,c\,v}\right)+2\,(-b-2\,c\,s+c\,v)\,\sqrt{\frac{\left(p+2\,(-b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{b+2\,c\,s-c\,v}}\;\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+k+2),\,\frac{\left(p+2\,(-b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{4\,b+8\,c\,s-4\,c\,v}\right)\right)+e^{\frac{p^{2}}{4\,b-8\,c\,s+4\,c\,v}}\left(-b+2\,c\,s-c\,v\right)^{-2\,(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,p^{-h-k+2\,n}\left(p-2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{b-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p-2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(p-2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{4\,(b-2\,c\,s+c\,v)}\right)-\right.$$

$$\left.2\,(b-2\,c\,s+c\,v)\,\sqrt{\frac{\left(p-2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{b-2\,c\,s+c\,v}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(p-2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{2}}{4\,(b-2\,c\,s+c\,v)}\right)\right)+$$

$$e^{\frac{p^{2}}{-4\,b+8\,c\,s-4\,c\,v}}\left(b-2\,c\,s+c\,v\right)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,p^{-h-k+2\,n}\left(p+2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{b-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(p+2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(b-2\,c\,s+c\,v)}\right)+2\sqrt{-\frac{\left(p+2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{b-2\,c\,s+c\,v}}\,(b-2\,c\,s+c\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(p+2\,(b-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(b-2\,c\,s+c\,v)}\right)\right)+$$

$$e^{\frac{p^2}{-4\,b-8\,c\,s+4\,c\,v}}\,(b+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,(b+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\,(b+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{b+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,(b+2\,c\,s-c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(p+2\,(b+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,b+8\,c\,s-4\,c\,v}\right)+2\sqrt{-\frac{\left(p+2\,(b+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{b+2\,c\,s-c\,v}}\,(b+2\,c\,s-c\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(p+2\,(b+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,b+8\,c\,s-4\,c\,v}\right)\right)\Big/;\,v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cosh\left(b\,z^r\right)\cosh^v(c\,z)$

01.20.21.3009.01

$$\int z^n e^{p z} \cosh\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$\frac{2^{-\nu-2}}{(-b)^{3/2}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{\frac{(p+c(\nu-2s))^2}{4b}} \binom{\nu}{s} \left(b (-b)^{-n-\frac{1}{2}} \sum_{q=0}^{n} 2^{q-n} (-p+2cs-c\nu)^{n-q} (p-2cs+c\nu-2bz)^{q+1} \right.$$

$$\left(\frac{(p-2cs+c\nu-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cs+c\nu-2bz)^2}{4b} \right) +$$

$$b e^{-\frac{cp(\nu-2s)}{b}} (-b)^{-n-\frac{1}{2}} \sum_{q=0}^{n} 2^{q-n} (c(\nu-2s)-p)^{n-q} (p+2cs-c\nu-2bz)^{q+1}$$

$$\left(\frac{(p+2cs-c\nu-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2cs-c\nu-2bz)^2}{4b} \right) + b^{-n-\frac{1}{2}} \sqrt{-b^2}$$

$$\left(e^{-\frac{(p-2cs+c\nu)^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-p+2cs-c\nu)^{n-q} (p+c(\nu-2s)+2bz)^{q+1} \left(-\frac{(p+c(\nu-2s)+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p-2cs+c\nu+2bz)^2}{4b} \right) + e^{-\frac{p^2+c^2(\nu-2s)^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (c(\nu-2s)-p)^{n-q} (p+2cs-c\nu+$$

$$\left. \left. 2bz)^{q+1} \left(-\frac{(p+2cs-c\nu+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2cs-c\nu+2bz)^2}{4b} \right) \right) \right) -$$

$$\frac{2^{-\nu-2}}{\sqrt{-b^2}} e^{\frac{p^2}{4b}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sqrt{b}\ (-b)^{-n-\frac{1}{2}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p-2bz)^{q+1} \left(\frac{(p-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2bz)^2}{4b} \right) + \sqrt{-b}\ b^{-n-\frac{1}{2}} e^{-\frac{p^2}{2b}}$$

$$\left. \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p+2bz)^{q+1} \left(-\frac{(p+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2bz)^2}{4b} \right) \right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3010.01

$$\int z^n e^{p z} \cosh\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz == 2^{-2n-\nu-2} e^{-\frac{b^2}{4p}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2n} \left(b+2p\sqrt{z}\right)^{h+k} \left(-\frac{\left(b+2p\sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b+2p\sqrt{z}\right) \right. \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2p\sqrt{z}\right)^2}{4p}\right)+2\sqrt{-\frac{\left(b+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2p\sqrt{z}\right)^2}{4p}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-\frac{\left(b-2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\left(2p\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b-2p\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-2p\sqrt{z}\right)^2}{4p}\right)+2\sqrt{-\frac{\left(b-2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-2p\sqrt{z}\right)^2}{4p}\right)\Bigg)\Bigg)$$

$$p^{-2(n+1)}+2^{-2n-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{b^2}{4(p-2cs+cv)}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b+2(p-2cs+cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2(p-2cs+cv)\sqrt{z}\right)^2}{p-2cs+cv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(p-2cs+cv)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(p-2cs+cv)\sqrt{z}\right)^2}{4(p-2cs+cv)}\right)+2\sqrt{-\frac{\left(b+2(p-2cs+cv)\sqrt{z}\right)^2}{p-2cs+cv}}$$

$$(p-2cs+cv)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(p-2cs+cv)\sqrt{z}\right)^2}{4(p-2cs+cv)}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(-\frac{\left(b-2(p-2cs+cv)\sqrt{z}\right)^2}{p-2cs+cv}\right)^{\frac{1}{2}(-h-k-1)}\left(2(p-2cs+cv)\sqrt{z}-b\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(2(p-2cs+cv)\sqrt{-\frac{\left(b-2(p-2cs+cv)\sqrt{z}\right)^2}{p-2cs+cv}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-2(p-2cs+cv)\sqrt{z}\right)^2}{4(p-2cs+cv)}\right)-b\left(2(p-2cs+cv)\sqrt{z}-b\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-2(p-2cs+cv)\sqrt{z}\right)^2}{4(p-2cs+cv)}\right)\Bigg)(p-2cs+cv)^{-2(n+1)}+$$

$$e^{-\frac{b^2}{4(p+2cs-cv)}}(p+2cs-cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2(p+2cs-cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(p+2cs-cv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.$$

$$\left.-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)+2\sqrt{-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}}\,(p+2cs-cv)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+2),-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\Bigg)\Bigg)+e^{-\frac{b^2}{4(p+2cs-cv)}}(p+2cs-cv)^{-2(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}\right)^{\frac{1}{2}(-h-k-1)}\left(2(p+2cs-cv)\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(2(p+2cs-cv)\sqrt{-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)-$$

$$b\left(2(p+2cs-cv)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)\Bigg)\Bigg)/;\,v\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cosh(b\,z)\cosh^v(c\,z^r)$

01.20.21.3011.01

$$\int z^n e^{p z} \cosh(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$-2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,(-b-p)z)(-b-p)^{-n-1}+(b-p)^{-n-1}\Gamma(n+1,(b-p)z)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{\frac{(p-b)^2}{4c(\nu-2k)}}(-c(\nu-2k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(b-p)^{n-q}(-b+p-2c(\nu-2k)z)^{q+1}\left(\frac{(-b+p-2c(\nu-2k)z)^2}{c(\nu-2k)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-b+p-2c(\nu-2k)z)^2}{4c(\nu-2k)}\right)+e^{\frac{(b+p)^2}{4c(\nu-2k)}}(-c(\nu-2k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-b-p)^{n-q}$$

$$(b+p-2c(\nu-2k)z)^{q+1}\left(\frac{(b+p-2c(\nu-2k)z)^2}{c(\nu-2k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b+p-2c(\nu-2k)z)^2}{4c(\nu-2k)}\right)+$$

$$e^{-\frac{(p-b)^2}{4c(\nu-2k)}}(c(\nu-2k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(b-p)^{n-q}(-b+p+2c(\nu-2k)z)^{q+1}$$

$$\left(-\frac{(-b+p+2c(\nu-2k)z)^2}{c(\nu-2k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-b+p+2c(\nu-2k)z)^2}{4c(\nu-2k)}\right)+$$

$$e^{-\frac{(b+p)^2}{4c(\nu-2k)}}(c(\nu-2k))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-b-p)^{n-q}(b+p+2c(\nu-2k)z)^{q+1}\left(-\frac{(b+p+2c(\nu-2k)z)^2}{c(\nu-2k)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b+p+2c(\nu-2k)z)^2}{4c(\nu-2k)}\right)\right) /; \nu\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

01.20.21.3012.01

$$\int z^n e^{p z} \cosh(b z) \cosh^{\nu}\left(c\sqrt{z}\right) dz ==$$

$$2^{-2n-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{c^2(2k-\nu)^2}{4(p-b)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(2k-\nu))^{-h-j+2n}\left(2(p-b)\sqrt{z}-c(2k-\nu)\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(2(p-b)\sqrt{z}-c(2k-\nu)\right)^2}{p-b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left.\left(2(p-b)\sqrt{-\frac{\left(2(p-b)\sqrt{z}-c(2k-\nu)\right)^2}{p-b}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(p-b)\sqrt{z}-c(2k-\nu)\right)^2}{4(p-b)}\right)-c\right.$$

$$(2k-v)\left(2(p-b)\sqrt{z}-c(2k-v)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(p-b)\sqrt{z}-c(2k-v)\right)^2}{4(p-b)}\right)\Bigg)\Bigg)$$

$$(p-b)^{-2n-2}+e^{-\frac{c^2(v-2k)^2}{4(p-b)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\left(2(p-b)\sqrt{z}-c(v-2k)\right)^{h+j}\right.$$

$$\left(-\frac{\left(2(p-b)\sqrt{z}-c(v-2k)\right)^2}{p-b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2(p-b)\sqrt{-\frac{\left(2(p-b)\sqrt{z}-c(v-2k)\right)^2}{p-b}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(p-b)\sqrt{z}-c(v-2k)\right)^2}{4(p-b)}\right)-c(v-2k)\left(2(p-b)\sqrt{z}-c(v-2k)\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(p-b)\sqrt{z}-c(v-2k)\right)^2}{4(p-b)}\right)\Bigg)\right)(p-b)^{-2n-2}+e^{-\frac{c^2(2k-v)^2}{4(b+p)}}(b+p)^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(2k-v))^{-h-j+2n}\left(2(b+p)\sqrt{z}-c(2k-v)\right)^{h+j}\left(-\frac{\left(2(b+p)\sqrt{z}-c(2k-v)\right)^2}{b+p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2(b+p)\sqrt{-\frac{\left(2(b+p)\sqrt{z}-c(2k-v)\right)^2}{b+p}}\ \Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(b+p)\sqrt{z}-c(2k-v)\right)^2}{4(b+p)}\right)-$$

$$c(2k-v)\left(2(b+p)\sqrt{z}-c(2k-v)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(b+p)\sqrt{z}-c(2k-v)\right)^2}{4(b+p)}\right)\Bigg)+$$

$$e^{-\frac{c^2(v-2k)^2}{4(b+p)}}(b+p)^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\left(2(b+p)\sqrt{z}-c(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(2(b+p)\sqrt{z}-c(v-2k)\right)^2}{b+p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2(b+p)\sqrt{-\frac{\left(2(b+p)\sqrt{z}-c(v-2k)\right)^2}{b+p}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(b+p)\sqrt{z}-c(v-2k)\right)^2}{4(b+p)}\right)-\right.$$

$$\left.c(v-2k)\left(2(b+p)\sqrt{z}-c(v-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(b+p)\sqrt{z}-c(v-2k)\right)^2}{4(b+p)}\right)\right)-$$

$$2^{-v-1}z^{n+1}\binom{v}{\frac{v}{2}}\left(\Gamma(n+1,(-b-p)z)((-b-p)z)^{-n-1}+((b-p)z)^{-n-1}\Gamma(n+1,(b-p)z)\right)$$

$$(1-v \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\, e^{p\,z}\cosh\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3013.01

$$\int z^n e^{p z} \cosh\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$-2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{\sqrt{-b-2cs+c\nu}} e^{\frac{p^2}{4b+8cs-4c\nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-b-2cs+c\nu)^{-n-\frac{1}{2}} (p+2(-b-2cs+c\nu)z)^{q+1} \right.$$

$$\left(-\frac{(p+2(-b-2cs+c\nu)z)^2}{-b-2cs+c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(-b-2cs+c\nu)z)^2}{-4b-8cs+4c\nu} \right) +$$

$$\frac{1}{\sqrt{b-2cs+c\nu}} e^{\frac{p^2}{-4b+8cs-4c\nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (b-2cs+c\nu)^{-n-\frac{1}{2}} (p+2(b-2cs+c\nu)z)^{q+1}$$

$$\left(-\frac{(p+2(b-2cs+c\nu)z)^2}{b-2cs+c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2(b-2cs+c\nu)z)^2}{-4b+8cs-4c\nu} \right) +$$

$$\frac{1}{\sqrt{-b+2cs-c\nu}} e^{\frac{p^2}{4b-8cs+4c\nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-b+2cs-c\nu)^{-n-\frac{1}{2}} (p+2(-b+2cs-c\nu)z)^{q+1}$$

$$\left(-\frac{(p+2(-b+2cs-c\nu)z)^2}{-b+2cs-c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2(-b+2cs-c\nu)z)^2}{-4b+8cs-4c\nu} \right) +$$

$$\frac{1}{\sqrt{b+2cs-c\nu}} e^{\frac{p^2}{-4b-8cs+4c\nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (b+2cs-c\nu)^{-n-\frac{1}{2}} (p+2(b+2cs-c\nu)z)^{q+1}$$

$$\left. \left(\frac{(p+2(b+2cs-c\nu)z)^2}{-b-2cs+c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2(b+2cs-c\nu)z)^2}{-4b-8cs+4c\nu} \right) \right) - \frac{2^{-\nu-2}}{\sqrt{-b^2}} e^{-\frac{p^2}{4b}} \binom{\nu}{\frac{\nu}{2}}$$

$$(1-\nu \bmod 2) \left(\sqrt{b}\ (-b)^{-n-\frac{1}{2}} e^{\frac{p^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p-2bz)^{q+1} \left(\frac{(p-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2bz)^2}{4b} \right) + \right.$$

$$\left. \sqrt{-b}\ b^{-n-\frac{1}{2}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p+2bz)^{q+1} \left(-\frac{(p+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2bz)^2}{4b} \right) \right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3014.01

$$\int z^n e^{p z} \cosh\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-2n-\nu-2} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(-b-c(2s-\nu))^2}{4p}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-b-c(2s-\nu))^{-h-j+2n} \left(-b-c(2s-\nu)+2p\sqrt{z}\right)^{h+j} \right. \right.$$

$$\left(-\frac{\left(-b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-b-c\,(2\,s-v))\left(-b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(-b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+e^{-\frac{(b-c\,(2\,s-v))^2}{4\,p}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-c\,(2\,s-v))^{-h-j+2\,n}\left(b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((b-c\,(2\,s-v))\left(b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(-b-c\,(v-2\,s))^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b-c\,(v-2\,s))^{-h-j+2\,n}\left(-b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-b-c\,(v-2\,s))\left(-b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(-b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(b-c\,(v-2\,s))^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-c\,(v-2\,s))^{-h-j+2\,n}\left(b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b-c\,(v-2\,s))\left(b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\Bigg)\Bigg)p^{-2\,n-2}+$$

$$2^{-2\,n-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(e^{-\frac{b^2}{4\,p}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b)^{-h-j+2\,n}\left(2\,p\,\sqrt{z}-b\right)^{h+j}\left(-\frac{\left(2\,p\,\sqrt{z}-b\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(2\,p\sqrt{-\frac{\left(2\,p\,\sqrt{z}-b\right)^2}{p}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,p\,\sqrt{z}-b\right)^2}{4\,p}\right)-\right.$$

$$\left.\left.b\left(2\,p\,\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(2\,p\,\sqrt{z}-b\right)^2}{4\,p}\right)\right)\Bigg)\Bigg)p^{-2\,n-2}+$$

$$e^{-\frac{b^2}{4\,p}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,b^{-h-j+2\,n}\left(b+2\,p\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left(b\left(b+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\Bigg)\Bigg)p^{-2\,n-2}\right)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{p\,z^r}\cosh(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.3015.01

$$\int z^n e^{p z^2} \cosh(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{-\frac{b^2}{4p}}\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\,(2\,p\,z-b)^{q+1}\left(-\frac{(2\,p\,z-b)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,p\,z-b)^2}{4\,p}\right)+\right.$$

$$\left.e^{-\frac{b^2}{4p}}\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b+2\,p\,z)^{q+1}\left(-\frac{(b+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b+2\,p\,z)^2}{4\,p}\right)\right)p^{-n-1}-$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{b^2}{4(p+c(\nu-2k))}}\left(\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\,(2\,(p+c\,(\nu-2\,k))\,z-b)^{q+1}\left(-\frac{(2\,(p+c\,(\nu-2\,k))\,z-b)^2}{p+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,(p+c\,(\nu-2\,k))\,z-b)^2}{4\,(p+c\,(\nu-2\,k))}\right)\right)(p+c\,(\nu-2\,k))^{-n-1}+\right.$$

$$\left.e^{-\frac{b^2}{4(p+c(\nu-2k))}}\left(\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b+2\,(p+c\,(\nu-2\,k))\,z)^{q+1}\left(-\frac{(b+2\,(p+c\,(\nu-2\,k))\,z)^2}{p+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b+2\,(p+c\,(\nu-2\,k))\,z)^2}{4\,(p+c\,(\nu-2\,k))}\right)\right)(p+c\,(\nu-2\,k))^{-n-1}+\right.$$

$$\left.e^{-\frac{b^2}{4(p-c(\nu-2k))}}\,(p-c\,(\nu-2\,k))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\,(2\,(p-c\,(\nu-2\,k))\,z-b)^{q+1}\right.$$

$$\left.\left(-\frac{(2\,(p-c\,(\nu-2\,k))\,z-b)^2}{p-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,(p-c\,(\nu-2\,k))\,z-b)^2}{4\,(p-c\,(\nu-2\,k))}\right)+\right.$$

$$\left.e^{-\frac{b^2}{4(p-c(\nu-2k))}}\,(p-c\,(\nu-2\,k))^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\,(b+2\,(p-c\,(\nu-2\,k))\,z)^{q+1}\right.$$

$$\left.\left(-\frac{(b+2\,(p-c\,(\nu-2\,k))\,z)^2}{p-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b+2\,(p-c\,(\nu-2\,k))\,z)^2}{4\,(p-c\,(\nu-2\,k))}\right)\right)/;\,\nu\in\mathbb{Z}\wedge\nu>0\wedge n\in\mathbb{N}$$

01.20.21.3016.01

$$\int z^n e^{p\sqrt{z}} \cosh(b z) \cosh^{\nu}\left(c\sqrt{z}\right) dz == 2^{-2n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{p^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,p^{-h-j+2n}\left(p-2\,b\sqrt{z}\right)^{h+j}\left(\frac{\left(p-2\,b\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right|p\left(p-2\,b\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(p-2\,b\,\sqrt{z}\right)^2}{4\,b}\right)-2\,b\sqrt{\frac{\left(p-2\,b\,\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(p-2\,b\,\sqrt{z}\right)^2}{4\,b}\right)\Bigg)+$$

$$e^{-\frac{p^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,p^{-h-j+2n}\left(2\sqrt{z}\ b+p\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\ b+p\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(p\left(2\sqrt{z}\ b+p\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2\sqrt{z}\ b+p\right)^2}{4\,b}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ b+p\right)^2}{b}}\ b\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\sqrt{z}\ b+p\right)^2}{4\,b}\right)\Bigg)\Bigg)$$

$$b^{-2n-2}+2^{-2n-v-2}\Bigg(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{\frac{(p+c(v-2k))^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p+c\,(v-2\,k))^{-h-j+2n}\left(-2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{\left(-2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((p+c\,(v-2\,k))\left(-2\sqrt{z}\ b+p+c\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{4\,b}\right)-2$$

$$b\sqrt{\frac{\left(-2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{4\,b}\right)\Bigg)+$$

$$e^{\frac{(p-c(v-2k))^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p-c\,(v-2\,k))^{-h-j+2n}\left(-2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{\left(-2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((p-c\,(v-2\,k))\left(-2\sqrt{z}\ b+p-c\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{4\,b}\right)-2\,b$$

$$\sqrt{\frac{\left(-2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{b}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{4\,b}\right)\Bigg)+e^{-\frac{(p+c\,(v-2\,k))^2}{4\,b}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p+c\,(v-2\,k))^{-h-j+2\,n}\left(2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^{h+j}\left(-\frac{\left(2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((p+c\,(v-2\,k))\left(2\sqrt{z}\ b+p+c\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{4\,b}\right)+2$$

$$\sqrt{-\frac{\left(2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{b}}\ b\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(2\sqrt{z}\ b+p+c\,(v-2\,k)\right)^2}{4\,b}\right)\Bigg)+$$

$$e^{-\frac{(p-c\,(v-2\,k))^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p-c\,(v-2\,k))^{-h-j+2\,n}\left(2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((p-c\,(v-2\,k))\left(2\sqrt{z}\ b+p-c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{4\,b}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{b}}$$

$$b\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(2\sqrt{z}\ b+p-c\,(v-2\,k)\right)^2}{4\,b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\ b^{-2\,n-2}\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\ e^{p\,z^r}\ \cosh\left(b\,z^r\right)\cosh^v(c\,z)$

01.20.21.3017.01

$$\int z^n e^{p z^2} \cosh\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2}, (-b-p) z^2\right)\left((-b-p) z^2\right)^{\frac{1}{2}(-n-1)} + \left((b-p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b-p) z^2\right)\right)(1-\nu \bmod 2)\, z^{n+1} -$$

$$\frac{2^{-\nu-2}}{\sqrt{p-b}\,\sqrt{b+p}} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-\frac{c^2 p (\nu-2s)^2}{2(p-b)(b+p)}}\binom{\nu}{s}\left(e^{\frac{c^2(\nu-2s)^2}{4(b+p)}}\sqrt{b+p}\sum_{q=0}^{n} 2^{q-n}(p-b)^{-n-\frac{1}{2}}(c(\nu-2s))^{n-q}(c(2s-\nu)+2(p-b)z)^{q+1}\right.$$

$$\left(-\frac{(c(2s-\nu)+2(p-b)z)^2}{p-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(2s-\nu)+2(p-b)z)^2}{4(p-b)}\right)+$$

$$e^{\frac{c^2(\nu-2s)^2}{4(b+p)}}\sqrt{b+p}\sum_{q=0}^{n}(p-b)^{-n-\frac{1}{2}}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(c(\nu-2s)+2(p-b)z)^{q+1}$$

$$\left(-\frac{(c(\nu-2s)+2(p-b)z)^2}{p-b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(\nu-2s)+2(p-b)z)^2}{4(p-b)}\right)+e^{\frac{c^2(\nu-2s)^2}{4(p-b)}}\sqrt{p-b}$$

$$\left(\sum_{q=0}^{n} 2^{q-n}(b+p)^{-n-\frac{1}{2}}(c(\nu-2s))^{n-q}(c(2s-\nu)+2(b+p)z)^{q+1}\left(-\frac{(c(2s-\nu)+2(b+p)z)^2}{b+p}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(2s-\nu)+2(b+p)z)^2}{4(b+p)}\right)+\sum_{q=0}^{n}(b+p)^{-n-\frac{1}{2}}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(c(\nu-2s)+2(b+p)z)^{q+1}$$

$$\left.\left.\left(-\frac{(c(\nu-2s)+2(b+p)z)^2}{b+p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(\nu-2s)+2(b+p)z)^2}{4(b+p)}\right)\right)\right) /; \nu\in\mathbb{N}^+ \bigwedge n\in\mathbb{N}$$

01.20.21.3018.01

$$\int z^n e^{p\sqrt{z}} \cosh\left(b\sqrt{z}\right)\cosh^{\nu}(c z)\, dz ==$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-\frac{b^2+p^2}{c(4s-2\nu)}}(c(2s-\nu))^{-2n}(c(\nu-2s))^{-2(n+1)}\binom{\nu}{s}\left(e^{\frac{(b+p)^2}{c(8s-4\nu)}}(c(\nu-2s))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(p-b)^{-h-k+2n}\right.$$

$$\left(-b+p+2c(2s-\nu)\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b+p+2c(2s-\nu)\sqrt{z}\right)^2}{c(2s-\nu)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((p-b)\left(-b+p+2c(2s-\nu)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(-b+p+2c(2s-\nu)\sqrt{z}\right)^2}{c(8s-4\nu)}\right)+\right.$$

$$2\,c\,(2\,s-v)\sqrt{-\frac{\left(-b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(-b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)+$$

$$e^{\frac{(p-b)^2}{c\,(8\,s-4\,v)}}\left((c\,(2\,s-v))^{2\,n}\left(e^{\frac{b^2+p^2}{c\,(4\,s-2\,v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p-b)^{-h-k+2\,n}\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((p-b)\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\,(v-2\,s)$$

$$\left.\sqrt{-\frac{\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{(b+p)^2}{4\,c\,s-2\,c\,v}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+p)^{-h-k+2\,n}\left(b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+p)\left(b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\,(v-2\,s)\right.$$

$$\left.\left.\sqrt{-\frac{\left(b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\right)+$$

$$(c\,(v-2\,s))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+p)^{-h-k+2\,n}\left(b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+p)\left(b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\,(2\,s-v)\right.$$

$$\left.\sqrt{-\frac{\left(b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\Bigg)\Bigg)-$$

$$2^{-v}\binom{v}{\frac{v}{2}}\left(\Gamma\left(2\,(n+1),\,(-b-p)\,\sqrt{z}\right)(-b-p)^{-2\,(n+1)}+(b-p)^{-2\,(n+1)}\,\Gamma\left(2\,n+2,\,(b-p)\,\sqrt{z}\right)\right)$$

$$(1-$$

$$v$$

$$\text{mod}$$

$$2)\;/;\;v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\cosh\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3019.01

$$\int z^{\alpha-1}\,e^{p\,z^r}\cosh(b\,z^r)\cosh^v(c\,z^r)\,dz==$$

$$-\frac{2^{-v-1}\,z^{\alpha}}{r}\left(\binom{v}{\frac{v}{2}}\left(\Gamma\left(\frac{\alpha}{r},\,(-b-p)\,z^r\right)((-b-p)\,z^r)^{-\frac{\alpha}{r}}+((b-p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b-p)\,z^r\right)\right)(1-v\bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,(-b-p-2\,c\,s+c\,v)\,z^r\right)((-b-p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$((b-p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b-p-2\,c\,s+c\,v)\,z^r\right)+((-b-p+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},\,(-b-p+2\,c\,s-c\,v)\,z^r\right)+((b-p+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b-p+2\,c\,s-c\,v)\,z^r\right)\right)\right)\Bigg)\Bigg)\Bigg

01.20.21.3020.01

$$\int z^{\alpha-1}\, e^{b\, z^r+e} \cosh(a\, z^r+q) \cosh^{\nu}(c\, z^r+g)\, dz ==$$

$$-\frac{2^{-\nu-1}\, z^{\alpha}}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e+q}\,\Gamma\left(\frac{\alpha}{r},\,(-a-b)\, z^r\right)((-a-b)\, z^r)^{-\frac{\alpha}{r}}+e^{e-q}\,((a-b)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(a-b)\, z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+q+2\, g\, s-g\, \nu}\,\Gamma\left(\frac{\alpha}{r},\,(-a-b-2\, c\, s+c\, \nu)\, z^r\right)((-a-b-2\, c\, s+c\, \nu)\, z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-q+2\, g\, s-g\, \nu}\,((a-b-2\, c\, s+c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(a-b-2\, c\, s+c\, \nu)\, z^r\right)+e^{e+q-2\, g\, s+g\, \nu}\,((-a-b+2\, c\, s-c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\right.$$

$$\left.\left.\left.\frac{\alpha}{r},\,(-a-b+2\, c\, s-c\, \nu)\, z^r\right)+e^{e-q-2\, g\, s+g\, \nu}\,((a-b+2\, c\, s-c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(a-b+2\, c\, s-c\, \nu)\, z^r\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $z^n\, e^{b\, z^r+d\, z+e}\cosh(a\, z^r+p\, z+q)\cosh^{\nu}(c\, z^r+f\, z+g)$

01.20.21.3021.01

$$\int z^n e^{b z^2+d z+e} \cosh\left(a z^2+p z+q\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left((b-a)^{-n-1} e^{-\frac{(d-p)^2}{4(b-a)}+e-q}\sum_{j=0}^{n} 2^{j-n}(p-d)^{n-j}(d-p+2(b-a)z)^{j+1}\left(-\frac{(d-p+2(b-a)z)^2}{b-a}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d-p+2(b-a)z)^2}{4(b-a)}\right)+(a+b)^{-n-1} e^{-\frac{(d+p)^2}{4(a+b)}+e+q}\sum_{j=0}^{n} 2^{j-n}(-d-p)^{n-j}$$

$$\left.(d+p+2(a+b)z)^{j+1}\left(-\frac{(d+p+2(a+b)z)^2}{a+b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+p+2(a+b)z)^2}{4(a+b)}\right)\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(d-p+f(2s-\nu))^2}{4(-a+b+c(2s-\nu))}+e-q+g(2s-\nu)}(-a+b+c(2s-\nu))^{-n-1}\right.$$

$$\sum_{j=0}^{n} 2^{j-n}(-d+p-f(2s-\nu))^{n-j}(d-p+f(2s-\nu)+2(-a+b+c(2s-\nu))z)^{j+1}$$

$$\left(-(d-p+f(2s-\nu)+2(-a+b+c(2s-\nu))z)^2/(-a+b+c(2s-\nu))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-(d-p+f(2s-\nu)+2(-a+b+c(2s-\nu))z)^2/(4(-a+b+c(2s-\nu)))\right)+e^{-\frac{(d+p+f(2s-\nu))^2}{4(a+b+c(2s-\nu))}+e+q+g(2s-\nu)}$$

$$(a+b+c(2s-\nu))^{-n-1}\sum_{j=0}^{n} 2^{j-n}(-d-p-f(2s-\nu))^{n-j}(d+p+f(2s-\nu)+2(a+b+c(2s-\nu))z)^{j+1}$$

$$\left(-(d+p+f(2s-\nu)+2(a+b+c(2s-\nu))z)^2/(a+b+c(2s-\nu))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-(d+p+f(2s-\nu)+2(a+b+c(2s-\nu))z)^2/(4(a+b+c(2s-\nu)))\right)+e^{-\frac{(d-p+f(\nu-2s))^2}{4(-a+b+c(\nu-2s))}+e-q+g(\nu-2s)}$$

$$(-a+b+c(\nu-2s))^{-n-1}\sum_{j=0}^{n} 2^{j-n}(-d+p-f(\nu-2s))^{n-j}(d-p+f(\nu-2s)+2(-a+b+c(\nu-2s))z)^{j+1}$$

$$\left(-(d-p+f(\nu-2s)+2(-a+b+c(\nu-2s))z)^2/(-a+b+c(\nu-2s))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-(d-p+f(\nu-2s)+2(-a+b+c(\nu-2s))z)^2/(4(-a+b+c(\nu-2s)))\right)+e^{-\frac{(d+p+f(\nu-2s))^2}{4(a+b+c(\nu-2s))}+e+q+g(\nu-2s)}$$

$$(a+b+c(\nu-2s))^{-n-1}\sum_{j=0}^{n} 2^{j-n}(-d-p-f(\nu-2s))^{n-j}(d+p+f(\nu-2s)+2(a+b+c(\nu-2s))z)^{j+1}$$

$$\left(-(d+p+f(\nu-2s)+2(a+b+c(\nu-2s))z)^2/(a+b+c(\nu-2s))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},-(d+p+f(\nu-2s)+2(a+b+c(\nu-2s))z)^2/(4(a+b+c(\nu-2s)))\right)\right)/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3022.01

$$\int z^n e^{\sqrt{z}\,b+d\,z+e} \cosh\left(\sqrt{z}\,a+p\,z+q\right) \cosh^{\nu}\left(\sqrt{z}\,c+f\,z+g\right) dz == 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(e^{-\frac{(b-a)^2}{4\,(d-p)}+e-q} (d-p)^{-2\,n-2} \right.$$

$$\sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h}\, 4^i\, (b-a)^{-h-i+2\,n} \left(-a+b+2\,(d-p)\,\sqrt{z}\right)^{h+i} \left(-\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{d-p} \right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h} \binom{n}{i} \left((b-a) \left(-a+b+2\,(d-p)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+i+1),\, -\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{4\,(d-p)} \right) + \right.$$

$$\left. 2 \sqrt{-\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{d-p}}\; (d-p)\, \Gamma\left(\frac{1}{2}\,(h+i+2),\, -\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{4\,(d-p)} \right) \right) + e^{-\frac{(a+b)^2}{4\,(d+p)}+e+q}$$

$$(d+p)^{-2\,n-2} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h}\, 4^i\, (a+b)^{-h-i+2\,n} \left(a+b+2\,(d+p)\,\sqrt{z}\right)^{h+i} \left(-\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{d+p} \right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h} \binom{n}{i} \left((a+b) \left(a+b+2\,(d+p)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+i+1),\, -\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{4\,(d+p)} \right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{d+p}}\; (d+p)\, \Gamma\left(\frac{1}{2}\,(h+i+2),\, -\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{4\,(d+p)} \right) \right) \right) +$$

$$2^{-2\,n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(-a+b+c\,(2\,s-\nu))^2}{4\,(d-p+f\,(2\,s-\nu))}+e-q+g\,(2\,s-\nu)} (d-p+f\,(2\,s-\nu))^{-2\,n-2} \right.$$

$$\sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h}\, 4^i\, (-a+b+c\,(2\,s-\nu))^{-h-i+2\,n} \left(-a+b+c\,(2\,s-\nu)+2\,(d-p+f\,(2\,s-\nu))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(-a+b+c\,(2\,s-\nu)+2\,(d-p+f\,(2\,s-\nu))\,\sqrt{z}\right)^2 \Big/ (d-p+f\,(2\,s-\nu)) \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}$$

$$\binom{n}{i} \left((-a+b+c\,(2\,s-\nu)) \left(-a+b+c\,(2\,s-\nu)+2\,(d-p+f\,(2\,s-\nu))\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}\,(h+i+1), \right. \right.$$

$$\left. -\left(-a+b+c\,(2\,s-\nu)+2\,(d-p+f\,(2\,s-\nu))\,\sqrt{z}\right)^2 \Big/ (4\,(d-p+f\,(2\,s-\nu))) \right) +$$

$$\left. 2 \sqrt{\left(-\left(-a+b+c\,(2\,s-\nu)+2\,(d-p+f\,(2\,s-\nu))\,\sqrt{z}\right)^2 \Big/ (d-p+f\,(2\,s-\nu))\right)}\, (d-p+f\,(2\,s-\nu)) \right)$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(-a+b+c(2s-v)+2(d-p+f(2s-v))\sqrt{z}\right)^2\Big/(4(d-p+f(2s-v)))\right)\Bigg)+$$

$$e^{-\frac{(a+b+c(2s-v))^2}{4(d+p+f(2s-v))}+e+q+g(2s-v)}(d+p+f(2s-v))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(a+b+c(2s-v))^{-h-i+2n}$$

$$\left(a+b+c(2s-v)+2(d+p+f(2s-v))\sqrt{z}\right)^{h+i}$$

$$\left(-\left(a+b+c(2s-v)+2(d+p+f(2s-v))\sqrt{z}\right)^2\Big/(d+p+f(2s-v))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Bigg((a+b+c(2s-v))\left(a+b+c(2s-v)+2(d+p+f(2s-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\right.$$

$$\left.-\left(a+b+c(2s-v)+2(d+p+f(2s-v))\sqrt{z}\right)^2\Big/(4(d+p+f(2s-v)))\right)+$$

$$2\sqrt{\left(-\left(a+b+c(2s-v)+2(d+p+f(2s-v))\sqrt{z}\right)^2\Big/(d+p+f(2s-v))\right)}(d+p+f(2s-v))$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(a+b+c(2s-v)+2(d+p+f(2s-v))\sqrt{z}\right)^2\Big/(4(d+p+f(2s-v)))\right)\Bigg)+$$

$$e^{-\frac{(-a+b+c(v-2s))^2}{4(d-p+f(v-2s))}+e-q+g(v-2s)}(d-p+f(v-2s))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(-a+b+c(v-2s))^{-h-i+2n}$$

$$\left(-a+b+c(v-2s)+2(d-p+f(v-2s))\sqrt{z}\right)^{h+i}$$

$$\left(-\left(-a+b+c(v-2s)+2(d-p+f(v-2s))\sqrt{z}\right)^2\Big/(d-p+f(v-2s))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Bigg((-a+b+c(v-2s))\left(-a+b+c(v-2s)+2(d-p+f(v-2s))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\right.$$

$$\left.-\left(-a+b+c(v-2s)+2(d-p+f(v-2s))\sqrt{z}\right)^2\Big/(4(d-p+f(v-2s)))\right)+$$

$$2\sqrt{\left(-\left(-a+b+c(v-2s)+2(d-p+f(v-2s))\sqrt{z}\right)^2\Big/(d-p+f(v-2s))\right)}(d-p+f(v-2s))$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(-a+b+c(v-2s)+2(d-p+f(v-2s))\sqrt{z}\right)^2\Big/(4(d-p+f(v-2s)))\right)\Bigg)+$$

$$e^{-\frac{(a+b+c(v-2s))^2}{4(d+p+f(v-2s))}+e+q+g(v-2s)}(d+p+f(v-2s))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(a+b+c(v-2s))^{-h-i+2n}$$

$$\left(a+b+c(v-2s)+2(d+p+f(v-2s))\sqrt{z}\right)^{h+i}$$

$$\left(-\left(a+b+c(v-2s)+2(d+p+f(v-2s))\sqrt{z}\right)^2\Big/(d+p+f(v-2s))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Bigg((a+b+c(v-2s))\left(a+b+c(v-2s)+2(d+p+f(v-2s))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\right.$$

$$\left.-\left(a+b+c(v-2s)+2(d+p+f(v-2s))\sqrt{z}\right)^2\Big/(4(d+p+f(v-2s)))\right)+$$

$$2\sqrt{\left(-\left(a+b+c(v-2s)+2(d+p+f(v-2s))\sqrt{z}\right)^2\Big/(d+p+f(v-2s))\right)}$$

$$(d+p+f(v-2s))\,\Gamma\left(\frac{1}{2}(h+i+2),\right.$$

$$\left.-\left(a+b+c(v-2s)+2(d+p+f(v-2s))\sqrt{z}\right)^2\Big/(4(d+p+f(v-2s)))\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\wedge v\in\mathbb{N}^+$$

Involving product of powers of two direct functions, exponential and a power functions

Involving $z^{\alpha-1}\, e^{b\,z}\, \cosh^{\mu}(c\,z)\, \cosh^{\nu}(a\,z)$

01.20.21.3023.01

$$\int z^{\alpha-1}\, e^{b\,z}\, \cosh^{m}(c\,z)\, \cosh^{\nu}(a\,z)\, dz == -2^{-m-\nu} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} E_{1-\alpha}(-b\,z)\, (1-m \bmod 2)\, (1-\nu \bmod 2)\, z^{\alpha} -$$

$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} (E_{1-\alpha}((c\,(m-2\,s)-b)\,z) + E_{1-\alpha}((-b-c\,(m-2\,s))\,z)) \right) z^{\alpha} -$$

$$2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (E_{1-\alpha}((-b-2\,a\,s+a\,\nu)\,z) + E_{1-\alpha}((-b-a\,(\nu-2\,s))\,z)) \right) z^{\alpha} -$$

$$2^{-m-\nu}\, z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (E_{1-\alpha}((-b+2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z) + E_{1-\alpha}((-b+c\,(m-2\,k)-2\,a\,s+a\,\nu)\,z) +$$

$$E_{1-\alpha}((-b-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z) + E_{1-\alpha}((-b+2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z))\ /;\ m \in \mathbb{N}^{+} \bigwedge \nu \in \mathbb{N}^{+}$$

01.20.21.3024.01

$$\int z^{n}\, e^{b\,z}\, \cosh^{\mu}(c\,z)\, \cosh^{\nu}(a\,z)\, dz == 2^{-\nu}\, e^{b\,z} \binom{\nu}{\frac{\nu}{2}} \cosh^{\mu}(c\,z)\, n!\, (1-\nu \bmod 2)\, \left(1+e^{-2\,c\,z}\right)^{-\mu}$$

$$\sum_{p=0}^{n} \frac{(-1)^{p}\, z^{n-p}\, (b+c\,\mu)^{-p-1}}{(n-p)!}\, {}_{p+2}F_{p+1}\left(-\frac{b+c\,\mu}{2\,c}, \ldots, -\frac{b+c\,\mu}{2\,c}, -\mu; 1-\frac{b+c\,\mu}{2\,c}, \ldots, 1-\frac{b+c\,\mu}{2\,c}; -e^{-2\,c\,z}\right) + 2^{-\nu}$$

$$e^{b\,z}\, \cosh^{\mu}(c\,z)\, n!\, \left(1+e^{-2\,c\,z}\right)^{-\mu}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-a\,(\nu-2\,s)\,z} \sum_{p=0}^{n} \frac{1}{(n-p)!}\, (-1)^{p}\, z^{n-p}\, (b-a\,(\nu-2\,s)+c\,\mu)^{-p-1}\, {}_{p+2}F_{p+1}\left(-\frac{b+2\,a\,s-a\,\nu+c\,\mu}{2\,c}, \ldots,\right.\right.$$

$$\left. -\frac{b+2\,a\,s-a\,\nu+c\,\mu}{2\,c}, -\mu; 1-\frac{b+2\,a\,s-a\,\nu+c\,\mu}{2\,c}, \ldots, 1-\frac{b+2\,a\,s-a\,\nu+c\,\mu}{2\,c}; -e^{-2\,c\,z}\right) + e^{a\,(\nu-2\,s)\,z}$$

$$\sum_{p=0}^{n} \frac{1}{(n-p)!}\, (-1)^{p}\, z^{n-p}\, (b+a\,(\nu-2\,s)+c\,\mu)^{-p-1}\, {}_{p+2}F_{p+1}\left(-\frac{b+a\,(\nu-2\,s)+c\,\mu}{2\,c}, \ldots, -\frac{b+a\,(\nu-2\,s)+c\,\mu}{2\,c},\right.$$

$$\left.\left. -\mu; 1-\frac{b+a\,(\nu-2\,s)+c\,\mu}{2\,c}, \ldots, 1-\frac{b+a\,(\nu-2\,s)+c\,\mu}{2\,c}; -e^{-2\,c\,z}\right)\right)\ /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \cosh^{m}(c\,z)\, \cosh^{\nu}(a\,z+b)$

01.20.21.3025.01

$$\int z^{\alpha-1}\, e^{p\,z} \cosh^{m}(c\,z) \cosh^{\nu}(b+a\,z)\, dz == -2^{-m-\nu} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} E_{1-\alpha}(-p\,z)\,(1-m \bmod 2)\,(1-\nu \bmod 2)\, z^{\alpha} -$$

$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(E_{1-\alpha}((c\,(m-2\,s)-p)\,z) + E_{1-\alpha}(-(p+c\,(m-2\,s))\,z) \right) \right) z^{\alpha} -$$

$$2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} e^{-b\,(2\,s+\nu)} \left(e^{4\,b\,s}\, E_{1-\alpha}(-(p+2\,a\,s-a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}(-(p+a\,(\nu-2\,s))\,z) \right) \right) z^{\alpha} -$$

$$2^{-m-\nu} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} e^{-2\,b\,s-b\,\nu} \left(e^{4\,b\,s}\, E_{1-\alpha}((2\,c\,k-c\,m-p-2\,a\,s+a\,\nu)\,z) + \right. \right.$$

$$e^{4\,b\,s}\, E_{1-\alpha}((c\,(m-2\,k)-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}(-(2\,c\,k-c\,m+p-2\,a\,s+a\,\nu)\,z) +$$

$$\left. \left. e^{2\,b\,\nu}\, E_{1-\alpha}((2\,c\,k-c\,m-p+2\,a\,s-a\,\nu)\,z) \right) \right) z^{\alpha} \;/;\; m \in \mathbb{N}^{+} \bigwedge \nu \in \mathbb{N}^{+}$$

01.20.21.3026.01

$$\int z^{n}\, e^{p\,z} \cosh^{\mu}(c\,z) \cosh^{\nu}(b+a\,z)\, dz == 2^{-\nu}\, e^{p\,z} \binom{\nu}{\frac{\nu}{2}} \cosh^{\mu}(c\,z)\, n!\,(1-\nu \bmod 2)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (p+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+c\,\mu}{2\,c}, \ldots, -\frac{p+c\,\mu}{2\,c}, -\mu; 1-\frac{p+c\,\mu}{2\,c}, \ldots, 1-\frac{p+c\,\mu}{2\,c}; -e^{-2\,c\,z} \right) \right)$$

$$\left(1+e^{-2\,c\,z}\right)^{-\mu} + 2^{-\nu} \cosh^{\mu}(c\,z)\, n!$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{(p-a\,(\nu-2\,k))\,z-b\,(\nu-2\,k)} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (p-a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, \right. \right. \right.$$

$$\left. -\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, -\mu; 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}; -e^{-2\,c\,z} \right) +$$

$$e^{b\,(\nu-2\,k)+(p+a\,(\nu-2\,k))\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (p+a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \right.$$

$$\ldots, -\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, -\mu; 1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots,$$

$$\left. \left. \left. 1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}; -e^{-2\,c\,z} \right) \right) \right) \left(1+e^{-2\,c\,z}\right)^{-\mu} \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^{+}$$

Involving $z^{\alpha-1}\, e^{p\,z} \cosh^{m}(c\,z+d) \cosh^{\nu}(a\,z+b)$

01.20.21.3027.01

$$\int z^{\alpha-1}\, e^{p\,z} \cosh^m(d+c\,z) \cosh^\nu(b+a\,z)\, dz == -2^{-m-\nu} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} E_{1-\alpha}(-p\,z)\,(1-m \bmod 2)\,(1-\nu \bmod 2)\, z^\alpha -$$

$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} e^{-d\,(m-2\,s)} \left(E_{1-\alpha}((c\,(m-2\,s)-p)\,z) + e^{2\,d\,(m-2\,s)}\, E_{1-\alpha}(-(p+c\,(m-2\,s))\,z) \right) \right) z^\alpha -$$

$$2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} e^{-b\,(2\,s+\nu)} \left(e^{4\,b\,s}\, E_{1-\alpha}(-(p+2\,a\,s-a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}(-(p+a\,(\nu-2\,s))\,z) \right) \right) z^\alpha -$$

$$2^{-m-\nu} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} e^{-2\,d\,k-d\,m-2\,b\,s-b\,\nu} \left(e^{2\,d\,m} \left(e^{4\,b\,s}\, E_{1-\alpha}((2\,c\,k-c\,m-p-2\,a\,s+a\,\nu)\,z) + \right. \right. \right.$$

$$\left. e^{2\,b\,\nu}\, E_{1-\alpha}((2\,c\,k-c\,m-p+2\,a\,s-a\,\nu)\,z) \right) + e^{4\,d\,k} \left(e^{4\,b\,s}\, E_{1-\alpha}((c\,(m-2\,k)-p-2\,a\,s+a\,\nu)\,z) + \right.$$

$$\left. \left. \left. e^{2\,b\,\nu}\, E_{1-\alpha}(-(2\,c\,k-c\,m+p-2\,a\,s+a\,\nu)\,z) \right) \right) \right) z^\alpha \;/;\; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3028.01

$$\int z^n\, e^{p\,z} \cosh^\mu(d+c\,z) \cosh^\nu(b+a\,z)\, dz == 2^{-\nu}\, e^{p\,z} \left(1+e^{-2\,(d+c\,z)}\right)^{-\mu} \binom{\nu}{\frac{\nu}{2}} n!\,(1-\nu \bmod 2) \cosh^\mu(d+c\,z)$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+c\,\mu)^{-j-1}}{(n-j)!}\; {}_{j+2}F_{j+1}\left(-\frac{p+c\,\mu}{2\,c}, \ldots, -\frac{p+c\,\mu}{2\,c}, -\mu; 1-\frac{p+c\,\mu}{2\,c}, \ldots, 1-\frac{p+c\,\mu}{2\,c}; -e^{-2\,(d+c\,z)} \right) +$$

$$2^{-\nu} \left(1+e^{-2\,(d+c\,z)}\right)^{-\mu} n! \cosh^\mu(d+c\,z) \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-b\,(\nu-2\,k)+(p-a\,(\nu-2\,k))\,z} \right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p-a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\; {}_{j+2}F_{j+1}\left(-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \right.$$

$$\left. -\mu; 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}; -e^{-2\,(d+c\,z)} \right) + e^{b\,(\nu-2\,k)+(p+a\,(\nu-2\,k))\,z}$$

$$\left. \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\; {}_{j+2}F_{j+1}\left(-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \right. \right.$$

$$\left. \left. -\mu; 1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}; -e^{-2\,(d+c\,z)} \right) \right) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n\, e^{p\,z^r} \cosh^m(b\,z) \cosh^\nu(c\,z)$

01.20.21.3029.01

$$\int z^n e^{p z^2} \cosh^m(b z) \cosh^v(c z)\, dz ==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s} e^{-\frac{b^2(m-2s)^2}{4p}}\left(\sum_{q=0}^{n}\left(b\left(s-\frac{m}{2}\right)\right)^{n-q}(b(m-2s)+2pz)^{q+1}\left(-\frac{(b(m-2s)+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b(m-2s)+2pz)^2}{4p}\right)+\sum_{q=0}^{n}2^{q-n}(b(m-2s))^{n-q}\left(-\frac{(b(m-2s)-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(-bm+2bs+2pz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b(m-2s)-2pz)^2}{4p}\right)\right)\right)p^{-n-1}-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s} e^{-\frac{c^2(v-2s)^2}{4p}}\left(\sum_{q=0}^{n}2^{q-n}(c(v-2s))^{n-q}(2cs-cv+2pz)^{q+1}\left(-\frac{(2cs-cv+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(2cs-cv+2pz)^2}{4p}\right)+\sum_{q=0}^{n}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}(c(v-2s)+2pz)^{q+1}$$

$$\left.\left.\left(-\frac{(c(v-2s)+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c(v-2s)+2pz)^2}{4p}\right)\right)\right)p^{-n-1}-2^{-m-v-1}$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-\frac{b^2(m-2k)^2+c^2(v-2s)^2}{2p}}\binom{m}{k}\left(e^{\frac{(2bk-bm-2cs+cv)^2}{4p}}\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)b+\left(s-\frac{v}{2}\right)c\right)^{n-q}(-2bk+bm-2cs+cv+2pz)^{q+1}\right.\right.$$

$$\left(-\frac{(-2bk+bm-2cs+cv+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2bk+bm-2cs+cv+2pz)^2}{4p}\right)+$$

$$e^{\frac{(-2bk+bm-2cs+cv)^2}{4p}}\sum_{q=0}^{n}2^{q-n}(-2bk+bm+2cs-cv)^{n-q}(2bk-bm-2cs+cv+2pz)^{q+1}$$

$$\left(-\frac{(2bk-bm-2cs+cv+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2bk-bm-2cs+cv+2pz)^2}{4p}\right)+$$

$$e^{\frac{(-2bk+bm-2cs+cv)^2}{4p}}\sum_{q=0}^{n}2^{q-n}(2bk-bm-2cs+cv)^{n-q}(-2bk+bm+2cs-cv+2pz)^{q+1}$$

$$\left(-\frac{(-2bk+bm+2cs-cv+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2bk+bm+2cs-cv+2pz)^2}{4p}\right)+$$

$$\left.\left.e^{\frac{(2bk-bm-2cs+cv)^2}{4p}}\sum_{q=0}^{n}2^{q-n}(b(m-2k)+c(v-2s))^{n-q}\left(-\frac{(b(m-2k)-2cs+cv-2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$(2\,b\,k-b\,m+2\,c\,s-c\,v+2\,p\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b\,(m-2\,k)-2\,c\,s+c\,v-2\,p\,z)^2}{4\,p}\right)\Bigg)\Bigg)$$

$$p^{-n-1}-2^{-m-v-1}\,z^{n+1}\left(-p\,z^2\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{n+1}{2},-p\,z^2\right)(1-m\bmod 2)$$

$$(1-v\bmod 2)\,/;\,m\in$$
$$\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge$$
$$n\in$$
$$\mathbb{N}$$

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$$\int z^n\,e^{p\sqrt{z}}\cosh^m(b\,z)\cosh^v(c\,z)\,dz==$$

$$-2^{-m-v+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2\,(n+1),-p\sqrt{z}\right)(1-m\bmod 2)\,(1-v\bmod 2)\,p^{-2\,n-2}+\frac{1}{b^2}\Bigg(2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2\,s)^2}\Bigg(\binom{m}{s}e^{\frac{p^2}{8\,b\,s-4\,b\,m}}\Bigg(e^{\frac{p^2}{2\,b\,m-4\,b\,s}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p-2\,b\,(m-2\,s)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p-2\,b\,(m-2\,s)\sqrt{z}\right)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p-2\,b\,(m-2\,s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(p-2\,b\,(m-2\,s)\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)-2\,b\,(m-2\,s)\sqrt{\frac{\left(p-2\,b\,(m-2\,s)\sqrt{z}\right)^2}{b\,(m-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(p-2\,b\,(m-2\,s)\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)\Bigg)\Bigg)(-b\,(m-2\,s))^{-2\,n}+(b\,(m-2\,s))^{-2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,b\,(m-2\,s)\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,b\,(m-2\,s)\sqrt{z}\right)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\,b\,(m-2\,s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(p+2\,b\,(m-2\,s)\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)+$$

$$2\,b\,(m-2\,s)\sqrt{-\frac{\left(p+2\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(p+2\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)\Bigg)\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}e^{\frac{p^2}{4\,c\,v-8\,c\,s}}\,(c\,(2\,s-v))^{-2\,n}\,(c\,(v-2\,s))^{-2\,(n+1)}$$

$$\left(e^{\frac{p^2}{4\,c\,s-2\,c\,v}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\right.$$

$$\left.\left.\sqrt{\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)(c\,(2\,s-v))^{2\,n}+$$

$$(c\,(v-2\,s))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$\left.2\,c\,(2\,s-v)\sqrt{-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{u}\left(e^{\frac{p^2}{4\,b\,m+8\,c\,s-8\,b\,u-4\,c\,v}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(\left(p+2\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)\,\sqrt{z}\right)^2\Big/\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p+2\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\left(p+2\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)\,\sqrt{z}\right)^2\Big/\right.\right.$$

$$\left.\left.(4\,b\,m+8\,c\,s-8\,b\,u-4\,c\,v)\right)+2\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)\right)$$

$$\sqrt{\left(\left(p+2\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\right)}$$

$$\Gamma\left(\frac{1}{2}\left(h+k+2\right),\left(p+2\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(4\,b\,m+8\,c\,s-8\,b\,u-4\,c\,v\right)\right)\Bigg)\Bigg)$$

$$\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)^{-2\left(n+1\right)}+e^{\frac{p^2}{4\,b\,m-8\,c\,s-8\,b\,u+4\,c\,v}}\left(-b\,m+2\,c\,s+2\,b\,u-c\,v\right)^{-2\left(n+1\right)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{b\,m-2\,c\,s-2\,b\,u+c\,v}\right)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\left(h+k+1\right),\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(4\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\right)\Bigg)-$$

$$2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{\left(\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\right)}$$

$$\Gamma\left(\frac{1}{2}\left(h+k+2\right),\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(4\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\right)\Bigg)\Bigg)+$$

$$e^{\frac{p^2}{-4\,b\,m+8\,c\,s+8\,b\,u-4\,c\,v}}\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)^{-2\left(n+1\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}$$

$$\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^{h+k}\Bigg(-\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/$$

$$\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\Bigg)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\left(h+k+1\right),-\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(4\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\right)\Bigg)+$$

$$2\sqrt{\left(-\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\right)}\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)$$

$$\Gamma\left(\frac{1}{2}\left(h+k+2\right),-\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2\Big/\left(4\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\right)\Bigg)\Bigg)+$$

$$e^{\frac{p^2}{-4\,b\,m-8\,c\,s+8\,b\,u+4\,c\,v}}\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)^{-2\left(n+1\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}$$

$$\left(p+2\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\sqrt{z}\right)^{h+k}\Bigg(-\left(p+2\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\sqrt{z}\right)^2\Big/$$

$$\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\Bigg)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\left(h+k+1\right),-\left(p+2\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\sqrt{z}\right)^2\Big/\left(8\,c\,s+4\,b\left(m-2\,u\right)-4\,c\,v\right)\Bigg)+$$

$$2\sqrt{\left(-\left(p+2\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\sqrt{z}\right)^2\Big/\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\right)}$$

$$\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),-\left(p+2\left(b\,m+2\,c\,s-2\,b\,u-c\,v\right)\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.\left.\left(8\,c\,s+4\,b\left(m-2\,u\right)-4\,c\,v\right)\right)\right)\right)\Bigg|_{/;\,m\in\mathbb{N}^+\,\bigwedge\,v\in\mathbb{N}^+\,\bigwedge\,n\in\mathbb{N}}$$

Involving $z^n e^{p z} \cosh^m(b z^r) \cosh^v(c z)$

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$$\int z^n e^{p z} \cosh^m\left(b z^2\right) \cosh^v(c z)\, dz ==$$

$$-2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p z)\,(1-m \bmod 2)\,(1-v \bmod 2)\,(-p)^{-n-1} - 2^{-m-v} z^{n+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,(-2 c k-p+c v) z)\,((-2 c k-p+c v) z)^{-n-1} + ((-p-c (v-2 k)) z)^{-n-1}\,\Gamma(n+1,\,(-p-c (v-2 k)) z)\right) -$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{p^2}{4 b (2 k-m)}}\left(\sum_{j=0}^{n} 2^{j-n}\,(-p)^{n-j}\,(p-2 b (2 k-m) z)^{j+1}\left(\frac{(p-2 b (2 k-m) z)^2}{b (2 k-m)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(p-2 b (2 k-m) z)^2}{4 b (2 k-m)}\right)\right)(-b (2 k-m))^{-n-1} + e^{\frac{p^2}{4 b (m-2 k)}}\,(-b (m-2 k))^{-n-1}$$

$$\left.\sum_{j=0}^{n} 2^{j-n}\,(-p)^{n-j}\,(p-2 b (m-2 k) z)^{j+1}\left(\frac{(p-2 b (m-2 k) z)^2}{b (m-2 k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(p-2 b (m-2 k) z)^2}{4 b (m-2 k)}\right)\right) -$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(p+c (2 s-v))^2}{4 b (2 k-m)}}\left(\sum_{j=0}^{n} 2^{j-n}\,(-p-c (2 s-v))^{n-j}\,(p+c (2 s-v)-2 b (2 k-m) z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(p+c (2 s-v)-2 b (2 k-m) z)^2}{b (2 k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(p+c (2 s-v)-2 b (2 k-m) z)^2}{4 b (2 k-m)}\right)\right)$$

$$(-b (2 k-m))^{-n-1} + e^{\frac{(p+c (v-2 s))^2}{4 b (2 k-m)}}\left(\sum_{j=0}^{n} 2^{j-n}\,(-p-c (v-2 s))^{n-j}\,(p+c (v-2 s)-2 b (2 k-m) z)^{j+1}\right.$$

$$\left.\left(\frac{(p+c (v-2 s)-2 b (2 k-m) z)^2}{b (2 k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(p+c (v-2 s)-2 b (2 k-m) z)^2}{4 b (2 k-m)}\right)\right)$$

$$(-b (2 k-m))^{-n-1} + e^{\frac{(p+c (2 s-v))^2}{4 b (m-2 k)}}\,(-b (m-2 k))^{-n-1}\sum_{j=0}^{n} 2^{j-n}\,(-p-c (2 s-v))^{n-j}$$

$$(p+c (2 s-v)-2 b (m-2 k) z)^{j+1}\left(\frac{(p+c (2 s-v)-2 b (m-2 k) z)^2}{b (m-2 k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{(p+c\,(2\,s-v)-2\,b\,(m-2\,k)\,z)^2}{4\,b\,(m-2\,k)}\right)+e^{\frac{(p+c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\,(-b\,(m-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-p-c\,(v-2\,s))^{n-j}\,(p+c\,(v-2\,s)-2\,b\,(m-2\,k)\,z)^{j+1}\left(\frac{(p+c\,(v-2\,s)-2\,b\,(m-2\,k)\,z)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{(p+c\,(v-2\,s)-2\,b\,(m-2\,k)\,z)^2}{4\,b\,(m-2\,k)}\right)\Bigg)\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\,e^{p\,z}\cosh^m\left(b\,\sqrt{z}\right)\cosh^v(c\,z)\,dz==$$

$$-2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(1-m\bmod 2)\,(1-v\bmod 2)\,(-p)^{-n-1}-2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Big(\Gamma(n+1,\,(-2\,c\,k-p+c\,v)\,z)\,((-2\,c\,k-p+c\,v)\,z)^{-n-1}+((-p-c\,(v-2\,k))\,z)^{-n-1}\,\Gamma(n+1,\,(-p-c\,(v-2\,k))\,z)\Big)+$$

$$2^{-m-2\,n-v-1}\,p^{-2\,n-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\Bigg(e^{-\frac{b^2\,(2\,k-m)^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(2\,k-m))^{-h-j+2\,n}\left(2\,p\,\sqrt{z}-b\,(2\,k-m)\right)^{h+j}\left(-\frac{\left(2\,p\,\sqrt{z}-b\,(2\,k-m)\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,p\,\sqrt{-\frac{\left(2\,p\,\sqrt{z}-b\,(2\,k-m)\right)^2}{p}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,p\,\sqrt{z}-b\,(2\,k-m)\right)^2}{4\,p}\right)-$$

$$b\,(2\,k-m)\left(2\,p\,\sqrt{z}-b\,(2\,k-m)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,p\,\sqrt{z}-b\,(2\,k-m)\right)^2}{4\,p}\right)\Bigg)+$$

$$e^{-\frac{b^2\,(m-2\,k)^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(m-2\,k))^{-h-j+2\,n}\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)^{h+j}\left(-\frac{\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,p\,\sqrt{-\frac{\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)^2}{p}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)^2}{4\,p}\right)-$$

$$b\,(m-2\,k)\left(2\,p\,\sqrt{z}\,-b\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,p\,\sqrt{z}\,-b\,(m-2\,k)\right)^2}{4\,p}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(e^{-\frac{b^2\,(2\,k-m)^2}{4\,(p+c\,(2\,s-\nu))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(2\,k-m))^{-h-j+2\,n}\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-\right.$$

$$\left.b\,(2\,k-m)\right)^{h+j}\left(-\frac{\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(2\,k-m)\right)^2}{p+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(2\,(p+c\,(2\,s-\nu))\sqrt{-\frac{\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(2\,k-m)\right)^2}{p+c\,(2\,s-\nu)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(2\,k-m)\right)^2}{4\,(p+c\,(2\,s-\nu))}\right)-b\,(2\,k-m)\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(2\,k-m)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(2\,k-m)\right)^2}{4\,(p+c\,(2\,s-\nu))}\right)\right)\Bigg)(p+c\,(2\,s-\nu))^{-2\,n-2}+$$

$$e^{-\frac{b^2\,(m-2\,k)^2}{4\,(p+c\,(2\,s-\nu))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-b\,(m-2\,k))^{-h-j+2\,n}\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(m-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(m-2\,k)\right)^2}{p+c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(p+c\,(2\,s-\nu))\sqrt{-\frac{\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(m-2\,k)\right)^2}{p+c\,(2\,s-\nu)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(m-2\,k)\right)^2}{4\,(p+c\,(2\,s-\nu))}\right)-b\,(m-2\,k)\left(2\,(p+c\,(2\,s-\nu))\,\sqrt{z}\,-b\,(m-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(p+c(2s-v))\sqrt{z}-b(m-2k)\right)^2}{4(p+c(2s-v))}\right)\Bigg)\Bigg)$$

$$(p+c(2s-v))^{-2n-2}+e^{-\frac{b^2(2k-m)^2}{4(p+c(v-2s))}}(p+c(v-2s))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-b(2k-m))^{-h-j+2n}$$

$$\left(2(p+c(v-2s))\sqrt{z}-b(2k-m)\right)^{h+j}\left(-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(2k-m)\right)^2}{p+c(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2(p+c(v-2s))\sqrt{-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(2k-m)\right)^2}{p+c(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(2k-m)\right)^2}{4(p+c(v-2s))}\right)-b(2k-m)\left(2(p+c(v-2s))\sqrt{z}-b(2k-m)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(2k-m)\right)^2}{4(p+c(v-2s))}\right)\Bigg)+$$

$$e^{-\frac{b^2(m-2k)^2}{4(p+c(v-2s))}}(p+c(v-2s))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-b(m-2k))^{-h-j+2n}$$

$$\left(2(p+c(v-2s))\sqrt{z}-b(m-2k)\right)^{h+j}\left(-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(m-2k)\right)^2}{p+c(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2(p+c(v-2s))\sqrt{-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(m-2k)\right)^2}{p+c(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(m-2k)\right)^2}{4(p+c(v-2s))}\right)-b(m-2k)\left(2(p+c(v-2s))\sqrt{z}-b(m-2k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(p+c(v-2s))\sqrt{z}-b(m-2k)\right)^2}{4(p+c(v-2s))}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n e^{p z^r} \cosh^m(b z^r) \cosh^v(c z)$

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$$\int z^n e^{p z^2} \cosh^m\left(b z^2\right) \cosh^v(c z)\, dz == -2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{c^2 (v-2k)^2}{4p}} \sum_{h=0}^{n} 2^{h-n} (c(v-2k))^{n-h} (2pz - c(v-2k))^{h+1} \left(-\frac{(2pz - c(v-2k))^2}{p}\right)^{\frac{1}{2}(-h-1)} \binom{n}{h} \right.\right.$$

$$\left. \Gamma\left(\frac{h+1}{2}, -\frac{(2pz - c(v-2k))^2}{4p}\right) + e^{-\frac{c^2 (v-2k)^2}{4p}} \sum_{h=0}^{n} 2^{h-n} (-c(v-2k))^{n-h} (c(v-2k) + 2pz)^{h+1} \right.$$

$$\left.\left. \left(-\frac{(c(v-2k) + 2pz)^2}{p}\right)^{\frac{1}{2}(-h-1)} \binom{n}{h} \Gamma\left(\frac{h+1}{2}, -\frac{(c(v-2k) + 2pz)^2}{4p}\right)\right)\right) p^{-n-1} -$$

$$2^{-m-v-1} z^{n+1} \left(-p z^2\right)^{\frac{1}{2}(-n-1)} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -p z^2\right) (1 - m \bmod 2)(1 - v \bmod 2) -$$

$$2^{-m-v-1} z^{n+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\Gamma\left(\frac{n+1}{2}, (-2bk + bm - p) z^2\right) \left((-2bk + bm - p) z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. \left((-b(m-2k) - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b(m-2k) - p) z^2\right)\right) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{j=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{j} \left(e^{-\frac{c^2 (v-2j)^2}{4(p - b(m-2k))}} \left(\sum_{h=0}^{n} 2^{h-n} (c(v-2j))^{n-h} (2(p - b(m-2k)) z - c(v-2j))^{h+1} \right.\right.$$

$$\left. \left(-\frac{(2(p - b(m-2k)) z - c(v-2j))^2}{p - b(m-2k)}\right)^{\frac{1}{2}(-h-1)} \binom{n}{h} \Gamma\left(\frac{h+1}{2}, -\frac{(2(p - b(m-2k)) z - c(v-2j))^2}{4(p - b(m-2k))}\right)\right)$$

$$(p - b(m-2k))^{-n-1} + e^{-\frac{c^2 (v-2j)^2}{4(p - b(m-2k))}} \left(\sum_{h=0}^{n} 2^{h-n} (-c(v-2j))^{n-h} (c(v-2j) + 2(p - b(m-2k)) z)^{h+1} \right.$$

$$\left. \left(-\frac{(c(v-2j) + 2(p - b(m-2k)) z)^2}{p - b(m-2k)}\right)^{\frac{1}{2}(-h-1)} \binom{n}{h} \Gamma\left(\frac{h+1}{2}, -\frac{(c(v-2j) + 2(p - b(m-2k)) z)^2}{4(p - b(m-2k))}\right)\right)$$

$$(p - b(m-2k))^{-n-1} + e^{-\frac{c^2 (v-2j)^2}{4(b(m-2k)+p)}} (b(m-2k) + p)^{-n-1} \sum_{h=0}^{n} 2^{h-n} (c(v-2j))^{n-h}$$

$$(2(b(m-2k) + p) z - c(v-2j))^{h+1} \left(-\frac{(2(b(m-2k) + p) z - c(v-2j))^2}{b(m-2k) + p}\right)^{\frac{1}{2}(-h-1)} \binom{n}{h}$$

$$\Gamma\left(\frac{h+1}{2}, -\frac{(2(b(m-2k)+p)z-c(v-2j))^2}{4(b(m-2k)+p)}\right)+e^{-\frac{c^2(v-2j)^2}{4(b(m-2k)+p)}}(b(m-2k)+p)^{-n-1}$$

$$\sum_{h=0}^{n}2^{h-n}(-c(v-2j))^{n-h}(c(v-2j)+2(b(m-2k)+p)z)^{h+1}\left(-\frac{(c(v-2j)+2(b(m-2k)+p)z)^2}{b(m-2k)+p}\right)^{\frac{1}{2}(-h-1)}$$

$$\binom{n}{h}\Gamma\left(\frac{h+1}{2}, -\frac{(c(v-2j)+2(b(m-2k)+p)z)^2}{4(b(m-2k)+p)}\right)\Big/; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n e^{p\sqrt{z}}\cosh^m\left(b\sqrt{z}\right)\cosh^v(cz)\,dz == -2^{-m-v+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2(n+1), -p\sqrt{z}\right)(1-m \bmod 2)(1-v \bmod 2)\,p^{-2(n+1)}-$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(2(n+1), (-2bk+bm-p)\sqrt{z}\right)(-2bk+bm-p)^{-2(n+1)}+\right.$$

$$\left.(b(m-2k)+p)^{-2(n+1)}\Gamma\left(2(n+1), (-b(m-2k)-p)\sqrt{z}\right)\right)+2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{p^2}{4c(v-2k)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j p^{-h-j+2n}\left(p-2c(v-2k)\sqrt{z}\right)^{h+j}\left(\frac{\left(p-2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(p\left(p-2c(v-2k)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(p-2c(v-2k)\sqrt{z}\right)^2}{4c(v-2k)}\right)-2c(v-2k)\right.$$

$$\left.\left.\left.\sqrt{\frac{\left(p-2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(p-2c(v-2k)\sqrt{z}\right)^2}{4c(v-2k)}\right)\right)\right)(-c(v-2k))^{-2n-2}+$$

$$e^{-\frac{p^2}{4c(v-2k)}}(c(v-2k))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j p^{-h-j+2n}\left(p+2c(v-2k)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(p+2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(p\left(p+2c(v-2k)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(p+2c(v-2k)\sqrt{z}\right)^2}{4c(v-2k)}\right)+\right.$$

$$2\,c\,(v-2\,k)\sqrt{-\frac{\left(p+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(p+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)\Bigg)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(p-b\,(m-2\,k))^2}{4\,c\,(v-2\,s)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p-b\,(m-2\,k))^{-h-j+2\,n}\left(-b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(\frac{\left(-b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((p-b\,(m-2\,k))\left(-b\,(m-2\,k)+\right.\right.$$

$$\left.\left.p-2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)-$$

$$2\,c\,(v-2\,s)\sqrt{\frac{\left(-b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\left.\frac{\left(-b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)\right)\right)(-c\,(v-2\,s))^{-2\,n-2}+$$

$$e^{\frac{(b\,(m-2\,k)+p)^2}{4\,c\,(v-2\,s)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)+p)^{-h-j+2\,n}\left(b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b\,(m-2\,k)+p)\right.$$

$$\left.\left(b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)-\right.$$

$$\left.2\,c\,(v-2\,s)\sqrt{\frac{\left(b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.\right.$$

$$\left.\left.\frac{\left(b\,(m-2\,k)+p-2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-2\,n-2}+e^{-\frac{(p-b\,(m-2\,k))^2}{4\,c\,(v-2\,s)}}$$

$$(c\,(v-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p-b\,(m-2\,k))^{-h-j+2\,n}\left(-b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((p-b\,(m-2\,k))\left(-b\,(m-2\,k)+\right.\right.$$

$$\left.p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)+$$

$$2\,c\,(v-2\,s)\sqrt{-\frac{\left(-b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(-b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)\right)+e^{-\frac{(b\,(m-2\,k)+p)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)+p)^{-h-j+2\,n}\left(b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b\,(m-2\,k)+p)\right.$$

$$\left(b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)+$$

$$2\,c\,(v-2\,s)\sqrt{-\frac{\left(b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\left.-\frac{\left(b\,(m-2\,k)+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,s)}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n e^{p z} \cosh^m(b z^r) \cosh^v(c z^r)$

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$$\int z^n e^{p z} \cosh^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == -2^{-m-v} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma(n+1, -p z) (1 - m \bmod 2) (1 - v \bmod 2) (-p)^{-n-1} +$$

$$2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(-\left(e^{\frac{p^2}{-8 b k + 4 b m - 8 c s + 4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (2 b k - b m + 2 c s - c v)^{-n-\frac{1}{2}} \right.\right.$$

$$(p + 2 (2 b k - b m + 2 c s - c v) z)^{q+1} \left(-\frac{(p + 2 (2 b k - b m + 2 c s - c v) z)^2}{2 b k - b m + 2 c s - c v} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p + 2 (2 b k - b m + 2 c s - c v) z)^2}{8 b k - 4 b m + 8 c s - 4 c v} \right) \right) \Big/ \left(\sqrt{2 b k - b m + 2 c s - c v} \right) -$$

$$\left(e^{\frac{p^2}{8 b k - 4 b m + 8 c s - 4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-2 b k + b m - 2 c s + c v)^{-n-\frac{1}{2}} (p + 2 (-2 b k + b m - 2 c s + c v) z)^{q+1} \right.$$

$$\left(-(p + 2 (-2 b k + b m - 2 c s + c v) z)^2 \Big/ (-2 b k + b m - 2 c s + c v) \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\right.$$

$$\left. \left. \frac{q+1}{2}, \frac{(p + 2 (-2 b k + b m - 2 c s + c v) z)^2}{8 b k - 4 b m + 8 c s - 4 c v} \right) \right) \Big/ \left(\sqrt{-2 b k + b m - 2 c s + c v} \right) -$$

$$\left(e^{\frac{p^2}{-8 b k + 4 b m + 8 c s - 4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (2 b k - b m - 2 c s + c v)^{-n-\frac{1}{2}} (p + 2 (2 b k - b m - 2 c s + c v) z)^{q+1} \right.$$

$$\left(-\frac{(p + 2 (2 b k - b m - 2 c s + c v) z)^2}{2 b k - b m - 2 c s + c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \right.$$

$$\left. \left. -\frac{(p + 2 (2 b k - b m - 2 c s + c v) z)^2}{8 b k - 4 b m - 8 c s + 4 c v} \right) \right) \Big/ \left(\sqrt{2 b k - b m - 2 c s + c v} \right) -$$

$$\left(e^{\frac{p^2}{8 b k - 4 b m - 8 c s + 4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-2 b k + b m + 2 c s - c v)^{-n-\frac{1}{2}} (p + 2 (-2 b k + b m + 2 c s - c v) z)^{q+1} \right.$$

$$\left(\frac{(p + 2 (-2 b k + b m + 2 c s - c v) z)^2}{2 b k - b m - 2 c s + c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \right.$$

$$\left. \left. \frac{(p + 2 (-2 b k + b m + 2 c s - c v) z)^2}{8 b k - 4 b m - 8 c s + 4 c v} \right) \right) \Big/ \left(\sqrt{-2 b k + b m + 2 c s - c v} \right) \Bigg) -$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b^2\,(m-2\,s)^2}}\left(\binom{m}{s}e^{\frac{p^2}{8\,b\,s-4\,b\,m}}\left(e^{\frac{p^2}{2\,b\,m-4\,b\,s}}\sqrt{b\,(m-2\,s)}\right.\right.$$

$$\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(-b\,(m-2\,s))^{-n-\frac{1}{2}}\,(p-2\,b\,(m-2\,s)\,z)^{q+1}\left(\frac{(p-2\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p-2\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)+\sqrt{-b\,(m-2\,s)}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(b\,(m-2\,s))^{-n-\frac{1}{2}}$$

$$\left.\left.(p+2\,b\,(m-2\,s)\,z)^{q+1}\left(-\frac{(p+2\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+2\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{c\,(v-2\,s)}}\left(e^{\frac{p^2}{8\,c\,s-4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(c\,(v-2\,s))^{-n-\frac{1}{2}}\right.\right.$$

$$\left.(p+2\,c\,(v-2\,s)\,z)^{q+1}\left(-\frac{(p+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+2\,c\,(v-2\,s)\,z)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$\frac{1}{\sqrt{c\,(2\,s-v)}}\left(e^{\frac{p^2}{4\,c\,v-8\,c\,s}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(c\,(2\,s-v))^{-n-\frac{1}{2}}\,(p+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\right.$$

$$\left.\left.\left(-\frac{(p+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(8\,s-4\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

01.20.21.3036.01

$$\int z^n\,e^{p\,z}\cosh^m\left(b\,\sqrt{z}\right)\cosh^v\left(c\,\sqrt{z}\right)dz==$$

$$(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,-p\,z)\,(1-m \bmod 2)\,(1-v \bmod 2)\,p^{-n-1}+2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{c^2\,(2\,k-v)^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(2\,k-v))^{-h-j+2\,n}\left(2\,p\,\sqrt{z}-c\,(2\,k-v)\right)^{h+j}\left(-\frac{\left(2\,p\,\sqrt{z}-c\,(2\,k-v)\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\left.\left.\binom{j}{h}\binom{n}{j}\left(2\,p\sqrt{-\frac{\left(2\,p\,\sqrt{z}-c\,(2\,k-v)\right)^2}{p}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,p\,\sqrt{z}-c\,(2\,k-v)\right)^2}{4\,p}\right)-c\right.\right.\right.$$

$$(2k-v)\left(2p\sqrt{z}-c(2k-v)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2p\sqrt{z}-c(2k-v)\right)^2}{4p}\right)\Bigg)+$$

$$e^{-\frac{c^2(v-2k)^2}{4p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\left(2p\sqrt{z}-c(v-2k)\right)^{h+j}\left(-\frac{\left(2p\sqrt{z}-c(v-2k)\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2p\sqrt{-\frac{\left(2p\sqrt{z}-c(v-2k)\right)^2}{p}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2p\sqrt{z}-c(v-2k)\right)^2}{4p}\right)-c$$

$$(v-2k)\left(2p\sqrt{z}-c(v-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2p\sqrt{z}-c(v-2k)\right)^2}{4p}\right)\Bigg)\Bigg)\Bigg)p^{-2n-2}+$$

$$2^{-m-2n-v-1}\Bigg(\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}\binom{m}{k}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(b(2k-m)-c(2s-v))^2}{4p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b(2k-m)-c(2s-v))^{-h-j+2n}$$

$$\left(b(2k-m)-c(2s-v)+2p\sqrt{z}\right)^{h+j}\left(-\frac{\left(b(2k-m)-c(2s-v)+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((b(2k-m)-c(2s-v))\left(b(2k-m)-c(2s-v)+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.-\frac{\left(b(2k-m)-c(2s-v)+2p\sqrt{z}\right)^2}{4p}\right)+2\sqrt{-\frac{\left(b(2k-m)-c(2s-v)+2p\sqrt{z}\right)^2}{p}}$$

$$p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b(2k-m)-c(2s-v)+2p\sqrt{z}\right)^2}{4p}\right)\Bigg)+e^{-\frac{(b(m-2k)-c(2s-v))^2}{4p}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(b(m-2k)-c(2s-v))^{-h-j+2n}\left(b(m-2k)-c(2s-v)+2p\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,(m-2\,k)-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)-c\,(2\,s-v))\left(b\,(m-2\,k)-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,k)-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b\,(m-2\,k)-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.p\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,(m-2\,k)-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+e^{-\frac{(b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,p}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(2\,k-m)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(2\,k-m)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,(2\,k-m)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(2\,k-m)-c\,(v-2\,s))\left(b\,(2\,k-m)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,(2\,k-m)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b\,(2\,k-m)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.p\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,(2\,k-m)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+e^{-\frac{(b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,p}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,(m-2\,k)-c\,(v-2\,s))\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.\left.p\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right)p^{-2\,n-2}+$$

$$2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{b^2\,(2\,k-m)^2}{4\,p}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(2\,k-m))^{-h-j+2\,n}\right.\right.$$

$$\left(b\,(2\,k-m)+2\,p\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,(2\,k-m)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,(2\,k-m)\left(b\,(2\,k-m)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,(2\,k-m)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\left.\sqrt{-\frac{\left(b\,(2\,k-m)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,(2\,k-m)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right)$$

$$p^{-2\,n-2}+e^{-\frac{b^2\,(m-2\,k)^2}{4\,p}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,(m-2\,k))^{-h-j+2\,n}\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,(m-2\,k)\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p$$

$$\left(1-\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2\right)\Big)\Big)\qquad\Big)$$

Involving $z^{\alpha-1}\, e^{p\, z^r}\, \cosh^m(b\, z^r) \cosh^v(c\, z^r)$

01.20.21.3037.01

$$\int z^{\alpha-1}\, e^{p\, z^r} \cosh^m(b\, z^r) \cosh^v(c\, z^r)\, dz == -\frac{2^{-m-v}\, z^\alpha}{r}$$

$$\left(\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{\alpha}{r}, -p\, z^r\right)(1-m \bmod 2)\,(1-v \bmod 2)\,(-p\, z^r)^{-\frac{\alpha}{r}} + \binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r}, (2\,b\,k-b\,m-p)\, z^r\right)\right.\right.$$

$$\left((2\,b\,k-b\,m-p)\, z^r\right)^{-\frac{\alpha}{r}} + (-(2\,b\,k-b\,m+p)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, -(2\,b\,k-b\,m+p)\, z^r\right)\Big)\Big) + \binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r}, -(p+2\,c\,s-c\,v)\, z^r\right)(-(p+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}} + (-(p+c\,(v-2\,s))\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, -(p+c\,(v-2\,s))\, z^r\right)\right) +$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r}, (-2\,b\,k+b\,m-p-2\,c\,s+c\,v)\, z^r\right)((-2\,b\,k+b\,m-p-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$((2\,b\,k-b\,m-p-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, (2\,b\,k-b\,m-p-2\,c\,s+c\,v)\, z^r\right) +$$

$$(-(2\,b\,k-b\,m+p-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, -(2\,b\,k-b\,m+p-2\,c\,s+c\,v)\, z^r\right) +$$

$$\left.\left.((2\,b\,k-b\,m-p+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r}, (2\,b\,k-b\,m-p+2\,c\,s-c\,v)\, z^r\right)\right)\right) /;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^{\alpha-1}\, e^{b\, z^r+e} \cosh^m(a\, z^r+q) \cosh^v(c\, z^r+g)$

01.20.21.3038.01

$$\int z^{\alpha-1}\, e^{b\,z^r+e} \cosh^m(a\,z^r+q) \cosh^v(c\,z^r+g)\,dz ==$$

$$-\frac{1}{r}\left((2^{-m-v}\,z^{\alpha})\left(e^{e}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{\alpha}{r},\,-b\,z^r\right)(1-m \bmod 2)\,(1-v \bmod 2)\,(-b\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{e+2\,k\,q-m\,q}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,a\,k+a\,m)\,z^r\right)((-b-2\,a\,k+a\,m)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.e^{e-2\,k\,q+m\,q}\,((-b+2\,a\,k-a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,a\,k-a\,m)\,z^r\right)\right)+$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e+2\,g\,s-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,s+c\,v)\,z^r\right)((-b-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.e^{e-2\,g\,s+g\,v}\,((-b+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,s-c\,v)\,z^r\right)\right)+\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e+2\,k\,q-m\,q+2\,g\,s-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,a\,k+a\,m-2\,c\,s+c\,v)\,z^r\right)((-b-2\,a\,k+a\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-2\,k\,q+m\,q+2\,g\,s-g\,v}\,((-b+2\,a\,k-a\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,a\,k-a\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$e^{e+2\,k\,q-m\,q-2\,g\,s+g\,v}\,((-b-2\,a\,k+a\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,a\,k+a\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$e^{e-2\,k\,q+m\,q-2\,g\,s+g\,v}\,((-b+2\,a\,k-a\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\left.\Gamma\left(\frac{\alpha}{r},\,(-b+2\,a\,k-a\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right)\right)/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\, e^{b\,z^r+d\,z+e}\cosh^m(a\,z^r+p\,z+q)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3039.01

$$\int z^n\, e^{b\,z^2+d\,z+e}\cosh^m(a\,z^2+p\,z+q)\cosh^v(c\,z^2+f\,z+g)\,dz == -2^{-m-v-1}\,e^{e-\frac{d^2}{4\,b}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)$$

$$(1-v \bmod 2)\,b^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d)^{n-j}\,(d+2\,b\,z)^{j+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(d+(2\,k-m)\,p)^2}{4\,(b+a\,(2\,k-m))}+e+(2\,k-m)\,q}\,(b+a\,(2\,k-m))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-(2\,k-m)\,p)^{n-j}\right.$$

$$\left.(d+(2\,k-m)\,p+2\,(b+a\,(2\,k-m))\,z)^{j+1}\left(-\frac{(d+(2\,k-m)\,p+2\,(b+a\,(2\,k-m))\,z)^2}{b+a\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+(2k-m)p+2(b+a(2k-m))z)^2}{4(b+a(2k-m))}\right)+$$

$$e^{-\frac{(d+(m-2k)p)^2}{4(b+a(m-2k))}+e+(m-2k)q}(b+a(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-(m-2k)p)^{n-j}$$

$$(d+(m-2k)p+2(b+a(m-2k))z)^{j+1}\left(-\frac{(d+(m-2k)p+2(b+a(m-2k))z)^2}{b+a(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+(m-2k)p+2(b+a(m-2k))z)^2}{4(b+a(m-2k))}\right)\Bigg)-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d+f(2s-v))^2}{4(b+c(2s-v))}+e+g(2s-v)}(b+c(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-f(2s-v))^{n-j}(d+f(2s-v)+2(b+c(2s-v))z)^{j+1}$$

$$\left(-\frac{(d+f(2s-v)+2(b+c(2s-v))z)^2}{b+c(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f(2s-v)+2(b+c(2s-v))z)^2}{4(b+c(2s-v))}\right)+$$

$$e^{-\frac{(d+f(v-2s))^2}{4(b+c(v-2s))}+e+g(v-2s)}(b+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-f(v-2s))^{n-j}(d+f(v-2s)+2(b+c(v-2s))z)^{j+1}$$

$$\left(-\frac{(d+f(v-2s)+2(b+c(v-2s))z)^2}{b+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f(v-2s)+2(b+c(v-2s))z)^2}{4(b+c(v-2s))}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d+(2k-m)p+f(2s-v))^2}{4(b+a(2k-m)+c(2s-v))}+e+(2k-m)q+g(2s-v)}(b+a(2k-m)+c(2s-v))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-d-(2k-m)p-f(2s-v))^{n-j}(d+(2k-m)p+f(2s-v)+2(b+a(2k-m)+c(2s-v))z)^{j+1}$$

$$\Big(-(d+(2k-m)p+f(2s-v)+2(b+a(2k-m)+c(2s-v))z)^2\Big/$$

$$(b+a(2k-m)+c(2s-v))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\Bigg(\frac{j+1}{2},$$

$$-(d+(2k-m)p+f(2s-v)+2(b+a(2k-m)+c(2s-v))z)^2\Big/(4(b+a(2k-m)+c(2s-v)))\Bigg)+$$

$$e^{-\frac{(d+(m-2k)p+f(2s-v))^2}{4(b+a(m-2k)+c(2s-v))}+e+(m-2k)q+g(2s-v)}(b+a(m-2k)+c(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-(m-2k)p-f(2s-v))^{n-j}$$

$$(d+(m-2k)p+f(2s-v)+2(b+a(m-2k)+c(2s-v))z)^{j+1}\Big(-(d+(m-2k)p+f(2s-v)+$$

$$2(b+a(m-2k)+c(2s-v))z)^2\Big/(b+a(m-2k)+c(2s-v))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\Bigg(\frac{j+1}{2},$$

$$-(d+(m-2k)p+f(2s-v)+2(b+a(m-2k)+c(2s-v))z)^2\Big/(4(b+a(m-2k)+c(2s-v)))\Bigg)+$$

$$e^{-\frac{(d+(2k-m)p+f(v-2s))^2}{4(b+a(2k-m)+c(v-2s))}+e+(2k-m)q+g(v-2s)}(b+a(2k-m)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-(2k-m)p-f(v-2s))^{n-j}$$

$$(d+(2k-m)p+f(v-2s)+2(b+a(2k-m)+c(v-2s))z)^{j+1}\left(-(d+(2k-m)p+f(v-2s)+\right.$$

$$\left.2(b+a(2k-m)+c(v-2s))z)^2\Big/(b+a(2k-m)+c(v-2s))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-(d+(2k-m)p+f(v-2s)+2(b+a(2k-m)+c(v-2s))z)^2\Big/(4(b+a(2k-m)+c(v-2s)))\right)+$$

$$e^{-\frac{(d+(m-2k)p+f(v-2s))^2}{4(b+a(m-2k)+c(v-2s))}+e+(m-2k)q+g(v-2s)}(b+a(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-(m-2k)p-f(v-2s))^{n-j}$$

$$(d+(m-2k)p+f(v-2s)+2(b+a(m-2k)+c(v-2s))z)^{j+1}\left(-(d+(m-2k)p+f(v-2s)+\right.$$

$$\left.2(b+a(m-2k)+c(v-2s))z)^2\Big/(b+a(m-2k)+c(v-2s))\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-(d+(m-2k)p+f(v-2s)+2(b+a(m-2k)+c(v-2s))z)^2\Big/\right.$$

$$\left.(4(b+a(m-2k)+c(v-2s)))\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3040.01

$$\int z^n e^{\sqrt{z}\,b+dz+e}\cosh^m\left(\sqrt{z}\,a+pz+q\right)\cosh^v\left(\sqrt{z}\,c+fz+g\right)dz==2^{-m-2n-v-1}e^{e-\frac{b^2}{4d}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)$$

$$(1-v\bmod 2)\,d^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i b^{-h-i+2n}\left(b+2d\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left(b\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)+2\sqrt{-\frac{\left(b+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)+$$

$$2^{-m-2n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(b+a(2k-m))^2}{4(d+(2k-m)p)}+e+(2k-m)q}(d+(2k-m)p)^{-2n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b+a(2k-m))^{-h-i+2n}\left(b+a(2k-m)+2(d+(2k-m)p)\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+a(2k-m)+2(d+(2k-m)p)\sqrt{z}\right)^2\Big/(d+(2k-m)p)\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((b+a(2k-m))\left(b+a(2k-m)+2(d+(2k-m)p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\right.\right.$$

$$\left.-\left(b+a(2k-m)+2(d+(2k-m)p)\sqrt{z}\right)^2\Big/(4(d+(2k-m)p))\right)+$$

$$2\sqrt{\left(-\left(b+a(2k-m)+2(d+(2k-m)p)\sqrt{z}\right)^2\Big/(d+(2k-m)p)\right)}(d+(2k-m)p)\,\Gamma\left(\frac{1}{2}(h+i+2),\right.$$

$$-\left(b+a\,(2\,k-m)+2\,(d+(2\,k-m)\,p)\,\sqrt{z}\right)^2\Big/\left(4\,(d+(2\,k-m)\,p)\right)\Big)\Big)+e^{-\frac{(b+a\,(m-2\,k))^2}{4\,(d+(m-2\,k)\,p)}+e+(m-2\,k)\,q}$$

$$(d+(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,(m-2\,k))^{-h-i+2\,n}\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2\Big/\left(d+(m-2\,k)\,p\right)\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Big((b+a\,(m-2\,k))\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(h+i+1),$$

$$-\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2\Big/\left(4\,(d+(m-2\,k)\,p)\right)\Big)+$$

$$2\,\sqrt{\left(-\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2\Big/\left(d+(m-2\,k)\,p\right)\Big)}\,(d+(m-2\,k)\,p)\,\Gamma\Big($$

$$\frac{1}{2}\,(h+i+2),\,-\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2\Big/\left(4\,(d+(m-2\,k)\,p)\right)\Big)\Big)\Big)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Big(e^{-\frac{(b+c\,(2\,s-v))^2}{4\,(d+f\,(2\,s-v))}+e+g\,(2\,s-v)}\,(d+f\,(2\,s-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c\,(2\,s-v))^{-h-i+2\,n}\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\left(d+f\,(2\,s-v)\right)\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Big((b+c\,(2\,s-v))\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(h+i+1),$$

$$-\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(2\,s-v))\right)\Big)+$$

$$2\,\sqrt{\left(-\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\left(d+f\,(2\,s-v)\right)\Big)}\,(d+f\,(2\,s-v))\,\Gamma\Big(\frac{1}{2}\,(h+i+2),$$

$$-\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(2\,s-v))\right)\Big)\Big)+e^{-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}+e+g\,(v-2\,s)}$$

$$(d+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c\,(v-2\,s))^{-h-i+2\,n}\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d+f\,(v-2\,s)\right)\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\Big((b+c\,(v-2\,s))\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(h+i+1),$$

$$-\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(v-2\,s))\right)\Big)+$$

$$2\,\sqrt{\left(-\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d+f\,(v-2\,s)\right)\Big)}\,(d+f\,(v-2\,s))\,\Gamma\Big($$

$$\frac{1}{2}\,(h+i+2),\,-\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d+f\,(v-2\,s))\right)\Big)\Big)\Big)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(b+a(2k-m)+c(2s-v))^2}{4(d+(2k-m)p+f(2s-v))}+e+(2k-m)q+g(2s-v)}(d+(2k-m)p+f(2s-v))^{-2n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b+a(2k-m)+c(2s-v))^{-h-i+2n}$$

$$\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^{h+i}\left(-\left(b+a(2k-m)+c(2s-v)+\right.\right.$$

$$\left.\left.2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/(d+(2k-m)p+f(2s-v))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((b+a(2k-m)+c(2s-v))\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+(2k-m)p+f(2s-v)))\right)+2(d+(2k-m)p+f(2s-v))$$

$$\Gamma\left(\frac{1}{2}(h+i+2),-\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+(2k-m)p+f(2s-v)))\right)\sqrt{\left(-\left(b+a(2k-m)+c(2s-v)+\right.\right.}$$

$$\left.\left.\left.2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/(d+(2k-m)p+f(2s-v))\right)\right)+$$

$$e^{-\frac{(b+a(m-2k)+c(2s-v))^2}{4(d+(m-2k)p+f(2s-v))}+e+(m-2k)q+g(2s-v)}(d+(m-2k)p+f(2s-v))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i$$

$$(b+a(m-2k)+c(2s-v))^{-h-i+2n}\left(b+a(m-2k)+c(2s-v)+2(d+(m-2k)p+f(2s-v))\right.$$

$$\left.\sqrt{z}\right)^{h+i}\left(-\left(b+a(m-2k)+c(2s-v)+2(d+(m-2k)p+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+(m-2k)p+f(2s-v))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+a(m-2k)+c(2s-v))\left(b+a(m-2k)+c(2s-v)+2(d+(m-2k)p+f(2s-v))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\left(b+a(m-2k)+c(2s-v)+2(d+(m-2k)p+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+(m-2k)p+f(2s-v)))\right)+2(d+(m-2k)p+f(2s-v))$$

$$\Gamma\left(\frac{1}{2}(h+i+2),-\left(b+a(m-2k)+c(2s-v)+2(d+(m-2k)p+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+(m-2k)p+f(2s-v)))\right)\sqrt{\left(-\left(b+a(m-2k)+c(2s-v)+\right.\right.}$$

$$\left.\left.\left.2(d+(m-2k)p+f(2s-v))\sqrt{z}\right)^2\Big/(d+(m-2k)p+f(2s-v))\right)\right)+$$

$$e^{-\frac{(b+a(2k-m)+c(v-2s))^2}{4(d+(2k-m)p+f(v-2s))}+e+(2k-m)q+g(v-2s)}(d+(2k-m)p+f(v-2s))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i$$

$$(b+a(2k-m)+c(v-2s))^{-h-i+2n}\left(b+a(2k-m)+c(v-2s)+2(d+(2k-m)p+f(v-2s))\right.$$

$$\sqrt{z}\Big)^{h+i}\left(-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+(2\,k-m)\,p+f\,(v-2\,s))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+a\,(2\,k-m)+c\,(v-2\,s))\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+(2\,k-m)\,p+f\,(v-2\,s)))\right)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))$$

$$\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+(2\,k-m)\,p+f\,(v-2\,s)))\right)\sqrt{\left(-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+\right.\right.}$$

$$\left.\left.2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/(d+(2\,k-m)\,p+f\,(v-2\,s))\right)\Big)+$$

$$e^{-\frac{(b+a\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d+(m-2\,k)\,p+f\,(v-2\,s))}+e+(m-2\,k)\,q+g\,(v-2\,s)}\,(d+(m-2\,k)\,p+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i$$

$$(b+a\,(m-2\,k)+c\,(v-2\,s))^{-h-i+2\,n}\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\right.$$

$$\sqrt{z}\Big)^{h+i}\left(-\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+(m-2\,k)\,p+f\,(v-2\,s))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+a\,(m-2\,k)+c\,(v-2\,s))\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+(m-2\,k)\,p+f\,(v-2\,s)))\right)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\right.$$

$$\left.-\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/(4\,(d+(m-2\,k)\,p+\right.$$

$$\left.\left.f\,(v-2\,s)))\right)\sqrt{\left(-\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\right.\right.}$$

$$\left.\left.\sqrt{z}\right)^2\Big/(d+(m-2\,k)\,p+f\,(v-2\,s))\right)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving functions of the direct function, exponential and algebraic functions

Involving powers of the direct function, exponential and algebraic functions

Involving powers of cosh, exp and algebraic functions

Involving $(a\,z+b)^{\beta}\,d^{z}\,\cosh^{\nu}(c\,z+e)$

01.20.21.3041.01

$$\int (b+a\,z)^{\beta}\,d^{z}\cosh^{\nu}(e+c\,z)\,dz == -\frac{1}{a}\,2^{-\nu}\,d^{-\frac{b}{a}}\,(b+a\,z)^{\beta+1}$$
$$\left(\binom{\nu}{\frac{\nu}{2}}E_{-\beta}\left(-\frac{(b+a\,z)\log(d)}{a}\right)(1-\nu \bmod 2)+\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{\frac{b\,c\,(2\,k-\nu)}{a}+e\,(\nu-2\,k)}\,E_{-\beta}\left(\frac{(b+a\,z)\,(c\,(2\,k-\nu)-\log(d))}{a}\right)+\right.\right.$$
$$\left.\left.e^{2\,e\,k-e\,\nu+\frac{b\,c\,(\nu-2\,k)}{a}}\,E_{-\beta}\left(-\frac{(b+a\,z)\,(c\,(2\,k-\nu)+\log(d))}{a}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}$$

01.20.21.3042.01

$$\int (a\,z+b)^{\beta}\,e^{p\,z}\cosh^{\nu}(e+c\,z)\,dz == -\frac{1}{a}\,2^{-\nu}\,e^{-\frac{b\,p}{a}}\,(b+a\,z)^{\beta+1}\left(\binom{\nu}{\frac{\nu}{2}}E_{-\beta}\left(-\frac{p\,(b+a\,z)}{a}\right)(1-\nu \bmod 2)+\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\right.$$
$$\left.\left(e^{2\,e\,k-e\,\nu+\frac{b\,c\,(\nu-2\,k)}{a}}\left(E_{-\beta}\left(-\frac{(2\,c\,k+p-c\,\nu)\,(b+a\,z)}{a}\right)+e^{-4\,e\,k+\frac{2\,b\,c\,(2\,k-\nu)}{a}+2\,e\,\nu}\,E_{-\beta}\left(-\frac{(p+c\,(\nu-2\,k))\,(b+a\,z)}{a}\right)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}$$

01.20.21.3043.01

$$\int (b+a\,z)^{\beta}\,d^{z}\cosh^{\nu}(c\,z)\,dz == -\frac{1}{a}\left(2^{-\nu}\,d^{-\frac{b}{a}}\,(b+a\,z)^{\beta+1}\left(\binom{\nu}{\frac{\nu}{2}}E_{-\beta}\left(-\frac{(b+a\,z)\log(d)}{a}\right)(1-\nu \bmod 2)+\right.\right.$$
$$\left.\left.\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{\frac{b\,c\,(2\,k-\nu)}{a}}\,E_{-\beta}\left(\frac{(b+a\,z)\,(c\,(2\,k-\nu)-\log(d))}{a}\right)+e^{-\frac{b\,c\,(2\,k-\nu)}{a}}\,E_{-\beta}\left(-\frac{(b+a\,z)\,(c\,(2\,k-\nu)+\log(d))}{a}\right)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}$$

01.20.21.3044.01

$$\int (a\,z+b)^{\beta}\,e^{p\,z}\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu}\,e^{-\frac{b\,p}{a}}\,(b+a\,z)^{\beta}}{p}\left(-\frac{p\,(b+a\,z)}{a}\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\Gamma\left(\beta+1,-\frac{p\,(b+a\,z)}{a}\right)(1-\nu \bmod 2)-$$
$$\frac{2^{-\nu}\,(b+a\,z)^{\beta+1}}{a}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{b\,(p-c\,(\nu-2\,k))}{a}}\left(-\frac{(p-c\,(\nu-2\,k))\,(b+a\,z)}{a}\right)^{-\beta-1}\Gamma\left(\beta+1,-\frac{(p-c\,(\nu-2\,k))\,(b+a\,z)}{a}\right)+\right.$$
$$\left.e^{-\frac{b\,(p+c\,(\nu-2\,k))}{a}}\left(-\frac{(p+c\,(\nu-2\,k))\,(b+a\,z)}{a}\right)^{-\beta-1}\Gamma\left(\beta+1,-\frac{(p+c\,(\nu-2\,k))\,(b+a\,z)}{a}\right)\right)\Big/;\ \nu\in\mathbb{N}$$

01.20.21.3045.01

$$\int \frac{e^{p\,z}\cosh^{\nu}(c\,z)}{\sqrt{a\,z+b}}\,dz == \frac{2^{-\nu}\sqrt{\pi}}{a}\left(\frac{e^{-\frac{b\,p}{a}}\binom{\nu}{\frac{\nu}{2}}\operatorname{erfi}\left(\sqrt{\frac{p}{a}}\sqrt{b+a\,z}\right)(1-\nu \bmod 2)}{\sqrt{\frac{p}{a}}}+\right.$$

$$\left.\sum_{k=0}^{\lfloor\frac{\nu-1}{2}\rfloor}\binom{\nu}{k}\left(\frac{e^{-\frac{b\,(p-c\,(\nu-2\,k))}{a}}\operatorname{erfi}\left(\sqrt{\frac{p-c\,(\nu-2\,k)}{a}}\sqrt{b+a\,z}\right)}{\sqrt{\frac{p-c\,(\nu-2\,k)}{a}}}+\frac{e^{-\frac{b\,(p+c\,(\nu-2\,k))}{a}}\operatorname{erfi}\left(\sqrt{\frac{p+c\,(\nu-2\,k)}{a}}\sqrt{b+a\,z}\right)}{\sqrt{\frac{p+c\,(\nu-2\,k)}{a}}}\right)\right) /;\ \nu\in\mathbb{N}$$

01.20.21.3046.01

$$\int \frac{e^{p\,z}\cosh^{2}(c\,z)}{\sqrt{b+a\,z}}\,dz ==$$

$$-\frac{e^{-\frac{b\,p}{a}}\sqrt{\pi}\,\sqrt{b+a\,z}}{4\,a}\left(\frac{e^{\frac{2\,b\,c}{a}}\operatorname{erfc}\left(\sqrt{\frac{(2\,c-p)\,(b+a\,z)}{a}}\right)}{\sqrt{\frac{(2\,c-p)\,(b+a\,z)}{a}}}+\frac{2\operatorname{erfc}\left(\sqrt{-\frac{p\,(b+a\,z)}{a}}\right)}{\sqrt{-\frac{p\,(b+a\,z)}{a}}}+\frac{e^{-\frac{2\,b\,c}{a}}\operatorname{erfc}\left(\sqrt{-\frac{(2\,c+p)\,(b+a\,z)}{a}}\right)}{\sqrt{-\frac{(2\,c+p)\,(b+a\,z)}{a}}}\right)$$

Involving products of the direct function, exponential and algebraic functions

Involving products of cosh, exp and algebraic functions

Involving $(a\,z+b)^{\beta}\,d^{z}\cosh(c\,z)\cosh(e\,z)$

01.20.21.3047.01

$$\int (a+b\,z)^{\beta}\,d^{z}\cosh(c\,z)\cosh(e\,z)\,dz ==$$

$$\frac{1}{4}d^{-\frac{a}{b}}(a+b\,z)^{\beta}\left(\frac{\Gamma\left(\beta+1,-\frac{(a+b\,z)\,(c-e+\log(d))}{b}\right)\left(-\frac{(a+b\,z)\,(c-e+\log(d))}{b}\right)^{-\beta}\left(\cosh\left(\frac{a\,(c-e)}{b}\right)-\sinh\left(\frac{a\,(c-e)}{b}\right)\right)}{c-e+\log(d)}-\right.$$

$$\frac{1}{b}\left((a+b\,z)\,\Gamma\left(\beta+1,\frac{(a+b\,z)\,(c-e-\log(d))}{b}\right)\left(\frac{(a+b\,z)\,(c-e-\log(d))}{b}\right)^{-\beta-1}\left(\cosh\left(\frac{a\,(c-e)}{b}\right)+\sinh\left(\frac{a\,(c-e)}{b}\right)\right)\right)+$$

$$\frac{\Gamma\left(\beta+1,-\frac{(a+b\,z)\,(c+e+\log(d))}{b}\right)\left(-\frac{(a+b\,z)\,(c+e+\log(d))}{b}\right)^{-\beta}\left(\cosh\left(\frac{a\,(c+e)}{b}\right)-\sinh\left(\frac{a\,(c+e)}{b}\right)\right)}{c+e+\log(d)}-$$

$$\left.\frac{\Gamma\left(\beta+1,\frac{(a+b\,z)\,(c+e-\log(d))}{b}\right)\left(\frac{(a+b\,z)\,(c+e-\log(d))}{b}\right)^{-\beta}\left(\cosh\left(\frac{a\,(c+e)}{b}\right)+\sinh\left(\frac{a\,(c+e)}{b}\right)\right)}{c+e-\log(d)}\right)$$

Involving functions of the direct function and trigonometric functions

Involving powers of the direct function and trigonometric functions

Involving sin

Involving $\sin(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3048.01

$$\int \sin(c\,z)\cosh^{\nu}(a\,z)\,dz == -\frac{1}{2}\left(1+e^{-2az}\right)^{-\nu}\cosh^{\nu}(a\,z)$$
$$\left(\frac{e^{-icz}}{c+ia\nu}\,{}_2F_1\left(\frac{i(c+ia\nu)}{2a},-\nu;\frac{1}{2}\left(2+\frac{ic}{a}-\nu\right);-e^{-2az}\right)+\frac{e^{icz}}{c-ia\nu}\,{}_2F_1\left(-\frac{ic+a\nu}{2a},-\nu;\frac{1}{2}\left(2-\frac{ic}{a}-\nu\right);-e^{-2az}\right)\right)$$

01.20.21.3049.01

$$\int \sin(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu-1}\left(\frac{2\cos(c\,z)\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)}{c}-\right.$$
$$\left.\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(-\frac{e^{icz-2asz+avz}}{-c-2ias+iav}-\frac{e^{icz+2asz-avz}}{-c+2ias-iav}+\frac{e^{-icz-2asz+avz}}{c+ai(\nu-2s)}+\frac{e^{(-ic+2as-a\nu)z}}{c+ai(2s-\nu)}\right)\binom{\nu}{s}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3050.01

$$\int \sin(d+c\,z)\cosh^{\nu}(a\,z)\,dz == -\frac{1}{2}e^{id}\left(1+e^{-2az}\right)^{-\nu}\cosh^{\nu}(a\,z)$$
$$\left(\frac{e^{-i(2d+cz)}}{c+ia\nu}\,{}_2F_1\left(\frac{i(c+ia\nu)}{2a},-\nu;\frac{1}{2}\left(2+\frac{ic}{a}-\nu\right);-e^{-2az}\right)+\frac{e^{icz}}{c-ia\nu}\,{}_2F_1\left(-\frac{ic+a\nu}{2a},-\nu;\frac{1}{2}\left(2-\frac{ic}{a}-\nu\right);-e^{-2az}\right)\right)$$

01.20.21.3051.01

$$\int \sin(d+c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu-1}\left(\frac{2\cos(d+c\,z)\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)}{c}-\right.$$
$$\left.e^{id}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(-\frac{e^{icz-2asz+avz}}{-c-2ias+iav}-\frac{e^{icz+2asz-avz}}{-c+2ias-iav}+\frac{e^{-2id-icz-2asz+avz}}{c+ai(\nu-2s)}+\frac{e^{-2id+(-ic+2as-a\nu)z}}{c+ai(2s-\nu)}\right)\binom{\nu}{s}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.3052.01

$$\int \sin(c\,z)\cosh^{\nu}(b+a\,z)\,dz == -\frac{1}{2}\left(1+e^{-2(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)$$
$$\left(\frac{e^{-i\,c\,z}}{c+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(2+\frac{i\,c}{a}-\nu\right);\,-e^{-2(b+a\,z)}\right)+\frac{e^{i\,c\,z}}{c-i\,a\,\nu}\,{}_2F_1\left(-\frac{i\,c+a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(2-\frac{i\,c}{a}-\nu\right);\,-e^{-2(b+a\,z)}\right)\right)$$

01.20.21.3053.01

$$\int \sin(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu-1}\left(\frac{2\cos(c\,z)\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)}{c}-\right.$$
$$\left.\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{b(2s+\nu)}\left(-\frac{e^{-4bs-2azs+icz+a\nu z}}{-c-2ias+ia\nu}-\frac{e^{-2b\nu-az\nu+icz+2asz}}{-c+2ias-ia\nu}+\frac{e^{-4bs-icz-2asz+a\nu z}}{c+ai(\nu-2s)}+\frac{e^{-2b\nu+(-ic+2as-a\nu)z}}{c+ai(2s-\nu)}\right)\binom{\nu}{s}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.3054.01

$$\int \sin(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == -\frac{1}{2}e^{i\,d}\left(1+e^{-2(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)$$
$$\left(\frac{e^{-i\,(2\,d+c\,z)}}{c+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(2+\frac{i\,c}{a}-\nu\right);\,-e^{-2(b+a\,z)}\right)+\frac{e^{i\,c\,z}}{c-i\,a\,\nu}\,{}_2F_1\left(-\frac{i\,c+a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(2-\frac{i\,c}{a}-\nu\right);\,-e^{-2(b+a\,z)}\right)\right)$$

01.20.21.3055.01

$$\int \sin(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu-1}\left(\frac{2\cos(d+c\,z)\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)}{c}-\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{i(d-ib(2s+\nu))}\right.$$
$$\left.\left(-\frac{e^{-4bs-2azs+icz+a\nu z}}{-c-2ias+ia\nu}-\frac{e^{-2b\nu-az\nu+icz+2asz}}{-c+2ias-ia\nu}+\frac{e^{-2id-4bs-icz-2asz+a\nu z}}{c+ai(\nu-2s)}+\frac{e^{-2id-2b\nu+(-ic+2as-a\nu)z}}{c+ai(2s-\nu)}\right)\binom{\nu}{s}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^{r}\right)\cosh^{\nu}(c\,z)$

01.20.21.3056.01

$$\int \sin\left(b\,z^2\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{-b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{\cos\left(\frac{c^2(\nu-2k)^2}{4b}\right)S\left(\frac{2ick-ic\nu+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)+C\left(\frac{2ick-ic\nu+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)\sin\left(\frac{c^2(\nu-2k)^2}{4b}\right)}{\sqrt{b}}+\right.$$

$$\left.\frac{\sin\left(\frac{c^2(\nu-2k)^2}{4b}\right)C\left(\frac{2ick-ic\nu-2bz}{\sqrt{-b}\,\sqrt{2\pi}}\right)-S\left(\frac{2ick-ic\nu-2bz}{\sqrt{-b}\,\sqrt{2\pi}}\right)\cos\left(\frac{c^2(\nu-2k)^2}{4b}\right)}{\sqrt{-b}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3057.01

$$\int \sin\left(b\sqrt{z}\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(b\sqrt{z}\right)-b\sqrt{z}\,\cos\left(b\sqrt{z}\right)\right)}{b^2}+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2ick-ic\nu)^{3/2}}\left(-2\sqrt{2ick-ic\nu}\,\cos\left(\sqrt{z}\,b+c\,i\,(2k-\nu)\,z\right)-b\sqrt{2\pi}\right.\right.$$

$$\left.\left.\left(\cosh\left(\frac{b^2}{4(2ck-c\nu)}\right)S\left(\frac{b+2c\,i\,(2k-\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{ic(2k-\nu)}}\right)+i\,C\left(\frac{b+2c\,i\,(2k-\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{ic(2k-\nu)}}\right)\sinh\left(\frac{b^2}{4(2ck-c\nu)}\right)\right)\right)+\right.$$

$$\frac{1}{(2ick-ic\nu)^{3/2}}\left(2\sqrt{2ick-ic\nu}\,\cos\left(b\sqrt{z}-ic(2k-\nu)\,z\right)+b\sqrt{2\pi}\left(-\cosh\left(\frac{b^2}{4(2ck-c\nu)}\right)S\left(\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{2ic(2k-\nu)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{ic(2k-\nu)}}\right)-i\,C\left(\frac{2ic(2k-\nu)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{ic(2k-\nu)}}\right)\sinh\left(\frac{b^2}{4(2ck-c\nu)}\right)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+e\right)\cosh^{\nu}(c\,z)$

01.20.21.3058.01

$$\int \sin\left(b\,z^2+e\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{-b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)-C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)\sin(e)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{\cos\left(\frac{c^2(\nu-2k)^2}{4b}+e\right)S\left(\frac{2ick-ic\nu+2bz}{\sqrt{b}\sqrt{2\pi}}\right)+C\left(\frac{2ick-ic\nu+2bz}{\sqrt{b}\sqrt{2\pi}}\right)\sin\left(\frac{c^2(\nu-2k)^2}{4b}+e\right)}{\sqrt{b}}+\right.$$

$$\left.\frac{\sin\left(\frac{c^2(\nu-2k)^2}{4b}+e\right)C\left(\frac{2ick-ic\nu-2bz}{\sqrt{-b}\sqrt{2\pi}}\right)-S\left(\frac{2ick-ic\nu-2bz}{\sqrt{-b}\sqrt{2\pi}}\right)\cos\left(\frac{c^2(\nu-2k)^2}{4b}+e\right)}{\sqrt{-b}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3059.01

$$\int \sin\left(\sqrt{z}\,b+e\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\sqrt{z}\,b+e\right)-b\sqrt{z}\,\cos\left(\sqrt{z}\,b+e\right)\right)}{b^2}+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2ick-ic\nu)^{3/2}}\left(-b\sqrt{2\pi}\left(\cos\left(\frac{ib^2}{4(2ck-c\nu)}+e\right)S\left(\frac{b+2ci(2k-\nu)\sqrt{z}}{\sqrt{2\pi}\sqrt{ic(2k-\nu)}}\right)+C\left(\frac{b+2ci(2k-\nu)\sqrt{z}}{\sqrt{2\pi}\sqrt{ic(2k-\nu)}}\right)\right.\right.\right.$$

$$\left.\left.\sin\left(\frac{ib^2}{4(2ck-c\nu)}+e\right)\right)-2\sqrt{2ick-ic\nu}\,\cos\left(\sqrt{z}\,b+e+ci(2k-\nu)z\right)\right)+$$

$$\frac{1}{(2ick-ic\nu)^{3/2}}\left(b\sqrt{2\pi}\left(\sin\left(e-\frac{ib^2}{4(2ck-c\nu)}\right)C\left(\frac{2ic(2k-\nu)\sqrt{z}-b}{\sqrt{2\pi}\sqrt{ic(2k-\nu)}}\right)-S\left(\frac{2ic(2k-\nu)\sqrt{z}-b}{\sqrt{2\pi}\sqrt{ic(2k-\nu)}}\right)\right.\right.$$

$$\left.\left.\left.\cos\left(e-\frac{ib^2}{4(2ck-c\nu)}\right)\right)+2\sqrt{2ick-ic\nu}\,\cos\left(\sqrt{z}\,b+e-ic(2k-\nu)z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh^{\nu}(c\,z)$

01.20.21.3060.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(-\cos\left(\frac{(-d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)S\left(\frac{-d+2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-C\left(\frac{-d+2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sin\left(\frac{(-d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)\right)+\frac{1}{\sqrt{b}}\left(\cos\left(\frac{(d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)S\left(\frac{d+2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)-\right.$$
$$\left.\left.C\left(\frac{d+2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)\right)\right)-$$
$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{d^2}{4\,b}\right)S\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)+C\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,b}\right)\right)}{\sqrt{-b}}\ /;\ \nu\in\mathbb{N}^+$$

01.20.21.3061.01

$$\int \sin\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}(c\,z)\,dz == \frac{1}{(-d)^{3/2}}2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}$$
$$\left(2\sqrt{-d}\ \cos\left(\sqrt{z}\ b+d\,z\right)-b\sqrt{2\,\pi}\left(\cos\left(\frac{b^2}{4\,d}\right)S\left(\frac{\sqrt{-d}\ \left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)+C\left(\frac{\sqrt{-d}\ \left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)\right)\right)$$
$$(1-\nu \bmod 2)+2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(d+2\,i\,c\,k-i\,c\,\nu)^{3/2}}\right.$$
$$\left(-2\sqrt{d+2\,i\,c\,k-i\,c\,\nu}\ \cos\left(\sqrt{z}\ b+(d+2\,i\,c\,k-i\,c\,\nu)\,z\right)-b\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d+2\,i\,c\,k-i\,c\,\nu}}\right)\right.$$
$$\left.\cos\left(\frac{b^2}{4\,(d+2\,i\,c\,k-i\,c\,\nu)}\right)+b\sqrt{2\,\pi}\ C\left(\frac{b+2\,(d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d+2\,i\,c\,k-i\,c\,\nu}}\right)\sin\left(\frac{b^2}{4\,(d+2\,i\,c\,k-i\,c\,\nu)}\right)\right)+$$
$$\frac{1}{(-d+2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(2\sqrt{-d+2\,i\,c\,k-i\,c\,\nu}\ \cos\left(b\sqrt{z}\ -(-d+2\,i\,c\,k-i\,c\,\nu)\,z\right)-\right.$$
$$b\sqrt{2\,\pi}\ S\left(\frac{2\,(-d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\ -b}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,c\,k-i\,c\,\nu}}\right)\cos\left(\frac{b^2}{4\,(-d+2\,i\,c\,k-i\,c\,\nu)}\right)+$$
$$\left.\left.b\sqrt{2\,\pi}\ C\left(\frac{2\,(-d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\ -b}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,c\,k-i\,c\,\nu}}\right)\sin\left(\frac{b^2}{4\,(-d+2\,i\,c\,k-i\,c\,\nu)}\right)\right)\right)\ /;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh^{\nu}(c\,z)$

01.20.21.3062.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\sin\left(e-\frac{(-d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)C\left(\frac{-d+2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{-d+2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\cos\left(e-\frac{(-d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)\right)+\frac{1}{\sqrt{b}}\left(\cos\left(e-\frac{(d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)S\left(\frac{d+2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)+$$
$$\left.C\left(\frac{d+2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(e-\frac{(d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)\right)\Bigg)-\frac{1}{\sqrt{-b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left.\left.\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)S\left(\frac{\sqrt{-b}\,(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)+C\left(\frac{\sqrt{-b}\,(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)\right)\right)\Bigg)\Bigg)\Bigg/;\ \nu\in\mathbb{N}^+$$

01.20.21.3063.01

$$\int \sin\left(\sqrt{z}\;b+e+d\,z\right)\cosh^{\nu}(c\,z)\,dz == \frac{1}{(-d)^{3/2}}2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(2\sqrt{-d}\;\cos\left(\sqrt{z}\;b+e+d\,z\right)-\right.$$
$$\left.b\sqrt{2\,\pi}\left(\cos\left(\frac{1}{4}\left(\frac{b^2}{d}-4\,e\right)\right)S\left(\frac{\sqrt{-d}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right)+C\left(\frac{\sqrt{-d}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{b^2}{d}-4\,e\right)\right)\right)\right)(1-\nu \bmod 2)+$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(d+2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(-2\sqrt{d+2\,i\,c\,k-i\,c\,\nu}\;\cos\left(\sqrt{z}\;b+e+(d+2\,i\,c\,k-i\,c\,\nu)\,z\right)-\right.\right.$$
$$b\sqrt{2\,\pi}\;S\left(\frac{b+2\,(d+2\,i\,c\,k-i\,c\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{d+2\,i\,c\,k-i\,c\,\nu}}\right)\cos\left(e-\frac{b^2}{4\,(d+2\,i\,c\,k-i\,c\,\nu)}\right)-$$
$$\left.b\sqrt{2\,\pi}\;C\left(\frac{b+2\,(d+2\,i\,c\,k-i\,c\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{d+2\,i\,c\,k-i\,c\,\nu}}\right)\sin\left(e-\frac{b^2}{4\,(d+2\,i\,c\,k-i\,c\,\nu)}\right)\right)+$$
$$\frac{1}{(-d+2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(2\sqrt{-d+2\,i\,c\,k-i\,c\,\nu}\;\cos\left(\sqrt{z}\;b+e-(-d+2\,i\,c\,k-i\,c\,\nu)\,z\right)-\right.$$
$$b\sqrt{2\,\pi}\;S\left(\frac{2\,(-d+2\,i\,c\,k-i\,c\,\nu)\,\sqrt{z}\;-b}{\sqrt{2\,\pi}\;\sqrt{-d+2\,i\,c\,k-i\,c\,\nu}}\right)\cos\left(\frac{b^2}{4\,(-d+2\,i\,c\,k-i\,c\,\nu)}+e\right)+$$
$$\left.\left.b\sqrt{2\,\pi}\;C\left(\frac{2\,(-d+2\,i\,c\,k-i\,c\,\nu)\,\sqrt{z}\;-b}{\sqrt{2\,\pi}\;\sqrt{-d+2\,i\,c\,k-i\,c\,\nu}}\right)\sin\left(\frac{b^2}{4\,(-d+2\,i\,c\,k-i\,c\,\nu)}+e\right)\right)\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3064.01

$$\int \sin\left(b\,z^2\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)(1-\nu \bmod 2)}{\sqrt{-b}} + 2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(C\left(\frac{i\,f\,(2\,k-\nu)-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2\,(\nu-2\,k)^2+4\,b\,(i\,g\,\nu-2\,i\,g\,k)}{4\,b}\right)-\cos\left(\frac{f^2\,(\nu-2\,k)^2+4\,b\,(i\,g\,\nu-2\,i\,g\,k)}{4\,b}\right)\right.\right.$$

$$\left.S\left(\frac{i\,f\,(2\,k-\nu)-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\right)+\frac{1}{\sqrt{b}}\left(\cos\left(\frac{f^2\,(\nu-2\,k)^2+4\,b\,(2\,i\,g\,k-i\,g\,\nu)}{4\,b}\right)S\left(\frac{f\,i\,(2\,k-\nu)+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)+$$

$$\left.\left.C\left(\frac{f\,i\,(2\,k-\nu)+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{f^2\,(\nu-2\,k)^2+4\,b\,(2\,i\,g\,k-i\,g\,\nu)}{4\,b}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3065.01

$$\int \sin\left(b\sqrt{z}\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(b\sqrt{z}\right)-b\sqrt{z}\,\cos\left(b\sqrt{z}\right)\right)}{b^2} +$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(2\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\cosh\left(2\,g\,k-g\,\nu+i\,b\sqrt{z}+2\,f\,k\,z-f\,\nu\,z\right)-\right.\right.$$

$$b\sqrt{2\,\pi}\,S\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\cosh\left(\frac{b^2+4\,f\,g\,(\nu-2\,k)^2}{f\,(8\,k-4\,\nu)}\right)-$$

$$i\,b\sqrt{2\,\pi}\,C\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sinh\left(\frac{b^2+4\,f\,g\,(\nu-2\,k)^2}{f\,(8\,k-4\,\nu)}\right)\Big)+\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}$$

$$\left(-2\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\cosh\left(2\,g\,k-g\,\nu-i\,b\sqrt{z}+2\,f\,k\,z-f\,\nu\,z\right)-b\sqrt{2\,\pi}\,S\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\cosh\left(\right.\right.$$

$$\left.\left.\frac{b^2+4\,f\,g\,(\nu-2\,k)^2}{f\,(8\,k-4\,\nu)}\right)-b\,i\sqrt{2\,\pi}\,C\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sinh\left(\frac{b^2+4\,f\,g\,(\nu-2\,k)^2}{f\,(8\,k-4\,\nu)}\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+e\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3066.01

$$\int \sin\left(b\,z^2+e\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{-b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)-C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)\sin(e)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(C\left(\frac{i\,f\,(2k-\nu)-2\,b\,z}{\sqrt{-b}\,\sqrt{2\pi}}\right)\sin\left(\frac{f^2(\nu-2k)^2+4\,b\,(e-2\,i\,g\,k+i\,g\,\nu)}{4\,b}\right)-\right.\right.$$

$$\left.\cos\left(\frac{f^2(\nu-2k)^2+4\,b\,(e-2\,i\,g\,k+i\,g\,\nu)}{4\,b}\right)S\left(\frac{i\,f\,(2k-\nu)-2\,b\,z}{\sqrt{-b}\,\sqrt{2\pi}}\right)\right)+$$

$$\frac{1}{\sqrt{b}}\left(\cos\left(\frac{f^2(\nu-2k)^2+4\,b\,(e+2\,i\,g\,k-i\,g\,\nu)}{4\,b}\right)S\left(\frac{f\,i\,(2k-\nu)+2\,b\,z}{\sqrt{b}\,\sqrt{2\pi}}\right)+\right.$$

$$\left.\left.C\left(\frac{f\,i\,(2k-\nu)+2\,b\,z}{\sqrt{b}\,\sqrt{2\pi}}\right)\sin\left(\frac{f^2(\nu-2k)^2+4\,b\,(e+2\,i\,g\,k-i\,g\,\nu)}{4\,b}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3067.01

$$\int \sin\left(\sqrt{z}\;b+e\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\sqrt{z}\;b+e\right)-b\sqrt{z}\;\cos\left(\sqrt{z}\;b+e\right)\right)}{b^2}+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(2\sqrt{2\,i\,f\,k-i\,f\,\nu}\;\cos\left(\sqrt{z}\;b+e-2\,i\,g\,k+i\,g\,\nu-2\,i\,f\,k\,z+i\,f\,\nu\,z\right)-\right.\right.$$

$$b\sqrt{2\pi}\;S\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\pi}\;\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\cos\left(\frac{i\,b^2}{4\,f\,\nu-8\,f\,k}+e-2\,i\,g\,k+i\,g\,\nu\right)+$$

$$\left.b\sqrt{2\pi}\;C\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\pi}\;\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(\frac{i\,b^2}{4\,f\,\nu-8\,f\,k}+e-2\,i\,g\,k+i\,g\,\nu\right)\right)+$$

$$\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(-2\sqrt{2\,i\,f\,k-i\,f\,\nu}\;\cos\left(\sqrt{z}\;b+e+g\,i\,(2k-\nu)+2\,i\,f\,k\,z-i\,f\,\nu\,z\right)-\right.$$

$$b\sqrt{2\pi}\;S\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\cos\left(e+i\left(\frac{b^2}{8\,f\,k-4\,f\,\nu}+2\,g\,k-g\,\nu\right)\right)-$$

$$\left.\left.b\sqrt{2\pi}\;C\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(e+i\left(\frac{b^2}{8\,f\,k-4\,f\,\nu}+2\,g\,k-g\,\nu\right)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3068.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$-\frac{1}{\sqrt{-b}}\,2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{d^2}{4\,b}\right)S\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)+C\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,b}\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\sin\left(-\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}-i\,g\,(2\,k-\nu)\right)C\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\cos\left(-\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}-i\,g\,(2\,k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{b}}\left(\cos\left(-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+g\,i\,(2\,k-\nu)\right)S\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)+\right.$$

$$\left.\left.C\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+g\,i\,(2\,k-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3069.01

$$\int \sin\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{1}{(-d)^{3/2}}\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(-b\sqrt{2\,\pi}\left(\cos\left(\frac{b^2}{4\,d}\right)S\left(\frac{\sqrt{-d}\,\left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)+C\left(\frac{\sqrt{-d}\,\left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)\right)+2\sqrt{-d}\,\cos\left(\sqrt{z}\ b+d\,z\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\left(-2\sqrt{d+2\,i\,f\,k-i\,f\,\nu}\,\cos\left(\sqrt{z}\ b+2\,i\,g\,k-i\,g\,\nu+(d+2\,i\,f\,k-i\,f\,\nu)\,z\right)-\right.\right.$$

$$b\sqrt{2\,\pi}\,S\left(\frac{b+2\,(d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{d+2\,i\,f\,k-i\,f\,\nu}}\right)\cos\left(-\frac{b^2}{4\,(d+2\,i\,f\,k-i\,f\,\nu)}+2\,i\,g\,k-i\,g\,\nu\right)-$$

$$\left.b\sqrt{2\,\pi}\,C\left(\frac{b+2\,(d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{d+2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(-\frac{b^2}{4\,(d+2\,i\,f\,k-i\,f\,\nu)}+2\,i\,g\,k-i\,g\,\nu\right)\right)\Big/$$

$$(d+2\,i\,f\,k-i\,f\,\nu)^{3/2}+\left(2\sqrt{-d+2\,i\,f\,k-i\,f\,\nu}\,\cos\left(\sqrt{z}\ b-2\,i\,g\,k+i\,g\,\nu-(-d+2\,i\,f\,k-i\,f\,\nu)\,z\right)-\right.$$

$$b\sqrt{2\,\pi}\,S\left(\frac{2\,(-d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,k-i\,f\,\nu}}\right)\cos\left(\frac{b^2}{4\,(-d+2\,i\,f\,k-i\,f\,\nu)}-2\,i\,g\,k+i\,g\,\nu\right)+$$

$$b\sqrt{2\,\pi}\,C\left(\frac{2\,(-d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,k-i\,f\,\nu}}\right)$$

$$\left.\left.\sin\left(\frac{b^2}{4\,(-d+2\,i\,f\,k-i\,f\,\nu)}-2\,i\,g\,k+i\,g\,\nu\right)\right)\Big/(-d+2\,i\,f\,k-i\,f\,\nu)^{3/2}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sin\left(b\,z^{r}+d\,z+e\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3070.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$-\frac{1}{\sqrt{-b}}\,2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)S\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)+C\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\sin\left(-\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e-i\,g\,(2\,k-\nu)\right)C\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\cos\left(-\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e-i\,g\,(2\,k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{b}}\left(\cos\left(-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e+g\,i\,(2\,k-\nu)\right)S\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)+\right.$$

$$\left.\left.C\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e+g\,i\,(2\,k-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3071.01

$$\int \sin\left(\sqrt{z}\, b+e+d z\right)\cosh^{\nu}(g+f z)\,dz == \frac{1}{(-d)^{3/2}}\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(-b\sqrt{2\pi}\left(\cos\left(\frac{1}{4}\left(\frac{b^2}{d}-4e\right)\right)S\left(\frac{\sqrt{-d}\,\left(b+2d\sqrt{z}\right)}{d\sqrt{2\pi}}\right)+C\left(\frac{\sqrt{-d}\,\left(b+2d\sqrt{z}\right)}{d\sqrt{2\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{b^2}{d}-4e\right)\right)\right)+\right.$$

$$\left.2\sqrt{-d}\,\cos\left(\sqrt{z}\, b+e+d z\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\left(-2\sqrt{d+2\,i\,f\,k-i\,f\,\nu}\,\cos\left(\sqrt{z}\, b+e+2\,i\,g\,k-i\,g\,\nu+(d+2\,i\,f\,k-i\,f\,\nu)\,z\right)-\right.\right.$$

$$b\sqrt{2\pi}\,S\left(\frac{b+2\,(d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{d+2\,i\,f\,k-i\,f\,\nu}}\right)\cos\left(-\frac{b^2}{4\,(d+2\,i\,f\,k-i\,f\,\nu)}+e+2\,i\,g\,k-i\,g\,\nu\right)-$$

$$\left.b\sqrt{2\pi}\,C\left(\frac{b+2\,(d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{d+2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(-\frac{b^2}{4\,(d+2\,i\,f\,k-i\,f\,\nu)}+e+2\,i\,g\,k-i\,g\,\nu\right)\right)\Big/$$

$$(d+2\,i\,f\,k-i\,f\,\nu)^{3/2}+\left(2\sqrt{-d+2\,i\,f\,k-i\,f\,\nu}\,\cos\left(\sqrt{z}\, b+e-2\,i\,g\,k+i\,g\,\nu-(-d+2\,i\,f\,k-i\,f\,\nu)\,z\right)-\right.$$

$$b\sqrt{2\pi}\,S\left(\frac{2\,(-d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{-d+2\,i\,f\,k-i\,f\,\nu}}\right)\cos\left(\frac{b^2}{4\,(-d+2\,i\,f\,k-i\,f\,\nu)}+e-2\,i\,g\,k+i\,g\,\nu\right)+$$

$$b\sqrt{2\pi}\,C\left(\frac{2\,(-d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{-d+2\,i\,f\,k-i\,f\,\nu}}\right)$$

$$\left.\left.\sin\left(\frac{b^2}{4\,(-d+2\,i\,f\,k-i\,f\,\nu)}+e-2\,i\,g\,k+i\,g\,\nu\right)\right)\Big/(-d+2\,i\,f\,k-i\,f\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sin(b\,z)\cosh^{\nu}(c\,z^{r})$

01.20.21.3072.01

$$\int \sin(b\,z)\cosh^{\nu}\left(c\,z^2\right)dz == -\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cos(b\,z)\,(1-\nu \bmod 2)}{b} -$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{(c\,\nu-2\,c\,s)^2}}\left(\binom{\nu}{s}\left(-\sqrt{i\,c\,(2\,s-\nu)}\,\cosh\left(\frac{b^2}{4\,c\,\nu-8\,c\,s}\right)S\left(\frac{b+2\,c\,i\,(2\,s-\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,c\,(2\,s-\nu)}}\right)+\right.\right.$$
$$\sqrt{-i\,c\,(2\,s-\nu)}\,\cosh\left(\frac{b^2}{4\,c\,\nu-8\,c\,s}\right)S\left(\frac{2\,i\,c\,(2\,s-\nu)\,z-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,s-\nu)}}\right)-i\left(\sqrt{i\,c\,(2\,s-\nu)}\,C\left(\frac{b+2\,c\,i\,(2\,s-\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-i\,c\,(2\,s-\nu)}}\right)+$$
$$\left.\left.\sqrt{-i\,c\,(2\,s-\nu)}\,C\left(\frac{2\,i\,c\,(2\,s-\nu)\,z-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,s-\nu)}}\right)\right)\sinh\left(\frac{b^2}{4\,c\,\nu-8\,c\,s}\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3073.01

$$\int \sin(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz == -\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cos(b\,z)\,(1-\nu \bmod 2)}{b} -$$

$$\frac{2^{-\nu-1}}{(-b)^{3/2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-2\sqrt{-b}\,\cosh\left(c\,\sqrt{z}\,(2\,s-\nu)+i\,b\,z\right)-2\sqrt{-b}\,\cosh\left(c\,(2\,s-\nu)\,\sqrt{z}\,-i\,b\,z\right)-\right.$$
$$i\,c\,\sqrt{2\,\pi}\,(2\,s-\nu)\cos\left(\frac{c^2\,(\nu-2\,s)^2}{4\,b}\right)S\left(\frac{i\,c\,(2\,s-\nu)-2\,b\,\sqrt{z}}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\,(2\,s-\nu)\cos\left(\frac{c^2\,(\nu-2\,s)^2}{4\,b}\right)$$
$$S\left(\frac{-2\,\sqrt{z}\,b-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\,(2\,s-\nu)\,C\left(\frac{i\,c\,(2\,s-\nu)-2\,b\,\sqrt{z}}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2\,(\nu-2\,s)^2}{4\,b}\right)-$$
$$\left.i\,c\,\sqrt{2\,\pi}\,(2\,s-\nu)\,C\left(\frac{-2\,\sqrt{z}\,b-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2\,(\nu-2\,s)^2}{4\,b}\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(d\,z+e)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3074.01

$$\int \sin(e+d\,z)\cosh^{\nu}\left(c\,z^2\right)dz == -\frac{\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\cos(e+d\,z)\,2^{-\nu}}{d} -$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(S\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\cos\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)-\right.\right.$$
$$\sin\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)C\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\Big)+\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\right.$$
$$\left.\left.\cos\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)-\sin\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)C\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3075.01

$$\int \sin(e+d\,z)\cosh^{\nu}\left(c\sqrt{z}\right)dz == -\frac{\binom{\nu}{\frac{\nu}{2}}\cos(e+d\,z)\,(1-\nu \bmod 2)\,2^{-\nu}}{d} -$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\,\cos\left(e+d\,z-(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)-\sqrt{2\,\pi}\,(i\,c\,\nu-2\,i\,c\,s)\,S\left(\frac{-2\sqrt{z}\,d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\cos\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+e\right)-\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,\nu)\,C\left(\frac{-2\sqrt{z}\,d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\right.$$
$$\left.\left.\sin\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+e\right)\right)+\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\,\cos\left(e+d\,z-(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.\right.$$
$$\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-2\sqrt{z}\,d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}+e\right)-$$
$$\left.\left.\sqrt{2\,\pi}\,(i\,c\,\nu-2\,i\,c\,s)\,C\left(\frac{-2\sqrt{z}\,d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}+e\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3076.01

$$\int \sin(b\,z^r)\cosh^{\nu}(c\,z^r)\,dz == \frac{i\,2^{-\nu-1}\,z}{r}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}-((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+\right.$$
$$\left.((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)-((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)+$$
$$\frac{2^{-\nu-1}\,i\,z\binom{\nu}{\frac{\nu}{2}}\left((-i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-i\,b\,z^r\right)-(i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^r\right)\right)(1-\nu \bmod 2)}{r}\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3077.01

$$\int \sin\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,S\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{b}} -$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}+\frac{S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)}{\sqrt{i\,c\,(2\,s-\nu)-b}}\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3078.01

$$\int \sin\left(b\sqrt{z}\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(b\sqrt{z}\right)-b\sqrt{z}\,\cos\left(b\sqrt{z}\right)\right)}{b^2}+$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(b+c\,i\,(\nu-2\,s))^2}\left(\sin\left((b+c\,i\,(\nu-2\,s))\sqrt{z}\right)-(b+c\,i\,(\nu-2\,s))\sqrt{z}\,\cos\left((b+c\,i\,(\nu-2\,s))\sqrt{z}\right)\right)+\right.$$

$$\left.\frac{1}{(i\,c\,(\nu-2\,s)-b)^2}\left((i\,c\,(\nu-2\,s)-b)\sqrt{z}\,\cos\left((i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)-\sin\left((i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3079.01

$$\int \sin(b\,z^r+e)\cosh^{\nu}(c\,z^r)\,dz ==$$

$$\frac{i\,2^{-\nu-1}\,z}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}-e^{-i\,e}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\right.$$

$$\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{i\,e}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)-$$

$$\left.e^{-i\,e}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)+$$

$$\frac{1}{r}\left(2^{-\nu-1}\,i\,z\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,(-i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-i\,b\,z^r\right)-e^{-i\,e}\,(i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^r\right)\right)(1-\nu \bmod 2)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3080.01

$$\int \sin\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,S\left(\sqrt{b}\sqrt{\frac{2}{\pi}}\,z\right)+C\left(\sqrt{b}\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)\right)}{\sqrt{b}}-2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{S\left(\sqrt{\frac{2}{\pi}}\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\cos(e)-\sin(e)\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}+\left(S\left(\sqrt{\frac{2}{\pi}}\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\right.\right.$$

$$\left.\left.\cos(e)-\sin(e)\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\right)\Big/\left(\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3081.01

$$\int \sin\left(\sqrt{z}\, b+e\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\sqrt{z}\, b+e\right)-b\sqrt{z}\,\cos\left(\sqrt{z}\, b+e\right)\right)}{b^2}+$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(b+c\,i\,(\nu-2s))^2}\left(\sin\left(e+(b+c\,i\,(\nu-2s))\sqrt{z}\right)-(b+c\,i\,(\nu-2s))\sqrt{z}\,\cos\left(e+(b+c\,i\,(\nu-2s))\sqrt{z}\right)\right)+\right.$$

$$\left.\frac{1}{(i\,c\,(\nu-2s)-b)^2}\left((i\,c\,(\nu-2s)-b)\sqrt{z}\,\cos\left(e-(i\,c\,(\nu-2s)-b)\sqrt{z}\right)+\sin\left(e-(i\,c\,(\nu-2s)-b)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3082.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$-\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\frac{d^2}{4b}\right)C\left(\frac{d+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)-S\left(\frac{d+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)\cos\left(\frac{d^2}{4b}\right)\right)}{\sqrt{b}}-2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(S\left(\frac{2(-b-2\,i\,c\,s+i\,c\,\nu)z-d}{\sqrt{2\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4(-b-2\,i\,c\,s+i\,c\,\nu)}\right)-\sin\left(\frac{d^2}{4(-b-2\,i\,c\,s+i\,c\,\nu)}\right)\right.\right.$$

$$\left.C\left(\frac{2(-b-2\,i\,c\,s+i\,c\,\nu)z-d}{\sqrt{2\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\right)+\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{2(-b+2\,i\,c\,s-i\,c\,\nu)z-d}{\sqrt{2\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right.$$

$$\left.\left.\cos\left(\frac{d^2}{4(-b+2\,i\,c\,s-i\,c\,\nu)}\right)-\sin\left(\frac{d^2}{4(-b+2\,i\,c\,s-i\,c\,\nu)}\right)C\left(\frac{2(-b+2\,i\,c\,s-i\,c\,\nu)z-d}{\sqrt{2\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3083.01

$$\int \sin\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left(2\sqrt{-d}\ \cos\left(\sqrt{z}\ b+d\,z\right)-i\,b\sqrt{2\pi}\left(C\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)-\cos\left(\frac{b^2}{4\,d}\right)S\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\right)\right)\Bigg)+$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{d^{3/2}}\left(-2\sqrt{d}\ \cos\left(d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)-\sqrt{2\pi}\ (b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\right.\right.$$
$$\cos\left(\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}\right)-\sqrt{2\pi}\ (-b-2\,i\,c\,k+i\,c\,\nu)\,C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)$$
$$\left.\sin\left(\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}\right)\right)+\frac{1}{(-d)^{3/2}}\left(2\sqrt{-d}\ \cos\left(d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)+\right.$$
$$\sqrt{2\pi}\ (-b+2\,i\,c\,k-i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}\right)S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)-$$
$$\left.\left.\sqrt{2\pi}\ (b-2\,i\,c\,k+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3084.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$
$$-\frac{1}{\sqrt{b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right)-S\left(\frac{d+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right)\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)\right)\right)-$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(S\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e\right)-\right.\right.$$
$$\left.\sin\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e\right)C\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\right)+$$
$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e\right)-\right.$$
$$\left.\left.\sin\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e\right)C\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3085.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left.\left(2\sqrt{-d}\ \cos\left(\sqrt{z}\ b+e+d\,z\right)-i\,b\sqrt{2\pi}\left(C\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,d}-e\right)-\cos\left(\frac{b^2}{4\,d}-e\right)S\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\right)\right)\right)+$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{d^{3/2}}\left(-2\sqrt{d}\ \cos\left(e+d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)-\right.\right.$$
$$\sqrt{2\pi}\ (b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\cos\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e\right)+$$
$$\left.\sqrt{2\pi}\ (-b-2\,i\,c\,k+i\,c\,\nu)\,C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e\right)\right)+$$
$$\frac{1}{(-d)^{3/2}}\left(2\sqrt{-d}\ \cos\left(e+d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)+\sqrt{2\pi}\ (-b+2\,i\,c\,k-i\,c\,\nu)\right.$$
$$\cos\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e\right)S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)+$$
$$\left.\left.\sqrt{2\pi}\ (b-2\,i\,c\,k+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(d\,z)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3086.01

$$\int \sin(d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == -\frac{\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\cos(d\,z)\,2^{-\nu}}{d}-$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(S\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\cos\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)-\right.\right.$$
$$\left.\sin\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)-\right.$$
$$\left.\left.\sin\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3087.01

$$\int \sin(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$-\frac{\binom{\nu}{\frac{\nu}{2}}\cos(d\,z)\,(1-\nu \bmod 2)\,2^{-\nu}}{d}-2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\;\cos\left(2\,i\,g\,s-i\,g\,\nu+d\,z-(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)-\right.\right.$$

$$\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,S\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\,\pi}}\right)\cos\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+2\,i\,g\,s-i\,g\,\nu\right)-$$

$$\left.\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\,C\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+2\,i\,g\,s-i\,g\,\nu\right)\right)+$$

$$\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\;\cos\left(-2\,g\,i\,s+i\,g\,\nu+d\,z-(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\right.$$

$$S\left(\frac{-2\sqrt{z}\;d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\,\pi}}\right)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}-2\,i\,g\,s+i\,g\,\nu\right)-$$

$$\left.\left.\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,C\left(\frac{-2\sqrt{z}\;d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}-2\,i\,g\,s+i\,g\,\nu\right)\right)\right)/;\;\nu\in\mathbb{N}^+$$

Involving $\sin(d\,z+e)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3088.01

$$\int \sin(e+d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == -\frac{\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\cos(e+d\,z)\,2^{-\nu}}{d}-$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(S\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\,\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\cos\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)-\right.\right.$$

$$\left.\sin\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\,\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)-\right.$$

$$\left.\left.\sin\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)/;\;\nu\in\mathbb{N}^+$$

01.20.21.3089.01

$$\int \sin(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$-\frac{\binom{\nu}{\frac{\nu}{2}}\cos(e+d\,z)\,(1-\nu \bmod 2)\,2^{-\nu}}{d}-2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\;\cos\left(e+2\,i\,g\,s-i\,g\,\nu+d\,z-(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)-\right.\right.$$

$$\sqrt{2\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,S\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)\cos\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+e+2\,i\,g\,s-i\,g\,\nu\right)-$$

$$\left.\sqrt{2\pi}\;(2\,i\,c\,s-i\,c\,\nu)\,C\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)\sin\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+e+2\,i\,g\,s-i\,g\,\nu\right)\right)+$$

$$\frac{1}{(-d)^{3/2}}\left(-2\sqrt{-d}\;\cos\left(e-2\,i\,g\,s+i\,g\,\nu+d\,z-(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.$$

$$\sqrt{2\pi}\;(2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-2\sqrt{z}\;d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}+e-2\,i\,g\,s+i\,g\,\nu\right)-$$

$$\left.\left.\sqrt{2\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,C\left(\frac{-2\sqrt{z}\;d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}+e-2\,i\,g\,s+i\,g\,\nu\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(b\,z^r)\cosh^{\nu}(c\,z^r+g)$

01.20.21.3090.01

$$\int \sin(b\,z^r)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$\frac{i\,2^{-\nu-1}\,z}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,g\,s-g\,\nu}\,\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}-e^{2\,g\,s-g\,\nu}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\right.$$

$$\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{g\,\nu-2\,g\,s}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)-$$

$$\left.e^{g\,\nu-2\,g\,s}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)+$$

$$\frac{2^{-\nu-1}\,i\,z\binom{\nu}{\frac{\nu}{2}}\left((-i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-i\,b\,z^r\right)-(i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^r\right)\right)(1-\nu \bmod 2)}{r}\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3091.01

$$\int \sin\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,S\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{b}} -$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,(2\,s-\nu)-b}}\left(\cosh(2\,g\,s-g\,\nu)\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)+ i\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\sinh(2\,g\,s-g\,\nu)\right)+\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cosh(2\,g\,s-g\,\nu)\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)- i\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\sinh(2\,g\,s-g\,\nu)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3092.01

$$\int \sin\left(b\,\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(b\,\sqrt{z}\right)-b\,\sqrt{z}\,\cos\left(b\,\sqrt{z}\right)\right)}{b^2} +$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,c\,(\nu-2\,s)-b)^2}\left((i\,c\,(\nu-2\,s)-b)\,\sqrt{z}\,\cos\left(g\,i\,(\nu-2\,s)+(i\,c\,(\nu-2\,s)-b)\,\sqrt{z}\right)- \sin\left(g\,i\,(\nu-2\,s)+(i\,c\,(\nu-2\,s)-b)\,\sqrt{z}\right)\right)+\frac{1}{(b+c\,i\,(\nu-2\,s))^2}\left(\sin\left(g\,i\,(\nu-2\,s)+(b+c\,i\,(\nu-2\,s))\,\sqrt{z}\right)- (b+c\,i\,(\nu-2\,s))\,\sqrt{z}\,\cos\left(g\,i\,(\nu-2\,s)+(b+c\,i\,(\nu-2\,s))\,\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3093.01

$$\int \sin(b\,z^r+e)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$\frac{i\,2^{-\nu-1}\,z}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}- e^{-i\,e+2\,g\,s-g\,\nu}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+ e^{i\,e-2\,g\,s+g\,\nu}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)- e^{-i\,e-2\,g\,s+g\,\nu}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)+$$

$$\frac{1}{r}\left(2^{-\nu-1}\,i\,z\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,(-i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-i\,b\,z^r\right)-e^{-i\,e}\,(i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^r\right)\right)(1-\nu \bmod 2)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3094.01

$$\int \sin\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,S\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)+C\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)\right)}{\sqrt{b}}-2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right.$$

$$\left(S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\cos(e+g\,i\,(2\,s-\nu))-\sin(e+g\,i\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\cos(e-i\,g\,(2\,s-\nu))-\right.$$

$$\left.\left.\sin(e-i\,g\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3095.01

$$\int \sin\left(\sqrt{z}\,b+e\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\sqrt{z}\,b+e\right)-b\sqrt{z}\,\cos\left(\sqrt{z}\,b+e\right)\right)}{b^2}+$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(b+c\,i\,(\nu-2\,s))^2}\left(\sin\left(e+g\,i\,(\nu-2\,s)+(b+c\,i\,(\nu-2\,s))\sqrt{z}\right)-\right.\right.$$

$$\left.(b+c\,i\,(\nu-2\,s))\sqrt{z}\,\cos\left(e+g\,i\,(\nu-2\,s)+(b+c\,i\,(\nu-2\,s))\sqrt{z}\right)\right)+\frac{1}{(i\,c\,(\nu-2\,s)-b)^2}\left((i\,c\,(\nu-2\,s)-b)\right.$$

$$\left.\left.\sqrt{z}\,\cos\left(e-i\,g\,(\nu-2\,s)-(i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)+\sin\left(e-i\,g\,(\nu-2\,s)-(i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3096.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == -\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\frac{d^2}{4\,b}\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\cos\left(\frac{d^2}{4\,b}\right)\right)}{\sqrt{b}}-$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(S\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)-\right.\right.$$

$$\left.\sin\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)-\right.$$

$$\left.\left.\sin\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3097.01

$$\int \sin\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left(2\sqrt{-d}\ \cos\left(\sqrt{z}\ b+d\,z\right)-i\,b\sqrt{2\pi}\left(C\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)-\cos\left(\frac{b^2}{4\,d}\right)S\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\right)\right)\Big)+$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{d^{3/2}}\left(-2\sqrt{d}\ \cos\left(2\,i\,g\,k-i\,g\,\nu+d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)-\right.\right.$$
$$\sqrt{2\pi}\ (b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\cos\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+2\,i\,g\,k-i\,g\,\nu\right)+$$
$$\sqrt{2\pi}\ (-b-2\,i\,c\,k+i\,c\,\nu)\,C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+2\,i\,g\,k-i\,g\,\nu\right)\Big)+$$
$$\frac{1}{(-d)^{3/2}}\left(2\sqrt{-d}\ \cos\left(-2\,g\,i\,k+i\,g\,\nu+d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)+\sqrt{2\pi}\ (-b+2\,i\,c\,k-i\,c\,\nu)\right.$$
$$\cos\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}-2\,i\,g\,k+i\,g\,\nu\right)S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)+\sqrt{2\pi}\ (b-2\,i\,c\,k+i\,c\,\nu)$$
$$\left.\left.C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}-2\,i\,g\,k+i\,g\,\nu\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3098.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$
$$-\frac{1}{\sqrt{b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right)-S\left(\frac{d+2\,b\,z}{\sqrt{b}\ \sqrt{2\pi}}\right)\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)\right)\right)-$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(S\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e+g\,i\,(2\,s-\nu)\right)-\right.\right.$$
$$\sin\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\Big)+$$
$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)-\right.$$
$$\left.\left.\sin\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3099.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left.\left(2\sqrt{-d}\ \cos\left(\sqrt{z}\ b+e+d\,z\right)-i\,b\sqrt{2\pi}\left(C\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,d}-e\right)-\cos\left(\frac{b^2}{4\,d}-e\right)S\left(\frac{i\,b+2\,i\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\right)\right)\right)+$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{d^{3/2}}\left(-2\sqrt{d}\ \cos\left(e+2\,i\,g\,k-i\,g\,\nu+d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)-\right.\right.$$
$$\sqrt{2\pi}\ (b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\cos\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e+2\,i\,g\,k-i\,g\,\nu\right)+$$
$$\left.\sqrt{2\pi}\ (-b-2\,i\,c\,k+i\,c\,\nu)\,C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e+2\,i\,g\,k-i\,g\,\nu\right)\right)+$$
$$\frac{1}{(-d)^{3/2}}\left(2\sqrt{-d}\ \cos\left(e-2\,i\,g\,k+i\,g\,\nu+d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)+\sqrt{2\pi}\ (-b+2\,i\,c\,k-i\,c\,\nu)\cos\right.\left(\right.$$
$$\left.-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e-2\,i\,g\,k+i\,g\,\nu\right)S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)+\sqrt{2\pi}\ (b-2\,i\,c\,k+i\,c\,\nu)$$
$$\left.\left.C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e-2\,i\,g\,k+i\,g\,\nu\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(d\,z)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.3100.01

$$\int \sin(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cos(d\,z)\,(\nu \bmod 2-1)}{d}-$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}\right)S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)-\right.\right.$$
$$\left.C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}\right)S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$
$$\left.\left.C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3101.01

$$\int \sin(d\,z)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz == -\frac{\binom{\nu}{\frac{\nu}{2}}\cos(d\,z)\,(1-\nu \bmod 2)\,2^{-\nu}}{d} -$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\pi}\,(2\,i\,c\,s-i\,c\,\nu)\left(\cos\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}\right)S\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\right.\right.$$

$$\left.C\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\sin\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}\right)\right)-$$

$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\,\cos\left((-d-2\,i\,f\,s+i\,f\,\nu)\,z+(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+$$

$$\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\,\cos\left((-d+2\,i\,f\,s-i\,f\,\nu)\,z+(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.$$

$$\sqrt{2\pi}\,(2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}\right)S\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-$$

$$\sqrt{2\pi}\,(i\,c\,\nu-2\,i\,c\,s)\,C\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)/;\,\nu\in\mathbb{N}^+$$

Involving $\sin(d\,z+e)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.3102.01

$$\int \sin(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cos(e+d\,z)\,(\nu \bmod 2-1)}{d} -$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)-\right.\right.$$

$$\left.C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$

$$\left.\left.C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3103.01

$$\int \sin(e+d\,z)\cosh^{v}\left(\sqrt{z}\;c+f\,z\right)dz == -\frac{\binom{v}{\frac{v}{2}}\cos(e+d\,z)\,(1-v \bmod 2)\,2^{-v}}{d} -$$

$$2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\;(2\,i\,c\,s-i\,c\,v)\left(\cos\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,v)}+e\right)S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(-d-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d-2\,i\,f\,s+i\,f\,v}}\right)-\right.\right.\right.$$

$$\left.\left.C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(-d-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d-2\,i\,f\,s+i\,f\,v}}\right)\sin\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,v)}+e\right)\right)-$$

$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,v}\;\cos\left(e-(-d-2\,i\,f\,s+i\,f\,v)\,z-(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,v)^{3/2}+$$

$$\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,v}\;\cos\left(e-(-d+2\,i\,f\,s-i\,f\,v)\,z-(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)-\right.$$

$$\sqrt{2\pi}\;(2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(-d+2\,i\,f\,s-i\,f\,v)}+e\right)S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(-d+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d+2\,i\,f\,s-i\,f\,v}}\right)-$$

$$\sqrt{2\pi}\;(i\,c\,v-2\,i\,c\,s)\,C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(-d+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(-d+2\,i\,f\,s-i\,f\,v)}+e\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,v\in\mathbb{N}^{+}$$

Involving $\sin\left(b\,z^{r}\right)\cosh^{v}\left(c\,z^{r}+f\,z\right)$

01.20.21.3104.01

$$\int \sin\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,S\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{b}} -$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\cos\left(\frac{(i\,f\,\nu-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}\right)S\left(\frac{-2\,f\,i\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)-\right.\right.$$

$$\left.C\left(\frac{-2\,f\,i\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{(i\,f\,\nu-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}\right)\right)\Big/\left(\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\right)+$$

$$\left(\cos\left(\frac{(2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}\right)S\left(\frac{2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$

$$\left.\left.C\left(\frac{2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}\right)\right)\Big/\left(\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3105.01

$$\int \sin\left(b\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(b\sqrt{z}\right)-b\sqrt{z}\,\cos\left(b\sqrt{z}\right)\right)}{b^2} - 2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,f\,\nu-2\,i\,f\,s)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\,(b+2\,i\,c\,s-i\,c\,\nu)\left(\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}\right)S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)-\right.\right.$$

$$\left.C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}\right)\right)-$$

$$\left.2\sqrt{i\,f\,\nu-2\,i\,f\,s}\,\cos\left((i\,f\,\nu-2\,i\,f\,s)\,z+(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(-2\sqrt{2\,i\,f\,s-i\,f\,\nu}\,\cos\left((2\,i\,f\,s-i\,f\,\nu)\,z+(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.$$

$$\sqrt{2\,\pi}\,(-b+2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}\right)S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)-\sqrt{2\,\pi}$$

$$\left.\left.(b-2\,i\,c\,s+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.3106.01

$$\int \sin\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,S\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)+C\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)\right)}{\sqrt{b}} -$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cos\left(\frac{(i\,f\,\nu-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e\right)S\left(\frac{-2\,f\,i\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)-\right.\right.$$

$$\left.C\left(\frac{-2\,f\,i\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{(i\,f\,\nu-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e\right)S\left(\frac{2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$

$$\left.\left.C\left(\frac{2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3107.01

$$\int \sin\left(\sqrt{z}\,b+e\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\sqrt{z}\,b+e\right)-b\sqrt{z}\,\cos\left(\sqrt{z}\,b+e\right)\right)}{b^2}-2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,f\,\nu-2\,i\,f\,s)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\,(b+2\,i\,c\,s-i\,c\,\nu)\left(\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}+e\right)S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)-\right.\right.$$

$$\left.C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}+e\right)\right)-$$

$$\left.2\sqrt{i\,f\,\nu-2\,i\,f\,s}\,\cos\left(e-(i\,f\,\nu-2\,i\,f\,s)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(-2\sqrt{2\,i\,f\,s-i\,f\,\nu}\,\cos\left(e-(2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\sqrt{2\,\pi}\right.$$

$$(-b+2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}+e\right)S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)-\sqrt{2\,\pi}$$

$$\left.\left.(b-2\,i\,c\,s+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}+e\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.3108.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(S\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\cos\left(\frac{d^2}{4\,b}\right)-\sin\left(\frac{d^2}{4\,b}\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\right)}{\sqrt{b}}-$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}\right)-\right.\right.$$

$$\left.\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}\right)C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}\right)-\right.$$

$$\left.\left.\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}\right)C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3109.01

$$\int \sin\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == -\frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left(2\sqrt{d}\;\cos\left(\sqrt{z}\;b+d\,z\right)+b\sqrt{2\,\pi}\;\cos\left(\frac{b^2}{4\,d}\right)S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)-b\sqrt{2\,\pi}\;C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)\right)\Big)-2^{-\nu-1}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\,\pi}\;(b+2\,i\,c\,s-i\,c\,\nu)\left(S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}\right)-\right.\right.\right.$$

$$\left.\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}\right)C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\right)-$$

$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\;\cos\left((-d-2\,i\,f\,s+i\,f\,\nu)\,z+(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+$$

$$\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\;\cos\left((-d+2\,i\,f\,s-i\,f\,\nu)\,z+(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.$$

$$\sqrt{2\,\pi}\;(-b+2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}\right)-$$

$$\sqrt{2\,\pi}\;(b-2\,i\,c\,s+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$

$$\left.\left.\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(b z^r + d z + e) \cosh^v(c z^r + f z)$

01.20.21.3110.01

$$\int \sin(b z^2 + d z + e) \cosh^v(c z^2 + f z)\, dz ==$$

$$\frac{1}{\sqrt{b}}\left(2^{-v-\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\left(S\left(\frac{d+2bz}{\sqrt{b}\sqrt{2\pi}}\right)\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4e\right)\right) - \sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4e\right)\right)C\left(\frac{d+2bz}{\sqrt{b}\sqrt{2\pi}}\right)\right) - 2^{-v-\frac{1}{2}}\sqrt{\pi}\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-b-2ics+icv}}\left(S\left(\frac{-d-2ifs+ifv+2(-b-2ics+icv)z}{\sqrt{2\pi}\sqrt{-b-2ics+icv}}\right)\cos\left(\frac{(-d-2ifs+ifv)^2}{4(-b-2ics+icv)}+e\right) - \right.\right.\right.$$

$$\left.\left.\left.\sin\left(\frac{(-d-2ifs+ifv)^2}{4(-b-2ics+icv)}+e\right)C\left(\frac{-d-2ifs+ifv+2(-b-2ics+icv)z}{\sqrt{2\pi}\sqrt{-b-2ics+icv}}\right)\right) + \right.\right.$$

$$\left.\left.\frac{1}{\sqrt{-b+2ics-icv}}\left(S\left(\frac{-d+2ifs-ifv+2(-b+2ics-icv)z}{\sqrt{2\pi}\sqrt{-b+2ics-icv}}\right)\cos\left(\frac{(-d+2ifs-ifv)^2}{4(-b+2ics-icv)}+e\right) - \right.\right.\right.$$

$$\left.\left.\left.\left.\sin\left(\frac{(-d+2ifs-ifv)^2}{4(-b+2ics-icv)}+e\right)C\left(\frac{-d+2ifs-ifv+2(-b+2ics-icv)z}{\sqrt{2\pi}\sqrt{-b+2ics-icv}}\right)\right)\right)\right) /; v \in \mathbb{N}^+$$

01.20.21.3111.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz == -\frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left(2\sqrt{d}\ \cos\left(\sqrt{z}\ b+e+d\,z\right)+b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,d}-e\right)S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)-b\sqrt{2\,\pi}\ C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}-e\right)\right)\Bigg)-$$
$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\,\pi}\ (b+2\,i\,c\,s-i\,c\,\nu)\left(S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+\right.\right.\right.$$
$$\left.e\right)-\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e\right)C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\Bigg)-$$
$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\ \cos\left(e-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)\Big/$$
$$(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\ \cos\left(e-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.$$
$$\sqrt{2\,\pi}\ (-b+2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+\right.$$
$$\left.e\right)-\sqrt{2\,\pi}\ (b-2\,i\,c\,s+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$
$$\left.\left.\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(d\,z)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.3112.01

$$\int \sin(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cos(d\,z)\,(\nu \bmod 2-1)}{d}-2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)-\right.\right.$$
$$\left.C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$
$$\left.\left.C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3113.01

$$\int \sin(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$
$$-\frac{\binom{\nu}{\frac{\nu}{2}}\cos(d\,z)\,(1-\nu \bmod 2)\,2^{-\nu}}{d}-2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\left(\cos\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)S\left(\right.\right.\right.\right.$$
$$\left.\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-C\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)$$
$$\left.\sin\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)\right)-2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}$$
$$\left.\cos\left(2\,i\,g\,s-i\,g\,\nu-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(i\,c\,\nu-2\,i\,c\,s)\,\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+$$
$$\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\;\cos\left(-2\,g\,i\,s+i\,g\,\nu-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(2\,i\,c\,s-i\,c\,\nu)\,\sqrt{z}\right)-\sqrt{2\,\pi}\right.$$
$$(2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)S\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-$$
$$\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,C\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$
$$\left.\left.\sin\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin(d\,z+e)\cosh^{\nu}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.3114.01

$$\int \sin(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == -\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin\left(e+\frac{1}{2}(2\,d\,z+\pi)\right)}{d} - 2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)-\right.\right.$$
$$\left.C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$
$$\left.\left.C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.3115.01

$$\int \sin(e+d\,z)\cosh^{v}\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$-\frac{\binom{v}{\frac{v}{2}}\cos(e+d\,z)\,(1-v \bmod 2)\,2^{-v}}{d}-2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\;(2\,i\,c\,s-i\,c\,v)\left(\cos\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,v)}+e+2\,i\,g\,s-i\,g\,v\right)\right.\right.\right.$$

$$\left.S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(-d-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d-2\,i\,f\,s+i\,f\,v}}\right)-C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(-d-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d-2\,i\,f\,s+i\,f\,v}}\right)\right.$$

$$\left.\left.\sin\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,v)}+e+2\,i\,g\,s-i\,g\,v\right)\right)-2\sqrt{-d-2\,i\,f\,s+i\,f\,v}$$

$$\left.\cos\left(e+2\,i\,g\,s-i\,g\,v-(-d-2\,i\,f\,s+i\,f\,v)\,z-(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,v)^{3/2}+$$

$$\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,v}\;\cos\left(e-2\,i\,g\,s+i\,g\,v-(-d+2\,i\,f\,s-i\,f\,v)\,z-(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)-\sqrt{2\pi}\;(2\,i\,c\,s-\right.$$

$$i\,c\,v)\cos\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(-d+2\,i\,f\,s-i\,f\,v)}+e-2\,i\,g\,s+i\,g\,v\right)S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(-d+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d+2\,i\,f\,s-i\,f\,v}}\right)-$$

$$\sqrt{2\pi}\;(i\,c\,v-2\,i\,c\,s)\,C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(-d+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\;\sqrt{-d+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\left.\left.\left.\sin\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(-d+2\,i\,f\,s-i\,f\,v)}+e-2\,i\,g\,s+i\,g\,v\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,v\in\mathbb{N}^{+}$$

Involving $\sin\left(b\,z^{r}\right)\cosh^{v}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.3116.01

$$\int \sin\left(b z^2\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz == \frac{2^{-\nu-\frac{1}{2}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\, S\left(\sqrt{b}\, \sqrt{\frac{2}{\pi}}\, z\right)}{\sqrt{b}} - 2^{-\nu-\frac{1}{2}} \sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{\sqrt{-b-2 i c s+i c \nu}} \left(\cos\left(\frac{(i f \nu-2 i f s)^2}{4(-b-2 i c s+i c \nu)} + g i (2 s-\nu) \right) S\left(\frac{-2 f i s+i f \nu+2(-b-2 i c s+i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b-2 i c s+i c \nu}} \right) - C\left(\frac{-2 f i s+i f \nu+2(-b-2 i c s+i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b-2 i c s+i c \nu}} \right) \sin\left(\frac{(i f \nu-2 i f s)^2}{4(-b-2 i c s+i c \nu)} + g i (2 s-\nu) \right) \right) + \frac{1}{\sqrt{-b+2 i c s-i c \nu}} \left(\cos\left(\frac{(2 i f s-i f \nu)^2}{4(-b+2 i c s-i c \nu)} - i g (2 s-\nu) \right) S\left(\frac{2 i f s-i f \nu+2(-b+2 i c s-i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b+2 i c s-i c \nu}} \right) - C\left(\frac{2 i f s-i f \nu+2(-b+2 i c s-i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b+2 i c s-i c \nu}} \right) \sin\left(\frac{(2 i f s-i f \nu)^2}{4(-b+2 i c s-i c \nu)} - i g (2 s-\nu) \right) \right) \right) /; \nu \in \mathbb{N}^+$$

01.20.21.3117.01

$$\int \sin\left(b \sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\, c+g+f z\right) dz ==$$

$$\frac{2^{1-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\sin\left(b \sqrt{z}\right) - b \sqrt{z} \cos\left(b \sqrt{z}\right)\right)}{b^2} - 2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{(i f \nu-2 i f s)^{3/2}} \left(\sqrt{2\pi}\, (b+2 i c s-i c \nu) \left(\cos\left(\frac{(-b-2 i c s+i c \nu)^2}{4(i f \nu-2 i f s)} + 2 i g s-i g \nu \right) S\left(\frac{-b-2 i c s+i c \nu+2(i f \nu-2 i f s) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{i f \nu-2 i f s}} \right) - C\left(\frac{-b-2 i c s+i c \nu+2(i f \nu-2 i f s) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{i f \nu-2 i f s}} \right) \sin\left(\frac{(-b-2 i c s+i c \nu)^2}{4(i f \nu-2 i f s)} + 2 i g s-i g \nu \right) \right) - 2 \sqrt{i f \nu-2 i f s} \cos\left(2 i g s-i g \nu-(i f \nu-2 i f s) z-(-b-2 i c s+i c \nu) \sqrt{z}\right) \right) + \frac{1}{(2 i f s-i f \nu)^{3/2}} \left(-2 \sqrt{2 i f s-i f \nu} \cos\left(-2 g i s+i g \nu-(2 i f s-i f \nu) z-(-b+2 i c s-i c \nu) \sqrt{z}\right) - \sqrt{2\pi}\, (-b+2 i c s-i c \nu) \cos\left(\frac{(-b+2 i c s-i c \nu)^2}{4(2 i f s-i f \nu)} - 2 i g s+i g \nu \right) S\left(\frac{-b+2 i c s-i c \nu+2(2 i f s-i f \nu) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{2 i f s-i f \nu}} \right) - \sqrt{2\pi}\, (b-2 i c s+i c \nu) C\left(\frac{-b+2 i c s-i c \nu+2(2 i f s-i f \nu) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{2 i f s-i f \nu}} \right) \sin\left(\frac{(-b+2 i c s-i c \nu)^2}{4(2 i f s-i f \nu)} - 2 i g s+i g \nu \right) \right) \right) /; \nu \in \mathbb{N}^+$$

Involving $\sin(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3118.01

$$\int \sin(b\,z^2+e)\cosh^v(c\,z^2+f\,z+g)\,dz ==$$

$$\frac{2^{-v-\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\cos(e)\,S\left(\sqrt{b}\sqrt{\frac{2}{\pi}}\,z\right)+C\left(\sqrt{b}\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)\right)}{\sqrt{b}}-2^{-v-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\left(\cos\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,v)}+e+g\,i\,(2\,s-v)\right)S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(-b-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\right)-\right.\right.$$

$$\left.C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(-b-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,v)}+e+g\,i\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\left(\cos\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(-b+2\,i\,c\,s-i\,c\,v)}+e-i\,g\,(2\,s-v)\right)S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(-b+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$\left.\left.C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(-b+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(-b+2\,i\,c\,s-i\,c\,v)}+e-i\,g\,(2\,s-v)\right)\right)\right)\Big/;\ v\in\mathbb{N}^+$$

01.20.21.3119.01

$$\int \sin\left(\sqrt{z}\ b+e\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sin\left(\sqrt{z}\ b+e\right)-b\sqrt{z}\ \cos\left(\sqrt{z}\ b+e\right)\right)}{b^2} -$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,f\,\nu-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\,\pi}\ (b+2\,i\,c\,s-i\,c\,\nu)\right.\right.$$

$$\left(\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}+e+2\,i\,g\,s-i\,g\,\nu\right)S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)-\right.$$

$$\left.C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}+e+2\,i\,g\,s-i\,g\,\nu\right)\right)-$$

$$\left.2\sqrt{i\,f\,\nu-2\,i\,f\,s}\ \cos\left(e+2\,i\,g\,s-i\,g\,\nu-(i\,f\,\nu-2\,i\,f\,s)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(-2\sqrt{2\,i\,f\,s-i\,f\,\nu}\ \cos\left(e-2\,i\,g\,s+i\,g\,\nu-(2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.$$

$$\sqrt{2\,\pi}\ (-b+2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)$$

$$S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)-\sqrt{2\,\pi}\ (b-2\,i\,c\,s+i\,c\,\nu)$$

$$\left.\left.C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.3120.01

$$\int \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(S\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\cos\left(\frac{d^2}{4\,b}\right)-\sin\left(\frac{d^2}{4\,b}\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\right)}{\sqrt{b}}-2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)-\right.\right.$$

$$\left.\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)-\right.$$

$$\left.\left.\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3121.01

$$\int \sin\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz == -\frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left.\left(2\sqrt{d}\ \cos\left(\sqrt{z}\ b+d\,z\right)+b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,d}\right)S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)-b\sqrt{2\,\pi}\ C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)\right)\right)-$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\,\pi}\ (b+2\,i\,c\,s-i\,c\,\nu)\left(S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\cos\left(\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)-\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)C\left(\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\right)-2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\right.$$

$$\left.\cos\left(2\,i\,g\,s-i\,g\,\nu-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+$$

$$\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\ \cos\left(-2\,g\,i\,s+i\,g\,\nu-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\right.$$

$$\sqrt{2\,\pi}\ (-b+2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-\right.$$

$$\left.2\,i\,g\,s+i\,g\,\nu\right)-\sqrt{2\,\pi}\ (b-2\,i\,c\,s+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$

$$\left.\left.\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sin\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.3122.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{\sqrt{b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(S\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)-\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\right)-\right.$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\right.\right.$$

$$\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e+g\,i\,(2\,s-\nu)\right)-\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e+g\,i\,(2\,s-\nu)\right)$$

$$\left.C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\right)+\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}$$

$$\left(S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)-\right.$$

$$\left.\left.\left.\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3123.01

$$\int \sin\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{1}{b}\left(i\,2^{-\nu-2}\,e^{-\frac{i\left(d^2+4\,b\,e\right)}{4\,b}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{i\,b}\;e^{2\,i\,e}\,\operatorname{erf}\left(\frac{d+2\,b\,z}{2\,\sqrt{i\,b}}\right)-\sqrt{-i\,b}\;e^{\frac{i\,d^2}{2\,b}}\,\operatorname{erf}\left(\frac{d+2\,b\,z}{2\,\sqrt{-i\,b}}\right)\right)(\nu \bmod 2-1)+2^{-\nu-2}\sqrt{\pi}\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{i\,b+2\,c\,s-c\,\nu}\left(e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{-4\,i\,b-8\,c\,s+4\,c\,\nu}-i\,e+g\,(\nu-2\,s)-\frac{i\,\pi}{2}}\left(\sqrt{-i\,b-2\,c\,s+c\,\nu}\;\operatorname{erfi}\left(\frac{-i\,d-2\,i\,b\,z-(2\,s-\nu)\,(f+2\,c\,z)}{2\,\sqrt{-i\,b-2\,c\,s+c\,\nu}}\right)+\right.\right.\right.$$

$$\left.\left.e^{2\left(\frac{(-i\,d-2\,f\,s+f\,\nu)^2}{-4\,i\,b-8\,c\,s+4\,c\,\nu}+i\,e+g\,(2\,s-\nu)\right)}\sqrt{i\,b+2\,c\,s-c\,\nu}\;\operatorname{erfi}\left(\frac{i\,d+2\,i\,b\,z+(2\,s-\nu)\,(f+2\,c\,z)}{2\,\sqrt{i\,b+2\,c\,s-c\,\nu}}\right)\right)\right)+$$

$$\frac{e^{\frac{(i\,d-2\,f\,s+f\,\nu)^2}{-4\,i\,b+8\,c\,s-4\,c\,\nu}+i\,e+g\,(\nu-2\,s)-\frac{i\,\pi}{2}}\operatorname{erfi}\left(\frac{i\,d+2\,i\,b\,z-(2\,s-\nu)\,(f+2\,c\,z)}{2\,\sqrt{i\,b+c\,(\nu-2\,s)}}\right)}{\sqrt{i\,b+c\,(\nu-2\,s)}}-\frac{1}{i\,b+c\,(\nu-2\,s)}$$

$$\left.\left.\left(e^{-\frac{(i\,d-2\,f\,s+f\,\nu)^2}{-4\,i\,b+8\,c\,s-4\,c\,\nu}-i\,e+g\,(2\,s-\nu)+\frac{i\,\pi}{2}}\sqrt{-i\,b+2\,c\,s-c\,\nu}\;\operatorname{erfi}\left(\frac{-i\,d-2\,i\,b\,z+(2\,s-\nu)\,(f+2\,c\,z)}{2\,\sqrt{-i\,b+2\,c\,s-c\,\nu}}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3124.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$-\frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(2\sqrt{d}\ \cos\left(\sqrt{z}\ b+e+d\,z\right)+b\sqrt{2\pi}\ \cos\left(\frac{b^2}{4\,d}-e\right)S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)-\right.\right.$$

$$\left.\left.b\sqrt{2\pi}\ C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,d}-e\right)\right)\right)-2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\left(\sqrt{2\pi}\ (b+2\,i\,c\,s-i\,c\,\nu)\right.\right.$$

$$\left(S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e+2\,i\,g\,s-i\,g\,\nu\right)-\right.$$

$$\left.\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e+2\,i\,g\,s-i\,g\,\nu\right)C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\right)-$$

$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\ \cos\left(e+2\,i\,g\,s-i\,g\,\nu-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\ \cos\left(e-2\,i\,g\,s+i\,g\,\nu-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-\right.\right.$$

$$\left.(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)-\sqrt{2\pi}\ (-b+2\,i\,c\,s-i\,c\,\nu)$$

$$S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)-$$

$$\sqrt{2\pi}\ (b-2\,i\,c\,s+i\,c\,\nu)\,C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$

$$\left.\left.\left.\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3125.01

$$\int \sin\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(\frac{4\,e^{i\,e}\cos\left(\sqrt{z}\ b+e+d\,z\right)}{d}-\frac{b\,e^{\frac{i\,b^2}{4\,d}}\sqrt{\pi}\ \text{erfi}\left(\frac{i\,b+2\,i\,d\,\sqrt{z}}{2\sqrt{-i\,d}}\right)}{(-i\,d)^{3/2}}-\frac{b\,e^{2\left(i\,e-\frac{i\,\pi}{2}\right)-\frac{i\,b^2}{4\,d}}\sqrt{\pi}\ \text{erfi}\left(\frac{i\,b+2\,i\,d\,\sqrt{z}}{2\sqrt{i\,d}}\right)}{(i\,d)^{3/2}}\right)e^{-i\,e+\frac{i\,\pi}{2}\,i\left(\begin{matrix}\nu\\ \frac{\nu}{2}\end{matrix}\right)}$$

$$(1-\nu \bmod 2)+2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e-\frac{i\,\pi}{2}-g\,(\nu-2\,s)}\left(\frac{e^{\frac{(b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,i\,d+8\,f\,s-4\,f\,\nu}}\sqrt{\pi}\ (i\,b+2\,c\,s-c\,\nu)\,\text{erfi}\left(\frac{-i\,b+c\,(\nu-2\,s)+2\,(-i\,d-2\,f\,s+f\,\nu)\,\sqrt{z}}{2\sqrt{i\,d+2\,f\,s-f\,\nu}}\right)}{(i\,d+2\,f\,s-f\,\nu)^{3/2}}+\right.\right.$$

$$\left.\left(e^{-\frac{(b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,i\,d+8\,f\,s-4\,f\,\nu}-2\,i\,e+2\,g\,(\nu-2\,s)}\sqrt{\pi}\ (-i\,b+c\,(\nu-2\,s))\,\text{erfi}\left(\frac{-i\,b+c\,(\nu-2\,s)+2\,(-i\,d-2\,f\,s+f\,\nu)\,\sqrt{z}}{2\sqrt{-i\,d+f\,(\nu-2\,s)}}\right)\right)\Big/$$

$$\left.(-i\,d+f\,(\nu-2\,s))^{3/2}+\frac{2\,e^{\sqrt{z}\ (i\,b+2\,c\,s-c\,\nu)+(i\,d+2\,f\,s-f\,\nu)\,z}}{i\,d+2\,f\,s-f\,\nu}+\frac{2\,e^{-2\,i\,e+2\,g\,(\nu-2\,s)+(-i\,b+c\,(\nu-2\,s))\,\sqrt{z}+(-i\,d+f\,(\nu-2\,s))\,z}}{i\,d+2\,f\,s-f\,\nu}\right)+$$

$$e^{-i\,e+\frac{i\,\pi}{2}-g\,(\nu-2\,s)}\left(\frac{e^{\frac{(b+c\,i\,(2\,s-\nu))^2}{-4\,i\,d+8\,f\,s-4\,f\,\nu}}\sqrt{\pi}\ (-i\,b+2\,c\,s-c\,\nu)\,\text{erfi}\left(\frac{i\,b+c\,(\nu-2\,s)+2\,(i\,d-2\,f\,s+f\,\nu)\,\sqrt{z}}{2\sqrt{-i\,d+2\,f\,s-f\,\nu}}\right)}{(-i\,d+2\,f\,s-f\,\nu)^{3/2}}+\frac{1}{(i\,d+f\,(\nu-2\,s))^{3/2}}\right.$$

$$\left(e^{-\frac{(b+c\,i\,(2\,s-\nu))^2}{-4\,i\,d+8\,f\,s-4\,f\,\nu}+2\,i\,e+2\,g\,(\nu-2\,s)}\sqrt{\pi}\ (i\,b+c\,(\nu-2\,s))\,\text{erfi}\left(\frac{i\,b+c\,(\nu-2\,s)+2\,(i\,d-2\,f\,s+f\,\nu)\,\sqrt{z}}{2\sqrt{i\,d+f\,(\nu-2\,s)}}\right)\right)+$$

$$\left.\left.\frac{2\,e^{2\,i\,e-4\,g\,s+2\,g\,\nu+i\,b\,\sqrt{z}-2\,c\,s\,\sqrt{z}+c\,\nu\,\sqrt{z}+i\,d\,z-2\,f\,s\,z+f\,\nu\,z}}{-i\,d+2\,f\,s-f\,\nu}+\frac{2\,e^{\sqrt{z}\ (-i\,b+2\,c\,s-c\,\nu)+(-i\,d+2\,f\,s-f\,\nu)\,z}}{-i\,d+2\,f\,s-f\,\nu}\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving powers of sin

Involving $\sin^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3126.01

$$\int \sin^{\mu}(c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{c\,\mu}\,i\,2^{-\nu}\left(1-e^{2\,i\,c\,z}\right)^{-\mu}\sin^{\mu}(c\,z)\left(\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,e^{2\,i\,c\,z}\right)(1-\nu \bmod 2)+\right.$$

$$c\,\mu\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{i\,(2\,i\,a\,k\,z-i\,a\,\nu\,z)}}{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(2\,k-\nu)}{c}-\mu+2\right);\,e^{2\,i\,c\,z}\right)+\right.$$

$$\left.\left.\frac{e^{-a\,(\nu-2\,k)\,z}}{2\,i\,a\,k-i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{2\,i\,a\,k-i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(\nu-2\,k)}{c}-\mu+2\right);\,e^{2\,i\,c\,z}\right)\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

01.20.21.3127.01

$$\int \sin^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{a\,\nu}\,2^{-m}\left(1+e^{-2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\left(-\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{-2\,a\,z}\right)(m \bmod 2-1)+\right.$$

$$i^{1-m}\,a\,\nu\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{i\,c\,(m-2\,k)\,z}}{2\,c\,k-c\,m+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(m-2\,k)}{a}-\nu+2\right);\,-e^{-2\,a\,z}\right)-\right.$$

$$\left.\left.\frac{e^{i\,(-c\,z\,m+\pi\,m+2\,c\,k\,z)}}{2\,c\,k-c\,m-i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(2\,k-m)}{a}-\nu+2\right);\,-e^{-2\,a\,z}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+$$

01.20.21.3128.01

$$\int \sin^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-m-\nu}\left((-1)^m\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\right.$$

$$\frac{i^{1-m}}{c}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{-i\,c\,(m-2\,k)\,z}\left(-(-1)^m+e^{2\,i\,c\,(m-2\,k)\,z}\right)\binom{m}{k}}{2\,k-m}-$$

$$\frac{(-1)^m}{a}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{e^{a\,(\nu-2\,s)\,z}\left(-1+e^{-2\,a\,(\nu-2\,s)\,z}\right)\binom{\nu}{s}}{2\,s-\nu}+$$

$$i^{m+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\frac{e^{-2\,c\,i\,k\,z-2\,a\,s\,z+a\,\nu\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m-2\,i\,a\,s+i\,a\,\nu}+\frac{e^{-2\,c\,i\,k\,z+2\,a\,s\,z-a\,\nu\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m+2\,i\,a\,s-i\,a\,\nu}+\right.$$

$$\left.\left.\frac{e^{2\,i\,c\,k\,z-i\,c\,m\,z-2\,a\,s\,z+a\,\nu\,z}}{c\,(m-2\,k)+a\,i\,(\nu-2\,s)}+\frac{e^{(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z}}{c\,(m-2\,k)+a\,i\,(2\,s-\nu)}\right)\binom{\nu}{s}\right)\Big/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\sin^{\mu}(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3129.01

$$\int \sin^{\mu}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{c\,\mu}\,i\,2^{-\nu}\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}\sin^{\mu}(d+c\,z)\left(\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,e^{2\,i\,(d+c\,z)}\right)(1-\nu \bmod 2)+\right.$$

$$c\,\mu\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{i\,(2\,i\,a\,k\,z-i\,a\,\nu\,z)}}{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(2\,k-\nu)}{c}-\mu+2\right);\,e^{2\,i\,(d+c\,z)}\right)+\right.$$

$$\left.\left.\frac{e^{-a\,(\nu-2\,k)\,z}}{2\,i\,a\,k-i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{2\,i\,a\,k-i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(\nu-2\,k)}{c}-\mu+2\right);\,e^{2\,i\,(d+c\,z)}\right)\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

01.20.21.3130.01

$$\int \sin^{m}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{a\,\nu}\,2^{-m}\left(1+e^{-2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\left(-\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{-2\,a\,z}\right)(m \bmod 2-1)+i^{1-m}\,a\,\nu\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{i\,d\,(m-2\,k)}\binom{m}{k}\left(\frac{e^{i\,c\,(m-2\,k)\,z}}{2\,c\,k-c\,m+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(m-2\,k)}{a}-\nu+2\right);\,-e^{-2\,a\,z}\right)-\right.$$

$$\left.\left.\frac{e^{i\,(4\,d\,k+2\,c\,z\,k-2\,d\,m-c\,m\,z+m\,\pi)}}{2\,c\,k-c\,m-i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(2\,k-m)}{a}-\nu+2\right);\,-e^{-2\,a\,z}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+$$

01.20.21.3131.01

$$\int \sin^{m}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-m-\nu}\left((-1)^m\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\right.$$

$$\frac{i^{1-m}}{c}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{-i\,(d\,(2\,k+m)+c\,(m-2\,k)\,z)}\left(-(-1)^m\,e^{4\,i\,d\,k}+e^{2\,i\,(d\,m+c\,(m-2\,k)\,z)}\right)\binom{m}{k}}{2\,k-m}+$$

$$\frac{2}{a}\,(-1)^m\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\sinh(a\,(\nu-2\,s)\,z)\binom{\nu}{s}}{2\,s-\nu}+$$

$$i^{m+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{i\,d\,(2\,k+m)}\left(\frac{e^{-4\,d\,i\,k-2\,i\,c\,z\,k-2\,a\,s\,z+a\,\nu\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m-2\,i\,a\,s+i\,a\,\nu}+\frac{e^{-4\,d\,i\,k-2\,i\,c\,z\,k+2\,a\,s\,z-a\,\nu\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m+2\,i\,a\,s-i\,a\,\nu}+\right.$$

$$\left.\left.\frac{e^{-2\,d\,i\,m-i\,c\,z\,m+2\,i\,c\,k\,z-2\,a\,s\,z+a\,\nu\,z}}{c\,(m-2\,k)+a\,i\,(\nu-2\,s)}+\frac{e^{(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z-2\,i\,d\,m}}{c\,(m-2\,k)+a\,i\,(2\,s-\nu)}\right)\binom{\nu}{s}\right)\Big/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\sin^{\mu}(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.3132.01

$$\int \sin^{\mu}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{c\,\mu}\,i\,2^{-\nu}\left(1-e^{2\,i\,c\,z}\right)^{-\mu}\sin^{\mu}(c\,z)\left(\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,e^{2\,i\,c\,z}\right)(1-\nu \bmod 2)+\right.$$

$$c\,\mu\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-b\,(\nu-2\,k)}\binom{\nu}{k}\left(\frac{e^{i\,(4\,i\,b\,k+2\,i\,a\,z\,k-2\,i\,b\,\nu-i\,a\,\nu\,z)}}{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(2\,k-\nu)}{c}-\mu+2\right);\,e^{2\,i\,c\,z}\right)+\right.$$

$$\left.\left.\frac{e^{-a\,(\nu-2\,k)\,z}}{2\,i\,a\,k-i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{2\,i\,a\,k-i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(\nu-2\,k)}{c}-\mu+2\right);\,e^{2\,i\,c\,z}\right)\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

01.20.21.3133.01

$$\int \sin^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{a\,\nu}\,2^{-m}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\left(-\binom{m}{\frac{m}{2}}{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{-2\,(b+a\,z)}\right)(m \bmod 2-1)+\right.$$

$$i^{1-m}\,a\,\nu\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{i\,c\,(m-2\,k)\,z}}{2\,c\,k-c\,m+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(m-2\,k)}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)-\right.$$

$$\left.\left.\frac{e^{i\,(-c\,z\,m+\pi\,m+2\,c\,k\,z)}}{2\,c\,k-c\,m-i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(2\,k-m)}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+$$

01.20.21.3134.01

$$\int \sin^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-m-\nu}\left((-1)^m\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\right.$$

$$\frac{i^{1-m}}{c}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{-i\,c\,(m-2\,k)\,z}\left(-(-1)^m+e^{2\,i\,c\,(m-2\,k)\,z}\right)\binom{m}{k}}{2\,k-m}-$$

$$\frac{(-1)^m}{a}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{e^{-i\,(b\,i\,(2\,s+\nu)+a\,i\,(\nu-2\,s)\,z)}\left(-e^{-4\,b\,s}+e^{2\,i\,(i\,b\,\nu+a\,i\,(\nu-2\,s)\,z)}\right)\binom{\nu}{s}}{2\,s-\nu}+$$

$$i^{m+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{b\,(2\,s+\nu)}\left(\frac{e^{-4\,b\,s-2\,a\,z\,s-2\,i\,c\,k\,z+a\,\nu\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m-2\,i\,a\,s+i\,a\,\nu}+\frac{e^{-2\,b\,\nu-a\,z\,\nu-2\,i\,c\,k\,z+2\,a\,s\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m+2\,i\,a\,s-i\,a\,\nu}+\right.$$

$$\left.\left.\frac{e^{-4\,b\,s-2\,a\,z\,s+2\,i\,c\,k\,z-i\,c\,m\,z+a\,\nu\,z}}{c\,(m-2\,k)+a\,i\,(\nu-2\,s)}+\frac{e^{(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z-2\,b\,\nu}}{c\,(m-2\,k)+a\,i\,(2\,s-\nu)}\right)\binom{\nu}{s}\right)\Big/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\sin^{\mu}(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.3135.01

$$\int \sin^{\mu}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{c\,\mu}\,i\,2^{-\nu}\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}\sin^{\mu}(d+c\,z)\left(\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,e^{2\,i\,(d+c\,z)}\right)(1-\nu \bmod 2)+\right.$$

$$c\,\mu\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-b\,(\nu-2\,k)}\binom{\nu}{k}\left(\frac{e^{i\,(4\,i\,b\,k+2\,i\,a\,z\,k-2\,i\,b\,\nu-i\,a\,\nu\,z)}}{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{-2\,a\,i\,k+i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(2\,k-\nu)}{c}-\mu+2\right);\,e^{2\,i\,(d+c\,z)}\right)+\right.$$

$$\left.\left.\frac{e^{-a\,(\nu-2\,k)\,z}}{2\,i\,a\,k-i\,a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{2\,i\,a\,k-i\,a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,i\,(\nu-2\,k)}{c}-\mu+2\right);\,e^{2\,i\,(d+c\,z)}\right)\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

01.20.21.3136.01

$$\int \sin^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$\frac{1}{a\,\nu}\,2^{-m}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\left(-\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{-2\,(b+a\,z)}\right)(m \bmod 2-1)+i^{1-m}\,a\,\nu\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{i\,d\,(m-2\,k)}\binom{m}{k}\left(\frac{e^{i\,c\,(m-2\,k)\,z}}{2\,c\,k-c\,m+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(m-2\,k)}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)-\right.$$

$$\left.\left.\frac{e^{i\,(4\,d\,k+2\,c\,z\,k-2\,d\,m-c\,m\,z+m\,\pi)}}{2\,c\,k-c\,m-i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{1}{2}\left(-\frac{i\,c\,(2\,k-m)}{a}-\nu+2\right);\,-e^{-2\,(b+a\,z)}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+$$

01.20.21.3137.01

$$\int \sin^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-m-\nu}\left((-1)^m\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\right.$$

$$\frac{i^{1-m}}{c}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{-i\,(d\,(2\,k+m)+c\,(m-2\,k)\,z)}\left(-(-1)^m\,e^{4\,i\,d\,k}+e^{2\,i\,(d\,m+c\,(m-2\,k)\,z)}\right)\binom{m}{k}}{2\,k-m}-$$

$$\frac{(-1)^m}{a}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{e^{-i\,(b\,i\,(2\,s+\nu)+a\,i\,(\nu-2\,s)\,z)}\left(-e^{-4\,b\,s}+e^{2\,i\,(i\,b\,\nu+a\,i\,(\nu-2\,s)\,z)}\right)\binom{\nu}{s}}{2\,s-\nu}+i^{m+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{i\,(d\,(2\,k+m)-i\,b\,(2\,s+\nu))}\left(\frac{e^{-4\,d\,i\,k-2\,i\,c\,z\,k-4\,b\,s-2\,a\,s\,z+a\,\nu\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m-2\,i\,a\,s+i\,a\,\nu}+\frac{e^{-4\,d\,i\,k-2\,i\,c\,z\,k-2\,b\,\nu+2\,a\,s\,z-a\,\nu\,z+i\,m\,(c\,z+\pi)}}{2\,c\,k-c\,m+2\,i\,a\,s-i\,a\,\nu}+\right.$$

$$\left.\left.\frac{e^{-2\,d\,i\,m-i\,c\,z\,m-4\,b\,s+2\,i\,c\,k\,z-2\,a\,s\,z+a\,\nu\,z}}{c\,(m-2\,k)+a\,i\,(\nu-2\,s)}+\frac{e^{-2\,d\,i\,m-2\,b\,\nu+(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z}}{c\,(m-2\,k)+a\,i\,(2\,s-\nu)}\right)\binom{\nu}{s}\right)\Big/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh^v(c\,z)$

01.20.21.3138.01

$$\int \sin^m\left(b\,z^2\right)\cosh^v(c\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k}{\sqrt{-b\,(m-2\,k)}}\binom{m}{k}\left(S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\sin\left(\frac{m\,\pi}{2}\right)-\cos\left(\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(2\,c\,k\,z-v\,c\,z)}{2\,k-v}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}-\frac{\pi\,m}{2}\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}-\frac{\pi\,m}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3139.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(c\,(v-2\,k)\,z)}{c\,(v-2\,k)}+\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2\,k)^2}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(b\,(2\,k-m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)+b\,(2\,k-m)\,\sqrt{z}\,\sin\left(b\,(2\,k-m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,c\,v-2\,i\,c\,s)^{3/2}}\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-(2\,b\,k-b\,m)\,\sqrt{2\,\pi}\,S\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)$$

$$\left.\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+\frac{m\,\pi}{2}\right)+2\,\sqrt{i\,c\,v-2\,i\,c\,s}\,\sin\left(-\frac{\pi\,m}{2}+(i\,c\,v-2\,i\,c\,s)\,z+(2\,b\,k-b\,m)\,\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,c\,s-i\,c\,v)^{3/2}}\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$(2\,b\,k-b\,m)\,\sqrt{2\,\pi}\,S\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)+$$

$$\left.\left.2\,\sqrt{2\,i\,c\,s-i\,c\,v}\,\sin\left(-\frac{\pi\,m}{2}+(2\,i\,c\,s-i\,c\,v)\,z+(2\,b\,k-b\,m)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+e\right)\cosh^v(c\,z)$

01.20.21.3140.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh^v(c\,z)\,dz ==$$

$$(-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k}{\sqrt{-b\,(m-2\,k)}}$$

$$\binom{m}{k}\left(\cos\left(e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)+S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\sin\left(e\,(m-2\,k)-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(2\,c\,k\,z-v\,c\,z)}{2\,k-v}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3141.01

$$\int \sin^m\left(\sqrt{z}\, b+e\right)\cosh^v(c\,z)\,dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(c\,(v-2\,k)\,z)}{c\,(v-2\,k)}+$$

$$\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2\,k)^2}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(2\,e\,k-e\,m+b\,(2\,k-m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)+\right.\right.\right.$$

$$\left.\left.\left.b\,(2\,k-m)\,\sqrt{z}\,\sin\left(2\,e\,k-e\,m+b\,(2\,k-m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,c\,v-2\,i\,c\,s)^{3/2}}\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+(2\,b\,k-b\,m)\,\sqrt{2\,\pi}$$

$$\left.S\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+\right.$$

$$2\,\sqrt{i\,c\,v-2\,i\,c\,s}\,\sin\left(2\,e\,k-e\,m+(i\,c\,v-2\,i\,c\,s)\,z+(2\,b\,k-b\,m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\Bigg)+\frac{1}{(2\,i\,c\,s-i\,c\,v)^{3/2}}$$

$$\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)+\right.$$

$$(2\,b\,k-b\,m)\,\sqrt{2\,\pi}\,S\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+$$

$$\left.2\,\sqrt{2\,i\,c\,s-i\,c\,v}\,\sin\left(2\,e\,k-e\,m+(2\,i\,c\,s-i\,c\,v)\,z+(2\,b\,k-b\,m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\right)\Bigg)\Bigg/;\, m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh^v(c\,z)$

01.20.21.3142.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh^v(c\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\left((-1)^k\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+2\,m\,\pi\right)\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+2\,m\,\pi\right)\right)\right)\right)(1-v \bmod 2)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\sinh(2\,c\,k\,z-v\,c\,z)}{2\,k-v}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$

$$\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}-\frac{\pi\,m}{2}\right)C\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}-\frac{\pi\,m}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.S\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)\right.$$

$$\left.\left.\sin\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int \sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v(c\,z)\,dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^{k+m}\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$b\,(m-2\,k)\,\sqrt{2\,\pi}\,S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}-\frac{m\,\pi}{2}\right)+$$

$$\left.\left.\left.2\,\sqrt{d\,(m-2\,k)}\,\sin\left(\frac{\pi\,m}{2}+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)\right)$$

$$(1-v \bmod 2)+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(c\,(v-2\,k)\,z)}{c\,(v-2\,k)}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)}+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v}}\right)-(2\,b\,k-b\,m)\,\sqrt{2\,\pi}$$

$$S\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)}+\frac{m\,\pi}{2}\right)+$$

$$\left.\left.2\,\sqrt{2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v}\,\sin\left(-\frac{\pi\,m}{2}+(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)\,z+(2\,b\,k-b\,m)\,\sqrt{z}\right)\right)\right/$$

$$(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)^{3/2}+\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v}}\right)-(2\,b\,k-b\,m)\,\sqrt{2\,\pi}$$

$$S\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)+$$

$$\left.\left.2\,\sqrt{2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v}\,\sin\left(-\frac{\pi\,m}{2}+(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)\,z+(2\,b\,k-b\,m)\,\sqrt{z}\right)\right)\right/$$

$$\left.(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)^{3/2}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

01.20.21.3144.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh^\nu(c\,z)\,dz == (-1)^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\left((-1)^k\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m+2\,m\,\pi\right)\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m+2\,m\,\pi\right)\right)\right)\right)\right)$$

$$(1-\nu \bmod 2)+\frac{(-1)^m\,2^{-m-\nu+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{k}\sinh(2\,c\,k\,z-c\,\nu\,z)}{2\,k-\nu}}{c}+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)-S\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)$$

$$\left.\sin\left(-\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+S\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)+\frac{m\,\pi}{2}\right)\right)\right)\Big/;\; m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

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$$\int \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v(c\,z)\,dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^{k+m}\binom{m}{k}\right.\right.$$

$$\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-b\,(m-2\,k)\right.$$

$$\sqrt{2\,\pi}\,S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)+$$

$$\left.\left.\left.2\,\sqrt{d\,(m-2\,k)}\,\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)\right)$$

$$(1-v \bmod 2)+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\sinh(c\,(v-2\,k)\,z)}{c\,(v-2\,k)}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v}}\right)+$$

$$(2\,b\,k-b\,m)\,\sqrt{2\,\pi}\,S\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+2\,\sqrt{2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v}\,\sin\left(2\,e\,k-\right.$$

$$\left.\left.e\,m+(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)\,z+(2\,b\,k-b\,m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\right)\Big/(2\,d\,k-d\,m-2\,i\,c\,s+i\,c\,v)^{3/2}+$$

$$\left((b\,m-2\,b\,k)\,\sqrt{2\,\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v}}\right)+(2\,b\,k-b\,m)\,\sqrt{2\,\pi}$$

$$S\left(\frac{2\,b\,k-b\,m+2\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4\,(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)}+2\,e\,k-\right.$$

$$e\,m-\frac{m\,\pi}{2}\Big)+2\,\sqrt{2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v}\,\sin\Big(2\,e\,k-e\,m+(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)\,z+$$

$$\left.\left.(2\,b\,k-b\,m)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,c\,s-i\,c\,v)^{3/2}\Bigg)\Big/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh^v(f\,z+g)$

01.20.21.3146.01

$$\int \sin^m\left(b\,z^2\right)\cosh^v(g+f\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k}{\sqrt{-b\,(m-2\,k)}}\binom{m}{k}\left(S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\sin\left(\frac{m\,\pi}{2}\right)-\cos\left(\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(g\,(2\,k-v)-v\,f\,z+2\,f\,k\,z)}{2\,k-v}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+g\,i\,(2\,k-v)+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+g\,i\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-v)+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right)\right)\text{/; }m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3147.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh^v(g+f z)\,dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}\right.$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)+b(2k-m)\sqrt{z}\,\sin\left(b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right)\right)$$

$$\left.(1-v \bmod 2)\right)+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(g(v-2k)+f z(v-2k))}{f(v-2k)}+2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i f v-2 i f s)^{3/2}}\right.$$

$$\left((b m-2bk)\sqrt{2\pi}\,\cos\left(-\frac{(2bk-bm)^2}{4(i f v-2 i f s)}-2 i g s+i g v-\frac{m\pi}{2}\right)C\left(\frac{2bk-bm+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)+\right.$$

$$(2bk-bm)\sqrt{2\pi}\,S\left(\frac{2bk-bm+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)\sin\left(-\frac{(2bk-bm)^2}{4(i f v-2 i f s)}-2 i g s+i g v-\right.$$

$$\left.\left.\frac{m\pi}{2}\right)+2\sqrt{i f v-2 i f s}\,\sin\left(-\frac{\pi m}{2}-2 i g s+i g v+(i f v-2 i f s)z+(2bk-bm)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2 i f s-i f v)^{3/2}}\left((b m-2bk)\sqrt{2\pi}\,\cos\left(-\frac{(2bk-bm)^2}{4(2 i f s-i f v)}+2 i g s-i g v-\frac{m\pi}{2}\right)\right.$$

$$C\left(\frac{2bk-bm+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)+(2bk-bm)\sqrt{2\pi}\,S\left(\frac{2bk-bm+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)$$

$$\sin\left(-\frac{(2bk-bm)^2}{4(2 i f s-i f v)}+2 i g s-i g v-\frac{m\pi}{2}\right)+2\sqrt{2 i f s-i f v}$$

$$\left.\left.\sin\left(-\frac{\pi m}{2}+2 i g s-i g v+(2 i f s-i f v)z+(2bk-bm)\sqrt{z}\right)\right)\right);\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+e\right)\cosh^v(f\,z+g)$

01.20.21.3148.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh^v(g+f\,z)\,dz ==$$

$$(-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k}{\sqrt{-b\,(m-2\,k)}}$$

$$\binom{m}{k}\left(\cos\left(e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)+S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\sin\left(e\,(m-2\,k)-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\sinh(g\,(2\,k-v)-v\,f\,z+2\,f\,k\,z)}{2\,k-v}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$

$$\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-v)+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3149.01

$$\int \sin^m\left(\sqrt{z}\ b+e\right)\cosh^v(g+f\,z)\,dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^{k+m}\binom{m}{k}\right.\right.\right.$$

$$\left.\left.\left.\left(\cos\left(2ek-em+b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)+b(2k-m)\sqrt{z}\,\sin\left(2ek-em+b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right)\right)$$

$$(1-v \bmod 2)\Bigg)+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(g(v-2k)+f\,z(v-2k))}{f(v-2k)}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4(i\,f\,v-2\,i\,f\,s)}+2\,e\,k-\right.\right.\right.$$

$$\left.\left.e\,m-2\,i\,g\,s+i\,g\,v-\frac{m\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)+(2\,b\,k-b\,m)\sqrt{2\pi}$$

$$S\left(\frac{2\,b\,k-b\,m+2(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4(i\,f\,v-2\,i\,f\,s)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v-\frac{m\pi}{2}\right)+$$

$$\left.2\sqrt{i\,f\,v-2\,i\,f\,s}\,\sin\left(2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v+(i\,f\,v-2\,i\,f\,s)\,z+(2\,b\,k-b\,m)\sqrt{z}-\frac{m\pi}{2}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left((b\,m-2\,b\,k)\sqrt{2\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4(2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v-\frac{m\pi}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)+(2\,b\,k-b\,m)\sqrt{2\pi}\,S\left(\frac{2\,b\,k-b\,m+2(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4(2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v-\frac{m\pi}{2}\right)+2\sqrt{2\,i\,f\,s-i\,f\,v}$$

$$\left.\left.\sin\left(2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v+(2\,i\,f\,s-i\,f\,v)\,z+(2\,b\,k-b\,m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+d\,z)\cosh^v(f\,z+g)$

01.20.21.3150.01

$$\int \sin^m(b\,z^2+d\,z)\cosh^v(g+f\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\left((-1)^k\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+2\,m\,\pi\right)\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+2\,m\,\pi\right)\right)\right)\right)(1-v \bmod 2)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(g\,(2\,k-v)-v\,f\,z+2\,f\,k\,z)}{2\,k-v}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+g\,i\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)-S\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)$$

$$\left.\sin\left(-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+g\,i\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+S\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-v)+\frac{m\,\pi}{2}\right)\right)\right)/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3151.01

$$\int \sin^m\left(\sqrt{z}\, b+e\right)\cosh^v(g+f z)\,dz ==$$

$$2^{-m-v} z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2) + 2^{-m-v+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{\binom{v}{k} \sinh(g\,(v-2k)+f z\,(v-2k))}{f\,(v-2k)} +$$

$$\frac{1}{b^2}\left(2^{-m-v+2} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{(m-2k)^2} \left((-1)^{k+m} \binom{m}{k}\right.\right.$$

$$\left.\left.\left(\cos\left(2ek-em+b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)+b(2k-m)\sqrt{z}\,\sin\left(2ek-em+b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right)\right) +$$

$$2^{-m-v} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{k+m} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{1}{(i f v-2 i f s)^{3/2}} \left((bm-2bk)\sqrt{2\pi}\,\cos\left(-\frac{(2bk-bm)^2}{4(i f v-2 i f s)}+2ek-\right.\right.\right.$$

$$\left.\left.\left.em-2igs+igv-\frac{m\pi}{2}\right) C\left(\frac{2bk-bm+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)+(2bk-bm)\sqrt{2\pi}\right.\right.$$

$$\left.\left.S\left(\frac{2bk-bm+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)\sin\left(-\frac{(2bk-bm)^2}{4(i f v-2 i f s)}+2ek-em-2igs+igv-\frac{m\pi}{2}\right)+\right.\right.$$

$$\left.\left.2\sqrt{i f v-2 i f s}\,\sin\left(2ek-em-2igs+igv+(i f v-2 i f s)z+(2bk-bm)\sqrt{z}-\frac{m\pi}{2}\right)\right)+\right.$$

$$\left.\frac{1}{(2 i f s-i f v)^{3/2}}\left((bm-2bk)\sqrt{2\pi}\,\cos\left(-\frac{(2bk-bm)^2}{4(2 i f s-i f v)}+2ek-em+2igs-igv-\frac{m\pi}{2}\right)\right.\right.$$

$$\left.\left.C\left(\frac{2bk-bm+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)+(2bk-bm)\sqrt{2\pi}\,S\left(\frac{2bk-bm+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)\right.\right.$$

$$\left.\left.\sin\left(-\frac{(2bk-bm)^2}{4(2 i f s-i f v)}+2ek-em+2igs-igv-\frac{m\pi}{2}\right)+2\sqrt{2 i f s-i f v}\right.\right.$$

$$\left.\left.\sin\left(2ek-em+2igs-igv+(2 i f s-i f v)z+(2bk-bm)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right) /;\ m\in\mathbb{N}^+ \bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b z^r+d z+e\right)\cosh^v(f z+g)$

01.20.21.3152.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh^\nu(g+f\,z)\,dz == (-1)^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\left((-1)^k\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m+2\,m\,\pi\right)\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m+2\,m\,\pi\right)\right)\right)\right)(1-\nu \bmod 2)+$$

$$\frac{(-1)^m\,2^{-m-\nu+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{k}\sinh(g\,(2\,k-\nu)-\nu\,f\,z+2\,f\,k\,z)}{2\,k-\nu}+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-\nu)+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)-S\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)$$

$$\left.\sin\left(-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-\nu)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-\nu)+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+S\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-\nu)+\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3153.01

$$\int \sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh^\nu(g+f\,z)\,dz ==$$

$$2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^{k+m}\binom{m}{k}\right.\right.$$

$$\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\;\cos\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\;\sqrt{2\,\pi}}\right)-b\,(m-2\,k)\right.$$

$$\sqrt{2\,\pi}\;S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)+$$

$$\left.\left.\left.2\,\sqrt{d\,(m-2\,k)}\;\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)\right)$$

$$(1-v \bmod 2)+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(g(v-2k)+fz(v-2k))}{f(v-2k)}+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left((b\,m-2\,b\,k)\sqrt{2\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v-\frac{m\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+(2\,b\,k-b\,m)\sqrt{2\pi}$$

$$S\left(\frac{2\,b\,k-b\,m+2(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-\right.$$

$$\left.e\,m-2\,i\,g\,s+i\,g\,v-\frac{m\pi}{2}\right)+2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\,\sin\left(2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v+\right.$$

$$\left.\left.\left.(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+(2\,b\,k-b\,m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\Big/(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\right.$$

$$\left((b\,m-2\,b\,k)\sqrt{2\pi}\,\cos\left(-\frac{(2\,b\,k-b\,m)^2}{4(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v-\frac{m\pi}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+$$

$$(2\,b\,k-b\,m)\sqrt{2\pi}\,S\left(\frac{2\,b\,k-b\,m+2(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m)^2}{4(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v-\frac{m\pi}{2}\right)+$$

$$2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\,\sin\left(2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+\right.$$

$$\left.\left.(2\,b\,k-b\,m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\Bigg);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z)\cosh^v(c\,z^r)$

01.20.21.3154.01

$$\int \sin^m(b\,z)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\;(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$\frac{2^{-m-v+1}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi\,m}{2}+b\,(m-2\,k)\,z\right)}{m-2\,k}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,v}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3155.01

$$\int \sin^m(b\,z)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi m}{2}+b\,(m-2k)\,z\right)}{m-2k}-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(v-2k)\sqrt{z}\right)-c\,(v-2k)\sqrt{z}\,\sinh\left(c\,(v-2k)\sqrt{z}\right)\right)}{(v-2k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,b\,k-b\,m)^{3/2}}\left(\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)\right.\right.$$
$$C\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)$$
$$\left.\sin\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)+2\sqrt{2\,b\,k-b\,m}\,\sin\left(-\frac{\pi\,m}{2}+(2\,b\,k-b\,m)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)+$$
$$\frac{1}{(2\,b\,k-b\,m)^{3/2}}\left(\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.$$
$$\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\sqrt{z}\,(2\,b\,k-b\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,b\,k-b\,m)}+\frac{m\,\pi}{2}\right)-$$
$$\left.\left.2\sqrt{2\,b\,k-b\,m}\,\sin\left(\frac{\pi\,m}{2}-(2\,b\,k-b\,m)\,z-(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(d\,z+e)\cosh^v\left(c\,z^r\right)$

01.20.21.3156.01

$$\int \sin^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(e\,(2\,k-m)+2\,d\,k\,z-\frac{1}{2}\,m\,(2\,d\,z+\pi)\right)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3157.01

$$\int \sin^m(e+d\,z)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z\right)}{m-2\,k}-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2\,k-v)\sqrt{z}\right)-c\,(2\,k-v)\sqrt{z}\,\sinh\left(c\,(2\,k-v)\sqrt{z}\right)\right)}{(v-2\,k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}\right)C\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+\right.$$

$$\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}\right)+$$

$$\left.2\sqrt{2\,d\,k-d\,m}\,\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}+(2\,d\,k-d\,m)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$

$$\left(\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}\right)C\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+\right.$$

$$\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}\right)+$$

$$\left.\left.2\sqrt{2\,d\,k-d\,m}\,\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}+(2\,d\,k-d\,m)\,z+(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.3158.01

$$\int \sin^m(b\,z^r)\cosh^v(c\,z^r)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) -$$

$$\frac{i^{-m}\,2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-1/r}+\right.$$

$$\left.((2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-\frac{(-1)^m\,2^{-m-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{1}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)-$$

$$\frac{i^{-m}\,2^{-m-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3159.01

$$\int \sin^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{m\,\pi}{2}\right)C\left(\frac{b\,(2\,k-m)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(2\,k-m)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{m\,\pi}{2}\right)\right)}{\sqrt{b\,(m-2\,k)}}\right)(1-v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{i\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)}{\sqrt{i\,c\,(v-2\,k)}}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{m\,\pi}{2}\right)C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)+S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)\sin\left(\frac{m\,\pi}{2}\right)\right)\Big/\right.$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(\frac{m\,\pi}{2}\right)C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)+S\left(\sqrt{\frac{2}{\pi}}\right.\right.$$

$$\left.\left.\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)\sin\left(\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3160.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\binom{m}{k}\left(\cos\left(b\sqrt{z}\,(2k-m)+\frac{m\pi}{2}\right)+b\,(2k-m)\sqrt{z}\,\sin\left(b\sqrt{z}\,(2k-m)+\frac{m\pi}{2}\right)\right)}{(2k-m)^2}-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2k-v)\sqrt{z}\right)-c\,(2k-v)\sqrt{z}\,\sinh\left(c\,(2k-v)\sqrt{z}\right)\right)}{(2k-v)^2}+$$

$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b\,(2k-m)+c\,i\,(v-2s))^2}\left(\cos\left(\frac{\pi m}{2}+(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)+\right.\right.$$
$$\left.(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\,\sin\left(\frac{\pi m}{2}+(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)\right)+$$
$$\frac{1}{(b\,(2k-m)-i\,c\,(v-2s))^2}\left(\cos\left(\frac{\pi m}{2}+(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)+\right.$$
$$\left.\left.(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\,\sin\left(\frac{\pi m}{2}+(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3161.01

$$\int \sin^m(b\,z^r+e)\cosh^v(c\,z^r)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{i^{-m}\,2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2iek-iem}\,\Gamma\left(\frac{1}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-1/r}+\right.$$
$$\left.e^{iem-2iek}\,((2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-\frac{(-1)^m\,2^{-m-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{1}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)-\frac{i^{-m}\,2^{-m-v}\,z}{r}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2iek-iem}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$
$$e^{iem-2iek}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$
$$(-1)^m\,e^{2iek-iem}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$
$$\left.e^{iem-2iek}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3162.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}$$

$$\left(\cos\left(\frac{\pi\,m}{2}+e\,(m-2\,k)\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\;(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)-\right.\right.$$

$$\left.S\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)\sin\left(e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)+$$

$$\left(\cos\left(e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)-S\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)\right.$$

$$\left.\left.\sin\left(e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3163.01

$$\int \sin^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(2k-m)^2}\left((-1)^k\binom{m}{k}\right.\right.$$

$$\left.\left.\left(\cos\left(-b\sqrt{z}\ (2k-m)+e\,(m-2k)-\frac{m\pi}{2}\right)-b\,(2k-m)\sqrt{z}\ \sin\left(-b\sqrt{z}\ (2k-m)+e\,(m-2k)-\frac{m\pi}{2}\right)\right)\right)\right)-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2k-v)\sqrt{z}\right)-c\,(2k-v)\sqrt{z}\ \sinh\left(c\,(2k-v)\sqrt{z}\right)\right)}{(2k-v)^2}+$$

$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b\,(2k-m)+c\,i\,(v-2s))^2}\left(\cos\left(-\frac{\pi m}{2}+e\,(m-2k)-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)-\right.\right.$$

$$\left.(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\ \sin\left(-\frac{\pi m}{2}+e\,(m-2k)-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)\right)+$$

$$\frac{1}{(b\,(2k-m)-i\,c\,(v-2s))^2}\left(\cos\left(-\frac{\pi m}{2}+e\,(m-2k)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)-(b\,(2k-m)-\right.$$

$$\left.\left.i\,c\,(v-2s))\sqrt{z}\ \sin\left(-\frac{\pi m}{2}+e\,(m-2k)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3164.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh^\nu\left(c\,z^2\right)dz == 2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)-$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)\right.\right.$$

$$\left.\left.C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)\right)\right)-$$

$$i\,2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(\nu-2\,k)}}\binom{\nu}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-\nu)\,z}{\sqrt{i\,c\,(\nu-2\,k)}}\right)+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}$$

$$\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)}+\frac{m\,\pi}{2}\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu}\right)+\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)}+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)+S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)}+\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3165.01

$$\int \sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(c\,\sqrt{z}\right)dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\left((-1)^k\binom{m}{k}\left(b\,(m-2\,k)\,\sqrt{2\,\pi}\,\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,b^2}{d}+2\,m\,\pi\right)\right)C\left(\frac{\sqrt{d\,(2\,k-m)}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{d\,(2\,k-m)}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,b^2}{d}+2\,m\,\pi\right)\right)\right)+2\,\sqrt{-d\,(m-2\,k)}\,\sin\left(\frac{\pi\,m}{2}-d\,(m-2\,k)\,z-b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)(1-v \bmod 2)-$$

$$\frac{(-1)^m\,2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(c\,(2\,k-v)\,\sqrt{z}\right)\right)}{(v-2\,k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{(2\,d\,s-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\,\left(-2\,c\,i\,k+b\,m-2\,b\,s+i\,c\,v\right)\cos\left(\frac{\pi\,m}{2}-\frac{(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}\right)C\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,s-d\,m}}\right)+\sqrt{2\,\pi}\,\left(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v\right)S\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,s-d\,m}}\right)\sin\left(\frac{\pi\,m}{2}-\frac{(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}\right)+2\,\sqrt{2\,d\,s-d\,m}\,\sin\left(\frac{\pi\,m}{2}+(2\,d\,s-d\,m)\,z+(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\,\sqrt{z}\right)\right)+\frac{1}{(d\,m-2\,d\,s)^{3/2}}\left(\sqrt{2\,\pi}\,\left(-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v\right)\cos\left(\frac{(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{d\,m-2\,d\,s}}\right)-\sqrt{2\,\pi}\,\left(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v\right)S\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{d\,m-2\,d\,s}}\right)\sin\left(\frac{(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+\frac{m\,\pi}{2}\right)-2\,\sqrt{d\,m-2\,d\,s}\,\sin\left(\frac{\pi\,m}{2}-(d\,m-2\,d\,s)\,z-(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\,\sqrt{z}\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3166.01

$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m-2\,m\,\pi\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m-2\,m\,\pi\right)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$i\,2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)$$

$$\left.\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+$$

$$\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.$$

$$\left.\left.e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big);\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3167.01

$$\int \sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh^v\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^{k+m}\binom{m}{k}\right.\right.$$

$$\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-b\,(m-2\,k)\right.$$

$$\left.\sqrt{2\,\pi}\,S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)+\right.$$

$$2\sqrt{d\,(m-2\,k)}\,\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\Bigg)\Bigg)(1-v \bmod 2)-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left((2\,k-v)\,c\,\sqrt{z}\right)+c\,(v-2\,k)\,\sqrt{z}\,\sinh\left((2\,k-v)\,c\,\sqrt{z}\right)\right)}{(v-2\,k)^2}+$$

$$2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\Bigg(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\Bigg(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+$$

$$2\,e\,k-e\,m-\frac{m\,\pi}{2}\Bigg)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+$$

$$\sqrt{2\,\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+$$

$$2\sqrt{2\,d\,k-d\,m}\,\sin\left(2\,e\,k-e\,m+(2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\Bigg)+$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\Bigg(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\Bigg(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+$$

$$2\,e\,k-e\,m-\frac{m\,\pi}{2}\Bigg)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+$$

$$\sqrt{2\,\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{m\,\pi}{2}\right)+2\sqrt{2\,d\,k-d\,m}$$

$$\sin\left(2\,e\,k-e\,m+(2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}-\frac{m\,\pi}{2}\right)\Bigg)\Bigg)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3168.01

$$\int \sin^m(d\,z)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(2\,d\,k\,z-\frac{1}{2}\,m\,(2\,d\,z+\pi)\right)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$
$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3169.01

$$\int \sin^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi m}{2}+d\,(m-2\,k)\,z\right)}{m-2\,k}-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$

$$\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}-\frac{\pi\,m}{2}-2\,i\,g\,s+\right.$$

$$\left.i\,g\,v\right)+2\sqrt{2\,d\,k-d\,m}\;\sin\left(-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v+(2\,d\,k-d\,m)\,z+(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}\right)\Bigg)+$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)\right.$$

$$C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)$$

$$S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)+$$

$$\left.\left.2\sqrt{2\,d\,k-d\,m}\;\sin\left(-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m)\,z+(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3170.01

$$\int \sin^m(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(e\,(2\,k-m)+2\,d\,k\,z-\frac{1}{2}\,m\,(2\,d\,z+\pi)\right)}{2\,k-m}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{\pi\,m}{2}-i\,g\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{\pi\,m}{2}-i\,g\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3171.01

$$\int \sin^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z\right)}{m-2\,k}-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\right.\right.\right.$$

$$\left.\left.\left.\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)C\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\right.\right.$$

$$\left.\left.S\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)+\right.\right.$$

$$\left.\left.2\,\sqrt{2\,d\,k-d\,m}\;\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v+(2\,d\,k-d\,m)\,z+(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}\right)\right)+\right.$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)\right.$$

$$C\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)$$

$$\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)+2\,\sqrt{2\,d\,k-d\,m}$$

$$\left.\left.\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m)\,z+(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}\right)\right)\right)\Big/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.3172.01

$$\int \sin^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz ==$$

$$(-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{i^{-m}\,2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-1/r}+((2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-$$

$$\frac{(-1)^m\,2^{-m-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{1}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+\right.$$

$$\left.e^{g\,v-2\,g\,k}\,((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)-\frac{i^{-m}\,2^{-m-v}\,z}{r}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$e^{2\,g\,s-g\,v}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,e^{g\,v-2\,g\,s}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.e^{g\,v-2\,g\,s}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3173.01

$$\int \sin^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\,-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{m\pi}{2}\right)C\left(\frac{b\,(2\,k-m)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(2\,k-m)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{m\pi}{2}\right)\right)}{\sqrt{b\,(m-2\,k)}}\right)(1-v \bmod 2)\,-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)+\right.\right.$$

$$\left.S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)\sin\left(\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+$$

$$\left(\cos\left(\frac{m\,\pi}{2}-i\,g\,(2\,s-v)\right)C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)+S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)\right.$$

$$\left.\left.\sin\left(\frac{m\,\pi}{2}-i\,g\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3174.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\binom{m}{k}\left(\cos\left(b\sqrt{z}\,(2k-m)+\frac{m\pi}{2}\right)+b\,(2k-m)\sqrt{z}\,\sin\left(b\sqrt{z}\,(2k-m)+\frac{m\pi}{2}\right)\right)}{(2k-m)^2}-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(2k-v)^2}\left(\binom{v}{k}\left(\cosh\left(c\,(2k-v)\sqrt{z}-g\,(v-2k)\right)-c\,(2k-v)\sqrt{z}\,\sinh\left(c\,(2k-v)\sqrt{z}-g\,(v-2k)\right)\right)\right)+$$
$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b\,(2k-m)+c\,i\,(v-2s))^2}\left(\cos\left(\frac{\pi m}{2}+g\,i\,(v-2s)+(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)+\right.\right.$$
$$\left.(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\,\sin\left(\frac{\pi m}{2}+g\,i\,(v-2s)+(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)\right)+$$
$$\frac{1}{(b\,(2k-m)-i\,c\,(v-2s))^2}\left(\cos\left(-\frac{\pi m}{2}+g\,i\,(v-2s)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)-(b\,(2k-m)-\right.$$
$$\left.\left.i\,c\,(v-2s))\sqrt{z}\,\sin\left(-\frac{\pi m}{2}+g\,i\,(v-2s)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)\right)\Bigg)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+e)\cosh^v(c\,z^r+g)$

01.20.21.3175.01

$$\int \sin^m(b\,z^r+e)\cosh^v(c\,z^r+g)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$
$$\frac{i^{-m}\,2^{-m-v}}{r}z\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2iek-iem}\,\Gamma\left(\frac{1}{r},(ibm-2ibk)z^r\right)((ibm-2ibk)z^r)^{-1/r}+\right.$$
$$\left.e^{iem-2iek}\,((2ibk-ibm)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2ibk-ibm)z^r\right)\right)-\frac{(-1)^m\,2^{-m-v}}{r}z\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2gk-gv}\,\Gamma\left(\frac{1}{r},(cv-2ck)z^r\right)((cv-2ck)z^r)^{-1/r}+e^{gv-2gk}\,((2ck-cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2ck-cv)z^r\right)\right)-$$
$$\frac{i^{-m}\,2^{-m-v}}{r}z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2iek-iem+2gs-gv}\,\Gamma\left(\frac{1}{r},(-2bik+ibm-2cs+cv)z^r\right)\right.$$
$$((-2bik+ibm-2cs+cv)z^r)^{-1/r}+e^{-2eik+iem+2gs-gv}\,((2ibk-ibm-2cs+cv)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(2ibk-ibm-2cs+cv)z^r\right)+(-1)^m\,e^{2iek-iem-2gs+gv}$$
$$((-2bik+ibm+2cs-cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2bik+ibm+2cs-cv)z^r\right)+e^{-2eik+iem-2gs+gv}$$
$$\left.((2ibk-ibm+2cs-cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2ibk-ibm+2cs-cv)z^r\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3176.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\,(8\,e\,k-4\,e\,m-2\,m\,\pi)\right)C\left(\frac{b\,(2\,k-m)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{b\,(2\,k-m)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{1}{4}\,(8\,e\,k-4\,e\,m-2\,m\,\pi)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\;(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\;(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(e\,(2\,k-m)+g\,i\,(2\,s-v)-\frac{m\,\pi}{2}\right)C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)-\right.\right.$$

$$\left.\left.S\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\;z\right)\sin\left(e\,(2\,k-m)+g\,i\,(2\,s-v)-\frac{m\,\pi}{2}\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)+\left(\cos\left(e\,(2\,k-m)-i\,g\,(2\,s-v)-\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)-S\left(\sqrt{\frac{2}{\pi}}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\;z\right)$$

$$\left.\left.\sin\left(e\,(2\,k-m)-i\,g\,(2\,s-v)-\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)\right);\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3177.01

$$\int \sin^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(2k-m)^2}\left((-1)^k\binom{m}{k}\left(\cos\left(-b\sqrt{z}\ (2k-m)+e\,(m-2k)-\frac{m\pi}{2}\right)-\right.\right.\right.$$

$$\left.\left.\left.b\,(2k-m)\sqrt{z}\ \sin\left(-b\sqrt{z}\ (2k-m)+e\,(m-2k)-\frac{m\pi}{2}\right)\right)\right)\right)-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(2k-v)^2}\left(\binom{v}{k}\left(\cosh\left(g\,(v-2k)-c\,(2k-v)\sqrt{z}\right)+c\,(2k-v)\sqrt{z}\ \sinh\left(g\,(v-2k)-c\,(2k-v)\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{\pi m}{2}+e\,(m-2k)-i\,g\,(v-2s)-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)-(b\,(2k-m)+\right.\right.$$

$$\left.\left.c\,i\,(v-2s))\sqrt{z}\ \sin\left(-\frac{\pi m}{2}+e\,(m-2k)-i\,g\,(v-2s)-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)\right)\Big/$$

$$(b\,(2k-m)+c\,i\,(v-2s))^2+\left(\cos\left(-\frac{\pi m}{2}+e\,(m-2k)+g\,i\,(v-2s)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)-\right.$$

$$(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\ \sin\left(-\frac{\pi m}{2}+e\,(m-2k)+g\,i\,(v-2s)-\right.$$

$$\left.\left.\left.(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)\right)\Big/\left(b\,(2k-m)-i\,c\,(v-2s)\right)^2\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3178.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\right.$$

$$\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}-\right.$$

$$\left.\left.\left.\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3179.01

$$\int \sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\left((-1)^k\binom{m}{k}\left(-i\,b\,(m-2\,k)\,\sqrt{2\,\pi}\,\left(\cos\left(\frac{(m-2\,k)\,b^2}{4\,d}+\frac{m\,\pi}{2}\right)C\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.S\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(m-2\,k)\,b^2}{4\,d}+\frac{m\,\pi}{2}\right)\right)-2\,\sqrt{-d\,(m-2\,k)}\right.\right.\right.$$

$$\left.\left.\left.\sin\left(-\frac{\pi\,m}{2}+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)\right)(1-v \bmod 2)-\frac{(-1)^m\,2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+\right.$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(\frac{1}{(2\,d\,s-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k+b\,m-2\,b\,s+i\,c\,v)\cosh\left(\frac{i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+\right.\right.\right.$$

$$\left.\left.\left.2\,g\,k-\frac{i\,\pi\,m}{2}-g\,v\right)C\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)+\right.\right.$$

$$\left.\left.i\,\sqrt{2\,\pi}\ (2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\,S\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)\right.\right.$$

$$\left.\left.\sinh\left(\frac{i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+2\,g\,k-\frac{i\,\pi\,m}{2}-g\,v\right)+\right.\right.$$

$$\left.\left.2\,i\,\sqrt{2\,d\,s-d\,m}\ \sinh\left(2\,g\,k-\frac{i\,\pi\,m}{2}-g\,v-i\,(2\,d\,s-d\,m)\,z-i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\,\sqrt{z}\right)\right)+\right.$$

$$\frac{1}{(d\,m-2\,d\,s)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v)\cosh\left(\frac{i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+\right.\right.$$

$$\left.\left.2\,g\,k-g\,v+\frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)+\right.$$

$$\left.i\,\sqrt{2\,\pi}\ (2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\,S\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)\right.$$

$$\left.\sinh\left(\frac{i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+2\,g\,k-g\,v+\frac{i\,m\,\pi}{2}\right)+2\,i\,\sqrt{d\,m-2\,d\,s}\right.$$

$$\left.\left.\sinh\left(2\,g\,k-g\,v-i\,(d\,m-2\,d\,s)\,z-i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\,\sqrt{z}+\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r + d\,z + e)\cosh^v(c\,z^r + g)$

01.20.21.3180.01

$$\int \sin^m\left(b\,z^2 + d\,z + e\right)\cosh^v\left(c\,z^2 + g\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)(1 - v \bmod 2) - 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\right.$$

$$\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b} + 8\,e\,k - 4\,e\,m - 2\,m\,\pi\right)\right)C\left(\frac{(2\,k-m)(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right) + S\left(\frac{(2\,k-m)(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\right.\right.$$

$$\left.\left.\left.\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b} + 8\,e\,k - 4\,e\,m - 2\,m\,\pi\right)\right)\right)\right)\right)(1 - v \bmod 2) - 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right) - S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right) +$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)} + e\,(2\,k-m) - \frac{\pi\,m}{2} - i\,g\,(2\,s-v)\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right) - S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)} + e\,(2\,k-m) - \frac{\pi\,m}{2} - i\,g\,(2\,s-v)\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right) + \left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)} + e\,(2\,k-m) - \right.\right.$$

$$\left.\frac{\pi\,m}{2} + g\,i\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right) -$$

$$S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)} + \right.$$

$$\left.\left.\left.e\,(2\,k-m) - \frac{\pi\,m}{2} + g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right) /;\; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3181.01

$$\int \sin^m\left(\sqrt{z}\;b + e + d\,z\right)\cosh^v\left(\sqrt{z}\;c + g\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)(1 - v \bmod 2) + 2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^{k+m}\binom{m}{k}\right.\right.$$

$$\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-b\,(m-2\,k)\right.$$

$$\sqrt{2\,\pi}\,S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)+$$

$$\left.2\,\sqrt{d\,(m-2\,k)}\,\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\right)\Bigg)(1-v\bmod 2)-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left((2\,k-v)\left(\sqrt{z}\,c+g\right)\right)+c\,(v-2\,k)\,\sqrt{z}\,\sinh\left((2\,k-v)\left(\sqrt{z}\,c+g\right)\right)\right)}{(v-2\,k)^2}+$$

$$2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+\right.\right.\right.$$

$$\left.2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v-\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+$$

$$\sqrt{2\,\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v-\frac{m\,\pi}{2}\right)+2\,\sqrt{2\,d\,k-d\,m}$$

$$\left.\sin\left(2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v+(2\,d\,k-d\,m)\,z+(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}\,-\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+\right.\right.$$

$$\left.2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v-\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+$$

$$\sqrt{2\,\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m)\,\sqrt{z}}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v-\frac{m\,\pi}{2}\right)+$$

$$2\,\sqrt{2\,d\,k-d\,m}\,\sin\left(2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m)\,z+\right.$$

$$\left.\left.\left.\left.(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}\,-\frac{m\,\pi}{2}\right)\right)\right)\Bigg/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3182.01

$$\int \sin^m(d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(2\,d\,k\,z-\frac{1}{2}\,m\,(2\,d\,z+\pi)\right)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+\frac{m\,\pi}{2}\right)\right)+\right.$$

$$\left.\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)C\left(\right.\right.\right.$$

$$\left.\left.\left.\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)+S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\right.\right.$$

$$\left.\left.\sin\left(\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3183.01

$$\int \sin^m(d\,z)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi m}{2}+d\,(m-2k)\,z\right)}{m-2k}}{d}+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2k)}\,\sinh\left(f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)-c\sqrt{2\pi}\right.\right.$$

$$\left.\left.(v-2k)\left(\cosh\left(\frac{c^2\,(v-2k)}{4\,f}\right)C\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)-i\,S\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)\sinh\left(\frac{c^2\,(v-2k)}{4\,f}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\,(2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)-\sqrt{2\pi}\,(i\,c\,v-2\,i\,c\,s)$$

$$S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)\sin\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+\frac{m\,\pi}{2}\right)-$$

$$\left.2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\,\sin\left(\frac{\pi\,m}{2}-(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z-(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/$$

$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\pi}\,(i\,c\,v-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+\frac{m\,\pi}{2}\right)\right.$$

$$C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)-\sqrt{2\pi}\,(2\,i\,c\,s-i\,c\,v)$$

$$S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)\sin\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+\frac{m\,\pi}{2}\right)-$$

$$\left.2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\,\sin\left(\frac{\pi\,m}{2}-(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z-(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/$$

$$\left.(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3184.01

$$\int \sin^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\,-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(e\,(2\,k-m)+2\,d\,k\,z-\frac{1}{2}\,m\,(2\,d\,z+\pi)\right)}{2\,k-m}}{d}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)+\right.$$

$$\left.\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{m\,\pi}{2}\right)\right)\right)\Big/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3185.01

$$\int \sin^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}\,(1-v \bmod 2)}{d}\binom{v}{\frac{v}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z\right)}{m-2\,k}+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)-c\sqrt{2\,\pi}\right.\right.$$

$$\left.\left.(v-2\,k)\left(\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}\right)\right.\right.$$

$$C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$

$$\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}\right)+2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\left.\left.\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/\right.$$

$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+\right.\right.$$

$$\left.2\,e\,k-e\,m-\frac{\pi\,m}{2}\right)C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)$$

$$S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-\right.$$

$$\left.e\,m-\frac{\pi\,m}{2}\right)+2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\;\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\right.$$

$$\left.\left.\left.z+(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh^v(c\,z^r+f\,z)$

01.20.21.3186.01

$$\int \sin^m(b\,z^2)\cosh^v(c\,z^2+f\,z)\,dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}\left(\cos\left(\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{m\,\pi}{2}\right)\right)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+\frac{m\,\pi}{2}\right)C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+\frac{m\,\pi}{2}\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)C\left(\right.\right.$$

$$\left.\left.\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)+S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\right.$$

$$\left.\sin\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3187.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2k)}\,\sinh\left(f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)-c\sqrt{2\pi}\right.\right.$$

$$\left.\left.(v-2k)\left(\cosh\left(\frac{c^2\,(v-2k)}{4\,f}\right)C\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)-i\,S\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)\sinh\left(\frac{c^2\,(v-2k)}{4\,f}\right)\right)\right)\right)+$$

$$\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{m\pi}{2}-b\,(2k-m)\sqrt{z}\right)-\right.\right.\right.$$

$$\left.\left.\left.b\,(2k-m)\sqrt{z}\,\sin\left(\frac{m\pi}{2}-b\,(2k-m)\sqrt{z}\right)\right)\right)\right)+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}+\right.\right.\right.$$

$$\left.\left.\frac{m\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)-\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\right.$$

$$\left.S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sin\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}+\frac{m\pi}{2}\right)-\right.$$

$$\left.2\sqrt{i\,f\,v-2\,i\,f\,s}\,\sin\left(\frac{\pi\,m}{2}-(i\,f\,v-2\,i\,f\,s)\,z-(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+\frac{m\pi}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)-\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)\sin\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+\frac{m\pi}{2}\right)-$$

$$\left.2\sqrt{2\,i\,f\,s-i\,f\,v}\,\sin\left(\frac{\pi\,m}{2}-(2\,i\,f\,s-i\,f\,v)\,z-(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z)$

01.20.21.3188.01

$$\int \sin^m(b\,z^2+e)\cosh^v(c\,z^2+f\,z)\,dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}$$

$$\left(\cos\left(\frac{\pi\,m}{2}+e\,(m-2\,k)\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)\right)\right)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\;\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\;\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\left(\cos\left(-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-\right.\right.$$

$$\left.S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+$$

$$\left(\cos\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$\left.S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.\right.$$

$$\left.\left.e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

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$$\int \sin^m\left(\sqrt{z}\;b+e\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)-c\sqrt{2\,\pi}\right.\right.$$

$$(v-2k)\left(\cosh\left(\frac{c^2(v-2k)}{4f}\right)C\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\sqrt{if(v-2k)}}\right)-iS\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\sqrt{if(v-2k)}}\right)\sinh\left(\frac{c^2(v-2k)}{4f}\right)\right)\Bigg)\Bigg)+$$

$$\frac{1}{b^2}\left(2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(2ek-em+b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)+\right.\right.\right.$$

$$\left.\left.\left.b(2k-m)\sqrt{z}\sin\left(2ek-em+b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right)\right)+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(ifv-2ifs)^{3/2}}\left(\sqrt{2\pi}\,(-2bk+bm+2ics-icv)\cos\left(-\frac{(2bk-bm-2ics+icv)^2}{4(ifv-2ifs)}+\right.\right.\right.$$

$$\left.2ek-em-\frac{\pi m}{2}\right)C\left(\frac{2bk-bm-2ics+icv+2(ifv-2ifs)\sqrt{z}}{\sqrt{2\pi}\sqrt{ifv-2ifs}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm-2ics+icv)S\left(\frac{2bk-bm-2ics+icv+2(ifv-2ifs)\sqrt{z}}{\sqrt{2\pi}\sqrt{ifv-2ifs}}\right)$$

$$\sin\left(-\frac{(2bk-bm-2ics+icv)^2}{4(ifv-2ifs)}+2ek-em-\frac{\pi m}{2}\right)+$$

$$\left.2\sqrt{ifv-2ifs}\sin\left(2ek-em-\frac{\pi m}{2}+(ifv-2ifs)z+(2bk-bm-2ics+icv)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2ifs-ifv)^{3/2}}\left(\sqrt{2\pi}\,(-2bk+bm-2ics+icv)\cos\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2ifs-ifv)}+\right.\right.$$

$$\left.2ek-em-\frac{\pi m}{2}\right)C\left(\frac{2bk-bm+2ics-icv+2(2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{2ifs-ifv}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm+2ics-icv)S\left(\frac{2bk-bm+2ics-icv+2(2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{2ifs-ifv}}\right)$$

$$\sin\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2ifs-ifv)}+2ek-em-\frac{\pi m}{2}\right)+2\sqrt{2ifs-ifv}$$

$$\left.\left.\sin\left(2ek-em-\frac{\pi m}{2}+(2ifs-ifv)z+(2bk-bm+2ics-icv)\sqrt{z}\right)\right)\right);\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+d\,z)\cosh^v(c\,z^r+f\,z)$

01.20.21.3190.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\left(\cos\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\right.$$

$$\left(\cos\left(\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)+\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int \sin^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^{k+m}\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$b\,(m-2\,k)\,\sqrt{2\,\pi}\;S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}-\frac{m\,\pi}{2}\right)+$$

$$\left.\left.\left.2\,\sqrt{d\,(m-2\,k)}\;\sin\left(\frac{\pi\,m}{2}+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)\right)(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\,\pi}\;(2\,k-v)\left(\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\right.\right.\right.$$

$$\left.\left.\left.\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)+2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\,\pi}\;(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)-$$

$$\sqrt{2\,\pi}\;(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+\frac{m\,\pi}{2}\right)+2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\left.\sin\left(-\frac{\pi\,m}{2}+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\sqrt{z}\right)\right)\Big/$$

$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\,\pi}\;(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+\right.\right.$$

$$\left.\frac{m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)-$$

$$\sqrt{2\,\pi}\;(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+\frac{m\,\pi}{2}\right)+2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}$$

$$\left.\left.\sin\left(-\frac{\pi\,m}{2}+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/$$

$$\left.(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int \sin^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m-2\,m\,\pi\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m-2\,m\,\pi\right)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-$$

$$S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+\right.$$

$$\left.\left.e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.\right.$$

$$\left.\left.e\,(2\,k-m)-\frac{\pi\,m}{2}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.$$

$$\left.\left.\left.e\,(2\,k-m)-\frac{\pi\,m}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3193.01

$$\int \sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\right.$$

$$\left(\left((-1)^{k+m}\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.b\,(m-2\,k)\,\sqrt{2\,\pi}\;S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)+\right.\right.\right.$$

$$2\sqrt{d\,(m-2k)}\,\sin\left(\frac{\pi m}{2}+e\,(m-2k)+d\,(m-2k)\,z+b\,(m-2k)\,\sqrt{z}\right)\Bigg)\Bigg)\Bigg)$$

$$(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\,(2k-v)\right.\right.$$

$$\left(\cosh\left(\frac{c^2\,(v-2k)}{4\,f}\right)C\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)-i\,S\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)\sinh\left(\frac{c^2\,(v-2k)}{4\,f}\right)\right)+$$

$$\left.2\,i\,\sqrt{i\,f\,(v-2k)}\,\sinh\left(f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)\right)\Bigg)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+\right.\right.\right.$$

$$\left.2\,e\,k-e\,m-\frac{\pi m}{2}\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi m}{2}\right)+$$

$$2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\,\sin\left(2\,e\,k-e\,m-\frac{\pi m}{2}+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+\right.$$

$$\left.\left.(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+$$

$$\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi m}{2}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi m}{2}\right)+$$

$$2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\,\sin\left(2\,e\,k-e\,m-\frac{\pi m}{2}+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+\right.$$

Involving $\sin^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3194.01

$$\int \sin^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(2\,d\,k\,z-\frac{1}{2}\,m\,(2\,d\,z+\pi)\right)}{2\,k-m}}{d}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)C\left(\right.\right.\right.$$

$$\left.\left.\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\right.$$

$$\left.\sin\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\right.\right.$$

$$\left.\left.\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3195.01

$$\int \sin^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}\,(1-v \bmod 2)}{d}\binom{v}{\frac{v}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi\,m}{2}+d\,(m-2\,k)\,z\right)}{m-2\,k}+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$\left.\left.c\sqrt{2\,\pi}\;(v-2\,k)\left(\cosh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.\right.\right.$$

$$i\,S\left(\frac{(2k-\nu)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i f(\nu-2k)}}\right)\sinh\left(g(\nu-2k)-\frac{c^2(\nu-2k)}{4f}\right)\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-\nu}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(\Bigg(\sqrt{2\pi}\,(2ics-ic\nu)\cos\left(-\frac{(ic\nu-2ics)^2}{4(2dk-dm-2ifs+if\nu)}-\frac{\pi m}{2}-2igs+ig\nu\right)$$

$$C\left(\frac{-2cis+ic\nu+2(2dk-dm-2ifs+if\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm-2ifs+if\nu}}\right)+$$

$$\sqrt{2\pi}\,(ic\nu-2ics)\,S\left(\frac{-2cis+ic\nu+2(2dk-dm-2ifs+if\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm-2ifs+if\nu}}\right)$$

$$\sin\left(-\frac{(ic\nu-2ics)^2}{4(2dk-dm-2ifs+if\nu)}-\frac{\pi m}{2}-2igs+ig\nu\right)+2\sqrt{2dk-dm-2ifs+if\nu}$$

$$\sin\left(-\frac{\pi m}{2}-2igs+ig\nu+(2dk-dm-2ifs+if\nu)z+(ic\nu-2ics)\sqrt{z}\right)\Bigg)\Bigg/$$

$$(2dk-dm-2ifs+if\nu)^{3/2}+\Bigg(\sqrt{2\pi}\,(ic\nu-2ics)\cos\left(-\frac{(2ics-ic\nu)^2}{4(2dk-dm+2ifs-if\nu)}-\right.$$

$$\left.\frac{\pi m}{2}+2igs-ig\nu\right)C\left(\frac{2ics-ic\nu+2(2dk-dm+2ifs-if\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm+2ifs-if\nu}}\right)+$$

$$\sqrt{2\pi}\,(2ics-ic\nu)\,S\left(\frac{2ics-ic\nu+2(2dk-dm+2ifs-if\nu)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm+2ifs-if\nu}}\right)$$

$$\sin\left(-\frac{(2ics-ic\nu)^2}{4(2dk-dm+2ifs-if\nu)}-\frac{\pi m}{2}+2igs-ig\nu\right)+$$

$$2\sqrt{2dk-dm+2ifs-if\nu}\,\sin\left(-\frac{\pi m}{2}+2igs-ig\nu+(2dk-dm+2ifs-if\nu)z+\right.$$

$$\left.(2ics-ic\nu)\sqrt{z}\right)\Bigg)\Bigg/(2dk-dm+2ifs-if\nu)^{3/2}\Bigg/;\ m\in\mathbb{N}^+\wedge\nu\in\mathbb{N}^+$$

Involving $\sin^m(dz+e)\cosh^\nu\left(cz^r+fz+g\right)$

01.20.21.3196.01

$$\int \sin^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(e\,(2\,k-m)+2\,d\,k\,z-\frac{1}{2}\,m\,(2\,d\,z+\pi)\right)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{\pi\,m}{2}-i\,g\,(2\,s-v)\right)C\left(\right.\right.\right.$$

$$\left.\left.\left.\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\right.\right.$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-\frac{\pi\,m}{2}-i\,g\,(2\,s-v)\right)\right)+\right.$$

$$\left.\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\right.\right.\right.$$

$$\left.\left.\left.\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\right.\right.$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3197.01

$$\int \sin^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\binom{m}{k}\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z\right)}{m-2\,k}\right)(1-v \bmod 2)}{d}+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\,\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\,\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$c\,\sqrt{2\,\pi}\;(v-2\,k)\left(\cosh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.$$

$$\left.\left.\left.i\,S\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\ (2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}-\right.\right.\right.$$
$$\left.2\,i\,g\,s+i\,g\,v\right)C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+\sqrt{2\pi}\ (i\,c\,v-2\,i\,c\,s)$$
$$S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-\right.$$
$$\left.e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)+2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\ \sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+\right.$$
$$\left.\left.i\,g\,v+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+$$
$$\left(\sqrt{2\pi}\ (i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)\right.$$
$$C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+$$
$$\sqrt{2\pi}\ (2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$
$$\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)+$$
$$2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\ \sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+\right.$$
$$\left.\left.(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\Bigg)\ /;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3198.01

$$\int \sin^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}$$

$$(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}\left(\cos\left(\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\;z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{m\,\pi}{2}\right)\right)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\;\sqrt{i\,c\,(v-2\,k)}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\;\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\left(\cos\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)+\right.$$

$$\left.\left.\left.\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}-\right.\right.\right.$$

$$\left.\left.\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-$$

$$S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}-\right.$$

$$\left.\left.\left.\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3199.01

$$\int \sin^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$c\sqrt{2\,\pi}\;(v-2\,k)\left(\cosh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)+\right.$$

$$\left.\left.\left.i\,S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)\right)+\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)+b(2k-m)\sqrt{z}\,\sin\left(b(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right)+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(ifv-2ifs)^{3/2}}\left(\sqrt{2\pi}\,(-2bk+bm+2ics-icv)\cos\left(-\frac{(2bk-bm-2ics+icv)^2}{4(ifv-2ifs)}-\right.\right.\right.$$

$$\left.\frac{\pi m}{2}-2igs+igv\right)C\left(\frac{2bk-bm-2ics+icv+2(ifv-2ifs)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{ifv-2ifs}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm-2ics+icv)S\left(\frac{2bk-bm-2ics+icv+2(ifv-2ifs)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{ifv-2ifs}}\right)$$

$$\sin\left(-\frac{(2bk-bm-2ics+icv)^2}{4(ifv-2ifs)}-\frac{\pi m}{2}-2igs+igv\right)+$$

$$\left.2\sqrt{ifv-2ifs}\,\sin\left(-\frac{\pi m}{2}-2igs+igv+(ifv-2ifs)z+(2bk-bm-2ics+icv)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2ifs-ifv)^{3/2}}\left(\sqrt{2\pi}\,(-2bk+bm-2ics+icv)\cos\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2ifs-ifv)}-\right.\right.$$

$$\left.\frac{\pi m}{2}+2igs-igv\right)C\left(\frac{2bk-bm+2ics-icv+2(2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2ifs-ifv}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm+2ics-icv)S\left(\frac{2bk-bm+2ics-icv+2(2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2ifs-ifv}}\right)$$

$$\sin\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2ifs-ifv)}-\frac{\pi m}{2}+2igs-igv\right)+2\sqrt{2ifs-ifv}$$

$$\left.\left.\sin\left(-\frac{\pi m}{2}+2igs-igv+(2ifs-ifv)z+(2bk-bm+2ics-icv)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3200.01

$$\int \sin^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}$$

$$\left(\cos\left(\frac{\pi\,m}{2}+e\,(m-2\,k)\right)C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)\right)-\right.$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\frac{\pi\,m}{2}-i\,g\,(2\,s-v)\right)\right.\right.$$

$$C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-$$

$$S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\right.$$

$$\left.\left.\left.\frac{\pi\,m}{2}-i\,g\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.\right.\right.$$

$$\left.\left.e\,(2\,k-m)-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-$$

$$S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.$$

$$\left.\left.\left.e\,(2\,k-m)-\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3201.01

$$\int \sin^m\left(\sqrt{z}\;b+e\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$\left.\left.c\sqrt{2\,\pi}\;(v-2\,k)\left(\cosh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.\right.$$

$$i\,S\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)\sinh\left(g\,(v-2k)-\frac{c^2\,(v-2k)}{4f}\right)\Bigg)\Bigg)\Bigg)+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(2ek-em+b\,(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)+\right.\right.$$

$$\left.\left.b\,(2k-m)\sqrt{z}\,\sin\left(2ek-em+b\,(2k-m)\sqrt{z}-\frac{m\pi}{2}\right)\right)\right)+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}+\right.\right.\right.$$

$$\left.\left.2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)+\right.$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)+2\sqrt{i\,f\,v-2\,i\,f\,s}$$

$$\left.\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v+(i\,f\,v-2\,i\,f\,s)\,z+(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+\right.\right.$$

$$\left.\left.2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)+\right.$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v\right)+$$

$$2\sqrt{2\,i\,f\,s-i\,f\,v}\,\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}+2\,i\,g\,s-i\,g\,v+(2\,i\,f\,s-i\,f\,v)\,z+\right.$$

$$\left.\left.(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Bigg)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sin^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3202.01

$$\int \sin^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2\,(m-2\,k)}{b}-2\,m\,\pi\right)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+$$

$$S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+\right.$$

$$\left.\left.g\,i\,(2\,s-v)+\frac{m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}-\right.\right.$$

$$\left.\left.\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}-\right.$$

$$\left.\left.\left.\left.\frac{\pi\,m}{2}+g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3203.01

$$\int \sin^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^{k+m}\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.b\,(m-2\,k)\,\sqrt{2\,\pi}\;S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}-\frac{m\,\pi}{2}\right)+\right.\right.\right.$$

$$2\sqrt{d\,(m-2k)}\,\sin\left(\frac{\pi m}{2}+d\,(m-2k)\,z+b\,(m-2k)\,\sqrt{z}\right)\Bigg)\Bigg)\Bigg)(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\,(2k-v)\left(\cosh\left(g\,(v-2k)-\frac{c^2\,(v-2k)}{4f}\right)\right.\right.\right.$$

$$C\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)+i\,S\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)\sinh\left(g\,(v-2k)-\frac{c^2\,(v-2k)}{4f}\right)\Bigg)+$$

$$2i\sqrt{i\,f\,(v-2k)}\,\sinh\left(g\,(v-2k)+f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)\Bigg)\Bigg)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\Bigg(\sqrt{2\pi}\,(-2bk+bm+2ics-icv)\cos\left(-\frac{(2bk-bm-2ics+icv)^2}{4\,(2dk-dm-2ifs+ifv)}-\right.$$

$$\left.\frac{\pi m}{2}-2igs+igv\right)C\left(\frac{2bk-bm-2ics+icv+2\,(2dk-dm-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm-2ifs+ifv}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm-2ics+icv)\,S\left(\frac{2bk-bm-2ics+icv+2\,(2dk-dm-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm-2ifs+ifv}}\right)$$

$$\sin\left(-\frac{(2bk-bm-2ics+icv)^2}{4\,(2dk-dm-2ifs+ifv)}-\frac{\pi m}{2}-2igs+igv\right)+$$

$$2\sqrt{2dk-dm-2ifs+ifv}\,\sin\left(-\frac{\pi m}{2}-2igs+igv+(2dk-dm-2ifs+ifv)\,z+\right.$$

$$\left.(2bk-bm-2ics+icv)\sqrt{z}\right)\Bigg)\Big/(2dk-dm-2ifs+ifv)^{3/2}+$$

$$\left(\sqrt{2\pi}\,(-2bk+bm-2ics+icv)\cos\left(-\frac{(2bk-bm+2ics-icv)^2}{4\,(2dk-dm+2ifs-ifv)}-\frac{\pi m}{2}+2igs-igv\right)\right.$$

$$C\left(\frac{2bk-bm+2ics-icv+2\,(2dk-dm+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm+2ifs-ifv}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm+2ics-icv)\,S\left(\frac{2bk-bm+2ics-icv+2\,(2dk-dm+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm+2ifs-ifv}}\right)$$

$$\sin\left(-\frac{(2bk-bm+2ics-icv)^2}{4\,(2dk-dm+2ifs-ifv)}-\frac{\pi m}{2}+2igs-igv\right)+$$

$$2\sqrt{2dk-dm+2ifs-ifv}\,\sin\left(-\frac{\pi m}{2}+2igs-igv+(2dk-dm+2ifs-ifv)\,z+\right.$$

Involving $\sin^m(b\,z^r + d\,z + e)\cosh^v(c\,z^r + f\,z + g)$

01.20.21.3204.01

$$\int \sin^m\left(b\,z^2 + d\,z + e\right)\cosh^v\left(c\,z^2 + f\,z + g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)\,(1 - v \bmod 2) - 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left((-1)^{k+m}\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b} + 8\,e\,k - 4\,e\,m - 2\,m\,\pi\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right) + \right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b} + 8\,e\,k - 4\,e\,m - 2\,m\,\pi\right)\right)\right)\right)\right)(1 - v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(i\cosh\left(g\,(v-2\,k) - \frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right) - \right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k) - \frac{f^2\,(v-2\,k)}{4\,c}\right)\right)\right) +$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v)^2}{4\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)} + e\,(2\,k-m) - \frac{\pi\,m}{2} - i\,g\,(2\,s-v)\right)\right.\right.$$

$$C\left(\frac{2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v + 2\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}}\right) -$$

$$S\left(\frac{2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v + 2\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}}\right)$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v)^2}{4\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)} + e\,(2\,k-m) - \frac{\pi\,m}{2} - i\,g\,(2\,s-v)\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}\right) + \left(\cos\left(-\frac{(2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v)^2}{4\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)} + e\,(2\,k-m) - \frac{\pi\,m}{2} + g\,i\,(2\,s-v)\right)\right.$$

$$C\left(\frac{2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v + 2\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}}\right) -$$

$$S\left(\frac{2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v + 2\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v)^2}{4\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)} + \right.$$

$$\left.\left.e\,(2\,k-m) - \frac{\pi\,m}{2} + g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}\right)\Big/;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3205.01

$$\int \sin^m\left(b z^2+d z+e\right)\cosh^v\left(c z^2+f z+g\right)dz ==$$

$$2^{-m-v} z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b}\left(i\, 2^{-m-v-1}\sqrt{\pi}\,\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k e^{-\frac{i(m-2k)d^2}{4b}-m\left(i e+\frac{i\pi}{2}\right)+2iek}\binom{m}{k}\left(e^{2ie(m-2k)}\sqrt{ib(m-2k)}\ \operatorname{erfi}\left(\frac{(2k-m)(id+2ibz)}{2\sqrt{ib(m-2k)}}\right)-\right.\right.$$

$$\left.\left.\left.ie^{\frac{i(m-2k)d^2}{2b}+im\pi}\sqrt{ib(2k-m)}\ \operatorname{erf}\left(\frac{\sqrt{ib(2k-m)}\ (id+2ibz)}{2b}\right)\right)\right)-$$

$$\frac{1}{c}\left(2^{-m-v-1}\sqrt{\pi}\,\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{\frac{\left(f^2+4cg\right)(2s-v)}{4c}}\binom{v}{s}\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c(2s-v)}\ (f+2cz)}{2c}\right)+\right.\right.\right.$$

$$\left.\left.\left.e^{2g(v-2s)}\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)\right)\right)+2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\left(e^{-\frac{(2idk-idm+f(v-2s))^2}{8ibk-4ibm-8cs+4cv}-2iem+ei(m-2k)+g(v-2s)-\frac{im\pi}{2}}\left(e^{2\left(\frac{(2idk-idm-2fs+fv)^2}{8ibk-4ibm-8cs+4cv}+iem+g(2s-v)\right)}\sqrt{-2bik+ibm+2cs-cv}\right.\right.\right.$$

$$\left.\operatorname{erfi}\left(\frac{-2k(id+2ibz)+m(id+2ibz)+(2s-v)(f+2cz)}{2\sqrt{-2bik+ibm+2cs-cv}}\right)-e^{4iek+im\pi}\right.$$

$$\left.\left.\sqrt{2ibk-ibm-2cs+cv}\ \operatorname{erfi}\left(\frac{2k(id+2ibz)-m(id+2ibz)-(2s-v)(f+2cz)}{2\sqrt{2ibk-ibm-2cs+cv}}\right)\right)\right)\Big/$$

$$(-2bik+ibm+2cs-cv)+\left(e^{\frac{(-2dik+idm-2fs+fv)^2}{8ibk-4ibm+8cs-4cv}+ei(m-2k)+g(v-2s)-\frac{im\pi}{2}}\right.$$

$$\left.\operatorname{erfi}\left(\frac{-2k(id+2ibz)+m(id+2ibz)-(2s-v)(f+2cz)}{2\sqrt{bi(m-2k)+c(v-2s)}}\right)\right)\Big/\left(\sqrt{bi(m-2k)+c(v-2s)}\right)-$$

$$\frac{1}{bi(m-2k)+c(v-2s)}\left(e^{-\frac{(-2dik+idm-2fs+fv)^2}{8ibk-4ibm+8cs-4cv}+ei(2k-m)+g(2s-v)+\frac{im\pi}{2}}\sqrt{2ibk-ibm+2cs-cv}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{2k(id+2ibz)-m(id+2ibz)+(2s-v)(f+2cz)}{2\sqrt{2ibk-ibm+2cs-cv}}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3206.01

$$\int \sin^m\left(\sqrt{z}\ b+d z+e\right)\cosh^v\left(\sqrt{z}\ c+f z+g\right)dz ==$$

$$2^{-m-v} z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d(m-2k))^{3/2}}\right.$$

$$\left((-1)^{k+m}\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-\right.$$

$$b\,(m-2\,k)\,\sqrt{2\,\pi}\,S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(m-2\,k)\,b^2}{4\,d}-e\,(m-2\,k)-\frac{m\,\pi}{2}\right)+$$

$$\left.\left.2\,\sqrt{d\,(m-2\,k)}\,\sin\left(\frac{\pi\,m}{2}+e\,(m-2\,k)+d\,(m-2\,k)\,z+b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)(1-v\bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(c\,\sqrt{2\,\pi}\,(2\,k-v)\left(\cosh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)\right.\right.\right.$$

$$C\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+i\,S\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}\right)\Bigg)+$$

$$\left.\left.2\,i\,\sqrt{i\,f\,(v-2\,k)}\,\sinh\left(g\,(v-2\,k)+f\,z\,(v-2\,k)+c\,\sqrt{z}\,(v-2\,k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-\right.\right.\right.$$

$$\left.\left.e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+\right.$$

$$\sqrt{2\,\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v\right)+$$

$$2\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\,\sin\left(2\,e\,k-e\,m-\frac{\pi\,m}{2}-2\,i\,g\,s+i\,g\,v+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+\right.$$

$$\left.\left.(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+$$

$$\left(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m-\frac{\pi\,m}{2}+\right.\right.$$

$$\left.\left.2\,i\,g\,s-i\,g\,v\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+\right.$$

$$\sqrt{2\pi}\,(2bk-bm+2ics-icv)\,S\left(\frac{2bk-bm+2ics-icv+2(2dk-dm+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2dk-dm+2ifs-ifv}}\right)$$

$$\sin\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2dk-dm+2ifs-ifv)}+2ek-em-\frac{\pi m}{2}+2igs-igv\right)+$$

$$2\sqrt{2dk-dm+2ifs-ifv}\,\sin\left(2ek-em-\frac{\pi m}{2}+2igs-igv+(2dk-dm+2ifs-ifv)z+\right.$$

$$\left.\left.(2bk-bm+2ics-icv)\sqrt{z}\right)\right)\Big/(2dk-dm+2ifs-ifv)^{3/2}\Bigg)\;/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3207.01

$$\int\sin^m\left(\sqrt{z}\,b+e+dz\right)\cosh^v\left(\sqrt{z}\,c+g+fz\right)dz=2^{-m-v}z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)+$$

$$2^{-m-v-1}i\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{\frac{im\pi}{2}-ie(m-2k)}\binom{m}{k}\left(-\frac{2e^{diz(2k-m)+bi\sqrt{z}(2k-m)-im\pi}\left(-e^{im\pi}+e^{2(m-2k)\left(ie+ib\sqrt{z}+idz\right)}\right)}{d(m-2k)}-\right.\right.$$

$$\frac{b\,e^{\frac{ib^2(m-2k)}{4d}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{bi(m-2k)+2di\sqrt{z}(m-2k)}{2\sqrt{id(2k-m)}}\right)}{(id(2k-m))^{3/2}}-$$

$$\left.\left.\frac{b\,e^{2\left(ie(m-2k)-\frac{im\pi}{2}\right)-\frac{ib^2(m-2k)}{4d}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{bi(m-2k)+2di\sqrt{z}(m-2k)}{2\sqrt{id(m-2k)}}\right)}{(id(m-2k))^{3/2}}\right)\right)(1-v\bmod 2)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g(v-2s)}\binom{v}{s}\left(\frac{2e^{(2s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2(v-2s)\left(\sqrt{z}\,c+g+fz\right)}\right)}{f(2s-v)}+\right.$$

$$\frac{c\,e^{\frac{c^2(v-2s)}{4f}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}(v-2s)}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}}+$$

$$\left.\frac{c\,e^{2g(v-2s)-\frac{c^2(v-2s)}{4f}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}(v-2s)}{2\sqrt{f(v-2s)}}\right)}{(f(v-2s))^{3/2}}\right)+2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-ie(2k-m)-g(v-2s)-\frac{im\pi}{2}}\left(\frac{2e^{\sqrt{z}(bi(2k-m)+c(v-2s))+2\left(ei(2k-m)+g(v-2s)+\frac{im\pi}{2}\right)+(di(2k-m)+f(v-2s))z}}{di(2k-m)+f(v-2s)}-\right.\right.$$

$$\left(e^{2\left(e\,i\,(2\,k-m)+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}\right)-\frac{(b\,i\,(2\,k-m)+c\,(v-2\,s))^2}{4\,(d\,i\,(2\,k-m)+f\,(v-2\,s))}}\sqrt{\pi}\;(b\,i\,(2\,k-m)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,i\,(2\,k-m)+f\,(v-2\,s))\sqrt{z}}{2\sqrt{d\,i\,(2\,k-m)+f\,(v-2\,s)}}\right)\right)\Big/(d\,i\,(2\,k-m)+f\,(v-2\,s))^{3/2}+$$

$$\frac{2\,e^{\sqrt{z}\;(-i\,b\,(2\,k-m)-c\,(v-2\,s))+(i\,d\,(m-2\,k)-f\,(v-2\,s))\,z}}{i\,d\,(m-2\,k)-f\,(v-2\,s)}-\left(e^{-\frac{(-i\,b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,(i\,d\,(m-2\,k)-f\,(v-2\,s))}}\sqrt{\pi}\;(b\,i\,(2\,k-m)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,i\,(2\,k-m)+f\,(v-2\,s))\sqrt{z}}{2\sqrt{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right)\right)\Big/(i\,d\,(m-2\,k)-f\,(v-2\,s))^{3/2}\Bigg)+$$

$$e^{\frac{i\,\pi\,m}{2}-i\,e\,(m-2\,k)-g\,(v-2\,s)}\left(\left(2\,e^{\sqrt{z}\;(b\,i\,(m-2\,k)+c\,(v-2\,s))+2\left(-\frac{1}{2}\,i\,\pi\,m+e\,i\,(m-2\,k)+g\,(v-2\,s)\right)+(d\,i\,(m-2\,k)+f\,(v-2\,s))\,z}\right)\Big/\right.$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s))-\left(e^{2\left(-\frac{1}{2}\,i\,\pi\,m+e\,i\,(m-2\,k)+g\,(v-2\,s)\right)-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}}\sqrt{\pi}\right.$$

$$(b\,i\,(m-2\,k)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\sqrt{z}}{2\sqrt{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\right)\Big)\Big/$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{\sqrt{z}\;(-i\,b\,(m-2\,k)-c\,(v-2\,s))+(i\,d\,(2\,k-m)-f\,(v-2\,s))\,z}}{i\,d\,(2\,k-m)-f\,(v-2\,s)}-\left(e^{-\frac{(-i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,(i\,d\,(2\,k-m)-f\,(v-2\,s))}}\sqrt{\pi}\right.$$

$$(b\,i\,(m-2\,k)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\sqrt{z}}{2\sqrt{i\,d\,(2\,k-m)-f\,(v-2\,s)}}\right)\Big)\Big/$$

$$\left.\left.(i\,d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving sin and rational functions of cosh

Involving $\frac{\sin(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.3208.01

$$\int \frac{\sin(d\,z)}{a+b\cosh(c\,z)}\,dz ==$$

$$-\frac{1}{2\,b\,\sqrt{a^2-b^2}}\left(i\,e^{-(c+i\,d)\,z}\left(\frac{1}{c+i\,d}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1+\frac{i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$

$$\left.\left.{}_2F_1\left(1+\frac{i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-\frac{1}{c-i\,d}\left(e^{2\,i\,d\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\right.\right.\right.$$

$$\left.\left.\left.\left(1-\frac{i\,d}{c},\,1;\,2-\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1-\frac{i\,d}{c},\,1;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)$$

Involving $\sin(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.3209.01

$$\int \frac{\sin(d\,z)}{(a+b\cosh(c\,z))^2}\,dz == -\frac{1}{2\,b\left(a^2-b^2\right)^{3/2}}$$

$$\left(i\left(\frac{1}{c+i\,d}\left(e^{-(c+i\,d)\,z}\left(-{}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)a^2+{}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)a^2+\right.\right.\right.$$

$$\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1+\frac{i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)a+$$

$$\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1+\frac{i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)a-\sqrt{a^2-b^2}$$

$${}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)a-\sqrt{a^2-b^2}\;{}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)a+$$

$$\left.\left.\left.b^2\,{}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)-b^2\,{}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$

$$\frac{1}{c-i\,d}\left(e^{i\,d\,z-c\,z}\left({}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)a^2-{}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)a^2+\right.\right.$$

$$\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{i\,d}{c},\,1;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)a+\sqrt{a^2-b^2}$$

$${}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)a+\sqrt{a^2-b^2}\;{}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)a-$$

$$a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{i\,d}{c},\,1;\,2-\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)-$$

$$\left.\left.\left.\left.\left.b^2\,{}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,\frac{b\,e^{-c\,z}}{\sqrt{a^2-b^2}-a}\right)+b^2\,{}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{-c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)\right)$$

Involving $\frac{\sin(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.3210.01

$$\int \frac{\sin(d\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{1}{2\sqrt{a}\;b\sqrt{a+b}}$$
$$\left(e^{-2cz-idz}\left(\frac{1}{d+2ic}\left(e^{2idz}\left(\left(2a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{id}{2c},1;2-\frac{id}{2c};-\frac{be^{-2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.\right.$$
$$\left.\left.\left.\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{id}{2c},1;2-\frac{id}{2c};-\frac{be^{-2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{2ic-d}\left(\left(2a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{id}{2c},1;2+\frac{id}{2c};-\frac{be^{-2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.$$
$$\left.\left.\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{id}{2c},1;2+\frac{id}{2c};-\frac{be^{-2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\sin(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.3211.01

$$\int \frac{\sin(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == \frac{1}{4a^{3/2}\,b\,(a+b)^{3/2}}$$
$$\left(e^{-2cz-idz}\left(\frac{1}{d+2ic}\left(e^{2idz}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1-\frac{id}{2c},1;2-\frac{id}{2c};-\frac{be^{-2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.\right.$$
$$(2a+b)\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{id}{2c},1;2-\frac{id}{2c};-\frac{be^{-2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\right.$$
$$\left(1-\frac{id}{2c},2;2-\frac{id}{2c};-\frac{be^{-2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\;a+\right.$$
$$\left.\left.\left.\left.2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{id}{2c},2;2-\frac{id}{2c};-\frac{be^{-2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)-$$
$$\frac{1}{2ic-d}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1+\frac{id}{2c},1;2+\frac{id}{2c};-\frac{be^{-2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.$$
$$(2a+b)\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{id}{2c},1;2+\frac{id}{2c};-\frac{be^{-2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{id}{2c},2;2+\frac{id}{2c};-\frac{be^{-2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left.\left(2a^{3/2}+2\sqrt{a+b}\;a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{id}{2c},2;2+\frac{id}{2c};-\frac{be^{-2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)$$

Involving cos

Involving $\cos(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3212.01

$$\int \cos(c\,z)\cosh^{\nu}(a\,z)\,dz == -\frac{1}{2}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)$$
$$\left(\frac{i\,e^{i\,c\,z}}{c+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{i\,c-a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)+\frac{e^{-i\,c\,z}}{i\,c+a\,\nu}\,{}_2F_1\left(-\frac{i\,c+a\,\nu}{2\,a},\,-\nu;\,-\frac{i\,c+a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)\right)$$

01.20.21.3213.01

$$\int \cos(c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{(2^{-\nu}\sin(c\,z))\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{c}-$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\frac{e^{-(i\,c-2\,a\,k+a\,\nu)\,z}}{i\,c-2\,a\,k+a\,\nu}+\frac{e^{-(-i\,c+2\,a\,k-a\,\nu)\,z}}{-i\,c+2\,a\,k-a\,\nu}+\frac{e^{-(i\,c+2\,a\,k-a\,\nu)\,z}}{i\,c+2\,a\,k-a\,\nu}+\frac{e^{-(-i\,c-2\,a\,k+a\,\nu)\,z}}{-i\,c-2\,a\,k+a\,\nu}\right)\binom{\nu}{k}\,/;\,\nu\in\mathbb{N}^+$$

Involving $\cos(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3214.01

$$\int \cos(d+c\,z)\cosh^{\nu}(a\,z)\,dz == -\frac{1}{2}\,e^{-i\,d}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)$$
$$\left(\frac{i\,e^{i\,(2\,d+c\,z)}}{c+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{i\,c-a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)+\frac{e^{-i\,c\,z}}{i\,c+a\,\nu}\,{}_2F_1\left(-\frac{i\,c+a\,\nu}{2\,a},\,-\nu;\,-\frac{i\,c+a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)\right)$$

01.20.21.3215.01

$$\int \cos(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{(2^{-\nu}\sin(d+c\,z))\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{c}-$$
$$2^{-\nu-1}\,e^{-i\,d}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\frac{e^{-(i\,c-2\,a\,k+a\,\nu)\,z}}{i\,c-2\,a\,k+a\,\nu}+\frac{e^{2\,i\,d-(-i\,c+2\,a\,k-a\,\nu)\,z}}{-i\,c+2\,a\,k-a\,\nu}+\frac{e^{-(i\,c+2\,a\,k-a\,\nu)\,z}}{i\,c+2\,a\,k-a\,\nu}+\frac{e^{2\,i\,d-(-i\,c-2\,a\,k+a\,\nu)\,z}}{-i\,c-2\,a\,k+a\,\nu}\right)\binom{\nu}{k}\,/;\,\nu\in\mathbb{N}^+$$

Involving $\cos(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.3216.01

$$\int \cos(c\,z)\cosh^{\nu}(b+a\,z)\,dz == -\frac{1}{2}\left(1+e^{2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)$$
$$\left(\frac{i\,e^{i\,c\,z}}{c+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{i\,c-a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)+\frac{e^{-i\,c\,z}}{i\,c+a\,\nu}\,{}_2F_1\left(-\frac{i\,c+a\,\nu}{2\,a},\,-\nu;\,-\frac{i\,c+a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)\right)$$

01.20.21.3217.01

$$\int \cos(c\,z)\cosh^{\nu}(b+a\,z)\,dz == -2^{-\nu-1}\left(\frac{2\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sin(c\,z)}{c}+\right.$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-b\,(2\,k+\nu)}\left(\frac{e^{4\,b\,k+(i\,c+a\,(2\,k-\nu))\,z}}{-i\,c+a\,(\nu-2\,k)}-\frac{e^{2\,b\,\nu+(i\,c+a\,(\nu-2\,k))\,z}}{i\,c+a\,(\nu-2\,k)}+\frac{e^{4\,b\,k+2\,a\,z\,k-i\,c\,z-a\,\nu\,z}}{i\,c+a\,(\nu-2\,k)}+\frac{e^{2\,b\,\nu+(-i\,c+a\,(\nu-2\,k))\,z}}{i\,c+a\,(2\,k-\nu)}\right)\binom{\nu}{k}\right) /;\ \nu\in\mathbb{N}^{+}$$

Involving $\cos(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.3218.01

$$\int \cos(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == -\frac{1}{2}e^{-i\,d}\left(1+e^{2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)$$

$$\left(\frac{i\,e^{i\,(2\,d+c\,z)}}{c+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,c-a\,(\nu-2)}{2\,a};-e^{2\,(b+a\,z)}\right)+\frac{e^{-i\,c\,z}}{i\,c+a\,\nu}\,{}_2F_1\left(-\frac{i\,c+a\,\nu}{2\,a},-\nu;-\frac{i\,c+a\,(\nu-2)}{2\,a};-e^{2\,(b+a\,z)}\right)\right)$$

01.20.21.3219.01

$$\int \cos(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == -2^{-\nu-1}\left(\frac{2\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sin(d+c\,z)}{c}+\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-i\,d-b\,(2\,k+\nu)}\right.$$

$$\left.\left(\frac{e^{2\,i\,d+4\,b\,k+(i\,c+a\,(2\,k-\nu))\,z}}{-i\,c+a\,(\nu-2\,k)}-\frac{e^{2\,i\,d+2\,b\,\nu+(i\,c+a\,(\nu-2\,k))\,z}}{i\,c+a\,(\nu-2\,k)}+\frac{e^{4\,b\,k+2\,a\,z\,k-i\,c\,z-a\,\nu\,z}}{i\,c+a\,(\nu-2\,k)}+\frac{e^{2\,b\,\nu+(-i\,c+a\,(\nu-2\,k))\,z}}{i\,c+a\,(2\,k-\nu)}\right)\binom{\nu}{k}\right) /;\ \nu\in\mathbb{N}^{+}$$

Involving $\cos^{m}\left(b\,z^{r}\right)\cosh^{\nu}(c\,z)$

01.20.21.3220.01

$$\int \cos\left(b\,z^2\right)\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{\cos\left(\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)C\left(\frac{2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)}{\sqrt{b}}+\right.$$

$$\left.\frac{\cos\left(\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)C\left(\frac{2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)}{\sqrt{-b}}\right)-$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{-b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3221.01

$$\int \cos\left(b\sqrt{z}\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(b\sqrt{z}\right)+b\sqrt{z}\,\sin\left(b\sqrt{z}\right)\right)}{b^2}+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(2\sqrt{2\,i\,c\,k-i\,c\,\nu}\,\sin\left(\sqrt{z}\,b+c\,i\,(2\,k-\nu)\,z\right)-\right.\right.$$

$$\left.b\sqrt{2\,\pi}\left(\cos\left(\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}\right)C\left(\frac{b+2\,c\,i\,(2\,k-\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)-S\left(\frac{b+2\,c\,i\,(2\,k-\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)\sin\left(\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}\right)\right)\right)+$$

$$\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\left(\cos\left(\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}\right)C\left(\frac{2\,i\,c\,(2\,k-\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)-S\left(\frac{2\,i\,c\,(2\,k-\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)\right.\right.$$

$$\left.\left.\sin\left(\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}\right)\right)-2\sqrt{2\,i\,c\,k-i\,c\,\nu}\,\sin\left(b\sqrt{z}-i\,c\,(2\,k-\nu)\,z\right)\right)\Bigg)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos^{m}\left(b\,z^{r}+e\right)\cosh^{\nu}(c\,z)$

01.20.21.3222.01

$$\int \cos\left(b\,z^2+e\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$-\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{-b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)+S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)\sin(e)\right)+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$

$$\left(\frac{1}{\sqrt{-b}}\left(\cos\left(-\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}+e\right)C\left(\frac{2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}+e\right)\right)+\right.$$

$$\frac{1}{\sqrt{b}}\left(\cos\left(-\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}+e\right)C\left(\frac{2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}+e\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3223.01

$$\int \cos\left(\sqrt{z}\ b+e\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\sqrt{z}\ b+e\right)+b\sqrt{z}\ \sin\left(\sqrt{z}\ b+e\right)\right)}{b^2}+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(2\sqrt{2\,i\,c\,k-i\,c\,\nu}\ \sin\left(\sqrt{z}\ b+e+c\,i\,(2\,k-\nu)\,z\right)-b\sqrt{2\,\pi}\right.\right.$$

$$\left.\left(\cos\left(\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)C\left(\frac{b+2\,c\,i\,(2\,k-\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)-S\left(\frac{b+2\,c\,i\,(2\,k-\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)\sin\left(\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)\right)\right)+$$

$$\frac{1}{(2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\left(\cos\left(-\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)C\left(\frac{2\,i\,c\,(2\,k-\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)+S\left(\frac{2\,i\,c\,(2\,k-\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-\nu)}}\right)\right.\right.$$

$$\left.\left.\left.\sin\left(-\frac{i\,b^2}{4\,(2\,c\,k-c\,\nu)}+e\right)\right)-2\sqrt{2\,i\,c\,k-i\,c\,\nu}\ \sin\left(\sqrt{z}\ b+e-i\,c\,(2\,k-\nu)\,z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+d\,z\right)\cosh^{\nu}(c\,z)$

01.20.21.3224.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{d^2}{4\,b}\right)C\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,b}\right)\right)}{\sqrt{-b}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{b}}\left(\cos\left(\frac{(d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)C\left(\frac{d+2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{d+2\,i\,c\,k-i\,c\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)\right)+\frac{1}{\sqrt{-b}}\left(\cos\left(\frac{(-d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)\right.$$

$$\left.\left.C\left(\frac{-d+2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-S\left(\frac{-d+2\,i\,c\,k-i\,c\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-d+2\,i\,c\,k-i\,c\,\nu)^2}{4\,b}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3225.01

$$\int \cos\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}(c\,z)\,dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left.\left(b\sqrt{2\,\pi}\left(\cos\left(\frac{b^2}{4\,d}\right)C\left(\frac{\sqrt{-d}\ \left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{-d}\ \left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)\right)-2\sqrt{-d}\ \sin\left(\sqrt{z}\ b+d\,z\right)\right)+\right.$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(d+2\,i\,c\,k-i\,c\,\nu)^{3/2}}\left(-b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,(d+2\,i\,c\,k-i\,c\,\nu)}\right)C\left(\frac{b+2\,(d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d+2\,i\,c\,k-i\,c\,\nu}}\right)-\right.\right.$$

$$b\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d+2\,i\,c\,k-i\,c\,\nu}}\right)\sin\left(\frac{b^2}{4\,(d+2\,i\,c\,k-i\,c\,\nu)}\right)+$$

$$\left.2\sqrt{d+2\,i\,c\,k-i\,c\,\nu}\ \sin\left(\sqrt{z}\ b+(d+2\,i\,c\,k-i\,c\,\nu)\,z\right)\right)+$$

$$\left(b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,(-d+2\,i\,c\,k-i\,c\,\nu)}\right)C\left(\frac{2\,(-d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\ -b}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,c\,k-i\,c\,\nu}}\right)+\right.$$

$$b\sqrt{2\,\pi}\ S\left(\frac{2\,(-d+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\ -b}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,c\,k-i\,c\,\nu}}\right)\sin\left(\frac{b^2}{4\,(-d+2\,i\,c\,k-i\,c\,\nu)}\right)-$$

$$\left.\left.2\sqrt{-d+2\,i\,c\,k-i\,c\,\nu}\ \sin\left(\sqrt{z}\ b-(-d+2\,i\,c\,k-i\,c\,\nu)\,z\right)\right)\Big/(-d+2\,i\,c\,k-i\,c\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+d\,z+e\right)\cosh^{\nu}(c\,z)$

01.20.21.3226.01

$$\int \cos\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$\frac{1}{\sqrt{-b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4e\right)\right)C\left(\frac{\sqrt{-b}\,(d+2bz)}{b\sqrt{2\pi}}\right)-S\left(\frac{\sqrt{-b}\,(d+2bz)}{b\sqrt{2\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4e\right)\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\cos\left(-\frac{(-d+2ick-icv)^2}{4b}+e\right)C\left(\frac{-d+2ick-icv-2bz}{\sqrt{-b}\,\sqrt{2\pi}}\right)+\right.\right.$$

$$S\left(\frac{-d+2ick-icv-2bz}{\sqrt{-b}\,\sqrt{2\pi}}\right)\sin\left(-\frac{(-d+2ick-icv)^2}{4b}+e\right)\Bigg)+\frac{1}{\sqrt{b}}\left(\cos\left(-\frac{(d+2ick-icv)^2}{4b}+e\right)\right.$$

$$\left.\left.\left.C\left(\frac{d+2ick-icv+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)-S\left(\frac{d+2ick-icv+2bz}{\sqrt{b}\,\sqrt{2\pi}}\right)\sin\left(-\frac{(d+2ick-icv)^2}{4b}+e\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3227.01

$$\int \cos\left(\sqrt{z}\,b+e+d\,z\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$\frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\pi}\left(\cos\left(\frac{1}{4}\left(\frac{b^2}{d}-4e\right)\right)C\left(\frac{\sqrt{-d}\,\left(b+2d\sqrt{z}\right)}{d\sqrt{2\pi}}\right)-S\left(\frac{\sqrt{-d}\,\left(b+2d\sqrt{z}\right)}{d\sqrt{2\pi}}\right)\right.\right.\right.$$

$$\left.\left.\left.\sin\left(\frac{1}{4}\left(\frac{b^2}{d}-4e\right)\right)\right)-2\sqrt{-d}\,\sin\left(\sqrt{z}\,b+e+dz\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(d+2ick-icv)^{3/2}}\left(-b\sqrt{2\pi}\,\cos\left(-\frac{b^2}{4(d+2ick-icv)}+e\right)C\left(\frac{b+2(d+2ick-icv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{d+2ick-icv}}\right)+\right.\right.$$

$$b\sqrt{2\pi}\,S\left(\frac{b+2(d+2ick-icv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{d+2ick-icv}}\right)\sin\left(-\frac{b^2}{4(d+2ick-icv)}+e\right)+$$

$$\left.2\sqrt{d+2ick-icv}\,\sin\left(\sqrt{z}\,b+e+(d+2ick-icv)z\right)\right)+$$

$$\left(b\sqrt{2\pi}\,\cos\left(\frac{b^2}{4(-d+2ick-icv)}+e\right)C\left(\frac{2(-d+2ick-icv)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{-d+2ick-icv}}\right)+\right.$$

$$b\sqrt{2\pi}\,S\left(\frac{2(-d+2ick-icv)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{-d+2ick-icv}}\right)\sin\left(\frac{b^2}{4(-d+2ick-icv)}+e\right)-$$

$$\left.\left.2\sqrt{-d+2ick-icv}\,\sin\left(\sqrt{z}\,b+e-(-d+2ick-icv)z\right)\right)\Big/(-d+2ick-icv)^{3/2}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3228.01

$$\int \cos\left(b\,z^2\right)\cosh^{\nu}(g+f\,z)\,dz == -\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{-b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\cos\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}-i\,g\,(2\,k-\nu)\right)C\left(\frac{2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sin\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}-i\,g\,(2\,k-\nu)\right)\right)+\frac{1}{\sqrt{b}}\left(\cos\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+g\,i\,(2\,k-\nu)\right)\right.$$
$$\left.\left.C\left(\frac{2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+g\,i\,(2\,k-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3229.01

$$\int \cos\left(b\sqrt{z}\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(b\sqrt{z}\right)+b\sqrt{z}\,\sin\left(b\sqrt{z}\right)\right)}{b^2}+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(-b\sqrt{2\,\pi}\,\cos\left(-\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}+2\,i\,g\,k-i\,g\,\nu\right)C\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+\right.\right.$$
$$b\sqrt{2\,\pi}\,S\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(-\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}+2\,i\,g\,k-i\,g\,\nu\right)+$$
$$\left.2\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sin\left(\sqrt{z}\,b+2\,i\,g\,k-i\,g\,\nu+(2\,i\,f\,k-i\,f\,\nu)\,z\right)\right)+$$
$$\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\,\cos\left(\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}-2\,i\,g\,k+i\,g\,\nu\right)C\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+\right.$$
$$b\sqrt{2\,\pi}\,S\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}-2\,i\,g\,k+i\,g\,\nu\right)-$$
$$\left.\left.2\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sin\left(\sqrt{z}\,b-2\,i\,g\,k+i\,g\,\nu-(2\,i\,f\,k-i\,f\,\nu)\,z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+e\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3230.01

$$\int \cos\left(b\,z^2+e\right)\cosh^{\nu}(g+f\,z)\,dz == -\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}}{\sqrt{-b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,C\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)+S\left(\frac{b\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b}}\right)\sin(e)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\cos\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e-i\,g\,(2\,k-\nu)\right)C\left(\frac{2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\,\sqrt{2\,\pi}}\right)\right.\right.$$
$$\left.\sin\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e-i\,g\,(2\,k-\nu)\right)\right)+\frac{1}{\sqrt{b}}\left(\cos\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e+g\,i\,(2\,k-\nu)\right)\right.$$
$$\left.\left.C\left(\frac{2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)-S\left(\frac{2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e+g\,i\,(2\,k-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3231.01

$$\int \cos\left(\sqrt{z}\,b+e\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\sqrt{z}\,b+e\right)+b\sqrt{z}\,\sin\left(\sqrt{z}\,b+e\right)\right)}{b^2}+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(-b\sqrt{2\,\pi}\,\cos\left(-\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}+e+2\,i\,g\,k-i\,g\,\nu\right)C\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+\right.\right.$$
$$b\sqrt{2\,\pi}\,S\left(\frac{b+2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(-\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}+e+2\,i\,g\,k-i\,g\,\nu\right)+$$
$$\left.2\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sin\left(\sqrt{z}\,b+e+2\,i\,g\,k-i\,g\,\nu+(2\,i\,f\,k-i\,f\,\nu)\,z\right)\right)+$$
$$\frac{1}{(2\,i\,f\,k-i\,f\,\nu)^{3/2}}\left(b\sqrt{2\,\pi}\,\cos\left(\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}+e-2\,i\,g\,k+i\,g\,\nu\right)C\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)+\right.$$
$$b\sqrt{2\,\pi}\,S\left(\frac{2\,(2\,i\,f\,k-i\,f\,\nu)\sqrt{z}-b}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(\frac{b^2}{4\,(2\,i\,f\,k-i\,f\,\nu)}+e-2\,i\,g\,k+i\,g\,\nu\right)-$$
$$\left.\left.2\sqrt{2\,i\,f\,k-i\,f\,\nu}\,\sin\left(\sqrt{z}\,b+e-2\,i\,g\,k+i\,g\,\nu-(2\,i\,f\,k-i\,f\,\nu)\,z\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+d\,z\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3232.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{d^2}{4\,b}\right)C\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,b}\right)\right)}{\sqrt{-b}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\cos\left(\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+g\,i\,(2\,k-\nu)\right)C\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)-\right.\right.$$

$$\left.S\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+g\,i\,(2\,k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{b}}\left(\cos\left(i\,g\,(2\,k-\nu)-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}\right)C\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.S\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(i\,g\,(2\,k-\nu)-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3233.01

$$\int \cos\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left.\left(b\sqrt{2\,\pi}\left(\cos\left(\frac{b^2}{4\,d}\right)C\left(\frac{\sqrt{-d}\ \left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{-d}\ \left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)\right)-2\sqrt{-d}\ \sin\left(\sqrt{z}\ b+d\,z\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\left(\left(-b\sqrt{2\,\pi}\ \cos\left(-\frac{b^2}{4\,(d+2\,i\,f\,k-i\,f\,\nu)}+2\,i\,g\,k-i\,g\,\nu\right)C\left(\frac{b+2\,(d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d+2\,i\,f\,k-i\,f\,\nu}}\right)+\right.\right.\right.$$

$$b\sqrt{2\,\pi}\ S\left(\frac{b+2\,(d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d+2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(-\frac{b^2}{4\,(d+2\,i\,f\,k-i\,f\,\nu)}+2\,i\,g\,k-i\,g\,\nu\right)+$$

$$\left.\left.2\sqrt{d+2\,i\,f\,k-i\,f\,\nu}\ \sin\left(\sqrt{z}\ b+2\,i\,g\,k-i\,g\,\nu+(d+2\,i\,f\,k-i\,f\,\nu)\,z\right)\right)\Big/(d+2\,i\,f\,k-i\,f\,\nu)^{3/2}+\right.$$

$$\left(b\sqrt{2\,\pi}\ \cos\left(\frac{b^2}{4\,(-d+2\,i\,f\,k-i\,f\,\nu)}-2\,i\,g\,k+i\,g\,\nu\right)C\left(\frac{2\,(-d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}\ -b}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,f\,k-i\,f\,\nu}}\right)+b\sqrt{2\,\pi}\right.$$

$$S\left(\frac{2\,(-d+2\,i\,f\,k-i\,f\,\nu)\sqrt{z}\ -b}{\sqrt{2\,\pi}\ \sqrt{-d+2\,i\,f\,k-i\,f\,\nu}}\right)\sin\left(\frac{b^2}{4\,(-d+2\,i\,f\,k-i\,f\,\nu)}-2\,i\,g\,k+i\,g\,\nu\right)-2\sqrt{-d+2\,i\,f\,k-i\,f\,\nu}$$

$$\left.\left.\sin\left(\sqrt{z}\ b-2\,i\,g\,k+i\,g\,\nu-(-d+2\,i\,f\,k-i\,f\,\nu)\,z\right)\right)\Big/(-d+2\,i\,f\,k-i\,f\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+d\,z+e\right)\cosh^{\nu}(f\,z+g)$

01.20.21.3234.01

$$\int \cos\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$\frac{1}{\sqrt{-b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)C\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{\sqrt{-b}}\left(\cos\left(-\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e-i\,g\,(2\,k-\nu)\right)C\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.S\left(\frac{-d+2\,i\,f\,k-i\,f\,\nu-2\,b\,z}{\sqrt{-b}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e-i\,g\,(2\,k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{b}}\left(\cos\left(-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e+g\,i\,(2\,k-\nu)\right)C\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)-\right.$$

$$\left.\left.S\left(\frac{d+2\,i\,f\,k-i\,f\,\nu+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(d+2\,i\,f\,k-i\,f\,\nu)^2}{4\,b}+e+g\,i\,(2\,k-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3235.01

$$\int \cos\left(\sqrt{z}\, b+e+d z\right)\cosh^{\nu}(g+f z)\, dz ==$$

$$\frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{2\pi}\left(\cos\left(\frac{1}{4}\left(\frac{b^2}{d}-4e\right)\right)C\left(\frac{\sqrt{-d}\,\left(b+2d\sqrt{z}\right)}{d\sqrt{2\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{-d}\,\left(b+2d\sqrt{z}\right)}{d\sqrt{2\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{b^2}{d}-4e\right)\right)\right)-2\sqrt{-d}\,\sin\left(\sqrt{z}\, b+e+d z\right)\right)+$$

$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\left(-b\sqrt{2\pi}\,\cos\left(-\frac{b^2}{4(d+2ifk-ifv)}+e+2igk-igv\right)C\left(\frac{b+2(d+2ifk-ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{d+2ifk-ifv}}\right)+\right.\right.$$

$$b\sqrt{2\pi}\,S\left(\frac{b+2(d+2ifk-ifv)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{d+2ifk-ifv}}\right)\sin\left(-\frac{b^2}{4(d+2ifk-ifv)}+e+2igk-igv\right)+$$

$$\left.\left.2\sqrt{d+2ifk-ifv}\,\sin\left(\sqrt{z}\, b+e+2igk-igv+(d+2ifk-ifv)z\right)\right)\Big/(d+2ifk-ifv)^{3/2}+\right.$$

$$\left(b\sqrt{2\pi}\,\cos\left(\frac{b^2}{4(-d+2ifk-ifv)}+e-2igk+igv\right)C\left(\frac{2(-d+2ifk-ifv)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{-d+2ifk-ifv}}\right)+\right.$$

$$b\sqrt{2\pi}\,S\left(\frac{2(-d+2ifk-ifv)\sqrt{z}-b}{\sqrt{2\pi}\,\sqrt{-d+2ifk-ifv}}\right)$$

$$\sin\left(\frac{b^2}{4(-d+2ifk-ifv)}+e-2igk+igv\right)-2\sqrt{-d+2ifk-ifv}$$

$$\left.\left.\sin\left(\sqrt{z}\, b+e-2igk+igv-(-d+2ifk-ifv)z\right)\right)\Big/(-d+2ifk-ifv)^{3/2}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\cos(b\,z)\cosh^{\nu}(c\,z^{r})$

01.20.21.3236.01

$$\int \cos(b z)\cosh^{\nu}\left(c z^2\right)dz ==$$

$$\frac{\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(b z)\,2^{-\nu}}{b}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{icv-2ics}}\left(\cos\left(\frac{b^2}{4(icv-2ics)}\right)C\left(\frac{2(icv-2ics)z-b}{\sqrt{2\pi}\,\sqrt{icv-2ics}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2(icv-2ics)z-b}{\sqrt{2\pi}\,\sqrt{icv-2ics}}\right)\sin\left(\frac{b^2}{4(icv-2ics)}\right)\right)+\frac{1}{\sqrt{2ics-icv}}\right.$$

$$\left.\left(\cos\left(\frac{b^2}{4(2ics-icv)}\right)C\left(\frac{2(2ics-icv)z-b}{\sqrt{2\pi}\,\sqrt{2ics-icv}}\right)+S\left(\frac{2(2ics-icv)z-b}{\sqrt{2\pi}\,\sqrt{2ics-icv}}\right)\sin\left(\frac{b^2}{4(2ics-icv)}\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.3237.01

$$\int \cos(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(b\,z)}{b} +$$

$$\frac{1}{(-b)^{3/2}}\left(2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-i\,c\,\sqrt{2\,\pi}\;(2\,s-\nu)\cos\left(\frac{c^2\,(2\,s-\nu)^2}{4\,b}\right)C\left(\frac{i\,c\,(2\,s-\nu)-2\,b\,\sqrt{z}}{\sqrt{-b}\;\sqrt{2\,\pi}}\right)+c\,i\,\sqrt{2\,\pi}\;(2\,s-\nu)\right.\right.$$

$$\cos\left(\frac{c^2\,(\nu-2\,s)^2}{4\,b}\right)C\left(\frac{-2\,\sqrt{z}\;b-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-b}\;\sqrt{2\,\pi}}\right)-i\,c\,\sqrt{2\,\pi}\;(2\,s-\nu)\,S\left(\frac{i\,c\,(2\,s-\nu)-2\,b\,\sqrt{z}}{\sqrt{-b}\;\sqrt{2\,\pi}}\right)$$

$$\sin\left(\frac{c^2\,(2\,s-\nu)^2}{4\,b}\right)+c\,i\,\sqrt{2\,\pi}\;(2\,s-\nu)\,S\left(\frac{-2\,\sqrt{z}\;b-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-b}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{c^2\,(\nu-2\,s)^2}{4\,b}\right)+$$

$$\left.\left.2\,\sqrt{-b}\;i\sinh\left(2\,c\,\sqrt{z}\;s+i\,b\,z-c\,\nu\,\sqrt{z}\right)-2\,i\,\sqrt{-b}\;\sinh\left(2\,c\,\sqrt{z}\;s-i\,b\,z-c\,\nu\,\sqrt{z}\right)\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

Involving $\cos(d\,z+e)\cosh^{\nu}\left(c\,z^{r}\right)$

01.20.21.3238.01

$$\int \cos(e+d\,z)\cosh^{\nu}\left(c\,z^2\right)dz == \frac{\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(e+d\,z)\,2^{-\nu}}{d} +$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)C\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\,\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\,\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)\right)+\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)\right.$$

$$\left.\left.C\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+S\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3239.01

$$\int \cos(e+d\,z)\cosh^{v}\left(c\sqrt{z}\right)dz == \frac{2^{-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sin(e+d\,z)}{d} +$$

$$2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(-d)^{3/2}}\left(\sqrt{2\pi}\,(2\,i\,c\,s-i\,c\,v)\cos\left(e-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,d}\right)C\left(\frac{-2\sqrt{z}\,d-2\,i\,c\,s+i\,c\,v}{\sqrt{-d}\,\sqrt{2\pi}}\right)-\sqrt{2\pi}\,(i\,c\,v-2\,i\,c\,s)\right.\right.$$
$$\left.S\left(\frac{-2\sqrt{z}\,d-2\,i\,c\,s+i\,c\,v}{\sqrt{-d}\,\sqrt{2\pi}}\right)\sin\left(e-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,d}\right)-2\sqrt{-d}\,\sin\left(e+d\,z-(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)+$$
$$\frac{1}{(-d)^{3/2}}\left(\sqrt{2\pi}\,(i\,c\,v-2\,i\,c\,s)\cos\left(e-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,d}\right)C\left(\frac{-2\sqrt{z}\,d+2\,i\,c\,s-i\,c\,v}{\sqrt{-d}\,\sqrt{2\pi}}\right)-\right.$$
$$\sqrt{2\pi}\,(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{-2\sqrt{z}\,d+2\,i\,c\,s-i\,c\,v}{\sqrt{-d}\,\sqrt{2\pi}}\right)\sin\left(e-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,d}\right)-$$
$$\left.\left.2\sqrt{-d}\,\sin\left(e+d\,z-(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\right)/;\ v\in\mathbb{N}^{+}$$

Involving $\cos\left(b\,z^{r}\right)\cosh^{v}\left(c\,z^{r}\right)$

01.20.21.3240.01

$$\int \cos(b\,z^{r})\cosh^{v}(c\,z^{r})\,dz == -\frac{2^{-v-1}\,z\binom{v}{\frac{v}{2}}\left(\Gamma\left(\frac{1}{r},-i\,b\,z^{r}\right)(-i\,b\,z^{r})^{-1/r}+(i\,b\,z^{r})^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^{r}\right)\right)(1-v \bmod 2)}{r} -$$
$$\frac{2^{-v-1}\,z}{r}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,v)\,z^{r}\right)((-i\,b-2\,c\,s+c\,v)\,z^{r})^{-1/r}+\right.$$
$$((i\,b-2\,c\,s+c\,v)\,z^{r})^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,v)\,z^{r}\right)+((-i\,b+2\,c\,s-c\,v)\,z^{r})^{-1/r}\,\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,v)\,z^{r}\right)+$$
$$\left.((i\,b+2\,c\,s-c\,v)\,z^{r})^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,v)\,z^{r}\right)\right)/;\ v\in\mathbb{N}^{+}$$

01.20.21.3241.01

$$\int \cos\left(b\,z^{2}\right)\cosh^{v}\left(c\,z^{2}\right)dz == \frac{2^{-v-\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\,C\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{b}} +$$
$$2^{-v-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,v}\,z\right)}{\sqrt{-b-2\,i\,c\,s+i\,c\,v}}+\frac{C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,v}\,z\right)}{\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\right)/;\ v\in\mathbb{N}^{+}$$

01.20.21.3242.01

$$\int \cos\left(b\sqrt{z}\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(b\sqrt{z}\right)+b\sqrt{z}\,\sin\left(b\sqrt{z}\right)\right)}{b^2}+$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\cos\left((i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)+(i\,c\,(\nu-2\,s)-b)\sqrt{z}\,\sin\left((i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)}{(i\,c\,(\nu-2\,s)-b)^2}+\right.$$

$$\left.\frac{\cos\left((b+c\,i\,(\nu-2\,s))\sqrt{z}\right)-(-b-i\,c\,(\nu-2\,s))\sqrt{z}\,\sin\left((b+c\,i\,(\nu-2\,s))\sqrt{z}\right)}{(-b-i\,c\,(\nu-2\,s))^2}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3243.01

$$\int \cos(b\,z^r+e)\cosh^{\nu}(c\,z^r)\,dz == -\frac{1}{r}\left(2^{-\nu-1}\,z\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(\frac{1}{r},-i\,b\,z^r\right)(-i\,b\,z^r)^{-1/r}+e^{-i\,e}\,(i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^r\right)\right)(1-\nu \bmod 2)\right)-$$

$$\frac{1}{r}\left(2^{-\nu-1}\,z\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}+\right.\right.$$

$$e^{-i\,e}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{i\,e}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}$$

$$\left.\left.\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-i\,e}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3244.01

$$\int \cos\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,C\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)-S\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)\right)}{\sqrt{b}}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right.$$

$$\left(\cos(e)\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)+S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\sin(e)\right)+\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}$$

$$\left.\left.\left(\cos(e)\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)+S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\sin(e)\right)\right)/;\ \nu\in\mathbb{N}^+\right.$$

01.20.21.3245.01

$$\int \cos\left(\sqrt{z}\, b+e\right)\cosh^{v}\left(c\sqrt{z}\right)dz ==$$
$$\frac{2^{1-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\cos\left(\sqrt{z}\, b+e\right)+b\sqrt{z}\,\sin\left(\sqrt{z}\, b+e\right)\right)}{b^2}+2^{1-v}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,c\,(v-2\,s)-b)^2}\right.$$
$$\left(\cos\left(e-(i\,c\,(v-2\,s)-b)\sqrt{z}\right)-(i\,c\,(v-2\,s)-b)\sqrt{z}\,\sin\left(e-(i\,c\,(v-2\,s)-b)\sqrt{z}\right)\right)+\frac{1}{(-b-i\,c\,(v-2\,s))^2}$$
$$\left.\left(\cos\left(e-(-b-i\,c\,(v-2\,s))\sqrt{z}\right)-(-b-i\,c\,(v-2\,s))\sqrt{z}\,\sin\left(e-(-b-i\,c\,(v-2\,s))\sqrt{z}\right)\right)\right)/;\ v\in\mathbb{N}^{+}$$

Involving $\cos\left(b\,z^{r}+d\,z\right)\cosh^{v}\left(c\,z^{r}\right)$

01.20.21.3246.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh^{v}\left(c\,z^2\right)dz == \frac{2^{-v-\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\cos\left(\frac{d^2}{4\,b}\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,b}\right)\right)}{\sqrt{b}}+$$
$$2^{-v-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\left(\cos\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,v)}\right)C\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,v)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,v)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,v)}\right)\right)+$$
$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\left(\cos\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,v)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,v)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,v)}\right)\right)\right)/;\ v\in\mathbb{N}^{+}$$

01.20.21.3247.01

$$\int \cos\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left(b\sqrt{2\pi}\left(S\left(\frac{b+2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4d}\right)-\cos\left(\frac{b^2}{4d}\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\right)-2\sqrt{-d}\ \sin\left(\sqrt{z}\ b+d\,z\right)\right)+2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$
$$\left(\frac{1}{d^{3/2}}\left(\sqrt{2\pi}\ (-b-2\,i\,c\,k+i\,c\,\nu)\cos\left(\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}\right)C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)-\sqrt{2\pi}\ (b+2\,i\,c\,k-i\,c\,\nu)\right.\right.$$
$$\left.S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}\right)+2\sqrt{d}\ \sin\left(d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)+$$
$$\frac{1}{(-d)^{3/2}}\left(\sqrt{2\pi}\ (b-2\,i\,c\,k+i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}\right)C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)+\right.$$
$$\sqrt{2\pi}\ (-b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}\right)-$$
$$\left.\left.\left.2\sqrt{-d}\ \sin\left(d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3248.01

$$\int \cos\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$
$$\frac{1}{\sqrt{b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4e\right)\right)C\left(\frac{d+2bz}{\sqrt{b}\ \sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{b}\ \sqrt{2\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4e\right)\right)\right)\right)+$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4(-b-2\,i\,c\,s+i\,c\,\nu)}+e\right)C\left(\frac{2(-b-2\,i\,c\,s+i\,c\,\nu)z-d}{\sqrt{2\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)+\right.\right.$$
$$\left.S\left(\frac{2(-b-2\,i\,c\,s+i\,c\,\nu)z-d}{\sqrt{2\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4(-b-2\,i\,c\,s+i\,c\,\nu)}+e\right)\right)+$$
$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4(-b+2\,i\,c\,s-i\,c\,\nu)}+e\right)C\left(\frac{2(-b+2\,i\,c\,s-i\,c\,\nu)z-d}{\sqrt{2\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{2(-b+2\,i\,c\,s-i\,c\,\nu)z-d}{\sqrt{2\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4(-b+2\,i\,c\,s-i\,c\,\nu)}+e\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3249.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left(b\sqrt{2\pi}\left(S\left(\frac{b+2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4d}-e\right)-\cos\left(\frac{b^2}{4d}-e\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\right)-2\sqrt{-d}\ \sin\left(\sqrt{z}\ b+e+d\,z\right)\right)+$$
$$2^{-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{d^{3/2}}\left(\sqrt{2\pi}\ (-b-2\,i\,c\,k+i\,c\,\nu)\cos\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}+e\right)C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)+\right.\right.$$
$$\sqrt{2\pi}\ (b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}+e\right)+$$
$$\left.2\sqrt{d}\ \sin\left(e+d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)+$$
$$\frac{1}{(-d)^{3/2}}\left(\sqrt{2\pi}\ (b-2\,i\,c\,k+i\,c\,\nu)\cos\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}+e\right)C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)-\right.$$
$$\sqrt{2\pi}\ (-b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\pi}}\right)\sin\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4d}+e\right)-$$
$$\left.\left.2\sqrt{-d}\ \sin\left(e+d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos(d\,z)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3250.01

$$\int \cos(d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(d\,z)\,2^{-\nu}}{d}+$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\pi}\ \sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\ \sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3251.01

$$\int \cos(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(d\,z)}{d} +$$

$$\frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-i\,c\sqrt{2\pi}\;(2\,s-\nu)\cos\left(\frac{\left(c^2\,(2\,s-\nu)-4\,i\,d\,g\right)(2\,s-\nu)}{4\,d}\right)C\left(\frac{i\,c\,(2\,s-\nu)-2\,d\sqrt{z}}{\sqrt{-d}\;\sqrt{2\pi}}\right)+\right.\right.$$

$$c\,i\sqrt{2\pi}\;(2\,s-\nu)\cosh\left(-\frac{i\,c^2\,(\nu-2\,s)^2}{4\,d}+2\,g\,s-g\,\nu\right)C\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)-$$

$$i\,c\sqrt{2\pi}\;(2\,s-\nu)\,S\left(\frac{i\,c\,(2\,s-\nu)-2\,d\sqrt{z}}{\sqrt{-d}\;\sqrt{2\pi}}\right)\sin\left(\frac{\left(c^2\,(2\,s-\nu)-4\,i\,d\,g\right)(2\,s-\nu)}{4\,d}\right)-$$

$$c\sqrt{2\pi}\;(2\,s-\nu)\,S\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)\sinh\left(-\frac{i\,c^2\,(\nu-2\,s)^2}{4\,d}+2\,g\,s-g\,\nu\right)+2\sqrt{-d}\;i\sinh\left(2\,g\,s+\right.$$

$$\left.\left.\left.2\,c\sqrt{z}\;s-g\,\nu+i\,d\,z-c\,\nu\sqrt{z}\right)-2\,i\sqrt{-d}\;\sinh\left(2\,g\,s+2\,c\sqrt{z}\;s-g\,\nu-i\,d\,z-c\,\nu\sqrt{z}\right)\right)\right)/;\;\nu\in\mathbb{N}^{+}$$

Involving $\cos(d\,z+e)\cosh^{\nu}\left(c\,z^{r}+g\right)$

01.20.21.3252.01

$$\int \cos(e+d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(e+d\,z)}{d} +$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,(i\,c\,\nu-2\,i\,c\,s)\,z-d}{\sqrt{2\pi}\;\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{d^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,(2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\pi}\;\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)\right)\right)/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.3253.01

$$\int \cos(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(e+d\,z)}{d} +$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-d)^{3/2}}\left(\sqrt{2\pi}\;(2\,i\,c\,s-i\,c\,\nu)\cos\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+e+2\,i\,g\,s-i\,g\,\nu\right)C\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)-\right.\right.$$

$$\sqrt{2\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,S\left(\frac{-2\sqrt{z}\;d-2\,i\,c\,s+i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)\sin\left(-\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,d}+e+2\,i\,g\,s-i\,g\,\nu\right)-$$

$$\left.2\sqrt{-d}\;\sin\left(e+2\,i\,g\,s-i\,g\,\nu+d\,z-(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-d)^{3/2}}\left(\sqrt{2\pi}\;(i\,c\,\nu-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}+e-2\,i\,g\,s+i\,g\,\nu\right)C\left(\frac{-2\sqrt{z}\;d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)-\right.$$

$$\sqrt{2\pi}\;(2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-2\sqrt{z}\;d+2\,i\,c\,s-i\,c\,\nu}{\sqrt{-d}\;\sqrt{2\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,d}+e-2\,i\,g\,s+i\,g\,\nu\right)-$$

$$\left.\left.2\sqrt{-d}\;\sin\left(e-2\,i\,g\,s+i\,g\,\nu+d\,z-(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

Involving $\cos(a\,z^r)\cosh^{\nu}(c\,z^r+g)$

01.20.21.3254.01

$$\int \cos(b\,z^r)\cosh^{\nu}(c\,z^r+g)\,dz == -\frac{2^{-\nu-1}\,z\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{1}{r},-i\,b\,z^r\right)(-i\,b\,z^r)^{-1/r}+(i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^r\right)\right)(1-\nu \bmod 2)}{r} -$$

$$\frac{2^{-\nu-1}\,z}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,g\,s-g\,\nu}\,\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}+\right.$$

$$e^{2\,g\,s-g\,\nu}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{g\,\nu-2\,g\,s}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)+e^{g\,\nu-2\,g\,s}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3255.01

$$\int \cos\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,C\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{b}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cosh(g\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)+\right.\right.$$

$$\left.i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\sinh(g\,(2\,s-\nu))\right)+\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(\cosh(g\,(2\,s-\nu))\right.$$

$$\left.\left.C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)-i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\sinh(g\,(2\,s-\nu))\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3256.01

$$\int \cos\left(b\,\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(b\,\sqrt{z}\right)+b\,\sqrt{z}\,\sin\left(b\,\sqrt{z}\right)\right)}{b^2}+$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,c\,(\nu-2\,s)-b)^2}\left(\cos\left(g\,i\,(\nu-2\,s)+(i\,c\,(\nu-2\,s)-b)\,\sqrt{z}\right)+\right.\right.$$

$$(i\,c\,(\nu-2\,s)-b)\,\sqrt{z}\,\sin\left(g\,i\,(\nu-2\,s)+(i\,c\,(\nu-2\,s)-b)\,\sqrt{z}\right)\Big)+\frac{1}{(-b-i\,c\,(\nu-2\,s))^2}\left(\cos\left(i\,g\,(\nu-2\,s)-\right.\right.$$

$$\left.\left.\left.(-b-i\,c\,(\nu-2\,s))\,\sqrt{z}\right)-(-b-i\,c\,(\nu-2\,s))\,\sqrt{z}\,\sin\left(i\,g\,(\nu-2\,s)-(-b-i\,c\,(\nu-2\,s))\,\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(a\,z^r+e\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3257.01

$$\int \cos(b\,z^r+e)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$-\frac{1}{r}\left(2^{-\nu-1}\,z\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(\frac{1}{r},-i\,b\,z^r\right)(-i\,b\,z^r)^{-1/r}+e^{-i\,e}\,(i\,b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},i\,b\,z^r\right)\right)(1-\nu \bmod 2)\right)-$$

$$\frac{2^{-\nu-1}\,z}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{1}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}+\right.$$

$$e^{-i\,e+2\,g\,s-g\,\nu}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{i\,e-2\,g\,s+g\,\nu}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}$$

$$\left.\Gamma\left(\frac{1}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-i\,e-2\,g\,s+g\,\nu}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3258.01

$$\int \cos\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos(e)\,C\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)-S\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)\right)}{\sqrt{b}}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right.$$

$$\left(\cos(e-i\,g\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)+S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}\,z\right)\sin(e-i\,g\,(2\,s-\nu))\right)+$$

$$\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cos(e+g\,i\,(2\,s-\nu))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)+\right.$$

$$\left.\left.S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}\,z\right)\sin(e+g\,i\,(2\,s-\nu))\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3259.01

$$\int \cos\left(\sqrt{z}\,b+e\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\sqrt{z}\,b+e\right)+b\sqrt{z}\,\sin\left(\sqrt{z}\,b+e\right)\right)}{b^2}+$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,c\,(\nu-2\,s)-b)^2}\left(\cos\left(e-i\,g\,(\nu-2\,s)-(i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)-\right.\right.$$

$$\left.(i\,c\,(\nu-2\,s)-b)\sqrt{z}\,\sin\left(e-i\,g\,(\nu-2\,s)-(i\,c\,(\nu-2\,s)-b)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-b-i\,c\,(\nu-2\,s))^2}\left(\cos\left(e+g\,i\,(\nu-2\,s)-(-b-i\,c\,(\nu-2\,s))\sqrt{z}\right)-(-b-i\,c\,(\nu-2\,s))\right.$$

$$\left.\left.\sqrt{z}\,\sin\left(e+g\,i\,(\nu-2\,s)-(-b-i\,c\,(\nu-2\,s))\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3260.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{d^2}{4\,b}\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,b\,z}{\sqrt{b}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2}{4\,b}\right)\right)}{\sqrt{b}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{2(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)+\right.\right.$$

$$\left.S\left(\frac{2(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)C\left(\frac{2(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{2(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3261.01

$$\int \cos\left(\sqrt{z}\,b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left(b\sqrt{2\,\pi}\left(S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)-\cos\left(\frac{b^2}{4\,d}\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\right)-2\sqrt{-d}\,\sin\left(\sqrt{z}\,b+d\,z\right)\right)+2^{-\nu-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{d^{3/2}}\left(\sqrt{2\,\pi}\,(-b-2\,i\,c\,k+i\,c\,\nu)\cos\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+2\,i\,g\,k-i\,g\,\nu\right)C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)+\right.\right.$$

$$\sqrt{2\,\pi}\,(b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+2\,i\,g\,k-i\,g\,\nu\right)+$$

$$\left.2\sqrt{d}\,\sin\left(2\,i\,g\,k-i\,g\,\nu+d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-d)^{3/2}}\left(\sqrt{2\,\pi}\,(b-2\,i\,c\,k+i\,c\,\nu)\cos\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}-2\,i\,g\,k+i\,g\,\nu\right)C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\sqrt{2\,\pi}\,(-b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}-2\,i\,g\,k+i\,g\,\nu\right)-$$

$$\left.\left.2\sqrt{-d}\,\sin\left(-2\,g\,i\,k+i\,g\,\nu+d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3262.01

$$\int \cos\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$
$$\frac{1}{\sqrt{b}}\left(2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)C\left(\frac{d+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)+S\left(\frac{d+2\,b\,z}{\sqrt{b}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4\,e\right)\right)\right)\right)+$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)+\right.\right.$$
$$\left.S\left(\frac{2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+e+g\,i\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z-d}{\sqrt{2\,\pi}\ \sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{d^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3263.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz == \frac{1}{(-d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$
$$\left(b\sqrt{2\,\pi}\left(S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2}{4\,d}-e\right)-\cos\left(\frac{b^2}{4\,d}-e\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\right)-2\sqrt{-d}\ \sin\left(\sqrt{z}\ b+e+d\,z\right)\right)+2^{-\nu-1}$$
$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{d^{3/2}}\left(\sqrt{2\,\pi}\ (-b-2\,i\,c\,k+i\,c\,\nu)\cos\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e+2\,i\,g\,k-i\,g\,\nu\right)C\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)+\right.\right.$$
$$\sqrt{2\,\pi}\ (b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{b+2\,i\,c\,k-i\,c\,\nu+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e+2\,i\,g\,k-i\,g\,\nu\right)+$$
$$\left.2\sqrt{d}\ \sin\left(e+2\,i\,g\,k-i\,g\,\nu+d\,z+(b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)+\frac{1}{(-d)^{3/2}}$$
$$\left(\sqrt{2\,\pi}\ (b-2\,i\,c\,k+i\,c\,\nu)\cos\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e-2\,i\,g\,k+i\,g\,\nu\right)C\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)-\right.$$
$$\sqrt{2\,\pi}\ (-b+2\,i\,c\,k-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,k-i\,c\,\nu-2\,d\sqrt{z}}{\sqrt{-d}\ \sqrt{2\,\pi}}\right)\sin\left(-\frac{(-b+2\,i\,c\,k-i\,c\,\nu)^2}{4\,d}+e-\right.$$
$$\left.\left.\left.2\,i\,g\,k+i\,g\,\nu\right)-2\sqrt{-d}\ \sin\left(e-2\,i\,g\,k+i\,g\,\nu+d\,z-(-b+2\,i\,c\,k-i\,c\,\nu)\sqrt{z}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cos(d\,z)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.3264.01

$$\int \cos(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == -\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sin(d\,z)}{d}+$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}\right)C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}\right)C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3265.01

$$\int \cos(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(d\,z)}{d}+$$
$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}\right)C\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\right.\right.$$
$$\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,S\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\sin\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}\right)+$$
$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\;\sin\left((-d-2\,i\,f\,s+i\,f\,\nu)\,z+(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+$$
$$\left(\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}\right)C\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-\right.$$
$$\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)\sin\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}\right)+$$
$$\left.\left.2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\;\sin\left((-d+2\,i\,f\,s-i\,f\,\nu)\,z+(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cos(d\,z+e)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.3266.01

$$\int \cos(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == -\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sin(e+d\,z)}{d}+$$
$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3267.01

$$\int \cos(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(e+d\,z)}{d}+$$
$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e\right)C\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\right.\right.$$
$$\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\,S\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\sin\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e\right)-$$
$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\;\sin\left(e-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+$$
$$\left(\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e\right)C\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-\right.$$
$$\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$
$$\sin\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e\right)-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}$$
$$\left.\sin\left(e-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cos(b\,z^r)\cosh^{\nu}(c\,z^r+f\,z)$

01.20.21.3268.01

$$\int \cos\left(b z^2\right) \cosh^{\nu}\left(c z^2 + f z\right) dz == \frac{2^{-\nu-\frac{1}{2}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)\, C\left(\sqrt{b}\, \sqrt{\frac{2}{\pi}}\, z\right)}{\sqrt{b}} +$$

$$2^{-\nu-\frac{1}{2}} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\left(\cos\left(\frac{(i f \nu - 2 i f s)^2}{4 (-b - 2 i c s + i c \nu)} \right) C\left(\frac{-2 f i s + i f \nu + 2 (-b - 2 i c s + i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b - 2 i c s + i c \nu}} \right) + \right. \right.$$

$$\left. S\left(\frac{-2 f i s + i f \nu + 2 (-b - 2 i c s + i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b - 2 i c s + i c \nu}} \right) \sin\left(\frac{(i f \nu - 2 i f s)^2}{4 (-b - 2 i c s + i c \nu)} \right) \right) \Big/ \left(\sqrt{-b - 2 i c s + i c \nu} \right) +$$

$$\left(\cos\left(\frac{(2 i f s - i f \nu)^2}{4 (-b + 2 i c s - i c \nu)} \right) C\left(\frac{2 i f s - i f \nu + 2 (-b + 2 i c s - i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b + 2 i c s - i c \nu}} \right) + \right.$$

$$\left. S\left(\frac{2 i f s - i f \nu + 2 (-b + 2 i c s - i c \nu) z}{\sqrt{2\pi}\, \sqrt{-b + 2 i c s - i c \nu}} \right) \sin\left(\frac{(2 i f s - i f \nu)^2}{4 (-b + 2 i c s - i c \nu)} \right) \right) \Big/ \left(\sqrt{-b + 2 i c s - i c \nu} \right) \Big) /; \nu \in \mathbb{N}^+$$

01.20.21.3269.01

$$\int \cos\left(b \sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\, c + f z\right) dz == 2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{(i f \nu - 2 i f s)^{3/2}} \right.$$

$$\left(\sqrt{2\pi}\, (b + 2 i c s - i c \nu) \cos\left(\frac{(-b - 2 i c s + i c \nu)^2}{4 (i f \nu - 2 i f s)} \right) C\left(\frac{-b - 2 i c s + i c \nu + 2 (i f \nu - 2 i f s) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{i f \nu - 2 i f s}} \right) - \right.$$

$$\sqrt{2\pi}\, (-b - 2 i c s + i c \nu) S\left(\frac{-b - 2 i c s + i c \nu + 2 (i f \nu - 2 i f s) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{i f \nu - 2 i f s}} \right) \sin\left(\frac{(-b - 2 i c s + i c \nu)^2}{4 (i f \nu - 2 i f s)} \right) +$$

$$\left. 2 \sqrt{i f \nu - 2 i f s}\, \sin\left(\sqrt{z}\, (-b - 2 i c s + i c \nu) + (i f \nu - 2 i f s) z \right) \right) + \frac{1}{(2 i f s - i f \nu)^{3/2}}$$

$$\left(\sqrt{2\pi}\, (b - 2 i c s + i c \nu) \cos\left(\frac{(-b + 2 i c s - i c \nu)^2}{4 (2 i f s - i f \nu)} \right) C\left(\frac{-b + 2 i c s - i c \nu + 2 (2 i f s - i f \nu) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{2 i f s - i f \nu}} \right) - \right.$$

$$\sqrt{2\pi}\, (-b + 2 i c s - i c \nu) S\left(\frac{-b + 2 i c s - i c \nu + 2 (2 i f s - i f \nu) \sqrt{z}}{\sqrt{2\pi}\, \sqrt{2 i f s - i f \nu}} \right) \sin\left(\frac{(-b + 2 i c s - i c \nu)^2}{4 (2 i f s - i f \nu)} \right) +$$

$$\left. \left. 2 \sqrt{2 i f s - i f \nu}\, \sin\left(\sqrt{z}\, (-b + 2 i c s - i c \nu) + (2 i f s - i f \nu) z \right) \right) \right) -$$

$$\frac{2^{1-\nu} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \left(\cos\left(b \sqrt{z}\right) + b \sqrt{z}\, \sin\left(b \sqrt{z}\right) \right)}{b^2} /; \nu \in \mathbb{N}^+$$

Involving $\cos(b\,z^r + e)\cosh^v(c\,z^r + f\,z)$

01.20.21.3270.01

$$\int \cos(b\,z^2+e)\cosh^v(c\,z^2+f\,z)\,dz == \frac{2^{-v-\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\cos(e)\,C\left(\sqrt{b}\sqrt{\frac{2}{\pi}}\,z\right)-S\left(\sqrt{b}\sqrt{\frac{2}{\pi}}\,z\right)\sin(e)\right)}{\sqrt{b}}+$$

$$2^{-v-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\left(\cos\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,v)}+e\right)C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(-b-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$\left.S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(-b-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,v)}+e\right)\right)+$$

$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\left(\cos\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(-b+2\,i\,c\,s-i\,c\,v)}+e\right)C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(-b+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(-b+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(-b+2\,i\,c\,s-i\,c\,v)}+e\right)\right)\right)\Big/;\ v\in\mathbb{N}^+$$

01.20.21.3271.01

$$\int \cos\left(\sqrt{z}\, b+e\right)\cosh^{v}\left(\sqrt{z}\, c+f z\right) dz =$$

$$2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i f v-2 i f s)^{3/2}}\left(\sqrt{2\pi}\,(b+2 i c s-i c v)\cos\left(\frac{(-b-2 i c s+i c v)^2}{4(i f v-2 i f s)}+e\right)\right.\right.$$

$$C\left(\frac{-b-2 i c s+i c v+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)-\sqrt{2\pi}\,(-b-2 i c s+i c v)$$

$$S\left(\frac{-b-2 i c s+i c v+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)\sin\left(\frac{(-b-2 i c s+i c v)^2}{4(i f v-2 i f s)}+e\right)-$$

$$\left.2\sqrt{i f v-2 i f s}\,\sin\left(e-(i f v-2 i f s) z-(-b-2 i c s+i c v)\sqrt{z}\right)\right)+\frac{1}{(2 i f s-i f v)^{3/2}}$$

$$\left(\sqrt{2\pi}\,(b-2 i c s+i c v)\cos\left(\frac{(-b+2 i c s-i c v)^2}{4(2 i f s-i f v)}+e\right)C\left(\frac{-b+2 i c s-i c v+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)-\right.$$

$$\sqrt{2\pi}\,(-b+2 i c s-i c v)S\left(\frac{-b+2 i c s-i c v+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)\sin\left(\frac{(-b+2 i c s-i c v)^2}{4(2 i f s-i f v)}+e\right)-$$

$$\left.\left.2\sqrt{2 i f s-i f v}\,\sin\left(e-(2 i f s-i f v) z-(-b+2 i c s-i c v)\sqrt{z}\right)\right)\right)-$$

$$\frac{2^{1-v}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\left(\cos\left(\sqrt{z}\, b+e\right)+b\sqrt{z}\,\sin\left(\sqrt{z}\, b+e\right)\right)}{b^2}\ /;\ v\in\mathbb{N}^{+}$$

Involving $\cos\left(b z^{r}+d z\right)\cosh^{v}\left(c z^{r}+f z\right)$

01.20.21.3272.01

$$\int \cos\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\cos\left(\frac{d^2}{4b}\right)C\left(\frac{d+2bz}{\sqrt{b}\sqrt{2\pi}}\right)+S\left(\frac{d+2bz}{\sqrt{b}\sqrt{2\pi}}\right)\sin\left(\frac{d^2}{4b}\right)\right)}{\sqrt{b}}+$$

$$2^{-\nu-\frac{1}{2}}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2ics+icv}}\left(\cos\left(\frac{(-d-2ifs+ifv)^2}{4(-b-2ics+icv)}\right)C\left(\frac{-d-2ifs+ifv+2(-b-2ics+icv)z}{\sqrt{2\pi}\sqrt{-b-2ics+icv}}\right)+\right.\right.$$

$$\left.S\left(\frac{-d-2ifs+ifv+2(-b-2ics+icv)z}{\sqrt{2\pi}\sqrt{-b-2ics+icv}}\right)\sin\left(\frac{(-d-2ifs+ifv)^2}{4(-b-2ics+icv)}\right)\right)+$$

$$\frac{1}{\sqrt{-b+2ics-icv}}\left(\cos\left(\frac{(-d+2ifs-ifv)^2}{4(-b+2ics-icv)}\right)C\left(\frac{-d+2ifs-ifv+2(-b+2ics-icv)z}{\sqrt{2\pi}\sqrt{-b+2ics-icv}}\right)+\right.$$

$$\left.\left.S\left(\frac{-d+2ifs-ifv+2(-b+2ics-icv)z}{\sqrt{2\pi}\sqrt{-b+2ics-icv}}\right)\sin\left(\frac{(-d+2ifs-ifv)^2}{4(-b+2ics-icv)}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3273.01

$$\int \cos\left(\sqrt{z}\,b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz == \frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left.\left(-b\sqrt{2\pi}\cos\left(\frac{b^2}{4d}\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{d}\sqrt{2\pi}}\right)-b\sqrt{2\pi}\,S\left(\frac{b+2d\sqrt{z}}{\sqrt{d}\sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4d}\right)+2\sqrt{d}\,\sin\left(\sqrt{z}\,b+d\,z\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\pi}\,(b+2ics-icv)\cos\left(\frac{(-b-2ics+icv)^2}{4(-d-2ifs+ifv)}\right)C\left(\frac{-b-2ics+icv+2(-d-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-d-2ifs+ifv}}\right)-\right.\right.$$

$$\sqrt{2\pi}\,(-b-2ics+icv)S\left(\frac{-b-2ics+icv+2(-d-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-d-2ifs+ifv}}\right)\sin\left(\frac{(-b-2ics+icv)^2}{4(-d-2ifs+ifv)}\right)+$$

$$\left.2\sqrt{-d-2ifs+ifv}\,\sin\left((-d-2ifs+ifv)z+(-b-2ics+icv)\sqrt{z}\right)\right)\Big/(-d-2ifs+ifv)^{3/2}+$$

$$\left(\sqrt{2\pi}\,(b-2ics+icv)\cos\left(\frac{(-b+2ics-icv)^2}{4(-d+2ifs-ifv)}\right)C\left(\frac{-b+2ics-icv+2(-d+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-d+2ifs-ifv}}\right)-\right.$$

$$\sqrt{2\pi}\,(-b+2ics-icv)S\left(\frac{-b+2ics-icv+2(-d+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{-d+2ifs-ifv}}\right)$$

$$\sin\left(\frac{(-b+2ics-icv)^2}{4(-d+2ifs-ifv)}\right)+2\sqrt{-d+2ifs-ifv}$$

$$\left.\left.\sin\left((-d+2ifs-ifv)z+(-b+2ics-icv)\sqrt{z}\right)\right)\Big/(-d+2ifs-ifv)^{3/2}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\cos(b z^r + d z + e) \cosh^v(c z^r + f z)$

01.20.21.3274.01

$$\int \cos(b z^2 + d z + e) \cosh^v(c z^2 + f z)\, dz ==$$

$$\frac{1}{\sqrt{b}}\left(2^{-v-\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b} - 4e\right)\right)C\left(\frac{d + 2bz}{\sqrt{b}\sqrt{2\pi}}\right) + S\left(\frac{d + 2bz}{\sqrt{b}\sqrt{2\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{d^2}{b} - 4e\right)\right)\right)\right) + 2^{-v-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{-b - 2ics + icv}}\left(\cos\left(\frac{(-d - 2ifs + ifv)^2}{4(-b - 2ics + icv)} + e\right)C\left(\frac{-d - 2ifs + ifv + 2(-b - 2ics + icv)z}{\sqrt{2\pi}\sqrt{-b - 2ics + icv}}\right) + \right.\right.$$

$$\left.S\left(\frac{-d - 2ifs + ifv + 2(-b - 2ics + icv)z}{\sqrt{2\pi}\sqrt{-b - 2ics + icv}}\right)\sin\left(\frac{(-d - 2ifs + ifv)^2}{4(-b - 2ics + icv)} + e\right)\right) +$$

$$\frac{1}{\sqrt{-b + 2ics - icv}}\left(\cos\left(\frac{(-d + 2ifs - ifv)^2}{4(-b + 2ics - icv)} + e\right)C\left(\frac{-d + 2ifs - ifv + 2(-b + 2ics - icv)z}{\sqrt{2\pi}\sqrt{-b + 2ics - icv}}\right) + \right.$$

$$\left.\left.S\left(\frac{-d + 2ifs - ifv + 2(-b + 2ics - icv)z}{\sqrt{2\pi}\sqrt{-b + 2ics - icv}}\right)\sin\left(\frac{(-d + 2ifs - ifv)^2}{4(-b + 2ics - icv)} + e\right)\right)\right) /; v \in \mathbb{N}^+$$

01.20.21.3275.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(-b\sqrt{2\pi}\ \cos\left(\frac{b^2}{4d}-e\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)-b\sqrt{2\pi}\ S\left(\frac{b+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4d}-e\right)+\right.\right.$$

$$\left.\left.2\sqrt{d}\ \sin\left(\sqrt{z}\ b+e+d\,z\right)\right)\right)+2^{-\nu-1}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\pi}\ (b+2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e\right)C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\right.\right.$$

$$\sqrt{2\pi}\ (-b-2\,i\,c\,s+i\,c\,\nu)\,S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)$$

$$\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e\right)-2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}$$

$$\left.\left.\sin\left(e-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+\right.$$

$$\left(\sqrt{2\pi}\ (b-2\,i\,c\,s+i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e\right)C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-\right.$$

$$\sqrt{2\pi}\ (-b+2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$

$$\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e\right)-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}$$

$$\left.\left.\left.\sin\left(e-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)\right/;\ \nu\in\mathbb{N}^+$$

Involving $\cos(d\,z)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.3276.01

$$\int \cos(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == -\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sin(d\,z)}{d}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.3277.01

$$\int \cos(d\,z)\cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(d\,z)}{d}+2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\left(\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)C\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\right.\right.$$
$$\sqrt{2\,\pi}\,(i\,c\,\nu-2\,i\,c\,s)\,S\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)$$
$$\sin\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)-2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}$$
$$\left.\sin\left(2\,i\,g\,s-i\,g\,\nu-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+$$
$$\left(\sqrt{2\,\pi}\,(i\,c\,\nu-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)C\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-\right.$$
$$\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$
$$\sin\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}$$
$$\left.\left.\sin\left(-2\,g\,i\,s+i\,g\,\nu-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\cos(d\,z+e)\cosh^{\nu}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.3278.01

$$\int \cos(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == -\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sin(e+d\,z)}{d}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)C\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$
$$\left.S\left(\frac{-d-2\,i\,f\,s+i\,f\,\nu+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(-d-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+e+g\,i\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)C\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{-d+2\,i\,f\,s-i\,f\,\nu+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(-d+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}+e-i\,g\,(2\,s-\nu)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3279.01

$$\int \cos(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sin(e+d\,z)}{d} +$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}}\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e+2\,i\,g\,s-i\,g\,\nu\right)\right.\right.$$

$$C\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)$$

$$S\left(\frac{-2\,c\,i\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\sin\left(\frac{(i\,c\,\nu-2\,i\,c\,s)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+e+2\,i\,g\,s-i\,g\,\nu\right)-$$

$$\left.\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\;\sin\left(e+2\,i\,g\,s-i\,g\,\nu-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(i\,c\,\nu-2\,i\,c\,s)\sqrt{z}\right)\right)+\right.$$

$$\frac{1}{(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(\sqrt{2\,\pi}\;(i\,c\,\nu-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)\right.$$

$$C\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,\nu)$$

$$S\left(\frac{2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)\sin\left(\frac{(2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)-$$

$$\left.\left.\left.2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\;\sin\left(e-2\,i\,g\,s+i\,g\,\nu-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\right)\right/;\;\nu\in\mathbb{N}^{+}$$

Involving $\cos\left(b\,z^{r}\right)\cosh^{\nu}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.3280.01

$$\int \cos\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == \frac{2^{-\nu-\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,C\left(\sqrt{b}\,\sqrt{\frac{2}{\pi}}\,z\right)}{\sqrt{b}}+2^{-\nu-\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\left(\cos\left(\frac{(i\,f\,\nu-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{-2\,f\,i\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)+\right.\right.$$
$$\left.S\left(\frac{-2\,f\,i\,s+i\,f\,\nu+2\,(-b-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{(i\,f\,\nu-2\,i\,f\,s)^2}{4\,(-b-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)\right)+$$
$$\frac{1}{\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(\frac{(2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)C\left(\frac{2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,i\,f\,s-i\,f\,\nu+2\,(-b+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{-b+2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(\frac{(2\,i\,f\,s-i\,f\,\nu)^2}{4\,(-b+2\,i\,c\,s-i\,c\,\nu)}-i\,g\,(2\,s-\nu)\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3281.01

$$\int \cos\left(b\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right)dz ==$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,f\,\nu-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\,\pi}\;(b+2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}+2\,i\,g\,s-i\,g\,\nu\right)\right.\right.$$

$$C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)-\sqrt{2\,\pi}\;(-b-2\,i\,c\,s+i\,c\,\nu)$$

$$S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(i\,f\,\nu-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,f\,\nu-2\,i\,f\,s}}\right)\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(i\,f\,\nu-2\,i\,f\,s)}+2\,i\,g\,s-i\,g\,\nu\right)-$$

$$\left.2\sqrt{i\,f\,\nu-2\,i\,f\,s}\;\sin\left(2\,i\,g\,s-i\,g\,\nu-(i\,f\,\nu-2\,i\,f\,s)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,\nu)^{3/2}}\left(\sqrt{2\,\pi}\;(b-2\,i\,c\,s+i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)\right.$$

$$C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)-\sqrt{2\,\pi}\;(-b+2\,i\,c\,s-i\,c\,\nu)$$

$$S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,s-i\,f\,\nu}}\right)\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)-$$

$$\left.\left.2\sqrt{2\,i\,f\,s-i\,f\,\nu}\;\sin\left(-2\,g\,i\,s+i\,g\,\nu-(2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\right)-$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(\cos\left(b\sqrt{z}\right)+b\sqrt{z}\;\sin\left(b\sqrt{z}\right)\right)}{b^2}\;/;\;\nu\in\mathbb{N}^+$$

Involving $\cos\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.3282.01

$$\int \cos\left(b z^2+e\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\left(\cos(e) C\left(\sqrt{b}\ \sqrt{\frac{2}{\pi}}\ z\right)-S\left(\sqrt{b}\ \sqrt{\frac{2}{\pi}}\ z\right) \sin(e)\right)}{\sqrt{b}}+2^{-\nu-\frac{1}{2}} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s}$$

$$\left(\frac{1}{\sqrt{-b-2 i c s+i c \nu}}\left(\cos\left(\frac{(i f \nu-2 i f s)^2}{4(-b-2 i c s+i c \nu)}+e+g i (2 s-\nu)\right) C\left(\frac{-2 f i s+i f \nu+2(-b-2 i c s+i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b-2 i c s+i c \nu}}\right)+\right.\right.$$

$$\left.S\left(\frac{-2 f i s+i f \nu+2(-b-2 i c s+i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b-2 i c s+i c \nu}}\right) \sin\left(\frac{(i f \nu-2 i f s)^2}{4(-b-2 i c s+i c \nu)}+e+g i (2 s-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{-b+2 i c s-i c \nu}}\left(\cos\left(\frac{(2 i f s-i f \nu)^2}{4(-b+2 i c s-i c \nu)}+e-i g (2 s-\nu)\right) C\left(\frac{2 i f s-i f \nu+2(-b+2 i c s-i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b+2 i c s-i c \nu}}\right)+\right.$$

$$\left.\left.S\left(\frac{2 i f s-i f \nu+2(-b+2 i c s-i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b+2 i c s-i c \nu}}\right) \sin\left(\frac{(2 i f s-i f \nu)^2}{4(-b+2 i c s-i c \nu)}+e-i g (2 s-\nu)\right)\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3283.01

$$\int \cos\left(\sqrt{z}\, b+e\right)\cosh^{v}\left(\sqrt{z}\, c+g+f z\right)dz ==$$

$$2^{-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i f v-2 i f s)^{3/2}}\left(\sqrt{2\pi}\,(b+2 i c s-i c v)\cos\left(\frac{(-b-2 i c s+i c v)^2}{4(i f v-2 i f s)}+e+2 i g s-i g v\right)\right.\right.$$

$$C\left(\frac{-b-2 i c s+i c v+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)-\sqrt{2\pi}\,(-b-2 i c s+i c v)$$

$$S\left(\frac{-b-2 i c s+i c v+2(i f v-2 i f s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i f v-2 i f s}}\right)\sin\left(\frac{(-b-2 i c s+i c v)^2}{4(i f v-2 i f s)}+e+2 i g s-i g v\right)-$$

$$\left.2\sqrt{i f v-2 i f s}\,\sin\left(e+2 i g s-i g v-(i f v-2 i f s) z-(-b-2 i c s+i c v)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2 i f s-i f v)^{3/2}}\left(\sqrt{2\pi}\,(b-2 i c s+i c v)\cos\left(\frac{(-b+2 i c s-i c v)^2}{4(2 i f s-i f v)}+e-2 i g s+i g v\right)\right.$$

$$C\left(\frac{-b+2 i c s-i c v+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)-\sqrt{2\pi}\,(-b+2 i c s-i c v)$$

$$S\left(\frac{-b+2 i c s-i c v+2(2 i f s-i f v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2 i f s-i f v}}\right)\sin\left(\frac{(-b+2 i c s-i c v)^2}{4(2 i f s-i f v)}+e-2 i g s+i g v\right)-$$

$$\left.\left.2\sqrt{2 i f s-i f v}\,\sin\left(e-2 i g s+i g v-(2 i f s-i f v) z-(-b+2 i c s-i c v)\sqrt{z}\right)\right)\right)-$$

$$\frac{2^{1-v}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\left(\cos\left(\sqrt{z}\, b+e\right)+b\sqrt{z}\,\sin\left(\sqrt{z}\, b+e\right)\right)}{b^2}\ /;\ v\in\mathbb{N}^{+}$$

Involving $\cos\left(b z^{r}+d z\right)\cosh^{v}\left(c z^{r}+f z+g\right)$

01.20.21.3284.01

$$\int \cos\left(b z^2 + d z\right) \cosh^{\nu}\left(c z^2 + f z + g\right) dz ==$$

$$\frac{2^{-\nu-\frac{1}{2}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(\cos\left(\frac{d^2}{4b}\right) C\left(\frac{d+2bz}{\sqrt{b}\sqrt{2\pi}}\right) + S\left(\frac{d+2bz}{\sqrt{b}\sqrt{2\pi}}\right) \sin\left(\frac{d^2}{4b}\right)\right)}{\sqrt{b}} + 2^{-\nu-\frac{1}{2}} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s}$$

$$\left(\frac{1}{\sqrt{-b-2ics+icv}} \left(\cos\left(\frac{(-d-2ifs+ifv)^2}{4(-b-2ics+icv)} + gi(2s-\nu)\right) C\left(\frac{-d-2ifs+ifv+2(-b-2ics+icv)z}{\sqrt{2\pi}\sqrt{-b-2ics+icv}}\right) + S\left(\frac{-d-2ifs+ifv+2(-b-2ics+icv)z}{\sqrt{2\pi}\sqrt{-b-2ics+icv}}\right) \sin\left(\frac{(-d-2ifs+ifv)^2}{4(-b-2ics+icv)} + gi(2s-\nu)\right)\right) + \frac{1}{\sqrt{-b+2ics-icv}} \left(\cos\left(\frac{(-d+2ifs-ifv)^2}{4(-b+2ics-icv)} - ig(2s-\nu)\right) C\left(\frac{-d+2ifs-ifv+2(-b+2ics-icv)z}{\sqrt{2\pi}\sqrt{-b+2ics-icv}}\right) + S\left(\frac{-d+2ifs-ifv+2(-b+2ics-icv)z}{\sqrt{2\pi}\sqrt{-b+2ics-icv}}\right) \sin\left(\frac{(-d+2ifs-ifv)^2}{4(-b+2ics-icv)} - ig(2s-\nu)\right)\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3285.01

$$\int \cos\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left.\left(-b\sqrt{2\pi}\ \cos\left(\frac{b^2}{4\,d}\right)C\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)-b\sqrt{2\pi}\ S\left(\frac{b+2\,d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4\,d}\right)+2\sqrt{d}\ \sin\left(\sqrt{z}\ b+d\,z\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\pi}\ (b+2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)\right.\right.$$

$$C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\sqrt{2\pi}\ (-b-2\,i\,c\,s+i\,c\,\nu)$$

$$S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2\,(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4\,(-d-2\,i\,f\,s+i\,f\,\nu)}+2\,i\,g\,s-i\,g\,\nu\right)-$$

$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\ \sin\left(2\,i\,g\,s-i\,g\,\nu-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)\Big/$$

$$(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+\left(\sqrt{2\pi}\ (b-2\,i\,c\,s+i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)\right.$$

$$C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-$$

$$\sqrt{2\pi}\ (-b+2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2\,(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$

$$\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4\,(-d+2\,i\,f\,s-i\,f\,\nu)}-2\,i\,g\,s+i\,g\,\nu\right)-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}$$

$$\left.\left.\sin\left(-2\,g\,i\,s+i\,g\,\nu-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $\cos\left(b\,z^{r}+d\,z+e\right)\cosh^{\nu}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.3286.01

$$\int \cos\left(b z^2+d z+e\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{\sqrt{b}}\left(2^{-\nu-\frac{1}{2}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\left(\cos\left(\frac{1}{4}\left(\frac{d^2}{b}-4 e\right)\right) C\left(\frac{d+2 b z}{\sqrt{b}\ \sqrt{2 \pi}}\right)+S\left(\frac{d+2 b z}{\sqrt{b}\ \sqrt{2 \pi}}\right) \sin\left(\frac{1}{4}\left(\frac{d^2}{b}-4 e\right)\right)\right)\right)+$$

$$2^{-\nu-\frac{1}{2}} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s}\left(\frac{1}{\sqrt{-b-2 i c s+i c \nu}}\left(\cos\left(\frac{(-d-2 i f s+i f \nu)^2}{4(-b-2 i c s+i c \nu)}+e+g i (2 s-\nu)\right)\right.\right.$$

$$\left. C\left(\frac{-d-2 i f s+i f \nu+2(-b-2 i c s+i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b-2 i c s+i c \nu}}\right)+S\left(\frac{-d-2 i f s+i f \nu+2(-b-2 i c s+i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b-2 i c s+i c \nu}}\right)\right.$$

$$\left.\left. \sin\left(\frac{(-d-2 i f s+i f \nu)^2}{4(-b-2 i c s+i c \nu)}+e+g i (2 s-\nu)\right)\right)+\frac{1}{\sqrt{-b+2 i c s-i c \nu}}\right.$$

$$\left.\left(\cos\left(\frac{(-d+2 i f s-i f \nu)^2}{4(-b+2 i c s-i c \nu)}+e-i g (2 s-\nu)\right) C\left(\frac{-d+2 i f s-i f \nu+2(-b+2 i c s-i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b+2 i c s-i c \nu}}\right)+\right.\right.$$

$$\left.\left. S\left(\frac{-d+2 i f s-i f \nu+2(-b+2 i c s-i c \nu) z}{\sqrt{2 \pi}\ \sqrt{-b+2 i c s-i c \nu}}\right) \sin\left(\frac{(-d+2 i f s-i f \nu)^2}{4(-b+2 i c s-i c \nu)}+e-i g (2 s-\nu)\right)\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3287.01

$$\int \cos\left(b z^2+d z+e\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{b}\left(i 2^{-\nu-2} e^{\frac{i\left(-d^2-4 b e\right)}{4 b}} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}}\left(-i \sqrt{-i b}\ e^{\frac{i d^2}{2 b}} \operatorname{erf}\left(\frac{\sqrt{-i b}\ (i d+2 i b z)}{2 b}\right)-\sqrt{i b}\ e^{2 i e} \operatorname{erfi}\left(\frac{i d+2 i b z}{2 \sqrt{i b}}\right)\right)(1-\nu \bmod 2)\right)+$$

$$2^{-\nu-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k}\left(\frac{1}{-i b-2 c k+c \nu}\left(e^{-\frac{(i d+2 f k-f \nu)^2}{4 i b+8 c k-4 c \nu}+i e-2 g \nu+g (\nu-2 k)}\right.\right.$$

$$\left(e^{2\left(\frac{(i d+2 f k-f \nu)^2}{4 i b+8 c k-4 c \nu}-i e+g \nu\right)} \sqrt{-i b-2 c k+c \nu}\ \operatorname{erfi}\left(\frac{-i d-2 i b z-2 k (f+2 c z)+\nu (f+2 c z)}{2 \sqrt{-i b-2 c k+c \nu}}\right)-\right.$$

$$\left.\left.\left. e^{4 g k} \sqrt{i b+2 c k-c \nu}\ \operatorname{erfi}\left(\frac{i d+2 i b z+2 k (f+2 c z)-\nu (f+2 c z)}{2 \sqrt{i b+2 c k-c \nu}}\right)\right)\right)-\right.$$

$$\frac{1}{i b+c (\nu-2 k)}\left(e^{-\frac{(i d-2 f k+f \nu)^2}{-4 i b+8 c k-4 c \nu}-i e+g (2 k-\nu)} \sqrt{-i b+2 c k-c \nu}\ \operatorname{erfi}\left(\frac{-i d-2 i b z+2 k (f+2 c z)-\nu (f+2 c z)}{2 \sqrt{-i b+2 c k-c \nu}}\right)\right)+$$

$$\left.\frac{e^{\frac{(i d-2 f k+f \nu)^2}{-4 i b+8 c k-4 c \nu}+i e+g (\nu-2 k)} \operatorname{erfi}\left(\frac{i d+2 i b z-2 k (f+2 c z)+\nu (f+2 c z)}{2 \sqrt{i b+c (\nu-2 k)}}\right)}{\sqrt{i b+c (\nu-2 k)}}\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3288.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{d^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\left.\left(-b\sqrt{2\pi}\ \cos\left(\frac{b^2}{4d}-e\right)C\left(\frac{b+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)-b\sqrt{2\pi}\ S\left(\frac{b+2d\sqrt{z}}{\sqrt{d}\ \sqrt{2\pi}}\right)\sin\left(\frac{b^2}{4d}-e\right)+2\sqrt{d}\ \sin\left(\sqrt{z}\ b+e+d\,z\right)\right)\right)+$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\sqrt{2\pi}\ (b+2\,i\,c\,s-i\,c\,\nu)\cos\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4(-d-2\,i\,f\,s+i\,f\,\nu)}+e+2\,i\,g\,s-i\,g\,\nu\right)\right.\right.$$

$$C\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)-\sqrt{2\pi}\ (-b-2\,i\,c\,s+i\,c\,\nu)$$

$$S\left(\frac{-b-2\,i\,c\,s+i\,c\,\nu+2(-d-2\,i\,f\,s+i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d-2\,i\,f\,s+i\,f\,\nu}}\right)\sin\left(\frac{(-b-2\,i\,c\,s+i\,c\,\nu)^2}{4(-d-2\,i\,f\,s+i\,f\,\nu)}+e+2\,i\,g\,s-i\,g\,\nu\right)-$$

$$\left.2\sqrt{-d-2\,i\,f\,s+i\,f\,\nu}\ \sin\left(e+2\,i\,g\,s-i\,g\,\nu-(-d-2\,i\,f\,s+i\,f\,\nu)\,z-(-b-2\,i\,c\,s+i\,c\,\nu)\sqrt{z}\right)\right)\Big/$$

$$(-d-2\,i\,f\,s+i\,f\,\nu)^{3/2}+\left(\sqrt{2\pi}\ (b-2\,i\,c\,s+i\,c\,\nu)\cos\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4(-d+2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)\right.$$

$$C\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)-$$

$$\sqrt{2\pi}\ (-b+2\,i\,c\,s-i\,c\,\nu)\,S\left(\frac{-b+2\,i\,c\,s-i\,c\,\nu+2(-d+2\,i\,f\,s-i\,f\,\nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{-d+2\,i\,f\,s-i\,f\,\nu}}\right)$$

$$\sin\left(\frac{(-b+2\,i\,c\,s-i\,c\,\nu)^2}{4(-d+2\,i\,f\,s-i\,f\,\nu)}+e-2\,i\,g\,s+i\,g\,\nu\right)-2\sqrt{-d+2\,i\,f\,s-i\,f\,\nu}\ \sin($$

$$\left.\left.e-2\,i\,g\,s+i\,g\,\nu-(-d+2\,i\,f\,s-i\,f\,\nu)\,z-(-b+2\,i\,c\,s-i\,c\,\nu)\sqrt{z}\right)\Big/(-d+2\,i\,f\,s-i\,f\,\nu)^{3/2}\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.3289.01

$$\int \cos\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(\frac{b\,e^{\frac{i\,b^2}{4\,d}}\,i\,\sqrt{\pi}\ \text{erfi}\left(\frac{-i\,b-2\,i\,d\,\sqrt{z}}{2\sqrt{-i\,d}}\right)}{(-i\,d)^{3/2}}+\frac{4\,e^{i\,e}\sin\left(\sqrt{z}\ b+e+d\,z\right)}{d}-\frac{i\,b\,e^{2\,i\,e-\frac{i\,b^2}{4\,d}}\,\sqrt{\pi}\ \text{erfi}\left(\frac{i\,b+2\,i\,d\,\sqrt{z}}{2\sqrt{i\,d}}\right)}{(i\,d)^{3/2}}\right)e^{-i\,e}\binom{\nu}{\frac{\nu}{2}}$$

$$(1-\nu \bmod 2)+2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{4\,i\sin\left(e+2\,i\,g\,k-i\,g\,\nu+i\,(-i\,d+2\,f\,k-f\,\nu)\,z-i\,(i\,b+c\,(\nu-2\,k))\,\sqrt{z}\right)}{i\,d+f\,(\nu-2\,k)}+\right.$$

$$\frac{4\,i\sin\left(e-2\,i\,g\,k+i\,g\,\nu-i\,(i\,d+2\,f\,k-f\,\nu)\,z-i\,(i\,b+2\,c\,k-c\,\nu)\,\sqrt{z}\right)}{i\,d+2\,f\,k-f\,\nu}-$$

$$\frac{1}{(-i\,d-2\,f\,k+f\,\nu)^{3/2}}\left(e^{-\frac{(-i\,b-2\,c\,k+c\,\nu)^2}{4\,(-i\,d-2\,f\,k+f\,\nu)}-i\,e-2\,g\,k+g\,\nu}\,\sqrt{\pi}\ (-i\,b-2\,c\,k+c\,\nu)\right.$$

$$\left.\text{erfi}\left(\frac{-i\,b-2\,c\,k+c\,\nu+2\,(-i\,d-2\,f\,k+f\,\nu)\,\sqrt{z}}{2\sqrt{-i\,d-2\,f\,k+f\,\nu}}\right)\right)-\frac{1}{(-i\,d+2\,f\,k-f\,\nu)^{3/2}}$$

$$\left(e^{-\frac{(-i\,b+2\,c\,k-c\,\nu)^2}{4\,(-i\,d+2\,f\,k-f\,\nu)}-i\,e+2\,g\,k-g\,\nu}\,\sqrt{\pi}\ (-i\,b+2\,c\,k-c\,\nu)\,\text{erfi}\left(\frac{-i\,b+2\,c\,k-c\,\nu+2\,(-i\,d+2\,f\,k-f\,\nu)\,\sqrt{z}}{2\sqrt{-i\,d+2\,f\,k-f\,\nu}}\right)\right)-$$

$$\left(e^{-\frac{(i\,b+2\,c\,k-c\,\nu)^2}{4\,(i\,d+2\,f\,k-f\,\nu)}+i\,e+2\,g\,k-g\,\nu}\,\sqrt{\pi}\ (i\,b+2\,c\,k-c\,\nu)\,\text{erfi}\left(\frac{i\,b+2\,c\,k-c\,\nu+2\,(i\,d+2\,f\,k-f\,\nu)\,\sqrt{z}}{2\sqrt{i\,d+2\,f\,k-f\,\nu}}\right)\right)\Big/$$

$$(i\,d+2\,f\,k-f\,\nu)^{3/2}-\left(e^{-\frac{(i\,b+c\,(\nu-2\,k))^2}{4\,(i\,d+f\,(\nu-2\,k))}+i\,e-2\,g\,k+g\,\nu}\,\sqrt{\pi}\ (i\,b+c\,(\nu-2\,k))\right.$$

$$\left.\left.\text{erfi}\left(\frac{i\,b-2\,c\,k+c\,\nu+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}}{2\sqrt{i\,d+f\,(\nu-2\,k)}}\right)\right)\Big/(i\,d+f\,(\nu-2\,k))^{3/2}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving powers of cos

Involving $\cos^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3290.01

$$\int \cos^{\mu}(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu}\cos^{\mu}(c\,z)\left(\left(1+e^{-2\,i\,c\,z}\right)^{-\mu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{2\,a\,z\,k-a\,\nu\,z}}{2\,a\,k-a\,\nu+i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(2\,a\,k-a\,\nu+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(2\,a\,k-a\,\nu+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,c\,z}\right)-\right.\right.$$
$$\left.\left.\frac{e^{a\,(\nu-2\,k)\,z}}{2\,a\,k-a\,\nu-i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(a\,(\nu-2\,k)+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(a\,(\nu-2\,k)+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,c\,z}\right)\right)-$$
$$\left.\frac{i}{c\,\mu}\left(1+e^{2\,i\,c\,z}\right)^{-\mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,-e^{2\,i\,c\,z}\right)(\nu \bmod 2-1)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3291.01

$$\int \cos^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-m}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\left(\frac{m \bmod 2-1}{a\,\nu}\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{2\,a\,z}\right)-\right.$$
$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{i\,e^{i\,(m-2\,s)\,c\,z}}{c\,(m-2\,s)+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,s)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{i\,c\,(m-2\,s)-a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)+\right.$$
$$\left.\left.\left.\frac{e^{-i\,c\,(m-2\,s)\,z}}{c\,i\,(m-2\,s)+a\,\nu}\,{}_2F_1\left(-\frac{c\,i\,(m-2\,s)+a\,\nu}{2\,a},\,-\nu;\,-\frac{c\,i\,(m-2\,s)+a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3292.01

$$\int \cos^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz ==$$
$$2^{-m-\nu}\left(z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\frac{2\,(\nu \bmod 2-1)}{c}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\sin((m-2\,s)\,c\,z)\binom{m}{s}}{m-2\,s}\right)+\right.$$
$$\frac{2}{a}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\sinh((2\,k-\nu)\,a\,z)\binom{\nu}{k}}{2\,k-\nu}-\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{e^{(c\,i\,(m-2\,s)+a\,(2\,k-\nu))\,z}}{a\,(\nu-2\,k)-i\,c\,(m-2\,s)}-\right.$$
$$\left.\left.\frac{e^{(c\,i\,(m-2\,s)+a\,(\nu-2\,k))\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\frac{e^{2\,a\,z\,k-i\,c\,m\,z+2\,i\,c\,s\,z-a\,\nu\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\frac{e^{(a\,(\nu-2\,k)-i\,c\,(m-2\,s))\,z}}{c\,i\,(m-2\,s)+a\,(2\,k-\nu)}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\cos^{\mu}(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3293.01

$$\int \cos^{\mu}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu}\cos^{\mu}(d+c\,z)$$
$$\left(\left(1+e^{-2\,i\,(d+c\,z)}\right)^{-\mu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{e^{2\,a\,z\,k-a\,\nu\,z}}{2\,a\,k-a\,\nu+i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(2\,a\,k-a\,\nu+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(2\,a\,k-a\,\nu+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,(d+c\,z)}\right)-\right.\right.$$
$$\left.\left.\frac{e^{a\,(\nu-2\,k)\,z}}{2\,a\,k-a\,\nu-i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(a\,(\nu-2\,k)+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(a\,(\nu-2\,k)+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,(d+c\,z)}\right)\right)-$$
$$\left.\frac{i}{c\,\mu}\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,-e^{2\,i\,(d+c\,z)}\right)(\nu \bmod 2-1)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3294.01

$$\int \cos^{m}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-m}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\left(\frac{m \bmod 2-1}{a\,\nu}\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{2\,a\,z}\right)-\right.$$
$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-i\,d\,(m-2\,s)}\binom{m}{s}\left(\frac{i\,e^{i\,(m-2\,s)\,(2\,d+c\,z)}}{c\,(m-2\,s)+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,s)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{i\,c\,(m-2\,s)-a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)+\right.$$
$$\left.\left.\frac{e^{-i\,c\,(m-2\,s)\,z}}{c\,i\,(m-2\,s)+a\,\nu}\,{}_2F_1\left(-\frac{c\,i\,(m-2\,s)+a\,\nu}{2\,a},\,-\nu;\,-\frac{c\,i\,(m-2\,s)+a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3295.01

$$\int \cos^{m}(d+c\,z)\cosh^{\nu}(a\,z)\,dz ==$$
$$2^{-m-\nu}\left(z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\frac{2\,(\nu \bmod 2-1)}{c}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\sin((m-2\,s)\,(d+c\,z))\binom{m}{s}}{m-2\,s}\right)+\right.$$
$$\frac{2}{a}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\sinh((2\,k-\nu)\,a\,z)\binom{\nu}{k}}{2\,k-\nu}-\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-i\,d\,(m+2\,s)}\binom{m}{s}\left(\frac{e^{2\,i\,d\,m+(c\,i\,(m-2\,s)+a\,(2\,k-\nu))\,z}}{a\,(\nu-2\,k)-i\,c\,(m-2\,s)}-\right.$$
$$\left.\left.\frac{e^{2\,i\,d\,m+(c\,i\,(m-2\,s)+a\,(\nu-2\,k))\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\frac{e^{2\,a\,z\,k+4\,i\,d\,s-i\,c\,m\,z+2\,i\,c\,s\,z-a\,\nu\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\frac{e^{4\,i\,d\,s+(a\,(\nu-2\,k)-i\,c\,(m-2\,s))\,z}}{c\,i\,(m-2\,s)+a\,(2\,k-\nu)}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\cos^{\mu}(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.3296.01

$$\int \cos^{\mu}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu}\cos^{\mu}(c\,z)$$

$$\left(\left(1+e^{-2\,i\,c\,z}\right)^{-\mu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{b\,(\nu-2\,k)}\binom{\nu}{k}\left(\frac{e^{4\,b\,k+2\,a\,z\,k-2\,b\,\nu-a\,\nu\,z}}{2\,a\,k-a\,\nu+i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(2\,a\,k-a\,\nu+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(2\,a\,k-a\,\nu+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,c\,z}\right)-\right.\right.$$

$$\left.\left.\frac{e^{a\,(\nu-2\,k)\,z}}{2\,a\,k-a\,\nu-i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(a\,(\nu-2\,k)+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(a\,(\nu-2\,k)+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,c\,z}\right)\right)-\right.$$

$$\left.\frac{i}{c\,\mu}\left(1+e^{2\,i\,c\,z}\right)^{-\mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,-e^{2\,i\,c\,z}\right)(\nu \bmod 2-1)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3297.01

$$\int \cos^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-m}\left(1+e^{2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\left(\frac{m \bmod 2-1}{a\,\nu}\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{2\,(b+a\,z)}\right)-\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{i\,e^{i\,(m-2\,s)\,c\,z}}{c\,(m-2\,s)+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,s)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{i\,c\,(m-2\,s)-a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)+\right.$$

$$\left.\left.\frac{e^{-i\,c\,(m-2\,s)\,z}}{c\,i\,(m-2\,s)+a\,\nu}\,{}_2F_1\left(-\frac{c\,i\,(m-2\,s)+a\,\nu}{2\,a},\,-\nu;\,-\frac{c\,i\,(m-2\,s)+a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3298.01

$$\int \cos^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$2^{-m-\nu}\left(z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\frac{2\,(\nu \bmod 2-1)}{c}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\sin((m-2\,s)\,c\,z)\binom{m}{s}}{m-2\,s}\right)+\right.$$

$$\frac{2}{a}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\sinh((2\,k-\nu)\,(b+a\,z))\binom{\nu}{k}}{2\,k-\nu}-\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-b\,(2\,k+\nu)}\binom{m}{s}\left(\frac{e^{4\,b\,k+(c\,i\,(m-2\,s)+a\,(2\,k-\nu))\,z}}{a\,(\nu-2\,k)-i\,c\,(m-2\,s)}-\right.$$

$$\left.\left.\frac{e^{2\,b\,\nu+(c\,i\,(m-2\,s)+a\,(\nu-2\,k))\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\frac{e^{4\,b\,k+2\,a\,z\,k-i\,c\,m\,z+2\,i\,c\,s\,z-a\,\nu\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\frac{e^{2\,b\,\nu+(a\,(\nu-2\,k)-i\,c\,(m-2\,s))\,z}}{c\,i\,(m-2\,s)+a\,(2\,k-\nu)}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\cos^{\mu}(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.3299.01

$$\int \cos^{\mu}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu}\cos^{\mu}(d+c\,z)\left(\left(1+e^{-2\,i\,(d+c\,z)}\right)^{-\mu}\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{b\,(\nu-2\,k)}\binom{\nu}{k}\left(\frac{e^{4\,b\,k+2\,a\,z\,k-2\,b\,\nu-a\,\nu\,z}}{2\,a\,k-a\,\nu+i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(2\,a\,k-a\,\nu+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(2\,a\,k-a\,\nu+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,(d+c\,z)}\right)-\right.$$

$$\left.\left.\frac{e^{a\,(\nu-2\,k)\,z}}{2\,a\,k-a\,\nu-i\,c\,\mu}\,{}_2F_1\left(\frac{i\,(a\,(\nu-2\,k)+i\,c\,\mu)}{2\,c},\,-\mu;\,\frac{i\,(a\,(\nu-2\,k)+c\,i\,(\mu-2))}{2\,c};\,-e^{-2\,i\,(d+c\,z)}\right)\right)-\right.$$

$$\left.\frac{i}{c\,\mu}\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,-e^{2\,i\,(d+c\,z)}\right)(\nu \bmod 2-1)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3300.01

$$\int \cos^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-m}\left(1+e^{2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\left(\frac{m \bmod 2-1}{a\,\nu}\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{2\,(b+a\,z)}\right)-\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-i\,d\,(m-2\,s)}\binom{m}{s}\left(\frac{i\,e^{i\,(m-2\,s)\,(2\,d+c\,z)}}{c\,(m-2\,s)+i\,a\,\nu}\,{}_2F_1\left(\frac{i\,(c\,(m-2\,s)+i\,a\,\nu)}{2\,a},\,-\nu;\,\frac{i\,c\,(m-2\,s)-a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)+\right.$$

$$\left.\left.\frac{e^{-i\,c\,(m-2\,s)\,z}}{c\,i\,(m-2\,s)+a\,\nu}\,{}_2F_1\left(-\frac{c\,i\,(m-2\,s)+a\,\nu}{2\,a},\,-\nu;\,-\frac{c\,i\,(m-2\,s)+a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)\right)\right/;\,\nu\in\mathbb{N}^+$$

01.20.21.3301.01

$$\int \cos^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-m-\nu}\left(z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)-\right.$$

$$\frac{2\,(\nu \bmod 2-1)}{c}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\sin((m-2\,s)\,(d+c\,z))\binom{m}{s}}{m-2\,s}\right)+\frac{2}{a}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\sinh((2\,k-\nu)\,(b+a\,z))\binom{\nu}{k}}{2\,k-\nu}-$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-i\,d\,(m+2\,s)-b\,(2\,k+\nu)}\binom{m}{s}\left(\frac{e^{4\,b\,k+2\,i\,d\,m+(c\,i\,(m-2\,s)+a\,(2\,k-\nu))\,z}}{a\,(\nu-2\,k)-i\,c\,(m-2\,s)}-\frac{e^{2\,i\,d\,m+2\,b\,\nu+(c\,i\,(m-2\,s)+a\,(\nu-2\,k))\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\right.$$

$$\left.\left.\frac{e^{4\,b\,k+2\,a\,z\,k+4\,i\,d\,s-i\,c\,m\,z+2\,i\,c\,s\,z-a\,\nu\,z}}{c\,i\,(m-2\,s)+a\,(\nu-2\,k)}+\frac{e^{4\,i\,d\,s+2\,b\,\nu+(a\,(\nu-2\,k)-i\,c\,(m-2\,s))\,z}}{c\,i\,(m-2\,s)+a\,(2\,k-\nu)}\right)\right/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\cos^{m}(b\,z^{r})\cosh^{\nu}(c\,z)$

01.20.21.3302.01

$$\int \cos^m\left(b\,z^2\right)\cosh^v(c\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(2\,c\,k\,z-v\,c\,z)}{2\,k-v}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}\right)\right)\right)\Big/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3303.01

$$\int \cos^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz ==$$

$$(-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\sinh(c\,(v-2\,k)\,z)}{v-2\,k}+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(b\,(2\,k-m)\,\sqrt{z}\right)+b\,(2\,k-m)\,\sqrt{z}\,\sin\left(b\,(2\,k-m)\,\sqrt{z}\right)\right)}{(m-2\,k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(2\,i\,c\,k-i\,c\,v)^{3/2}}\left(2\sqrt{2\,i\,c\,k-i\,c\,v}\,\sin\left(\sqrt{z}\,(2\,b\,s-b\,m)+c\,i\,(2\,k-v)\,z\right)+b\sqrt{2\,\pi}\,(m-2\,s)\right.\right.$$

$$\left.\left(\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}\right)C\left(\frac{2\,i\,c\,(2\,k-v)\,\sqrt{z}-b\,(m-2\,s)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)-i\,S\left(\frac{2\,i\,c\,(2\,k-v)\,\sqrt{z}-b\,(m-2\,s)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)\right.\right.$$

$$\left.\left.\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}\right)\right)\right)+\frac{1}{(2\,i\,c\,k-i\,c\,v)^{3/2}}\left(2\sqrt{2\,i\,c\,k-i\,c\,v}\,\sin\left(\sqrt{z}\,(b\,m-2\,b\,s)+\right.\right.$$

$$\left.c\,i\,(2\,k-v)\,z\right)-b\sqrt{2\,\pi}\,(m-2\,s)\left(\cosh\left(\frac{(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}\right)C\left(\frac{b\,(m-2\,s)+2\,c\,i\,(2\,k-v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)-$$

$$\left.\left.\left.i\,S\left(\frac{b\,(m-2\,s)+2\,c\,i\,(2\,k-v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)\sinh\left(\frac{(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh^v(c\,z)$

01.20.21.3304.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh^v(c\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\binom{m}{k}\left(\cos(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)+S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\sin(e\,(m-2\,k))\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\sinh(2\,c\,k\,z-v\,c\,z)}{2\,k-v}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(e\,(2\,s-m)-\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$
$$\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(e\,(2\,s-m)-\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}\right)\right)+$$
$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)C\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$
$$\left.\left.S\left(\frac{2\,i\,c\,k-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(2\,i\,c\,k-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3305.01

$$\int \cos^m\left(\sqrt{z}\ b+e\right)\cosh^v(c\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\sinh(c\,(v-2\,k)\,z)}{v-2\,k}+\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2\,k)^2}\left(\binom{m}{k}\left(\cos\left(2\,e\,k-e\,m+b\,(2\,k-m)\,\sqrt{z}\right)+b\,(2\,k-m)\,\sqrt{z}\,\sin\left(2\,e\,k-e\,m+b\,(2\,k-m)\,\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(2\,i\,c\,k-i\,c\,v)^{3/2}}\left(2\sqrt{2\,i\,c\,k-i\,c\,v}\,\sin\left(e\,m-2\,e\,s+c\,i\,(2\,k-v)\,z+(b\,m-2\,b\,s)\,\sqrt{z}\right)-\right.\right.$$

$$b\sqrt{2\,\pi}\,(m-2\,s)\left(\cos\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}+e\,m-2\,e\,s\right)C\left(\frac{b\,(m-2\,s)+2\,c\,i\,(2\,k-v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)-\right.$$

$$\left.\left.\left.S\left(\frac{b\,(m-2\,s)+2\,c\,i\,(2\,k-v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)\sin\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}+e\,m-2\,e\,s\right)\right)\right)+\frac{1}{(2\,i\,c\,k-i\,c\,v)^{3/2}}$$

$$\left(b\sqrt{2\,\pi}\,(m-2\,s)\left(\cos\left(-\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}+e\,m-2\,e\,s\right)C\left(\frac{2\,i\,c\,(2\,k-v)\,\sqrt{z}\,-b\,(m-2\,s)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,(2\,k-v)\,\sqrt{z}\,-b\,(m-2\,s)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(2\,k-v)}}\right)\sin\left(-\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,c\,k-c\,v)}+e\,m-2\,e\,s\right)\right)-\right.$$

$$\left.\left.2\sqrt{2\,i\,c\,k-i\,c\,v}\,\sin\left(e\,m-2\,e\,s-i\,c\,(2\,k-v)\,z-(2\,b\,s-b\,m)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z\right)\cosh^v(c\,z)$

01.20.21.3306.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh^\nu(c\,z)\,dz == (-1)^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)\right)}{\sqrt{-b\,(m-2\,k)}}\right)(1-\nu \bmod 2)+$$

$$\frac{(-1)^m\,2^{-m-\nu+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{k}\sinh(2\,c\,k\,z-\nu\,c\,z)}{2\,k-\nu}+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu)^2}{4\,(2\,b\,s-b\,m)}\right)C\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)\sin\left(\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,\nu)^2}{4\,(2\,b\,s-b\,m)}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu)^2}{4\,(b\,m-2\,b\,s)}\right)C\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,\nu)^2}{4\,(b\,m-2\,b\,s)}\right)\right)\right)/;\; m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3307.01

$$\int \cos^m\left(\sqrt{z}\ b + d\,z\right)\cosh^v(c\,z)\,dz ==$$

$$(-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) + 2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(b\,(m-2\,k)\,\sqrt{2\,\pi}\right.\right.\right.$$

$$\left.\left.\left.\left(\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)C\left(\frac{\sqrt{d\,(2\,k-m)}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{d\,(2\,k-m)}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)\right)-\right.\right.\right.$$

$$\left.\left.\left.2\,\sqrt{-d\,(m-2\,k)}\,\sin\left(d\,z\,(m-2\,k)+b\,\sqrt{z}\,(m-2\,k)\right)\right)\right)\right)(1-v \bmod 2) +$$

$$\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(c\,(v-2\,k)\,z)}{v-2\,k} + 2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}$$

$$\left(\left(\sqrt{2\,\pi}\,(b\,m-2\,b\,s)\cos\left(\frac{(2\,b\,s-b\,m)^2}{4\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)}\right)C\left(\frac{-b\,m+2\,b\,s+2\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v}}\right)-\right.\right.$$

$$\sqrt{2\,\pi}\,(2\,b\,s-b\,m)\,S\left(\frac{-b\,m+2\,b\,s+2\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v}}\right)$$

$$\sin\left(\frac{(2\,b\,s-b\,m)^2}{4\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)}\right)+2\,\sqrt{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v}$$

$$\left.\left.\sin\left(\sqrt{z}\,(2\,b\,s-b\,m)+(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)\,z\right)\right)\Big/(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)^{3/2}+\right.$$

$$\left(\sqrt{2\,\pi}\,(2\,b\,s-b\,m)\cos\left(\frac{(b\,m-2\,b\,s)^2}{4\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)}\right)C\left(\frac{b\,m-2\,b\,s+2\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v}}\right)-\right.$$

$$\sqrt{2\,\pi}\,(b\,m-2\,b\,s)\,S\left(\frac{b\,m-2\,b\,s+2\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v}}\right)$$

$$\sin\left(\frac{(b\,m-2\,b\,s)^2}{4\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)}\right)+2\,\sqrt{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v}\,\sin\left(\sqrt{z}\,(b\,m-2\,b\,s)+\right.$$

$$\left.\left.\left.(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)\,z\right)\right)\Big/(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)^{3/2}\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

01.20.21.3308.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh^v(c\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\left(\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)\right)\right)\right)$$

$$(1-v \bmod 2)+\frac{(-1)^m\,2^{-m-v+1}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(2\,c\,k\,z-v\,c\,z)}{2\,k-v}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(e\,(2\,s-m)-\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}\right)\right.\right.$$

$$\left.C\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)-S\left(\frac{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)\right.$$

$$\left.\sin\left(e\,(2\,s-m)-\frac{(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)^2}{4\,(2\,b\,s-b\,m)}\right)\right)+\frac{1}{\sqrt{b\,m-2\,b\,s}}$$

$$\left(\cos\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)C\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$S\left(\frac{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)\right)\right)\right)/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3309.01

$$\int \cos^m\left(\sqrt{z}\, b+e+d\, z\right)\cosh^v(c\, z)\, dz == (-1)^m\, 2^{-m-v}\, z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2) + 2^{-m-v} \binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{(-d\,(m-2\,k))^{3/2}} \left(\binom{m}{k} \left(b\,(m-2\,k)\,\sqrt{2\,\pi}\,\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,b^2}{d}+8\,e\,k-4\,e\,m\right)\right) C\left(\frac{\sqrt{d\,(2\,k-m)}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right) - \right.\right.\right.$$

$$\left.\left.\left. S\left(\frac{\sqrt{d\,(2\,k-m)}\,\left(b+2\,d\,\sqrt{z}\right)}{d\,\sqrt{2\,\pi}}\right) \sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,b^2}{d}+8\,e\,k-4\,e\,m\right)\right)\right) -\right.\right.$$

$$\left.\left. 2\,\sqrt{-d\,(m-2\,k)}\,\sin\left(e\,(m-2\,k)+d\,z\,(m-2\,k)+b\,\sqrt{z}\,(m-2\,k)\right)\right)\right)$$

$$(1-v \bmod 2) + \frac{(-1)^m\, 2^{-m-v+1}}{c} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{\binom{v}{k} \sinh(c\,(v-2\,k)\,z)}{v-2\,k} +$$

$$2^{-m-v} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\left(\sqrt{2\,\pi}\,(2\,b\,s-b\,m) \cos\left(-\frac{(b\,m-2\,b\,s)^2}{4\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)}+e\,m-2\,e\,s\right)\right.\right.$$

$$C\left(\frac{b\,m-2\,b\,s+2\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v}}\right) + \sqrt{2\,\pi}\,(b\,m-2\,b\,s)\, S\left(\right.$$

$$\left.\left.\frac{b\,m-2\,b\,s+2\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v}}\right) \sin\left(-\frac{(b\,m-2\,b\,s)^2}{4\,(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)}+e\,m-2\,e\,s\right) +\right.$$

$$\left. 2\,\sqrt{2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v}\,\sin\left(e\,m-2\,e\,s+(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)\,z+(b\,m-2\,b\,s)\,\sqrt{z}\right)\right) \Big/$$

$$(2\,i\,c\,k+d\,m-2\,d\,s-i\,c\,v)^{3/2} + \left(\sqrt{2\,\pi}\,(b\,m-2\,b\,s) \cos\left(\frac{(2\,b\,s-b\,m)^2}{4\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)}+e\,m-2\,e\,s\right)\right.$$

$$C\left(\frac{-b\,m+2\,b\,s+2\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v}}\right) - \sqrt{2\,\pi}\,(2\,b\,s-b\,m)\, S\left(\right.$$

$$\left.\left.\frac{-b\,m+2\,b\,s+2\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v}}\right) \sin\left(\frac{(2\,b\,s-b\,m)^2}{4\,(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)}+e\,m-2\,e\,s\right) -\right.$$

$$\left. 2\,\sqrt{2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v}\,\sin\left(e\,m-2\,e\,s-(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)\,z-(2\,b\,s-b\,m)\,\sqrt{z}\right)\right) \Big/$$

$$\left.(2\,i\,c\,k-d\,m+2\,d\,s-i\,c\,v)^{3/2}\right) /;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $\cos^m\left(b\, z^r\right) \cosh^v(f\, z+g)$

01.20.21.3310.01

$$\int \cos^m\left(b\,z^2\right)\cosh^v(g+f\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\,-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\sinh(g\,(2\,k-v)-v\,f\,z+2\,f\,k\,z)}{2\,k-v}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(i\,g\,(2\,k-v)-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}\right)C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(i\,g\,(2\,k-v)-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-v)\right)C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$\left.\left.S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)\sin\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3311.01

$$\int \cos^m\left(b\sqrt{z}\right)\cosh^v(g+f\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(b\,(2\,k-m)\sqrt{z}\right)+b\,(2\,k-m)\sqrt{z}\,\sin\left(b\,(2\,k-m)\sqrt{z}\right)\right)}{(m-2\,k)^2}}{b^2}+$$

$$\frac{(-1)^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(g\,(v-2\,k)+f\,z\,(v-2\,k))}{v-2\,k}}{f}+2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(2\,i\,f\,k-i\,f\,v)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\;(b\,m-2\,b\,s)\cosh\left(\frac{i\,(2\,b\,s-b\,m)^2}{4\,(2\,i\,f\,k-i\,f\,v)}+2\,g\,k-g\,v\right)C\left(\frac{-b\,m+2\,b\,s+2\,(2\,i\,f\,k-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,k-i\,f\,v}}\right)+\right.$$

$$i\sqrt{2\,\pi}\;(2\,b\,s-b\,m)\,S\left(\frac{-b\,m+2\,b\,s+2\,(2\,i\,f\,k-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,k-i\,f\,v}}\right)\sinh\left(\frac{i\,(2\,b\,s-b\,m)^2}{4\,(2\,i\,f\,k-i\,f\,v)}+2\,g\,k-g\,v\right)+$$

$$\left.2\,i\sqrt{2\,i\,f\,k-i\,f\,v}\;\sinh\left(2\,g\,k-g\,v-i\,(2\,i\,f\,k-i\,f\,v)\,z-i\,(2\,b\,s-b\,m)\sqrt{z}\right)\right)+\frac{1}{(2\,i\,f\,k-i\,f\,v)^{3/2}}$$

$$\left(\sqrt{2\,\pi}\;(2\,b\,s-b\,m)\cosh\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,i\,f\,k-i\,f\,v)}+2\,g\,k-g\,v\right)C\left(\frac{b\,m-2\,b\,s+2\,(2\,i\,f\,k-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,k-i\,f\,v}}\right)+\right.$$

$$i\sqrt{2\,\pi}\;(b\,m-2\,b\,s)\,S\left(\frac{b\,m-2\,b\,s+2\,(2\,i\,f\,k-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,i\,f\,k-i\,f\,v}}\right)\sinh\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,i\,f\,k-i\,f\,v)}+2\,g\,k-g\,v\right)+$$

$$\left.\left.2\,i\sqrt{2\,i\,f\,k-i\,f\,v}\;\sinh\left(2\,g\,k-g\,v-i\,(2\,i\,f\,k-i\,f\,v)\,z-i\,(b\,m-2\,b\,s)\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh^v(f\,z+g)$

01.20.21.3312.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh^v(g+f\,z)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\binom{m}{k}\left(\cos(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)+S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{-b\,(m-2\,k)}}\right)\sin(e\,(m-2\,k))\right)+$$

$$\frac{(-1)^m\,2^{-m-v+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\sinh(g\,(2\,k-v)-v\,f\,z+2\,f\,k\,z)}{2\,k-v}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-v)\right)C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,s-b\,m}}\right)\sin\left(-\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-v)\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-v)\right)C\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)+\right.$$

$$S\left(\frac{2\,i\,f\,k-i\,f\,v+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\left.\sin\left(\frac{(2\,i\,f\,k-i\,f\,v)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-v)\right)\right)\right)\right);\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3313.01

$$\int \cos^m\left(\sqrt{z}\, b+e\right)\cosh^v(g+f z)\,dz == (-1)^m\, 2^{-m-v}\, z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2) + \frac{2^{-m-v+2}}{b^2} \binom{v}{\frac{v}{2}} (1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{(m-2k)^2} \left(\binom{m}{k} \left(\cos\left(2ek - em + b(2k-m)\sqrt{z}\right) + b(2k-m)\sqrt{z}\, \sin\left(2ek - em + b(2k-m)\sqrt{z}\right)\right)\right) +$$

$$\frac{(-1)^m\, 2^{-m-v+1}}{f} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{\binom{v}{k} \sinh(g(v-2k) + f z (v-2k))}{v-2k} +$$

$$2^{-m-v} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\frac{1}{(2ifk - ifv)^{3/2}} \left(\sqrt{2\pi}\, (bm - 2bs) \cosh\left(\frac{i(2bs-bm)^2}{4(2ifk-ifv)} + 2gk + iem - 2ies - gv \right) \right.\right.$$

$$C\left(\frac{-bm + 2bs + 2(2ifk - ifv)\sqrt{z}}{\sqrt{2\pi}\, \sqrt{2ifk - ifv}} \right) + i\sqrt{2\pi}\, (2bs - bm)$$

$$S\left(\frac{-bm + 2bs + 2(2ifk - ifv)\sqrt{z}}{\sqrt{2\pi}\, \sqrt{2ifk - ifv}} \right) \sinh\left(\frac{i(2bs-bm)^2}{4(2ifk-ifv)} + 2gk + iem - 2ies - gv \right) +$$

$$\left. 2i\sqrt{2ifk - ifv}\, \sinh\left(2gk + iem - 2ies - gv - i(2ifk - ifv)z - i(2bs - bm)\sqrt{z}\right) \right) +$$

$$\frac{1}{(2ifk - ifv)^{3/2}} \left(\sqrt{2\pi}\, (2bs - bm) \cosh\left(\frac{i(bm-2bs)^2}{4(2ifk-ifv)} + 2gk - iem + 2ies - gv \right) \right.$$

$$C\left(\frac{bm - 2bs + 2(2ifk - ifv)\sqrt{z}}{\sqrt{2\pi}\, \sqrt{2ifk - ifv}} \right) + i\sqrt{2\pi}\, (bm - 2bs)\, S\left(\frac{bm - 2bs + 2(2ifk - ifv)\sqrt{z}}{\sqrt{2\pi}\, \sqrt{2ifk - ifv}} \right)$$

$$\sinh\left(\frac{i(bm-2bs)^2}{4(2ifk-ifv)} + 2gk - iem + 2ies - gv \right) + 2i\sqrt{2ifk - ifv}$$

$$\left.\left. \sinh\left(2gk - iem + 2ies - gv - i(2ifk - ifv)z - i(bm - 2bs)\sqrt{z}\right) \right) \right) /; m \in \mathbb{N}^+ \wedge v \in \mathbb{N}^+$$

Involving $\cos^m\left(b z^r + d z\right)\cosh^v(f z + g)$

01.20.21.3314.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh^\nu(g+f\,z)\,dz == (-1)^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)\right)}{\sqrt{-b\,(m-2\,k)}}\right)(1-\nu \bmod 2)+$$

$$\frac{(-1)^m\,2^{-m-\nu+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{k}\sinh(g\,(2\,k-\nu)-\nu\,f\,z+2\,f\,k\,z)}{2\,k-\nu}+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\right.$$

$$\left(\cos\left(i\,g\,(2\,k-\nu)-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu)^2}{4\,(2\,b\,s-b\,m)}\right)C\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)-\right.$$

$$\left.S\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)\sin\left(i\,g\,(2\,k-\nu)-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu)^2}{4\,(2\,b\,s-b\,m)}\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-\nu)\right)\right.$$

$$C\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+S\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\left.\sin\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu)^2}{4\,(b\,m-2\,b\,s)}-i\,g\,(2\,k-\nu)\right)\right)\right)\right/;\; m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3315.01

$$\int \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh^\nu(g+f\,z)\,dz ==$$

$$(-1)^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\right.$$

$$\left(\binom{m}{k}\left(b\,(m-2\,k)\sqrt{2\,\pi}\left(\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)C\left(\frac{\sqrt{d\,(2\,k-m)}\;\left(b+2\,d\,\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)-S\left(\frac{\sqrt{d\,(2\,k-m)}\;\left(b+2\,d\,\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)\sin\left(\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{b^2\,(m-2\,k)}{4\,d}\right)\right)-2\sqrt{-d\,(m-2\,k)}\;\sin\left(d\,z\,(m-2\,k)+b\sqrt{z}\;(m-2\,k)\right)\right)\right)\right)$$

$$(1-\nu \bmod 2)+\frac{(-1)^m\,2^{-m-\nu+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{k}\sinh(g\,(\nu-2\,k)+f\,z\,(\nu-2\,k))}{\nu-2\,k}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\left(\sqrt{2\pi}\ (b\,m-2\,b\,s)\cosh\left(\frac{i\,(2\,b\,s-b\,m)^2}{4\,(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)}+2\,g\,k-g\,v\right)\right.\right.$$

$$C\left(\frac{-b\,m+2\,b\,s+2\,(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)\,\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v}}\right)+$$

$$i\,\sqrt{2\pi}\ (2\,b\,s-b\,m)\,S\left(\frac{-b\,m+2\,b\,s+2\,(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)\,\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v}}\right)$$

$$\sinh\left(\frac{i\,(2\,b\,s-b\,m)^2}{4\,(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)}+2\,g\,k-g\,v\right)+2\,i\,\sqrt{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v}$$

$$\left.\left.\sinh\left(2\,g\,k-g\,v-i\,(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)\,z-i\,(2\,b\,s-b\,m)\,\sqrt{z}\right)\right)\Big/\right.$$

$$(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,v)^{3/2}+\left(\sqrt{2\pi}\ (2\,b\,s-b\,m)\cosh\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)}+2\,g\,k-g\,v\right)\right.$$

$$C\left(\frac{b\,m-2\,b\,s+2\,(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)\,\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v}}\right)+i\,\sqrt{2\pi}\ (b\,m-2\,b\,s)$$

$$S\left(\frac{b\,m-2\,b\,s+2\,(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)\,\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v}}\right)\sinh\left(\frac{i\,(b\,m-2\,b\,s)^2}{4\,(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)}+2\,g\,k-\right.$$

$$\left.g\,v\right)+2\,i\,\sqrt{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v}\ \sinh\left(2\,g\,k-g\,v-i\,(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)\,z-\right.$$

$$\left.\left.\left.i\,(b\,m-2\,b\,s)\,\sqrt{z}\right)\right)\Big/(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,v)^{3/2}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r+d\,z+e)\cosh^v(f\,z+g)$

01.20.21.3316.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh^\nu(g+f\,z)\,dz == (-1)^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{-b\,(m-2\,k)}}\left(\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)C\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{b\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)\right)\right)(1-\nu \bmod 2)+$$

$$\frac{(-1)^m\,2^{-m-\nu+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{k}\sinh(g\,(2\,k-\nu)+2\,f\,k\,z-f\,\nu\,z)}{2\,k-\nu}+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{\sqrt{2\,b\,s-b\,m}}\left(\cos\left(-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-\nu)\right)\right.\right.$$

$$C\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)-S\left(\frac{2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu+2\,(2\,b\,s-b\,m)\,z}{\sqrt{2\,\pi}\;\sqrt{2\,b\,s-b\,m}}\right)$$

$$\left.\sin\left(-\frac{(2\,i\,f\,k-d\,m+2\,d\,s-i\,f\,\nu)^2}{4\,(2\,b\,s-b\,m)}+e\,(2\,s-m)+g\,i\,(2\,k-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{b\,m-2\,b\,s}}\left(\cos\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-\nu)\right)\right.$$

$$C\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)+S\left(\frac{2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu+2\,(b\,m-2\,b\,s)\,z}{\sqrt{2\,\pi}\;\sqrt{b\,m-2\,b\,s}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,f\,k+d\,m-2\,d\,s-i\,f\,\nu)^2}{4\,(b\,m-2\,b\,s)}+e\,(2\,s-m)-i\,g\,(2\,k-\nu)\right)\right)\right)/;\; m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3317.01

$$\int \cos^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh^\nu(g+f\,z)\,dz == (-1)^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(b\,(m-2\,k)\sqrt{2\,\pi}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,b^2}{d}+8\,e\,k-4\,e\,m\right)\right)C\left(\frac{\sqrt{d\,(2\,k-m)}\;\left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)-\right.\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{\sqrt{d\,(2\,k-m)}\;\left(b+2\,d\sqrt{z}\right)}{d\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,b^2}{d}+8\,e\,k-4\,e\,m\right)\right)\right)-\right.$$

$$\left.\left.2\sqrt{-d\,(m-2\,k)}\;\sin\left(e\,(m-2\,k)+d\,z\,(m-2\,k)+b\sqrt{z}\;(m-2\,k)\right)\right)\right)(1-\nu \bmod 2)+$$

$$\frac{(-1)^m 2^{-m-\nu+1}}{f}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{k}\sinh(g(\nu-2k)+f z(\nu-2k))}{\nu-2k}+$$

$$2^{-m-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\left(\sqrt{2\pi}\ (b m-2 b s)\cosh\left(\frac{i(2 b s-b m)^2}{4(2 i f k-d m+2 d s-i f \nu)}+2 g k+i e m-2 i e s-g \nu\right)\right.\right.$$

$$C\left(\frac{-b m+2 b s+2(2 i f k-d m+2 d s-i f \nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2 i f k-d m+2 d s-i f \nu}}\right)+$$

$$i\sqrt{2\pi}\ (2 b s-b m)S\left(\frac{-b m+2 b s+2(2 i f k-d m+2 d s-i f \nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2 i f k-d m+2 d s-i f \nu}}\right)$$

$$\sinh\left(\frac{i(2 b s-b m)^2}{4(2 i f k-d m+2 d s-i f \nu)}+2 g k+i e m-2 i e s-g \nu\right)+2 i\sqrt{2 i f k-d m+2 d s-i f \nu}$$

$$\left.\left.\sinh\left(2 g k+i e m-2 i e s-g \nu-i(2 i f k-d m+2 d s-i f \nu)z-i(2 b s-b m)\sqrt{z}\right)\right)\right/$$

$$(2 i f k-d m+2 d s-i f \nu)^{3/2}+\left(\sqrt{2\pi}\ (2 b s-b m)\cosh\left(\frac{i(b m-2 b s)^2}{4(2 i f k+d m-2 d s-i f \nu)}+\right.\right.$$

$$\left.2 g k-i e m+2 i e s-g \nu\right)C\left(\frac{b m-2 b s+2(2 i f k+d m-2 d s-i f \nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2 i f k+d m-2 d s-i f \nu}}\right)+$$

$$i\sqrt{2\pi}\ (b m-2 b s)S\left(\frac{b m-2 b s+2(2 i f k+d m-2 d s-i f \nu)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2 i f k+d m-2 d s-i f \nu}}\right)$$

$$\sinh\left(\frac{i(b m-2 b s)^2}{4(2 i f k+d m-2 d s-i f \nu)}+2 g k-i e m+2 i e s-g \nu\right)+$$

$$2 i\sqrt{2 i f k+d m-2 d s-i f \nu}\ \sinh\left(2 g k-i e m+2 i e s-g \nu-i(2 i f k+d m-2 d s-i f \nu)z-\right.$$

$$\left.\left.\left.i(b m-2 b s)\sqrt{z}\right)\right)\right/(2 i f k+d m-2 d s-i f \nu)^{3/2}\Bigg/; m\in\mathbb{N}^+\wedge\nu\in\mathbb{N}^+$$

Involving $\cos^m(b z)\cosh^\nu(c z^r)$

01.20.21.3318.01

$$\int \cos^m(b\,z)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$\frac{2^{-m-v+1}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(b\,(m-2\,k)\,z)}{m-2\,k}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)C\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+S\left(\frac{2\,b\,k-b\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\right.\right.$$

$$\left.\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)\right)+\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)+$$

$$\left.\left.S\left(\frac{2\,b\,k-b\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\frac{(2\,b\,k-b\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3319.01

$$\int \cos^m(b\,z)\cosh^v\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(b\,(m-2\,k)\,z)}{m-2\,k}-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(v-2\,k)\,\sqrt{z}\right)-c\,(v-2\,k)\,\sqrt{z}\,\sinh\left(c\,(v-2\,k)\,\sqrt{z}\right)\right)}{(v-2\,k)^2}+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,b\,k-b\,m)^{3/2}}\left(\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,b\,k-b\,m)}\right)C\left(\frac{2\,\sqrt{z}\,(2\,b\,k-b\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.\right.$$

$$\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{2\,\sqrt{z}\,(2\,b\,k-b\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,b\,k-b\,m)}\right)+$$

$$\left.2\,\sqrt{2\,b\,k-b\,m}\,\sin\left(\sqrt{z}\,(i\,c\,v-2\,i\,c\,s)+(2\,b\,k-b\,m)\,z\right)\right)+$$

$$\frac{1}{(2\,b\,k-b\,m)^{3/2}}\left(\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,b\,k-b\,m)}\right)C\left(\frac{2\,\sqrt{z}\,(2\,b\,k-b\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)-\right.$$

$$\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,\sqrt{z}\,(2\,b\,k-b\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,b\,k-b\,m}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,b\,k-b\,m)}\right)+$$

$$\left.\left.2\,\sqrt{2\,b\,k-b\,m}\,\sin\left(\sqrt{z}\,(2\,i\,c\,s-i\,c\,v)+(2\,b\,k-b\,m)\,z\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh^v\left(c\,z^r\right)$

01.20.21.3320.01

$$\int \cos^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(2\,k-m)-m\,d\,z+2\,d\,k\,z)}{2\,k-m}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.\right.$$
$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)\right)+$$
$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$
$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\sin\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3321.01

$$\int \cos^m(e+d\,z)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2\,k-v)\sqrt{z}\right)-c\,(2\,k-v)\sqrt{z}\,\sinh\left(c\,(2\,k-v)\sqrt{z}\right)\right)}{(v-2\,k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+\right.$$

$$\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)+$$

$$\left.2\sqrt{2\,d\,k-d\,m}\,\sin\left(2\,e\,k-e\,m+(2\,d\,k-d\,m)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$

$$\left(\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)C\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)+\right.$$

$$\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\sqrt{z}\,(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\,\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m\right)+$$

$$\left.\left.2\sqrt{2\,d\,k-d\,m}\,\sin\left(2\,e\,k-e\,m+(2\,d\,k-d\,m)\,z+(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.3322.01

$$\int \cos^m(b\,z^r)\cosh^v(c\,z^r)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) -$$

$$\frac{1}{r}\left(2^{-m-v}\,z\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-1/r} +\right.\right.$$

$$\left.\left.((2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)\right) - \frac{1}{r}\left((-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{1}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r} + ((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)\right) -$$

$$\frac{1}{r}\left(2^{-m-v}\,z\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r} +\right.\right.$$

$$((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right) +$$

$$((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right) +$$

$$\left.\left.((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right) /;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3323.01

$$\int \cos^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) + 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}\right)(1-v \bmod 2) +$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)}{\sqrt{i\,c\,(v-2\,k)}} + 2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)}{\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}} + \frac{C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)}{\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right) /;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3324.01

$$\int \cos^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(b\,(2k-m)\sqrt{z}\right)+b\,(2k-m)\sqrt{z}\,\sin\left(b\,(2k-m)\sqrt{z}\right)\right)}{(2k-m)^2}-$$

$$\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2k-v)\sqrt{z}\right)-c\,(2k-v)\sqrt{z}\,\sinh\left(c\,(2k-v)\sqrt{z}\right)\right)}{(2k-v)^2}+$$

$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)-\right.\right.$$

$$\left.(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\,\sin\left(-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)\right)\Big/(b\,(2k-m)+c\,i\,(v-2s))^2+$$

$$\left(\cos\left((b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)+(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\,\sin\left((b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)\right)\Big/$$

$$\left.(b\,(2k-m)-i\,c\,(v-2s))^2\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3325.01

$$\int \cos^m(b\,z^r+e)\cosh^v(c\,z^r)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2iek-iem}\,\Gamma\left(\frac{1}{r},(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-1/r}+\right.$$

$$\left.e^{iem-2iek}\,((2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-\frac{(-1)^m\,2^{-m-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{1}{r},(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,k-c\,v)\,z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2iek-iem}\,\Gamma\left(\frac{1}{r},(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$e^{iem-2iek}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$e^{2iek-iem}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.e^{iem-2iek}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3326.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}\left(\cos(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin(e\,(m-2\,k))\right)+$$

$$2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos(e\,(2\,k-m))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)-\right.\right.$$

$$\left.S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)\sin(e\,(2\,k-m))\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+$$

$$\left(\cos(e\,(2\,k-m))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)-S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)\right.$$

$$\left.\left.\sin(e\,(2\,k-m))\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3327.01

$$\int \cos^m\left(\sqrt{z}\,b+e\right)\cosh^v\left(\sqrt{z}\,c\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cos\left(i\,c\,(2\,k-v)\sqrt{z}\right)+c\,i\,(2\,k-v)\sqrt{z}\,\sin\left(i\,c\,(2\,k-v)\sqrt{z}\right)\right)}{(2\,k-v)^2}+\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(2\,k-m)^2}\left(\binom{m}{k}\left(\cos\left(e\,(m-2\,k)-b\,(2\,k-m)\sqrt{z}\right)-b\,(2\,k-m)\sqrt{z}\,\sin\left(e\,(m-2\,k)-b\,(2\,k-m)\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b\,(2\,k-m)+c\,i\,(v-2\,s))^2}\left(\cos\left(e\,(m-2\,k)-(b\,(2\,k-m)+c\,i\,(v-2\,s))\sqrt{z}\right)-\right.\right.$$

$$\left.(b\,(2\,k-m)+c\,i\,(v-2\,s))\sqrt{z}\,\sin\left(e\,(m-2\,k)-(b\,(2\,k-m)+c\,i\,(v-2\,s))\sqrt{z}\right)\right)+$$

$$\frac{1}{(b\,(2\,k-m)-i\,c\,(v-2\,s))^2}\left(\cos\left(e\,(m-2\,k)-(b\,(2\,k-m)-i\,c\,(v-2\,s))\sqrt{z}\right)-\right.$$

$$\left.\left.(b\,(2\,k-m)-i\,c\,(v-2\,s))\sqrt{z}\,\sin\left(e\,(m-2\,k)-(b\,(2\,k-m)-i\,c\,(v-2\,s))\sqrt{z}\right)\right)\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r + d\,z)\cosh^v(c\,z^r)$

01.20.21.3328.01

$$\int \cos^m\left(b\,z^2 + d\,z\right)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)\,(1 - v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)\right)}{\sqrt{b\,(m-2\,k)}}\right)(1 - v \bmod 2) -$$

$$i\,2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right.$$

$$C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)+S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\, m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3329.01

$$\int \cos^m\left(\sqrt{z}\ b + d\,z\right)\cosh^v\left(c\,\sqrt{z}\right)dz ==$$

$$(-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) + 2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\right.$$

$$\left(\binom{m}{k}\left(-i\,b\,(m-2\,k)\,\sqrt{2\,\pi}\left(\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)C\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)\sin\left(\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\frac{b^2\,(m-2\,k)}{4\,d}\right)\right)-2\,\sqrt{-d\,(m-2\,k)}\ \sin\left(d\,z\,(m-2\,k)+b\,\sqrt{z}\ (m-2\,k)\right)\right)\right)\right)(1-v \bmod 2) -$$

$$\frac{(-1)^m\,2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\ \sinh\left(c\,(2\,k-v)\,\sqrt{z}\right)\right)}{(v-2\,k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(2\,d\,s-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k+b\,m-2\,b\,s+i\,c\,v)\cos\left(\frac{(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}\right)\right.\right.$$

$$C\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)-\sqrt{2\,\pi}\ (2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)$$

$$S\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)\sin\left(\frac{(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}\right)+$$

$$\left.2\,\sqrt{2\,d\,s-d\,m}\ \sin\left(\sqrt{z}\ (2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)+(2\,d\,s-d\,m)\,z\right)\right)+$$

$$\frac{1}{(d\,m-2\,d\,s)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v)\cos\left(\frac{(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}\right)\right.$$

$$C\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)-\sqrt{2\,\pi}\ (2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)$$

$$S\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)\sin\left(\frac{(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}\right)+$$

$$\left.\left.2\,\sqrt{d\,m-2\,d\,s}\ \sin\left(\sqrt{z}\ (2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)+(d\,m-2\,d\,s)\,z\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3330.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left(\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$i\,2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-\right.\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)C\left(\right.\right.$$

$$\left.\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\right.$$

$$\left.\left.e\,(2\,k-m)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3331.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(c\,\sqrt{z}\right)dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(-i\,b\,(m-2\,k)\,\sqrt{2\,\pi}\,\left(\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)C\left(\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)\right)-\right.\right.$$

$$\left.\left.2\,\sqrt{-d\,(m-2\,k)}\ \sin\left(e\,(m-2\,k)+d\,z\,(m-2\,k)+b\,\sqrt{z}\ (m-2\,k)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$\frac{(-1)^m\,2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\ \sinh\left(c\,(2\,k-v)\,\sqrt{z}\right)\right)}{(v-2\,k)^2}+$$

$$2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(d\,m-2\,d\,s)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v)\cos\left(-\frac{(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+e\,m-2\,e\right.\right.\right.$$

$$\left.\left.\left.s\right)C\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)+\sqrt{2\,\pi}\ (2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\right.\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)\sin\left(-\frac{(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+e\,m-2\,e\,s\right)+\right.\right.$$

$$\left.\left.2\,\sqrt{d\,m-2\,d\,s}\ \sin\left(e\,m-2\,e\,s+(d\,m-2\,d\,s)\,z+(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\,\sqrt{z}\right)\right)+\right.$$

$$\left.\frac{1}{(2\,d\,s-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k+b\,m-2\,b\,s+i\,c\,v)\cos\left(\frac{(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+e\,m-2\,e\,s\right)\right.\right.$$

$$\left.\left.C\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)-\sqrt{2\,\pi}\ (2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\right.\right.$$

$$\left.\left.S\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)\sin\left(\frac{(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+e\,m-2\,e\,s\right)-\right.\right.$$

$$\left.\left.2\,\sqrt{2\,d\,s-d\,m}\ \sin\left(e\,m-2\,e\,s-(2\,d\,s-d\,m)\,z-(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\,\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3332.01

$$\int \cos^m(d\,z)\cosh^\nu\left(c\,z^2+g\right)dz == 2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(\nu-2\,k)}}\binom{\nu}{k}\left(i\cosh(g\,(\nu-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(\nu-2\,k)\,z}{\sqrt{i\,c\,(\nu-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(\nu-2\,k)\,z}{\sqrt{i\,c\,(\nu-2\,k)}}\right)\sinh(g\,(\nu-2\,k))\right)+$$

$$\frac{2^{-m-\nu+1}}{d}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(2\,d\,k\,z-m\,d\,z)}{2\,k-m}+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{\sqrt{i\,c\,\nu-2\,i\,c\,s}}\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,\nu-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,\nu-2\,i\,c\,s}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,\nu-2\,i\,c\,s)}+g\,i\,(2\,s-\nu)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,\nu}}\left(\cos\left(i\,g\,(2\,s-\nu)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(i\,g\,(2\,s-\nu)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,\nu)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3333.01

$$\int \cos^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}\,(1-v \bmod 2)}{d}\binom{v}{\frac{v}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(d\,(m-2\,k)\,z)}{m-2\,k}-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\right.$$

$$\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}-2\,i\,g\,s+i\,g\,v\right)C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$

$$\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}-2\,i\,g\,s+i\,g\,v\right)+$$

$$\left.2\sqrt{2\,d\,k-d\,m}\;\sin\left(-2\,g\,i\,s+i\,g\,v+(2\,d\,k-d\,m)\,z+(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}\right)\right)+\frac{1}{(2\,d\,k-d\,m)^{3/2}}$$

$$\left(\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,i\,g\,s-i\,g\,v\right)C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\right.$$

$$\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,i\,g\,s-i\,g\,v\right)+$$

$$\left.\left.2\sqrt{2\,d\,k-d\,m}\;\sin\left(2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m)\,z+(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3334.01

$$\int \cos^m(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\,i\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)+i\,S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(2\,k-m)-m\,d\,z+2\,d\,k\,z)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-i\,g\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-i\,g\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)+g\,i\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)+g\,i\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3335.01

$$\int \cos^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v\right)\right.\right.$$

$$C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)$$

$$S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)-2\,i\,c\,s+i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v\right)+$$

$$\left.2\sqrt{2\,d\,k-d\,m}\;\sin\left(2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v+(2\,d\,k-d\,m)\,z+(i\,c\,v-2\,i\,c\,s)\,\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,d\,k-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v\right)\right.$$

$$C\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)+\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\sqrt{z}\;(2\,d\,k-d\,m)+2\,i\,c\,s-i\,c\,v}{\sqrt{2\,d\,k-d\,m}\;\sqrt{2\,\pi}}\right)$$

$$\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v\right)+2\sqrt{2\,d\,k-d\,m}$$

$$\left.\left.\sin\left(2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m)\,z+(2\,i\,c\,s-i\,c\,v)\,\sqrt{z}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.3336.01

$$\int \cos^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - \frac{2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-1/r}+((2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-$$

$$\frac{(-1)^m\,2^{-m-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{1}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+e^{g\,v-2\,g\,k}\,((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$e^{2\,g\,s-g\,v}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$e^{g\,v-2\,g\,s}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.e^{g\,v-2\,g\,s}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3337.01

$$\int \cos^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cosh(g\,(2\,s-v))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)+\right.\right.$$

$$\left.i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)\sinh(g\,(2\,s-v))\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+$$

$$\left(\cosh(g\,(2\,s-v))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)-i\,S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)\right.$$

$$\left.\left.\sinh(g\,(2\,s-v))\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3338.01

$$\int \cos^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\frac{\left(\cos\left(b\,(2k-m)\sqrt{z}\right)+b\,(2k-m)\sqrt{z}\,\sin\left(b\,(2k-m)\sqrt{z}\right)\right)}{(2k-m)^2}-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(2k-v)^2}\left(\binom{v}{k}\left(\cosh\left(c\,(2k-v)\sqrt{z}-g\,(v-2k)\right)-c\,(2k-v)\sqrt{z}\,\sinh\left(c\,(2k-v)\sqrt{z}-g\,(v-2k)\right)\right)\right)+$$

$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b\,(2k-m)+c\,i\,(v-2s))^2}\left(\cos\left(g\,i\,(v-2s)+(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)+\right.\right.$$
$$(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\,\sin\left(g\,i\,(v-2s)+(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)\Big)+$$
$$\frac{1}{(b\,(2k-m)-i\,c\,(v-2s))^2}\left(\cos\left(i\,g\,(v-2s)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)-\right.$$
$$\left.\left.(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\,\sin\left(i\,g\,(v-2s)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)\right)\Big)\Big/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3339.01

$$\int \cos^m(b\,z^r+e)\cosh^v(c\,z^r+g)\,dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{2^{-m-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{1}{r},(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-1/r}+\right.$$
$$\left.e^{i\,e\,m-2\,i\,e\,k}\,((2\,i\,b\,k-i\,b\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-\frac{(-1)^m\,2^{-m-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{1}{r},(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-1/r}+e^{g\,v-2\,g\,k}\,((2\,c\,k-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,k-c\,v)\,z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,i\,e\,k-i\,e\,m+2\,g\,s-g\,v}\,\Gamma\left(\frac{1}{r},(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$
$$e^{-2\,e\,i\,k+i\,e\,m+2\,g\,s-g\,v}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$
$$e^{2\,i\,e\,k-i\,e\,m-2\,g\,s+g\,v}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$
$$e^{-2\,e\,i\,k+i\,e\,m-2\,g\,s+g\,v}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}$$
$$\left.\Gamma\left(\frac{1}{r},(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\Big/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3340.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}\left(\cos(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin(e\,(m-2\,k))\right)\right)$$

$$(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(v-2\,k)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos(e\,(2\,k-m)+g\,i\,(2\,s-v))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)-\right.\right.$$

$$\left.S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\,z\right)\sin(e\,(2\,k-m)+g\,i\,(2\,s-v))\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)+\left(\cos(e\,(2\,k-m)-i\,g\,(2\,s-v))\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)-\right.$$

$$\left.\left.S\left(\sqrt{\frac{2}{\pi}}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\,z\right)\sin(e\,(2\,k-m)-i\,g\,(2\,s-v))\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)\right)/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3341.01

$$\int \cos^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(2k-v)^2}\left(\binom{v}{k}\left(\cos\left(i\,c\,(2k-v)\sqrt{z}-i\,g\,(v-2k)\right)+c\,i\,(2k-v)\sqrt{z}\,\sin\left(i\,c\,(2k-v)\sqrt{z}-i\,g\,(v-2k)\right)\right)\right)+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(2k-m)^2}\left(\binom{m}{k}\left(\cos\left(e\,(m-2k)-b\,(2k-m)\sqrt{z}\right)-b\,(2k-m)\sqrt{z}\,\sin\left(e\,(m-2k)-b\,(2k-m)\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v+2}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(b\,(2k-m)+c\,i\,(v-2s))^2}\right.$$

$$\left(\cos\left(e\,(m-2k)-i\,g\,(v-2s)-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right.$$

$$\left.\sin\left(e\,(m-2k)-i\,g\,(v-2s)-(b\,(2k-m)+c\,i\,(v-2s))\sqrt{z}\right)\right)+\frac{1}{(b\,(2k-m)-i\,c\,(v-2s))^2}$$

$$\left(\cos\left(e\,(m-2k)+g\,i\,(v-2s)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)-(b\,(2k-m)-i\,c\,(v-2s))\right.$$

$$\left.\left.\sqrt{z}\,\sin\left(e\,(m-2k)+g\,i\,(v-2s)-(b\,(2k-m)-i\,c\,(v-2s))\sqrt{z}\right)\right)\right)\text{/; }m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3342.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)\right)}{\sqrt{b\,(m-2\,k)}}\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}$$

$$\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(i\,g\,(2\,s-v)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)C\left(\right.\right.$$

$$\left.\left.\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(\right.\right.$$

$$\left.\left.i\,g\,(2\,s-v)-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3343.01

$$\int \cos^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz ==$$

$$(-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(-i\,b\,(m-2\,k)\sqrt{2\,\pi}\right.\right.\right.$$

$$\left.\left(\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)C\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)\right)-$$

$$\left.\left.\left.2\sqrt{-d\,(m-2\,k)}\ \sin\left(d\,z\,(m-2\,k)+b\sqrt{z}\ (m-2\,k)\right)\right)\right)\right)(1-v \bmod 2)-\frac{(-1)^m\,2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\sqrt{z}\right)-c\,(2\,k-v)\sqrt{z}\,\sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\sqrt{z}\right)\right)\right)+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(2\,d\,s-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k+b\,m-2\,b\,s+i\,c\,v)\cosh\left(\frac{i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+2\,g\,k-\right.\right.\right.$$

$$\left.\left.g\,v\right)C\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)+i\sqrt{2\,\pi}\ (2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\right.$$

$$S\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)\sinh\left(\frac{i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+2\,g\,k-g\,v\right)+$$

$$\left.2\,i\sqrt{2\,d\,s-d\,m}\ \sinh\left(2\,g\,k-g\,v-i\,(2\,d\,s-d\,m)\,z-i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\sqrt{z}\right)\right)+$$

$$\frac{1}{(d\,m-2\,d\,s)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v)\cosh\left(\frac{i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+2\,g\,k-g\,v\right)\right.$$

$$C\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)+$$

$$i\sqrt{2\,\pi}\ (2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\,S\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)$$

$$\sinh\left(\frac{i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+2\,g\,k-g\,v\right)+2\,i\sqrt{d\,m-2\,d\,s}$$

$$\left.\left.\sinh\left(2\,g\,k-g\,v-i\,(d\,m-2\,d\,s)\,z-i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3344.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left(\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\right.\right.\right.$$

$$\left.\left.\left.\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)\right)\right)\right)(1-v \bmod 2)-2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\binom{v}{k}\left(i\cosh(g\,(v-2\,k))\,C\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)-S\left(\frac{c\sqrt{\frac{2}{\pi}}\,(2\,k-v)\,z}{\sqrt{i\,c\,(v-2\,k)}}\right)\sinh(g\,(v-2\,k))\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-i\,g\,(2\,s-v)\right)\right.\right.$$

$$\left.C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-i\,g\,(2\,s-v)\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)+g\,i\,(2\,s-v)\right)\right.$$

$$\left.C\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)+g\,i\,(2\,s-v)\right)\right)\Big/$$

$$\left.\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3345.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == (-1)^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(-d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(-i\,b\,(m-2\,k)\,\sqrt{2\,\pi}\,\left(\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)C\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.S\left(\frac{(2\,k-m)\left(i\,b+2\,i\,d\,\sqrt{z}\right)}{\sqrt{-d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)\right)-2\,\sqrt{-d\,(m-2\,k)}\right.\right.\right.$$

$$\left.\left.\left.\sin\left(e\,(m-2\,k)+d\,z\,(m-2\,k)+b\,\sqrt{z}\ (m-2\,k)\right)\right)\right)\right)(1-v \bmod 2)-\frac{(-1)^m\,2^{-m-v+2}}{c^2}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,k)^2}\left(\left(\binom{v}{k}\left(\cosh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)-c\,(2\,k-v)\,\sqrt{z}\ \sinh\left(2\,g\,k-g\,v+c\,(2\,k-v)\,\sqrt{z}\right)\right)\right)+\right.$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{1}{(2\,d\,s-d\,m)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k+b\,m-2\,b\,s+i\,c\,v)\cosh\left(\frac{i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+\right.\right.\right.$$

$$\left.\left.\left.2\,g\,k+i\,e\,m-2\,i\,e\,s-g\,v\right)C\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)+\right.\right.$$

$$\left.\left.i\,\sqrt{2\,\pi}\ (2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\,S\left(\frac{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v+2\,(2\,d\,s-d\,m)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,d\,s-d\,m}}\right)\right.\right.$$

$$\left.\left.\sinh\left(\frac{i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)^2}{4\,(2\,d\,s-d\,m)}+2\,g\,k+i\,e\,m-2\,i\,e\,s-g\,v\right)+2\,i\,\sqrt{2\,d\,s-d\,m}\right.\right.$$

$$\left.\left.\sinh\left(2\,g\,k+i\,e\,m-2\,i\,e\,s-g\,v-i\,(2\,d\,s-d\,m)\,z-i\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)\,\sqrt{z}\right)\right)+\right.$$

$$\frac{1}{(d\,m-2\,d\,s)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v)\cosh\left(\frac{i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+\right.\right.$$

$$\left.\left.2\,g\,k-i\,e\,m+2\,i\,e\,s-g\,v\right)C\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)+\right.$$

$$\left.i\,\sqrt{2\,\pi}\ (2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\,S\left(\frac{2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v+2\,(d\,m-2\,d\,s)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{d\,m-2\,d\,s}}\right)\right.$$

$$\left.\sinh\left(\frac{i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)^2}{4\,(d\,m-2\,d\,s)}+2\,g\,k-i\,e\,m+2\,i\,e\,s-g\,v\right)+2\,i\,\sqrt{d\,m-2\,d\,s}\ \sinh\left(2\,g\,k-\right.\right.$$

$$\left.\left.\left.i\,e\,m+2\,i\,e\,s-g\,v-i\,(d\,m-2\,d\,s)\,z-i\,(2\,i\,c\,k+b\,m-2\,b\,s-i\,c\,v)\,\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3346.01

$$\int \cos^m(d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\,-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,i\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\frac{\left(\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(2\,d\,k\,z-m\,d\,z)}{2\,k-m}}{d}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+\right.\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)+\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3347.01

$$\int \cos^m(d\,z)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}\,(1-v \bmod 2)}{d}\binom{v}{\frac{v}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(d\,(m-2\,k)\,z)}{m-2\,k}+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\,\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\,(v-2\,k)\right)-c\sqrt{2\,\pi}\right.\right.$$

$$\left.\left.(v-2\,k)\left(\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}\right)\right.\right.$$

$$C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)-\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)$$

$$S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)\sin\left(\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}\right)+$$

$$\left.2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\,\sin\left(\sqrt{z}\,(i\,c\,v-2\,i\,c\,s)+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z\right)\right)\Big/$$

$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\,\pi}\,(i\,c\,v-2\,i\,c\,s)\cos\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}\right)\right.$$

$$C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)-\sqrt{2\,\pi}\,(2\,i\,c\,s-i\,c\,v)$$

$$S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)\sin\left(\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}\right)+$$

$$\left.2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\,\sin\left(\sqrt{z}\,(2\,i\,c\,s-i\,c\,v)+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z\right)\right)\Big/$$

$$\left.(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\, m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3348.01

$$\int \cos^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,i\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$\frac{2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(2\,k-m)-m\,d\,z+2\,d\,k\,z)}{2\,k-m}}{d}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)C\left(\right.\right.\right.$$

$$\left.\left.\left.\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\right.\right.$$

$$\left.\left.\sin\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}\right)\right)+\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\right.$$

$$\left(\cos\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\left.\sin\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3349.01

$$\int \cos^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}\,(1-v \bmod 2)}{d}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}\right)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\;\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\;(v-2\,k)\right)-c\sqrt{2\,\pi}\right.\right.$$

$$\left.\left.(v-2\,k)\left(\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m\right)\right.\right.$$

$$C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$

$$\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\,S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m\right)+$$

$$\left.2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\;\sin\left(2\,e\,k-e\,m+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/$$

$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\,\pi}\;(i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m\right)\right.$$

$$C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+\sqrt{2\,\pi}\;(2\,i\,c\,s-i\,c\,v)$$

$$S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+\right.$$

$$2\,e\,k-e\,m\Big)+2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\;\sin\left(2\,e\,k-e\,m+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+\right.$$

$$\left.\left.\left.(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r)\cosh^v(c\,z^r+f\,z)$

01.20.21.3350.01

$$\int \cos^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)C\left(\right.\right.$$

$$\left.\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)+S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\sin\left(\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3351.01

$$\int \cos^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,(c+f\,z)\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\,\sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\,(v-2\,k)\right)-c\sqrt{2\,\pi}\right.\right.$$

$$\left.\left.(v-2\,k)\left(\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)\right)+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(b\,(2\,k-m)\sqrt{z}\right)+b\,(2\,k-m)\sqrt{z}\,\sin\left(b\,(2\,k-m)\sqrt{z}\right)\right)}{(m-2\,k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)-\sqrt{2\,\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sin\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}\right)+$$

$$\left.2\sqrt{i\,f\,v-2\,i\,f\,s}\,\sin\left(\sqrt{z}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)+(i\,f\,v-2\,i\,f\,s)\,z\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\,\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)-\sqrt{2\,\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)$$

$$S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)\sin\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}\right)+$$

$$\left.\left.2\sqrt{2\,i\,f\,s-i\,f\,v}\,\sin\left(\sqrt{z}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)+(2\,i\,f\,s-i\,f\,v)\,z\right)\right)\right)\Big/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3352.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}\left(\cos(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin(e\,(m-2\,k))\right)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(e\,(2\,k-m)-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-\right.\right.$$

$$S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)$$

$$\left.\left.\sin\left(e\,(2\,k-m)-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\right.$$

$$\left(\cos\left(e\,(2\,k-m)-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$\left.S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(e\,(2\,k-m)-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right)\Big/$$

$$\left.\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3353.01

$$\int \cos^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\,i\sqrt{i\,f\,(v-2\,k)}\ \sinh\left(f\,z\,(v-2\,k)+c\sqrt{z}\ (v-2\,k)\right)-c\sqrt{2\,\pi}\right.\right.$$

$$\left.\left.(v-2\,k)\left(\cosh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\ \sqrt{i\,f\,(v-2\,k)}}\right)-i\,S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\ \sqrt{i\,f\,(v-2\,k)}}\right)\sinh\left(\frac{c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2\,k)^2}\left(\binom{m}{k}\left(\cos\left(2\,e\,k-e\,m+b\,(2\,k-m)\sqrt{z}\right)+\right.\right.$$

$$\left.\left.b\,(2\,k-m)\sqrt{z}\ \sin\left(2\,e\,k-e\,m+b\,(2\,k-m)\sqrt{z}\right)\right)\right)+2^{-m-v}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}+2\,e\,k-\right.\right.\right.$$

$$\left.\left.e\,m\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,f\,v-2\,i\,f\,s}}\right)+\sqrt{2\,\pi}\ (2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\right.$$

$$S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,f\,v-2\,i\,f\,s}}\right)\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}+2\,e\,k-\right.$$

$$\left.\left.e\,m\right)+2\sqrt{i\,f\,v-2\,i\,f\,s}\ \sin\left(2\,e\,k-e\,m+(i\,f\,v-2\,i\,f\,s)\,z+(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\,\pi}\ (-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+\right.\right.$$

$$\left.2\,e\,k-e\,m\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,i\,f\,s-i\,f\,v}}\right)+$$

$$\sqrt{2\,\pi}\ (2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m\right)+2\sqrt{2\,i\,f\,s-i\,f\,v}$$

$$\left.\left.\sin\left(2\,e\,k-e\,m+(2\,i\,f\,s-i\,f\,v)\,z+(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\right)\text{/;}\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r + d\,z)\cosh^v(c\,z^r + f\,z)$

01.20.21.3354.01

$$\int \cos^m\left(b\,z^2 + d\,z\right)\cosh^v\left(c\,z^2 + f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)\,(1 - v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right) + S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)\right)}{\sqrt{b\,(m-2\,k)}}\right)(1 - v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right) + S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}} +$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v)^2}{4\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)}\right)C\left(\frac{2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v + 2\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}}\right) +\right.$$

$$S\left(\frac{2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v + 2\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}}\right)$$

$$\left.\sin\left(\frac{(2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v)^2}{4\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}\right) +$$

$$\left(\cos\left(\frac{(2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v)^2}{4\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)}\right)C\left(\frac{2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v + 2\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}}\right) +\right.$$

$$S\left(\frac{2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v + 2\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}}\right)\sin\left(\frac{(2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v)^2}{4\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)}\right)\Big)\Big/$$

$$\left.\left(\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}\right)\right) /;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3355.01

$$\int \cos^m\left(\sqrt{z}\;b + d\,z\right)\cosh^v\left(\sqrt{z}\;c + f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)\,(1 - v \bmod 2) +$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)C\left(\frac{b\,(m-2\,k) + 2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right) -\right.\right.\right.$$

$$\left.\left.\left.b\,(m-2\,k)\,\sqrt{2\,\pi}\;S\left(\frac{b\,(m-2\,k) + 2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}\right) +\right.\right.\right.$$

$$2\sqrt{d\,(m-2k)}\,\sin\left(d\,z\,(m-2k)+b\sqrt{z}\,(m-2k)\right)\Bigg)\Bigg)(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\,(2k-v)\left(\cosh\left(\frac{c^2\,(v-2k)}{4\,f}\right)C\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)-i\,S\left(\frac{(2k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{i\,f\,(v-2k)}}\right)\right.\right.\right.$$

$$\left.\left.\left.\sinh\left(\frac{c^2\,(v-2k)}{4\,f}\right)\right)+2\,i\sqrt{i\,f\,(v-2k)}\,\sinh\left(f\,z\,(v-2k)+c\sqrt{z}\,(v-2k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}\right)\right.\right.$$

$$C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)-$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}\right)+2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\left.\left.\sin\left(\sqrt{z}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z\right)\right)\Big/\right.$$

$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)-$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}\right)+2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\,\sin\left(\sqrt{z}\,(2\,b\,k-b\,m+2\,i\,c\,s-\right.$$

$$\left.\left.\left.i\,c\,v)+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r+d\,z+e)\cosh^v(c\,z^r+f\,z)$

01.20.21.3356.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left(\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b}+8\,e\,k-4\,e\,m\right)\right)\right)\right)\right)(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{k}\left(i\cosh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\ \sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\ \sqrt{i\,c\,(v-2\,k)}}\right)\sinh\left(\frac{f^2\,(v-2\,k)}{4\,c}\right)\right)}{\sqrt{i\,c\,(v-2\,k)}}+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(e\,(2\,k-m)-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-$$

$$S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(e\,(2\,k-m)-\right.$$

$$\left.\left.\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(e\,(2\,k-m)-\right.\right.$$

$$\left.\left.\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\ \sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(e\,(2\,k-m)-\right.$$

$$\left.\left.\left.\left.\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3357.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\ \cos\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{\sqrt{d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$b\,(m-2\,k)\,\sqrt{2\,\pi}\ S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{\sqrt{d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)+$$

$$\left.\left.\left.2\,\sqrt{d\,(m-2\,k)}\ \sin\left(e\,(m-2\,k)+d\,z\,(m-2\,k)+b\,\sqrt{z}\ (m-2\,k)\right)\right)\right)\right)$$

$$(1-v \bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i f (v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\ (2k-v)\right.\right.$$

$$\left(\cosh\left(\frac{c^2(v-2k)}{4f}\right)C\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\sqrt{i f (v-2k)}}\right)-iS\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\sqrt{i f (v-2k)}}\right)\sinh\left(\frac{c^2(v-2k)}{4f}\right)\right)+$$

$$\left.\left.2i\sqrt{i f (v-2k)}\ \sinh\left(f z (v-2k)+c\sqrt{z}\ (v-2k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\ (-2bk+bm+2ics-icv)\cos\left(-\frac{(2bk-bm-2ics+icv)^2}{4(2dk-dm-2ifs+ifv)}+2ek-em\right)\right.\right.$$

$$C\left(\frac{2bk-bm-2ics+icv+2(2dk-dm-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{2dk-dm-2ifs+ifv}}\right)+$$

$$\sqrt{2\pi}\ (2bk-bm-2ics+icv)S\left(\frac{2bk-bm-2ics+icv+2(2dk-dm-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{2dk-dm-2ifs+ifv}}\right)$$

$$\sin\left(-\frac{(2bk-bm-2ics+icv)^2}{4(2dk-dm-2ifs+ifv)}+2ek-em\right)+$$

$$2\sqrt{2dk-dm-2ifs+ifv}\ \sin\left(2ek-em+(2dk-dm-2ifs+ifv)z+\right.$$

$$\left.\left.(2bk-bm-2ics+icv)\sqrt{z}\right)\right)\Big/(2dk-dm-2ifs+ifv)^{3/2}+$$

$$\left(\sqrt{2\pi}\ (-2bk+bm-2ics+icv)\cos\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2dk-dm+2ifs-ifv)}+2ek-em\right)\right.$$

$$C\left(\frac{2bk-bm+2ics-icv+2(2dk-dm+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{2dk-dm+2ifs-ifv}}\right)+$$

$$\sqrt{2\pi}\ (2bk-bm+2ics-icv)S\left(\frac{2bk-bm+2ics-icv+2(2dk-dm+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\sqrt{2dk-dm+2ifs-ifv}}\right)$$

$$\sin\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2dk-dm+2ifs-ifv)}+2ek-em\right)+2\sqrt{2dk-dm+2ifs-ifv}$$

$$\left.\sin\left(2ek-em+(2dk-dm+2ifs-ifv)z+(2bk-bm+2ics-icv)\sqrt{z}\right)\right)\Big/$$

$$\left.(2dk-dm+2ifs-ifv)^{3/2}\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3358.01

$$\int \cos^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,i\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k)-\frac{i\,f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(2\,d\,k\,z-m\,d\,z)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\right.$$

$$\left(\cos\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+g\,i\,(2\,s-v)\right)C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)+\right.$$

$$\left.S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\sin\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+g\,i\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(i\,g\,(2\,s-v)-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)C\left(\right.\right.$$

$$\left.\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)$$

$$\left.\left.\sin\left(i\,g\,(2\,s-v)-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3359.01

$$\int \cos^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(d\,(m-2\,k)\,z)}{m-2\,k}\right)(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\sqrt{i\,f\,(v-2\,k)}\;\sin\left(g\,i\,(v-2\,k)+f\,i\,z\,(v-2\,k)+c\,i\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$c\sqrt{2\,\pi}\;(v-2\,k)\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\ (2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}-2\,i\,g\,s+i\,g\,v\right)\right.\right.$$
$$C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$
$$\sqrt{2\pi}\ (i\,c\,v-2\,i\,c\,s)\,S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$
$$\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}-2\,i\,g\,s+i\,g\,v\right)+2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}$$
$$\left.\sin\left(-2\,g\,i\,s+i\,g\,v+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/$$
$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\pi}\ (i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,i\,g\,s-i\,g\,v\right)\right.$$
$$C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+\sqrt{2\pi}\ (2\,i\,c\,s-i\,c\,v)$$
$$S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,i\,g\,s-\right.$$
$$\left.i\,g\,v\right)+2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\ \sin\left(2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+\right.$$
$$\left.\left.\left.(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3360.01

$$\int \cos^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,i\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k)-\frac{i\,f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+$$

$$\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(2\,k-m)-m\,d\,z+2\,d\,k\,z)}{2\,k-m}+2^{-m-v+\frac{1}{2}}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{i\,c\,v-2\,i\,c\,s}}\left(\cos\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-i\,g\,(2\,s-v)\right)C\left(\right.\right.\right.$$

$$\left.\left.\left.\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)-S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v+2\,(i\,c\,v-2\,i\,c\,s)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,c\,v-2\,i\,c\,s}}\right)\right.\right.$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^2}{4\,(i\,c\,v-2\,i\,c\,s)}+e\,(2\,k-m)-i\,g\,(2\,s-v)\right)\right)+$$

$$\frac{1}{\sqrt{2\,i\,c\,s-i\,c\,v}}\left(\cos\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)+g\,i\,(2\,s-v)\right)C\left(\right.\right.$$

$$\left.\left.\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)-S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v+2\,(2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,i\,c\,s-i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,i\,c\,s-i\,c\,v)}+e\,(2\,k-m)+g\,i\,(2\,s-v)\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3361.01

$$\int \cos^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v+1}}{d}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\sin(e\,(m-2\,k)+d\,z\,(m-2\,k))}{m-2\,k}\right)(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\sqrt{i\,f\,(v-2\,k)}\;\sin\left(g\,i\,(v-2\,k)+f\,i\,z\,(v-2\,k)+c\,i\,\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$c\sqrt{2\,\pi}\;(v-2\,k)\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\ (2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v\right)\right.\right.$$

$$C\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$

$$\sqrt{2\pi}\ (i\,c\,v-2\,i\,c\,s)\,S\left(\frac{-2\,c\,i\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(-\frac{(i\,c\,v-2\,i\,c\,s)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v\right)+2\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}$$

$$\left.\left.\sin\left(2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+(i\,c\,v-2\,i\,c\,s)\sqrt{z}\right)\right)\Big/\right.$$

$$(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\left(\sqrt{2\pi}\ (i\,c\,v-2\,i\,c\,s)\cos\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+\right.\right.$$

$$\left.2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v\right)C\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+$$

$$\sqrt{2\pi}\ (2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v\right)+$$

$$2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\ \sin\left(2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+\right.$$

$$\left.\left.\left.(2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3362.01

$$\int \cos^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\binom{m}{k}C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-$$

$$i\,2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k)-\frac{i\,f^2\,(v-2\,k)}{4\,c}\right)\right)\right)+2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)\right)C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)+\right.\right.$$

$$\left.S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\right.$$

$$\left.\left.\sin\left(\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\right.$$

$$\left(\cos\left(i\,g\,(2\,s-v)-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-\right.$$

$$\left.\left.S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(i\,g\,(2\,s-v)-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}\right)\right)\Big/\right.$$

$$\left.\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3363.01

$$\int \cos^m\left(b\,\sqrt{z}\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\sqrt{i\,f\,(v-2\,k)}\;\sin\left(g\,i\,(v-2\,k)+f\,i\,z\,(v-2\,k)+c\,i\,\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$c\sqrt{2\,\pi}\;(v-2\,k)\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)\right)\right)\right)+$$

$$\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(b\,(2k-m)\sqrt{z}\right)+b\,(2k-m)\sqrt{z}\,\sin\left(b\,(2k-m)\sqrt{z}\right)\right)}{(m-2k)^2}+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(i\,f\,v-2\,i\,f\,s)^{3/2}}\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}-2\,i\,g\,s+\right.\right.\right.$$

$$\left.i\,g\,v\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)+$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(i\,f\,v-2\,i\,f\,s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{i\,f\,v-2\,i\,f\,s}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(i\,f\,v-2\,i\,f\,s)}-2\,i\,g\,s+i\,g\,v\right)+$$

$$\left.2\sqrt{i\,f\,v-2\,i\,f\,s}\,\sin\left(-2\,g\,i\,s+i\,g\,v+(i\,f\,v-2\,i\,f\,s)\,z+(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2\,i\,f\,s-i\,f\,v)^{3/2}}\left(\sqrt{2\pi}\,(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+\right.\right.$$

$$\left.2\,i\,g\,s-i\,g\,v\right)C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)+$$

$$\sqrt{2\pi}\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,i\,f\,s-i\,f\,v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,i\,f\,s-i\,f\,v)}+2\,i\,g\,s-i\,g\,v\right)+2\sqrt{2\,i\,f\,s-i\,f\,v}$$

$$\left.\left.\sin\left(2\,i\,g\,s-i\,g\,v+(2\,i\,f\,s-i\,f\,v)\,z+(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\sqrt{z}\right)\right)\right)\Big/;\, m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3364.01

$$\int \cos^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos(e\,(m-2\,k))\,C\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)-S\left(\frac{b\,(m-2\,k)\sqrt{\frac{2}{\pi}}\,z}{\sqrt{b\,(m-2\,k)}}\right)\sin(e\,(m-2\,k))\right)}{\sqrt{b\,(m-2\,k)}}-$$

$$i\,2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(\cos\left(-\frac{i\,(v-2\,k)\,f^2}{4\,c}+g\,i\,(v-2\,k)\right)\right.\right.$$

$$\left.\left.C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sin\left(-\frac{i\,(v-2\,k)\,f^2}{4\,c}+g\,i\,(v-2\,k)\right)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-i\,g\,(2\,s-v)\right)\right.\right.$$

$$C\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)-$$

$$S\left(\frac{-2\,f\,i\,s+i\,f\,v+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}}\right)\sin\left(-\frac{(i\,f\,v-2\,i\,f\,s)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)}+e\,(2\,k-m)-\right.$$

$$\left.\left.i\,g\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v}\right)+\left(\cos\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.\right.$$

$$\left.e\,(2\,k-m)+g\,i\,(2\,s-v)\right)C\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)-$$

$$S\left(\frac{2\,i\,f\,s-i\,f\,v+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}}\right)\sin\left(-\frac{(2\,i\,f\,s-i\,f\,v)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)}+\right.$$

$$\left.\left.e\,(2\,k-m)+g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)\Big/;\, m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3365.01

$$\int \cos^m\left(\sqrt{z}\;b+e\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(2\sqrt{i\,f\,(v-2\,k)}\;\sin\left(g\,i\,(v-2\,k)+f\,i\,z\,(v-2\,k)+c\,i\sqrt{z}\;(v-2\,k)\right)-\right.\right.$$

$$\left.\left.c\sqrt{2\,\pi}\;(v-2\,k)\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)C\left(\frac{(2\,k-v)\left(c+2\,f\sqrt{z}\right)}{\sqrt{2\,\pi}\,\sqrt{i\,f\,(v-2\,k)}}\right)+\right.\right.$$

$$S\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\,\sqrt{if(v-2k)}}\right)\sin\left(ig(v-2k)-\frac{ic^2(v-2k)}{4f}\right)\Bigg)\Bigg)+\frac{2^{-m-v+2}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left(\binom{m}{k}\left(\cos\left(2ek-em+b(2k-m)\sqrt{z}\right)+b(2k-m)\sqrt{z}\,\sin\left(2ek-em+b(2k-m)\sqrt{z}\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(if v-2if s)^{3/2}}\left(\sqrt{2\pi}\,(-2bk+bm+2ics-icv)\cos\left(-\frac{(2bk-bm-2ics+icv)^2}{4(if v-2if s)}+\right.\right.\right.$$

$$\left.2ek-em-2igs+igv\right)C\left(\frac{2bk-bm-2ics+icv+2(if v-2if s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{if v-2if s}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm-2ics+icv)S\left(\frac{2bk-bm-2ics+icv+2(if v-2if s)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{if v-2if s}}\right)$$

$$\sin\left(-\frac{(2bk-bm-2ics+icv)^2}{4(if v-2if s)}+2ek-em-2igs+igv\right)+2\sqrt{if v-2if s}$$

$$\left.\sin\left(2ek-em-2igs+igv+(if v-2if s)z+(2bk-bm-2ics+icv)\sqrt{z}\right)\right)+$$

$$\frac{1}{(2if s-if v)^{3/2}}\left(\sqrt{2\pi}\,(-2bk+bm-2ics+icv)\cos\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2if s-if v)}+\right.\right.$$

$$\left.2ek-em+2igs-igv\right)C\left(\frac{2bk-bm+2ics-icv+2(2if s-if v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2if s-if v}}\right)+$$

$$\sqrt{2\pi}\,(2bk-bm+2ics-icv)S\left(\frac{2bk-bm+2ics-icv+2(2if s-if v)\sqrt{z}}{\sqrt{2\pi}\,\sqrt{2if s-if v}}\right)$$

$$\sin\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2if s-if v)}+2ek-em+2igs-igv\right)+2\sqrt{2if s-if v}\,\sin\left(2ek-\right.$$

$$\left.\left.\left.em+2igs-igv+(2if s-if v)z+(2bk-bm+2ics-icv)\sqrt{z}\right)\right)\right)/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\cos^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3366.01

$$\int \cos^m\left(b\,z^2+d\,z\right)\cosh^\nu\left(c\,z^2+f\,z+g\right)dz == 2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)-$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{\binom{m}{k}\left(\cos\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{d^2\,(m-2\,k)}{4\,b}\right)\right)}{\sqrt{b\,(m-2\,k)}}\right)(1-\nu \bmod 2)-$$

$$i\,2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(\nu-2\,k)}}\left(\binom{\nu}{k}\left(\cos\left(i\,g\,(\nu-2\,k)-\frac{i\,f^2\,(\nu-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-\nu)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(\nu-2\,k)}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-\nu)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(\nu-2\,k)}}\right)\sin\left(i\,g\,(\nu-2\,k)-\frac{i\,f^2\,(\nu-2\,k)}{4\,c}\right)\right)\right)+$$

$$2^{-m-\nu+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\cos\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)}+g\,i\,(2\,s-\nu)\right)\right.\right.$$

$$C\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,\nu+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)+$$

$$S\left(\frac{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,\nu+2\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu}}\right)\sin\left(\frac{(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,\nu)^2}{4\,(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu)}+\right.$$

$$\left.\left.g\,i\,(2\,s-\nu)\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,\nu}\right)+\left(\cos\left(i\,g\,(2\,s-\nu)-\right.\right.$$

$$\left.\left.\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)}\right)C\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,\nu+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)-\right.$$

$$S\left(\frac{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,\nu+2\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu}}\right)\sin\left(i\,g\,(2\,s-\nu)-\right.$$

$$\left.\left.\left.\left.\frac{(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,\nu)^2}{4\,(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu)}\right)\right)\Big/\left(\sqrt{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,\nu}\right)\right)/;\,m\in\mathbb{N}^+\wedge\nu\in\mathbb{N}^+$$

01.20.21.3367.01

$$\int \cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh^\nu\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)+$$

$$2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(-b\,(m-2\,k)\,\sqrt{2\,\pi}\,\cos\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)C\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$b\,(m-2\,k)\,\sqrt{2\,\pi}\,S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}\right)+$$

$$\left.\left.\left.2\,\sqrt{d\,(m-2\,k)}\;\sin\left(d\,z\,(m-2\,k)+b\,\sqrt{z}\;(m-2\,k)\right)\right)\right)\right)(1-\nu \bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i f (v-2k))^{3/2}}\left(\binom{v}{k}\left(c\sqrt{2\pi}\ (2k-v)\left(\cos\left(i g (v-2k)-\frac{i c^2 (v-2k)}{4f}\right)\right.\right.\right.$$
$$\left.C\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\ \sqrt{i f (v-2k)}}\right)+S\left(\frac{(2k-v)\left(c+2f\sqrt{z}\right)}{\sqrt{2\pi}\ \sqrt{i f (v-2k)}}\right)\sin\left(i g (v-2k)-\frac{i c^2 (v-2k)}{4f}\right)\right)+$$
$$\left.\left.2\sqrt{i f (v-2k)}\ \sin\left(g i (v-2k)+f i z (v-2k)+c i\sqrt{z}\ (v-2k)\right)\right)\right)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\pi}\ (-2bk+bm+2ics-icv)\cos\left(-\frac{(2bk-bm-2ics+icv)^2}{4(2dk-dm-2ifs+ifv)}-2igs+igv\right)\right.\right.$$
$$C\left(\frac{2bk-bm-2ics+icv+2(2dk-dm-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2dk-dm-2ifs+ifv}}\right)+$$
$$\sqrt{2\pi}\ (2bk-bm-2ics+icv)S\left(\frac{2bk-bm-2ics+icv+2(2dk-dm-2ifs+ifv)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2dk-dm-2ifs+ifv}}\right)$$
$$\sin\left(-\frac{(2bk-bm-2ics+icv)^2}{4(2dk-dm-2ifs+ifv)}-2igs+igv\right)+$$
$$2\sqrt{2dk-dm-2ifs+ifv}\ \sin\left(-2gis+igv+(2dk-dm-2ifs+ifv)z+\right.$$
$$\left.\left.(2bk-bm-2ics+icv)\sqrt{z}\right)\right)\Big/(2dk-dm-2ifs+ifv)^{3/2}+$$

$$\left(\sqrt{2\pi}\ (-2bk+bm-2ics+icv)\cos\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2dk-dm+2ifs-ifv)}+2igs-igv\right)\right.$$
$$C\left(\frac{2bk-bm+2ics-icv+2(2dk-dm+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2dk-dm+2ifs-ifv}}\right)+$$
$$\sqrt{2\pi}\ (2bk-bm+2ics-icv)S\left(\frac{2bk-bm+2ics-icv+2(2dk-dm+2ifs-ifv)\sqrt{z}}{\sqrt{2\pi}\ \sqrt{2dk-dm+2ifs-ifv}}\right)$$
$$\sin\left(-\frac{(2bk-bm+2ics-icv)^2}{4(2dk-dm+2ifs-ifv)}+2igs-igv\right)+2\sqrt{2dk-dm+2ifs-ifv}$$
$$\left.\sin\left(2igs-igv+(2dk-dm+2ifs-ifv)z+(2bk-bm+2ics-icv)\sqrt{z}\right)\right)\Big/$$
$$\left.(2dk-dm+2ifs-ifv)^{3/2}\right)/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(b\,z^r + d\,z + e)\cosh^v(c\,z^r + f\,z + g)$

01.20.21.3368.01

$$\int \cos^m\left(b\,z^2 + d\,z + e\right)\cosh^v\left(c\,z^2 + f\,z + g\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)\,(1 - v \bmod 2) -$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b\,(m-2\,k)}}\left(\binom{m}{k}\left(\cos\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b} + 8\,e\,k - 4\,e\,m\right)\right)C\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right) +\right.\right.\right.$$

$$\left.\left.\left.S\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{\sqrt{b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sin\left(\frac{1}{4}\left(\frac{(m-2\,k)\,d^2}{b} + 8\,e\,k - 4\,e\,m\right)\right)\right)\right)\right)(1 - v \bmod 2) -$$

$$i\,2^{-m-v+\frac{1}{2}}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,k)}}\left(\binom{v}{k}\left(\cos\left(i\,g\,(v-2\,k) - \frac{i\,f^2\,(v-2\,k)}{4\,c}\right)C\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right) +\right.\right.$$

$$\left.\left.S\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k) - \frac{i\,f^2\,(v-2\,k)}{4\,c}\right)\right)\right) +$$

$$2^{-m-v+\frac{1}{2}}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\cos\left(-\frac{(2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v)^2}{4\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)} + e\,(2\,k-m) - i\,g\,(2\,s-v)\right)\right.\right.$$

$$C\left(\frac{2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v + 2\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}}\right) -$$

$$S\left(\frac{2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v + 2\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}}\right)$$

$$\left.\left.\sin\left(-\frac{(2\,d\,k - d\,m - 2\,i\,f\,s + i\,f\,v)^2}{4\,(2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v)} + e\,(2\,k-m) - i\,g\,(2\,s-v)\right)\right)\Big/$$

$$\left(\sqrt{2\,b\,k - b\,m - 2\,i\,c\,s + i\,c\,v}\right) + \left(\cos\left(-\frac{(2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v)^2}{4\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)} + e\,(2\,k-m) + g\,i\,(2\,s-v)\right)\right.$$

$$C\left(\frac{2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v + 2\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}}\right) -$$

$$S\left(\frac{2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v + 2\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}}\right)\sin\left(-\frac{(2\,d\,k - d\,m + 2\,i\,f\,s - i\,f\,v)^2}{4\,(2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v)} +\right.$$

$$\left.\left.\left.e\,(2\,k-m) + g\,i\,(2\,s-v)\right)\right)\Big/\left(\sqrt{2\,b\,k - b\,m + 2\,i\,c\,s - i\,c\,v}\right)\right)/;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3369.01

$$\int \cos^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,s}\left(e^{-\frac{i\left(-d^2-4\,b\,e\right)(2\,s-m)}{4\,b}}\binom{m}{s}\left(e^{\frac{i\,d^2\,(m-2\,s)}{2\,b}}\sqrt{i\,b\,(2\,s-m)}\ \operatorname{erf}\left(\frac{\sqrt{i\,b\,(2\,s-m)}\ (i\,d+2\,i\,b\,z)}{2\,b}\right)+\right.\right.$$

$$\left.\left.\left.e^{2\,i\,e\,(m-2\,s)}\,i\,\sqrt{i\,b\,(m-2\,s)}\ \operatorname{erfi}\left(\frac{(2\,s-m)\,(i\,d+2\,i\,b\,z)}{2\sqrt{i\,b\,(m-2\,s)}}\right)\right)\right)-$$

$$\frac{1}{c}\left(2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,k}\left(e^{-\frac{(v-2\,k)\,f^2}{4\,c}+2\,g\,k-g\,v}\binom{v}{k}\left(e^{\frac{f^2\,(v-2\,k)}{2\,c}}\sqrt{c\,(2\,k-v)}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{\sqrt{c\,(2\,k-v)}\ (f+2\,c\,z)}{2\,c}\right)+e^{2\,g\,(v-2\,k)}\sqrt{c\,(v-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-v)\,(f+2\,c\,z)}{2\sqrt{c\,(v-2\,k)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\left(e^{-\frac{(2\,f\,k+d\,i\,(m-2\,s)-f\,v)^2}{8\,c\,k+4\,i\,b\,m-8\,i\,b\,s-4\,c\,v}+e\,i\,(m-2\,s)-2\,g\,v+g\,(v-2\,k)}\left(e^{2\left(\frac{(2\,f\,k+i\,d\,m-2\,i\,d\,s-f\,v)^2}{8\,c\,k+4\,i\,b\,m-8\,i\,b\,s-4\,c\,v}+e\,i\,(2\,s-m)+g\,v\right)}\right.\right.\right.$$

$$\sqrt{-2\,c\,k-i\,b\,m+2\,i\,b\,s+c\,v}\ \operatorname{erfi}\left(\frac{(2\,s-m)\,(i\,d+2\,i\,b\,z)-2\,k\,(f+2\,c\,z)+v\,(f+2\,c\,z)}{2\sqrt{-2\,c\,k-i\,b\,m+2\,i\,b\,s+c\,v}}\right)-e^{4\,g\,k}$$

$$\left.\left.\left.\sqrt{2\,c\,k+i\,b\,m-2\,i\,b\,s-c\,v}\ \operatorname{erfi}\left(\frac{-(2\,s-m)\,(i\,d+2\,i\,b\,z)+2\,k\,(f+2\,c\,z)-v\,(f+2\,c\,z)}{2\sqrt{2\,c\,k+i\,b\,m-2\,i\,b\,s-c\,v}}\right)\right)\right)\Big/$$

$$(-2\,c\,k-i\,b\,m+2\,i\,b\,s+c\,v)+\left(e^{\frac{(-2\,f\,k+i\,d\,m-2\,i\,d\,s+f\,v)^2}{8\,c\,k-4\,i\,b\,m+8\,i\,b\,s-4\,c\,v}+e\,i\,(m-2\,s)+g\,(v-2\,k)}\right.$$

$$\left.\operatorname{erfi}\left(\frac{-(2\,s-m)\,(i\,d+2\,i\,b\,z)-2\,k\,(f+2\,c\,z)+v\,(f+2\,c\,z)}{2\sqrt{b\,i\,(m-2\,s)+c\,(v-2\,k)}}\right)\right)\Big/\left(\sqrt{b\,i\,(m-2\,s)+c\,(v-2\,k)}\right)-$$

$$\frac{1}{b\,i\,(m-2\,s)+c\,(v-2\,k)}\left(e^{-\frac{(-2\,f\,k+i\,d\,m-2\,i\,d\,s+f\,v)^2}{8\,c\,k-4\,i\,b\,m+8\,i\,b\,s-4\,c\,v}+e\,i\,(2\,s-m)+g\,(2\,k-v)}\sqrt{2\,c\,k-i\,b\,m+2\,i\,b\,s-c\,v}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{(2\,s-m)\,(i\,d+2\,i\,b\,z)+2\,k\,(f+2\,c\,z)-v\,(f+2\,c\,z)}{2\sqrt{2\,c\,k-i\,b\,m+2\,i\,b\,s-c\,v}}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3370.01

$$\int \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz == 2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(d\,(m-2\,k))^{3/2}}\left(\binom{m}{k}\left(-b\,(m-2\,k)\sqrt{2\,\pi}\ \cos\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)C\left(\frac{b\,(m-2\,k)+2\,d\sqrt{z}\ (m-2\,k)}{\sqrt{d\,(m-2\,k)}\ \sqrt{2\,\pi}}\right)-\right.\right.\right.$$

$$b\,(m-2\,k)\,\sqrt{2\,\pi}\;S\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\;(m-2\,k)}{\sqrt{d\,(m-2\,k)}\;\sqrt{2\,\pi}}\right)\sin\left(\frac{b^2\,(m-2\,k)}{4\,d}-e\,(m-2\,k)\right)+$$

$$2\,\sqrt{d\,(m-2\,k)}\;\sin\left(e\,(m-2\,k)+d\,z\,(m-2\,k)+b\,\sqrt{z}\;(m-2\,k)\right)\Bigg)\Bigg)\Bigg)\,(1-v\bmod 2)+$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,k))^{3/2}}\left(\binom{v}{k}\left(c\,\sqrt{2\,\pi}\;(2\,k-v)\left(\cos\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)\right.\right.\right.$$

$$\left.C\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)+S\left(\frac{(2\,k-v)\left(c+2\,f\,\sqrt{z}\right)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,k)}}\right)\sin\left(i\,g\,(v-2\,k)-\frac{i\,c^2\,(v-2\,k)}{4\,f}\right)\right)+$$

$$\left.2\,\sqrt{i\,f\,(v-2\,k)}\;\sin\left(g\,i\,(v-2\,k)+f\,i\,z\,(v-2\,k)+c\,i\,\sqrt{z}\;(v-2\,k)\right)\right)\Bigg)+$$

$$2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\sqrt{2\,\pi}\;(-2\,b\,k+b\,m+2\,i\,c\,s-i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-\right.\right.\right.$$

$$\left.e\,m-2\,i\,g\,s+i\,g\,v\right)C\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)+$$

$$\sqrt{2\,\pi}\;(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v+2\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)^2}{4\,(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)}+2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v\right)+$$

$$2\,\sqrt{2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v}\;\sin\left(2\,e\,k-e\,m-2\,i\,g\,s+i\,g\,v+(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)\,z+\right.$$

$$\left.\left.\left.(2\,b\,k-b\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}\right)\right)\Big/(2\,d\,k-d\,m-2\,i\,f\,s+i\,f\,v)^{3/2}+\right.$$

$$\left(\sqrt{2\,\pi}\;(-2\,b\,k+b\,m-2\,i\,c\,s+i\,c\,v)\cos\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v\right)\right.$$

$$C\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)+$$

$$\sqrt{2\,\pi}\;(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,S\left(\frac{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v+2\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}}\right)$$

$$\sin\left(-\frac{(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)^2}{4\,(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)}+2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v\right)+$$
$$2\sqrt{2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v}\,\sin\left(2\,e\,k-e\,m+2\,i\,g\,s-i\,g\,v+(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)\,z+\right.$$
$$\left.\left.(2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}\right)\right/(2\,d\,k-d\,m+2\,i\,f\,s-i\,f\,v)^{3/2}\Bigg/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.3371.01

$$\int\cos^m\left(\sqrt{z}\,b+e+d\,z\right)\cosh^v\left(\sqrt{z}\,c+g+f\,z\right)dz==2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)+$$
$$2^{-m-v-1}\,i\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-i\,e\,(m-2\,s)}\binom{m}{s}\left(\frac{b\,e^{\frac{i\,b^2\,(m-2\,s)}{4\,d}}\sqrt{\pi}\,(m-2\,s)\,\text{erfi}\left(\frac{\sqrt{-i\,d\,(m-2\,s)}\,\left(b+2\,d\,\sqrt{z}\right)}{2\,d}\right)}{(-i\,d\,(m-2\,s))^{3/2}}+\right.\right.$$
$$\frac{1}{d^2\,(m-2\,s)}\left(b\,e^{-\frac{i\left(b^2-8\,d\,e\right)(m-2\,s)}{4\,d}}\sqrt{\pi}\,\sqrt{i\,d\,(m-2\,s)}\,\text{erfi}\left(\frac{\sqrt{i\,d\,(m-2\,s)}\,\left(b+2\,d\,\sqrt{z}\right)}{2\,d}\right)-\right.$$
$$\left.\left.2\,d\,e^{-i\,(m-2\,s)\left(b+d\,\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,i\,(m-2\,s)\left(\sqrt{z}\,b+e+d\,z\right)}\right)\right)\right)(1-v\bmod 2)+$$
$$\frac{1}{f}\left(2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g\,(v-2\,k)}\binom{v}{k}\left(\frac{\left(2\,e^{(2\,k-v)\left(c+f\,\sqrt{z}\right)\sqrt{z}}\left(1-e^{2\,(v-2\,k)\left(\sqrt{z}\,c+g+f\,z\right)}\right)\right)(-1)}{v-2\,k}-\right.\right.$$
$$\left.\left.\frac{\left(c\,e^{\frac{c^2\,(v-2\,k)}{4\,f}}\sqrt{\pi}\right)\text{erfi}\left(\frac{\sqrt{f\,(2\,k-v)}\,\left(c+2\,f\,\sqrt{z}\right)}{2\,f}\right)}{\sqrt{f\,(2\,k-v)}}-\frac{\left(c\,e^{-\frac{(v-2\,k)\,c^2}{4\,f}-4\,g\,k+2\,g\,v}\sqrt{\pi}\right)\text{erfi}\left(\frac{\sqrt{f\,(v-2\,k)}\,\left(c+2\,f\,\sqrt{z}\right)}{2\,f}\right)}{\sqrt{f\,(v-2\,k)}}\right)\right)+$$
$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-i\,e\,(m-2\,s)-g\,(2\,k-v)}\left(\frac{2\,e^{\sqrt{z}\,(b\,i\,(m-2\,s)+c\,(2\,k-v))+2\,(e\,i\,(m-2\,s)+g\,(2\,k-v))+(d\,i\,(m-2\,s)+f\,(2\,k-v))\,z}}{d\,i\,(m-2\,s)+f\,(2\,k-v)}-\right.\right.$$
$$\left(e^{2\,(e\,i\,(m-2\,s)+g\,(2\,k-v))-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}}\sqrt{\pi}\,(b\,i\,(m-2\,s)+c\,(2\,k-v))\,\text{erfi}\left(\right.\right.$$
$$\left.\left.\left.\frac{b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}}{2\,\sqrt{d\,i\,(m-2\,s)+f\,(2\,k-v)}}\right)\right)\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))^{3/2}+$$

$$\frac{2\,e^{\sqrt{z}\,(-i\,b\,(m-2\,s)-c\,(2\,k-v))+(f\,(v-2\,k)-i\,d\,(m-2\,s))\,z}}{f\,(v-2\,k)-i\,d\,(m-2\,s)}-\left(e^{-\frac{(-i\,b\,(m-2\,s)-c\,(2\,k-v))^2}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}}\sqrt{\pi}\;(b\,i\,(m-2\,s)+c\,(2\,k-v))\,\text{erfi}\left(\frac{b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}}{2\,\sqrt{f\,(v-2\,k)-i\,d\,(m-2\,s)}}\right)\right)\Big/\left(f\,(v-2\,k)-i\,d\,(m-2\,s)\right)^{3/2}\Bigg)+$$

$$e^{-i\,e\,(m-2\,s)-g\,(v-2\,k)}\left(\frac{2\,e^{\sqrt{z}\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))+(f\,(2\,k-v)-i\,d\,(m-2\,s))\,z}}{f\,(2\,k-v)-i\,d\,(m-2\,s)}-\left(e^{-\frac{(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,(f\,(2\,k-v)-i\,d\,(m-2\,s))}}\sqrt{\pi}\;(b\,i\,(m-2\,s)+c\,(v-2\,k))\,\text{erfi}\left(\frac{b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}}{2\,\sqrt{f\,(2\,k-v)-i\,d\,(m-2\,s)}}\right)\right)\Big/\left(f\,(2\,k-v)-i\,d\,(m-2\,s)\right)^{3/2}+\frac{2\,e^{\sqrt{z}\,(b\,i\,(m-2\,s)+c\,(v-2\,k))+2\,(e\,i\,(m-2\,s)+g\,(v-2\,k))+(d\,i\,(m-2\,s)+f\,(v-2\,k))\,z}}{d\,i\,(m-2\,s)+f\,(v-2\,k)}-\left(e^{2\,(e\,i\,(m-2\,s)+g\,(v-2\,k))-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}}\sqrt{\pi}\;(b\,i\,(m-2\,s)+c\,(v-2\,k))\,\text{erfi}\left(\frac{b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}}{2\,\sqrt{d\,i\,(m-2\,s)+f\,(v-2\,k)}}\right)\right)\Big/\left(d\,i\,(m-2\,s)+f\,(v-2\,k)\right)^{3/2}\Bigg)\Bigg/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving tan

01.20.21.3372.01

$$\int\tan(b\,z)\cosh^{v}(c\,z)\,dz==2^{-v}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{i\,e^{c\,(v-2\,s)\,z}}{c\,(2\,s-v)}\,{}_2F_1\left(\frac{i\,c\,(2\,s-v)}{2\,b},\,1;\,\frac{c\,i\,(2\,s-v)}{2\,b}+1;\,-e^{2\,i\,b\,z}\right)+\frac{e^{(2\,i\,b-2\,c\,s+c\,v)\,z}}{-2\,b-2\,i\,c\,s+i\,c\,v}\,{}_2F_1\left(\frac{2\,b+2\,i\,c\,s-i\,c\,v}{2\,b},\,1;\,\frac{4\,b+2\,i\,c\,s-i\,c\,v}{2\,b};\,-e^{2\,i\,b\,z}\right)+\frac{e^{(2\,i\,b+2\,c\,s-c\,v)\,z}}{-2\,b+2\,i\,c\,s-i\,c\,v}\,{}_2F_1\left(\frac{2\,b-2\,i\,c\,s+i\,c\,v}{2\,b},\,1;\,\frac{4\,b-2\,i\,c\,s+i\,c\,v}{2\,b};\,-e^{2\,i\,b\,z}\right)+\frac{e^{c\,(2\,s-v)\,z}\,i}{c\,(2\,s-v)}\,{}_2F_1\left(-\frac{i\,c\,(2\,s-v)}{2\,b},\,1;\,1-\frac{i\,c\,(2\,s-v)}{2\,b};\,-e^{2\,i\,b\,z}\right)\right)-\binom{v}{\frac{v}{2}}\frac{2^{-v}\;(1-v\bmod 2)\log(\cos(b\,z))}{b}\;/;\;v\in\mathbb{N}^+$$

Involving cot

01.20.21.3373.01

$$\int \cot(b\,z)\cosh^{\nu}(c\,z)\,dz == \binom{\nu}{\frac{\nu}{2}}\frac{2^{-\nu}\log(\sin(b\,z))\,(1-\nu \bmod 2)}{b}+2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{i\,e^{c\,(\nu-2\,s)\,z}}{c\,(2\,s-\nu)}\,{}_2F_1\left(\frac{i\,c\,(2\,s-\nu)}{2\,b},\,1;\,\frac{c\,i\,(2\,s-\nu)}{2\,b}+1;\,e^{2\,i\,b\,z}\right)+\right.$$
$$\frac{e^{(2\,i\,b+2\,c\,s-c\,\nu)\,z}}{-2\,b+2\,i\,c\,s-i\,c\,\nu}\,{}_2F_1\left(\frac{2\,b-2\,i\,c\,s+i\,c\,\nu}{2\,b},\,1;\,\frac{4\,b-2\,i\,c\,s+i\,c\,\nu}{2\,b};\,e^{2\,i\,b\,z}\right)+$$
$$\frac{e^{(2\,i\,b-2\,c\,s+c\,\nu)\,z}}{-2\,b-2\,i\,c\,s+i\,c\,\nu}\,{}_2F_1\left(\frac{2\,b+2\,i\,c\,s-i\,c\,\nu}{2\,b},\,1;\,\frac{4\,b+2\,i\,c\,s-i\,c\,\nu}{2\,b};\,e^{2\,i\,b\,z}\right)-$$
$$\left.\frac{i\,e^{c\,(2\,s-\nu)\,z}}{c\,(2\,s-\nu)}\,{}_2F_1\left(-\frac{i\,c\,(2\,s-\nu)}{2\,b},\,1;\,1-\frac{i\,c\,(2\,s-\nu)}{2\,b};\,e^{2\,i\,b\,z}\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

Involving csc

01.20.21.3374.01

$$\int \csc(b\,z)\cosh^{\nu}(c\,z)\,dz == \binom{\nu}{\frac{\nu}{2}}\frac{2^{-\nu}\,(1-\nu \bmod 2)}{b}\log\left(\tan\left(\frac{b\,z}{2}\right)\right)-$$
$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{b^2+c^2\,(\nu-2\,s)^2}\binom{\nu}{s}e^{(i\,b-c\,(2\,s+\nu))\,z}\left(e^{4\,c\,s\,z}\,(b+c\,i\,(2\,s-\nu))\,{}_2F_1\left(\frac{b-2\,i\,c\,s+i\,c\,\nu}{2\,b},\,1;\,\frac{3\,b-2\,i\,c\,s+i\,c\,\nu}{2\,b};\,e^{2\,i\,b\,z}\right)+\right.$$
$$\left.e^{2\,c\,\nu\,z}\,(b-2\,i\,c\,s+i\,c\,\nu)\,{}_2F_1\left(\frac{b+2\,i\,c\,s-i\,c\,\nu}{2\,b},\,1;\,\frac{3\,b+2\,i\,c\,s-i\,c\,\nu}{2\,b};\,e^{2\,i\,b\,z}\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

Involving sec

01.20.21.3375.01

$$\int \sec(b\,z)\cosh^{\nu}(c\,z)\,dz == \binom{\nu}{\frac{\nu}{2}}\frac{2^{-\nu}\,\log\left(\tan\left(\frac{1}{4}\,(2\,b\,z+\pi)\right)\right)(1-\nu \bmod 2)}{b}+2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}e^{(i\,b-c\,(2\,s+\nu))\,z}$$
$$\left(e^{4\,c\,s\,z}\,(b+c\,i\,(2\,s-\nu))\,{}_2F_1\left(\frac{b-2\,i\,c\,s+i\,c\,\nu}{2\,b},\,1;\,\frac{3\,b-2\,i\,c\,s+i\,c\,\nu}{2\,b};\,-e^{2\,i\,b\,z}\right)+e^{2\,c\,\nu\,z}\,(b-2\,i\,c\,s+i\,c\,\nu)\right.$$
$$\left.{}_2F_1\left(\frac{b+2\,i\,c\,s-i\,c\,\nu}{2\,b},\,1;\,\frac{3\,b+2\,i\,c\,s-i\,c\,\nu}{2\,b};\,-e^{2\,i\,b\,z}\right)\right)\Big/\left((b-2\,i\,c\,s+i\,c\,\nu)\,(i\,b+c\,(\nu-2\,s))\right)\Big/;\,\nu\in\mathbb{N}^+$$

Involving products of the direct function and trigonometric functions

Involving sin

Involving $\sin(a\,z)\cosh(b\,z)\cosh(c\,z)$

01.20.21.3376.01

$$\int \sin(a\,z)\cosh(b\,z)\cosh(c\,z)\,dz ==$$
$$\frac{1}{4}i\left(\frac{\cosh((-b-c+i\,a)\,z)}{b+c-i\,a}+\frac{\cosh((b-c+i\,a)\,z)}{-b+c-i\,a}+\frac{\cosh((-b+c+i\,a)\,z)}{b-c-i\,a}+\frac{\cosh((b+c+i\,a)\,z)}{-b-c-i\,a}\right)$$

Involving rational functions of sin

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sin(c\,z)}$

01.20.21.3377.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sin(c\,z)}\,dz ==$$
$$\frac{1}{4}\left(-\frac{1}{b\sqrt{a^2-b^2}\,(-d-e+i\,c)}\left(i\,e^{(-d-e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},1;2-\frac{i\,(-d-e)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},1;2-\frac{i\,(-d-e)}{c};\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\right.$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(d-e+i\,c)}\left(i\,e^{(d-e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},1;2-\frac{i\,(d-e)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},1;2-\frac{i\,(d-e)}{c};\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(-d+e+i\,c)}\left(i\,e^{(-d+e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},1;2-\frac{i\,(e-d)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},1;2-\frac{i\,(e-d)}{c};\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\left.\frac{1}{b\sqrt{a^2-b^2}\,(d+e+i\,c)}\left(i\,e^{(d+e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},1;2-\frac{i\,(d+e)}{c};-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},1;2-\frac{i\,(d+e)}{c};\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\,(a+b\sin(c\,z))^{-n}$

01.20.21.3378.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{(a+b\sin(c\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c)}\left(i\,e^{(-d-e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\right.\right.\right.\right.$$

$$\left.\left.\left.\left.-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.\right.$$

$$\left.\left.\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c)}\left(i\,e^{(d-e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.$$

$$\left.\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right)\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c)}$$

$$\left(i\,e^{(-d+e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.$$

$$\left.\left.\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c)}\left(i\,e^{(d+e+i\,c)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+$$
$$\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sin^2(c\,z)}$

01.20.21.3379.01

$$\int\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sin^2(c\,z)}\,dz==$$
$$\frac{1}{4}\left(-\left(e^{(-d-e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,(-d-e)}{2\,c},\,1;\,2+\frac{i\,(-d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,(-d-e)}{2\,c},\,1;\,2+\frac{i\,(-d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\;b\sqrt{a+b}\;(-d-e-2\,i\,c)\right)-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(d-e-2\,i\,c)}$$
$$\left(e^{(d-e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,(d-e)}{2\,c},\,1;\,2+\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,(d-e)}{2\,c},\,1;\,2+\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)-$$
$$\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(-d+e-2\,i\,c)}\left(e^{(-d+e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right)\right.\right.$$
$${}_2F_1\left(1+\frac{i\,(e-d)}{2\,c},\,1;\,2+\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right)$$
$$\left.\left.{}_2F_1\left(1+\frac{i\,(e-d)}{2\,c},\,1;\,2+\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(d+e-2\,i\,c)}$$
$$\left(e^{(d+e-2\,i\,c)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,(d+e)}{2\,c},\,1;\,2+\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}-b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,(d+e)}{2\,c},\,1;\,2+\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}-b}\right)\right)\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\left(a+b\sin^2(c\,z)\right)^{-n}$

01.20.21.3380.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{\left(a+b\sin^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}\left(-\left(e^{(-d-e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},1;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},1;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},2;2-\frac{i(-d-e)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},\right.$$
$$\left.\left.\left.\left.2;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-d-e+2ic)\right)-$$
$$\left(e^{(d-e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d-e)}{2c},1;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d-e)}{2c},1;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d-e)}{2c},2;2-\frac{i(d-e)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1$$
$$\left.\left.\left.\left(1-\frac{i(d-e)}{2c},2;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d-e+2ic)\right)-$$
$$\left(e^{(-d+e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(e-d)}{2c},1;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(e-d)}{2c},1;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(e-d)}{2c},2;2-\frac{i(e-d)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\right.$$
$$\left.\left.\left.\left.\frac{i(e-d)}{2c},2;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-d+e+2ic)\right)-$$

$$\left(e^{(d+e+2ic)z}\left((2a+b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d+e)}{2c},1;2-\frac{i(d+e)}{2c};-\frac{be^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\right.\right.$$
$$(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d+e)}{2c},1;2-\frac{i(d+e)}{2c};-\frac{be^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\,a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e)}{2c},2;2-\frac{i(d+e)}{2c};\right.\right.$$
$$\left.-\frac{be^{2icz}}{-2a+2\sqrt{a+b}\,\sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\,a+2b\sqrt{a}-b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(1-\frac{i(d+e)}{2c},2;2-\frac{i(d+e)}{2c};-\frac{be^{2icz}}{-2a-2\sqrt{a+b}\,\sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d+e+2ic)\right)\right)$$

Involving algebraic functions of sin

Involving $\cosh(dz)\cosh(ez)(a+b\sin(cz))^{\beta}$

01.20.21.3381.01

$$\int\cosh(dz)\cosh(ez)(a+b\sin(cz))^{\beta}\,dz==\frac{1}{4}\left(1+\frac{ibe^{icz}}{\sqrt{a^2-b^2}-a}\right)^{-\beta}\left(1-\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}(a+b\sin(cz))^{\beta}$$
$$\left(-\frac{e^{-(d+e)z}}{d+e+ic\beta}F_1\left(\frac{i(d+e+ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c+(d+e)i}{c};\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)-\right.$$
$$\frac{e^{(e-d)z}}{d-e+ic\beta}F_1\left(\frac{i(d-e)}{c}-\beta;-\beta,-\beta;1+\frac{i(d-e)}{c}-\beta;\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)+$$
$$\frac{e^{(d-e)z}}{d-e-ic\beta}F_1\left(-\frac{i(d-e)}{c}-\beta;-\beta,-\beta;1-\frac{i(d-e)}{c}-\beta;\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)+$$
$$\left.\frac{e^{(d+e)z}}{d+e-ic\beta}F_1\left(-\frac{i(d+e)}{c}-\beta;-\beta,-\beta;1-\frac{i(d+e)}{c}-\beta;\frac{ibe^{icz}}{a+\sqrt{a^2-b^2}},\frac{ibe^{icz}}{a-\sqrt{a^2-b^2}}\right)\right)$$

Involving $\cosh(dz)\cosh(ez)\left(a+b\sin^2(cz)\right)^{\beta}$

01.20.21.3382.01

$$\int \cosh(d\,z)\cosh(e\,z)\left(a+b\sin^2(c\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{4}\left(1-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(1-\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}}\right)^{-\beta}\left(a-\frac{1}{4}\,b\,e^{-2\,i\,c\,z}\left(-1+e^{2\,i\,c\,z}\right)^2\right)^{\beta}$$
$$\left(-\frac{e^{-(d+e)\,z}}{d+e+2\,i\,c\,\beta}F_1\left(\frac{i\,(d+e+2\,i\,c\,\beta)}{2\,c};-\beta,-\beta;\frac{i\,(d+e)-2\,c\,(\beta-1)}{2\,c};\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-\right.$$
$$\frac{e^{(e-d)\,z}}{d-e+2\,i\,c\,\beta}F_1\left(\frac{i\,(d-e)}{2\,c}-\beta;-\beta,-\beta;1+\frac{i\,(d-e)}{2\,c}-\beta;\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+$$
$$\frac{e^{(d-e)\,z}}{d-e-2\,i\,c\,\beta}F_1\left(-\frac{i\,(d-e)}{2\,c}-\beta;-\beta,-\beta;1-\frac{i\,(d-e)}{2\,c}-\beta;\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+$$
$$\left.\frac{e^{(d+e)\,z}}{d+e-2\,i\,c\,\beta}F_1\left(-\frac{i\,(d+e)}{2\,c}-\beta;-\beta,-\beta;1-\frac{i\,(d+e)}{2\,c}-\beta;\frac{b\,e^{2\,i\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},\frac{b\,e^{2\,i\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)$$

Involving cos

Involving $\cos(a\,z)\cosh(b\,z)\cosh(c\,z)$

01.20.21.3383.01

$$\int \cos(a\,z)\cosh(b\,z)\cosh(c\,z)\,dz ==$$
$$-\frac{1}{4}\left(\frac{\sinh((-b-c+i\,a)\,z)}{b+c-i\,a}+\frac{\sinh((b-c+i\,a)\,z)}{-b+c-i\,a}+\frac{\sinh((-b+c+i\,a)\,z)}{b-c-i\,a}+\frac{\sinh((b+c+i\,a)\,z)}{-b-c-i\,a}\right)$$

Involving rational functions of cos

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\cos(c\,z)}$

01.20.21.3384.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{a+b\cos(c\,z)}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\,(-d-e+i\,c)}\left(e^{(-d-e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(d-e+i\,c)}\left(e^{(d-e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(-d+e+i\,c)}\left(e^{(-d+e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(d+e+i\,c)}\left(e^{(d+e+i\,c)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\,(a+b\cos(c\,z))^{-n}$

01.20.21.3385.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{(a+b\cos(c\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c)}\left(e^{(-d-e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,1;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\left.\left.\left.\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.\right.\right.$$

$$ {}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\right.\right.$$

$$\left.\left.2-\frac{i\,(-d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(-\frac{i\,(-d-e+i\,c)}{c},\,2;\,2-\frac{i\,(-d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c)}\left(e^{(d-e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,1;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.$$

$$ {}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\right.\right.$$

$$\left.\left.2-\frac{i\,(d-e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(-\frac{i\,(d-e+i\,c)}{c},\,2;\,2-\frac{i\,(d-e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c)}\left(e^{(-d+e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,1;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.$$

$$ {}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\right.\right.$$

$$\left.\left.2-\frac{i\,(e-d)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(-\frac{i\,(-d+e+i\,c)}{c},\,2;\,2-\frac{i\,(e-d)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c)}\left(e^{(d+e+i\,c)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,1;\,2-\frac{i\,(d+e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\right.\right.$$

$$\left.\left.2-\frac{i\,(d+e)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+{}_2F_1\left(-\frac{i\,(d+e+i\,c)}{c},\,2;\,2-\frac{i\,(d+e)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Big)\Big)\Big)$$

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\cos^2(c\,z)}$

01.20.21.3386.01

$$\int\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\cos^2(c\,z)}\,dz==$$

$$\frac{1}{4}\left(-\left(e^{(-d-e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\,1;\,2-\frac{i\,(-d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}\,+b}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}\,-b\right){}_2F_1\left(1-\frac{i\,(-d-e)}{2\,c},\,1;\,2-\frac{i\,(-d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b}\right)\right)\right)\Big/$$

$$\left(\sqrt{a}\,b\sqrt{a+b}\,(-d-e+2\,i\,c)\right)-\frac{1}{\sqrt{a}\,b\sqrt{a+b}\,(d-e+2\,i\,c)}$$

$$\left(e^{(d-e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b\right){}_2F_1\left(1-\frac{i\,(d-e)}{2\,c},\,1;\,2-\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}\,+b}\right)+\right.\right.$$

$$\left.\left.\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}\,-b\right){}_2F_1\left(1-\frac{i\,(d-e)}{2\,c},\,1;\,2-\frac{i\,(d-e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b}\right)\right)\right)-$$

$$\frac{1}{\sqrt{a}\,b\sqrt{a+b}\,(-d+e+2\,i\,c)}\left(e^{(-d+e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b\right)\right.\right.$$

$${}_2F_1\left(1-\frac{i\,(e-d)}{2\,c},\,1;\,2-\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}\,+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}\,-b\right)$$

$$\left.\left.{}_2F_1\left(1-\frac{i\,(e-d)}{2\,c},\,1;\,2-\frac{i\,(e-d)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b}\right)\right)\right)-\frac{1}{\sqrt{a}\,b\sqrt{a+b}\,(d+e+2\,i\,c)}$$

$$\left(e^{(d+e+2\,i\,c)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b\right){}_2F_1\left(1-\frac{i\,(d+e)}{2\,c},\,1;\,2-\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}\,+b}\right)+\right.\right.$$

$$\left.\left.\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}\,-b\right){}_2F_1\left(1-\frac{i\,(d+e)}{2\,c},\,1;\,2-\frac{i\,(d+e)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}\,+b}\right)\right)\right)\Big)$$

Involving $\cosh(e\,z)\cosh(d\,z)\left(a+b\cos^2(c\,z)\right)^{-n}$

01.20.21.3387.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{\left(a+b\cos^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}\left(-\left(e^{(-d-e+2ic)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},1;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},1;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},2;2-\frac{i(-d-e)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e)}{2c},\right.$$
$$\left.\left.\left.\left.2;2-\frac{i(-d-e)}{2c};-\frac{b\,e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-d-e+2ic)\right)-$$
$$\left(e^{(d-e+2ic)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d-e)}{2c},1;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d-e)}{2c},1;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d-e)}{2c},2;2-\frac{i(d-e)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(1-\frac{i(d-e)}{2c},2;2-\frac{i(d-e)}{2c};-\frac{b\,e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d-e+2ic)\right)-$$
$$\left(e^{(-d+e+2ic)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(e-d)}{2c},1;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(e-d)}{2c},1;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(e-d)}{2c},2;2-\frac{i(e-d)}{2c};\right.\right.$$
$$\left.-\frac{b\,e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1$$
$$\left.\left.\left.\left(1-\frac{i(e-d)}{2c},2;2-\frac{i(e-d)}{2c};-\frac{b\,e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-d+e+2ic)\right)-$$

$$\left(e^{(d+e+2ic)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right){}_2F_1\left(1-\frac{i(d+e)}{2c},\ 1;\ 2-\frac{i(d+e)}{2c};\ -\frac{be^{2icz}}{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\ \sqrt{a}\ +b\right){}_2F_1\left(1-\frac{i(d+e)}{2c},\ 1;\ 2-\frac{i(d+e)}{2c};\ -\frac{be^{2icz}}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\ a-2b\sqrt{a}\ +b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e)}{2c},\ 2;\ 2-\frac{i(d+e)}{2c};\right.\right.$$
$$\left.-\frac{be^{2icz}}{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\ a+2b\sqrt{a}\ +b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{i(d+e)}{2c},\ 2;\ 2-\frac{i(d+e)}{2c};\ -\frac{be^{2icz}}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d+e+2ic)\right)\Bigg)$$

Involving algebraic functions of cos

Involving $\cosh(e\,z)\cosh(d\,z)(a+b\cos(c\,z))^{\beta}$

01.20.21.3388.01

$$\int\cosh(ez)\cosh(dz)(a+b\cos(cz))^{\beta}\,dz==\frac{1}{4}\left(\frac{e^{icz}b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{icz}b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}be^{-icz}\left(1+e^{2icz}\right)\right)^{\beta}$$
$$\left(-\frac{e^{(e-d)z}}{d-e+icz\beta}F_1\left(\frac{i(d-e+icz\beta)}{c};-\beta,-\beta;\frac{-\beta c+c+(d-e)i}{c};-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\frac{e^{-(d+e)z}}{d+e+icz\beta}F_1\left(\frac{i(d+e+icz\beta)}{c};-\beta,-\beta;\frac{-\beta c+c+(d+e)i}{c};-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)+$$
$$\frac{e^{(d-e)z}}{d-e-icz\beta}F_1\left(-\frac{id-ie+cz\beta}{c};-\beta,-\beta;\frac{-\beta c+c-id+ie}{c};-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)+$$
$$\left.\frac{e^{(d+e)z}}{d+e-icz\beta}F_1\left(-\frac{i(d+e-icz\beta)}{c};-\beta,-\beta;\frac{-\beta c+c-i(d+e)}{c};-\frac{be^{icz}}{a+\sqrt{a^2-b^2}},\frac{be^{icz}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\left(a+b\cos^2(c\,z)\right)^{\beta}$

01.20.21.3389.01

$$\int \cosh(e\,z)\cosh(d\,z)\left(a+b\cos^2(c\,z)\right)^{\beta}dz ==$$

$$\frac{1}{4}\left(\frac{e^{2icz}b}{2a+b-2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2icz}b}{2a+b+2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}be^{-2icz}\left(1+e^{2icz}\right)^2+a\right)^{\beta}\left(-\frac{e^{-(d+e)z}}{d+e+2ic\beta}\right.$$
$$F_1\left(\frac{i(d+e+2ic\beta)}{2c};-\beta,-\beta;\frac{i(d+e)-2c(\beta-1)}{2c};-\frac{be^{2icz}}{2a+b+2\sqrt{a(a+b)}},-\frac{be^{2icz}}{2a+b-2\sqrt{a(a+b)}}\right)-$$
$$\frac{e^{(e-d)z}}{d-e+2ic\beta}F_1\left(\frac{i(d-e)}{2c}-\beta;-\beta,-\beta;1+\frac{i(d-e)}{2c}-\beta;-\frac{be^{2icz}}{2a+b+2\sqrt{a(a+b)}},-\frac{be^{2icz}}{2a+b-2\sqrt{a(a+b)}}\right)+$$
$$\frac{e^{(d-e)z}}{d-e-2ic\beta}F_1\left(-\frac{i(d-e)}{2c}-\beta;-\beta,-\beta;1-\frac{i(d-e)}{2c}-\beta;-\frac{be^{2icz}}{2a+b+2\sqrt{a(a+b)}},-\frac{be^{2icz}}{2a+b-2\sqrt{a(a+b)}}\right)+$$
$$\left.\left.\frac{e^{(d+e)z}}{d+e-2ic\beta}F_1\left(-\frac{i(d+e)}{2c}-\beta;-\beta,-\beta;1-\frac{i(d+e)}{2c}-\beta;-\frac{be^{2icz}}{2a+b+2\sqrt{a(a+b)}},-\frac{be^{2icz}}{2a+b-2\sqrt{a(a+b)}}\right)\right)\right)$$

Involving rational functions of the direct function and trigonometric functions

Involving sin

Involving $\frac{\sin(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.3390.01

$$\int \frac{\sin(d\,z)}{a+b\cosh(c\,z)}dz ==$$

$$-\frac{ie^{(c-id)z}}{2b\sqrt{a^2-b^2}}\left(\frac{1}{c+id}e^{2idz}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1+\frac{id}{c},1;2+\frac{id}{c};\frac{be^{cz}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.{}_2F_1\left(1+\frac{id}{c},1;2+\frac{id}{c};-\frac{be^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)+\frac{1}{id-c}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{id}{c},1;2-\frac{id}{c};\frac{be^{cz}}{\sqrt{a^2-b^2}-a}\right)+$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1-\frac{id}{c},1;2-\frac{id}{c};-\frac{be^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

Involving $\sin(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.3391.01

$$\int \frac{\sin(d\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$

$$\frac{1}{2}\,i\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-i\,d)}\left(e^{(c-i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d}{c},\,1;\,2-\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$

$${}_2F_1\left(\frac{c-i\,d}{c},\,1;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$\left.\left.\left.a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+i\,d)}\left(e^{(c+i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$\left.\left.a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\frac{\sin(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.3392.01

$$\int \frac{\sin(d\,z)}{a+b\cosh^2(c\,z)}\,dz ==$$
$$-\frac{1}{2\sqrt{a}\;b\sqrt{a+b}}\left(i\left(\frac{1}{2c-i\,d}\left(e^{(2c-i\,d)z}\left(\left(2a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,d}{2c},1;2-\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.\right.$$
$$\left.\left.\left.\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,d}{2c},1;2-\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{2c+i\,d}\left(e^{(2c+i\,d)z}\left(\left(2a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,d}{2c},1;2+\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.$$
$$\left.\left.\left.\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,d}{2c},1;2+\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\sin(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.3393.01

$$\int \frac{\sin(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == -\frac{1}{4\,a^{3/2}\,b\,(a+b)^{3/2}}$$
$$\left(i\left(\frac{1}{2c-i\,d}\left(e^{(2c-i\,d)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1-\frac{i\,d}{2c},1;2-\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.\right.$$
$$(2a+b)\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,d}{2c},1;2-\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\right.$$
$$\left(1-\frac{i\,d}{2c},2;2-\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\;a+\right.$$
$$\left.\left.\left.\left.2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,d}{2c},2;2-\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)-$$
$$\frac{1}{2c+i\,d}\left(e^{(2c+i\,d)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,d}{2c},1;2+\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.$$
$$(2a+b)\left(2a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,d}{2c},1;2+\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\right.$$
$$\left(1+\frac{i\,d}{2c},2;2+\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\;a+\right.$$
$$\left.\left.\left.\left.\left.2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{i\,d}{2c},2;2+\frac{i\,d}{2c};-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)\right)$$

Involving $\frac{\sin(d\,z)\cosh(e\,z)}{a+b\cosh(c\,z)}$

01.20.21.3394.01

$$\int \frac{\sin(d\,z)\cosh(e\,z)}{a+b\cosh(c\,z)}\,dz ==$$
$$-\frac{1}{4}i\left(\frac{1}{b\sqrt{a^2-b^2}\,(c-e+i\,d)}\left(e^{(c-e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+e+i\,d)}\left(e^{(c+e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+e+i\,d}{c},\,1;\,\frac{e+i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+e+i\,d}{c},\,1;\,\frac{e+i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-i\,d-e)}\left(e^{(c-i\,d-e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d-e}{c},\,1;\,\frac{-e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d-e}{c},\,1;\,\frac{-e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-i\,d+e)}\left(e^{(c-i\,d+e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d+e}{c},\,1;\,\frac{e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d+e}{c},\,1;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\sin(d\,z)\cosh(e\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.3395.01

$$\int \frac{\sin(d\,z)\cosh(e\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$
$$-\frac{1}{4}i\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-e+i\,d)}\left(e^{(c-e+i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-e+i\,d}{c},\,2;\right.\right.\right.\right.$$

$$\frac{i\,d-e}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)-{}_2F_1\Bigg(\frac{c-e+i\,d}{c},\ 2;\ \frac{i\,d-e}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)-a\sqrt{a^2-b^2}$$

$$\Bigg({}_2F_1\Bigg(\frac{c-e+i\,d}{c},\ 2;\ \frac{i\,d-e}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)+{}_2F_1\Bigg(\frac{c-e+i\,d}{c},\ 2;\ \frac{i\,d-e}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+e+i\,d)}\Bigg(e^{(c+e+i\,d)\,z}\Bigg(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\Bigg(\frac{c+e+i\,d}{c},\ 1;\ \frac{e+i\,d}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)+$$

$$a\left(\sqrt{a^2-b^2}\ -a\right){}_2F_1\Bigg(\frac{c+e+i\,d}{c},\ 1;\ \frac{e+i\,d}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)+\left(b^2-a^2\right)$$

$$\Bigg({}_2F_1\Bigg(\frac{c+e+i\,d}{c},\ 2;\ \frac{e+i\,d}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)-{}_2F_1\Bigg(\frac{c+e+i\,d}{c},\ 2;\ \frac{e+i\,d}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)-$$

$$a\sqrt{a^2-b^2}\Bigg({}_2F_1\Bigg(\frac{c+e+i\,d}{c},\ 2;\ \frac{e+i\,d}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)+$$

$${}_2F_1\Bigg(\frac{c+e+i\,d}{c},\ 2;\ \frac{e+i\,d}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)\Bigg)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-i\,d-e)}\Bigg(e^{(c-i\,d-e)\,z}\Bigg(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\Bigg(\frac{c-i\,d-e}{c},\ 1;\ \frac{-e-i\,d}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)+$$

$$a\left(\sqrt{a^2-b^2}\ -a\right){}_2F_1\Bigg(\frac{c-i\,d-e}{c},\ 1;\ \frac{-e-i\,d}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)+\left(b^2-a^2\right)$$

$$\Bigg({}_2F_1\Bigg(\frac{c-i\,d-e}{c},\ 2;\ \frac{-e-i\,d}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)-{}_2F_1\Bigg(\frac{c-i\,d-e}{c},\ 2;\ \frac{-e-i\,d}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)-$$

$$a\sqrt{a^2-b^2}\Bigg({}_2F_1\Bigg(\frac{c-i\,d-e}{c},\ 2;\ \frac{-e-i\,d}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)+$$

$${}_2F_1\Bigg(\frac{c-i\,d-e}{c},\ 2;\ \frac{-e-i\,d}{c}+2;\ -\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)\Bigg)\Bigg)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-i\,d+e)}\Bigg(e^{(c-i\,d+e)\,z}\Bigg(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\Bigg(\frac{c-i\,d+e}{c},\ 1;\ \frac{e-i\,d}{c}+2;\ \frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\ -a}\Bigg)+$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d+e}{c},\,1;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$

$$\left({}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\sin(d\,z)\cosh(e\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.3396.01

$$\int\frac{\sin(d\,z)\cosh(e\,z)}{a+b\cosh^2(c\,z)}\,dz==$$

$$-\frac{1}{4}i\left(\left(e^{(2\,c-i\,d-e)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e-i\,d}{2\,c}+1,\,1;\,\frac{-e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-e-i\,d}{2\,c}+1,\,1;\,\frac{-e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-i\,d-e)\right)+\left(e^{(2\,c-i\,d+e)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-i\,d}{2\,c}+1,\,1;\,\frac{e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-i\,d}{2\,c}+1,\,1;\,\frac{e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-i\,d+e)\right)-\left(e^{(2\,c-e+i\,d)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i\,d-e}{2\,c}+1,\,1;\,\frac{i\,d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i\,d-e}{2\,c}+1,\,1;\,\frac{i\,d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-e+i\,d)\right)-\left(e^{(2\,c+e+i\,d)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e+i\,d}{2\,c}+1,\,1;\,\frac{e+i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e+i\,d}{2\,c}+1,\,1;\,\frac{e+i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c+e+i\,d)\right)\right)$$

Involving $\sin(d\,z)\cosh(e\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.3397.01

$$\int \frac{\sin(d\,z)\cosh(e\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz ==$$

$$-\frac{1}{4}i\left(\left(e^{(2c-i\,d-e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-e-i\,d}{2c}+1,1;\frac{-e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e-i\,d}{2c}+1,1;\frac{-e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-e-i\,d}{2c}+1,2;\frac{-e-i\,d}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{-e-i\,d}{2c}+1,2;\frac{-e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-i\,d-e)\right)+$$
$$\left(e^{(2c-i\,d+e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-i\,d}{2c}+1,1;\frac{e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-i\,d}{2c}+1,1;\frac{e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e-i\,d}{2c}+1,2;\frac{e-i\,d}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{e-i\,d}{2c}+1,2;\frac{e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-i\,d+e)\right)-$$
$$\left(e^{(2c-e+i\,d)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i\,d-e}{2c}+1,1;\frac{i\,d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i\,d-e}{2c}+1,1;\frac{i\,d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{i\,d-e}{2c}+1,2;\frac{i\,d-e}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{i\,d-e}{2c}+1,2;\frac{i\,d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-e+i\,d)\right)-$$
$$\left(e^{(2c+e+i\,d)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e+i\,d}{2c}+1,1;\frac{e+i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e+id}{2c}+1,\,1;\,\frac{e+id}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e+id}{2c}+1,\,2;\,\frac{e+id}{2c}+\right.\right.$$
$$\left.2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{e+id}{2c}+1,\,2;\,\frac{e+id}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c+e+id)\right)\Big)$$

Involving cos

Involving $\frac{\cos(dz)}{a+b\cosh(cz)}$

01.20.21.3398.01

$$\int\frac{\cos(dz)}{a+b\cosh(cz)}\,dz==$$
$$\frac{1}{2b\sqrt{a^2-b^2}}\left(\frac{1}{c+id}e^{(c+id)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1+\frac{id}{c},\,1;\,2+\frac{id}{c};\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.{}_2F_1\left(1+\frac{id}{c},\,1;\,2+\frac{id}{c};\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)+\frac{1}{c-id}e^{(c-id)z}\left(\left(a+\sqrt{a^2-b^2}\right)\right.$$
$$\left.\left.{}_2F_1\left(1-\frac{id}{c},\,1;\,2-\frac{id}{c};\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1-\frac{id}{c},\,1;\,2-\frac{id}{c};\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

Involving $\cos(dz)\,(a+b\cosh(cz))^{-n}$

01.20.21.3399.01

$$\int \frac{\cos(d\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$

$$\frac{1}{2\,b\left(a^2-b^2\right)^{3/2}}\left(\frac{1}{c+i\,d}\left(e^{(c+i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1+\frac{i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.{}_2F_1\left(1+\frac{i\,d}{c},\,1;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)-\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\right.$$
$$\left.\left.\left.\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(1+\frac{i\,d}{c},\,2;\,2+\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{c-i\,d}\left(e^{(c-i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{i\,d}{c},\,1;\,2-\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1-\frac{i\,d}{c},\right.\right.\right.$$
$$\left.1;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)-\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\left.\left.\left.\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(1-\frac{i\,d}{c},\,2;\,2-\frac{i\,d}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\frac{\cos(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.3400.01

$$\int \frac{\cos(d\,z)}{a+b\cosh^2(c\,z)}\,dz ==$$

$$\frac{1}{2\sqrt{a}\;b\sqrt{a+b}}\left(-\frac{1}{2\,c+i\,d}\left(e^{(2\,c+i\,d)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,d}{2\,c},\,1;\,2+\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.\right.$$
$$\left.\left.\left.\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,d}{2\,c},\,1;\,2+\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{2\,c-i\,d}\left(e^{(2\,c-i\,d)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,d}{2\,c},\,1;\,2-\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\right.\right.$$
$$\left.\left.\left.\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,d}{2\,c},\,1;\,2-\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\cos(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.3401.01

$$\int \frac{\cos(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == \frac{1}{4\,a^{3/2}\,b\,(a+b)^{3/2}}$$

$$\left(-\frac{1}{2\,c+i\,d}\left(e^{(2\,c+i\,d)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1+\frac{i\,d}{2\,c},\,1;\,2+\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.\right.$$

$$(2\,a+b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1+\frac{i\,d}{2\,c},\,1;\,2+\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{i\,d}{2\,c},\,2;\,2+\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$

$$\left.\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1+\frac{i\,d}{2\,c},\,2;\,2+\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)-$$

$$\frac{1}{2\,c-i\,d}\left(e^{(2\,c-i\,d)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i\,d}{2\,c},\,1;\,2-\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.$$

$$(2\,a+b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,d}{2\,c},\,1;\,2-\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\,a-2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,d}{2\,c},\,2;\,2-\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$

$$\left.\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\,a+2\,b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,d}{2\,c},\,2;\,2-\frac{i\,d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\right)$$

Involving $\frac{\cos(d\,z)\cosh(e\,z)}{a+b\cosh(c\,z)}$

01.20.21.3402.01

$$\int \frac{\cos(d\,z)\cosh(e\,z)}{a+b\cosh(c\,z)}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\,(c-e+i\,d)}\left(e^{(c-e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-i\,d-e)}\left(e^{(c-i\,d-e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d-e}{c},\,1;\,\frac{-e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d-e}{c},\,1;\,\frac{-e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+e+i\,d)}\left(e^{(c+e+i\,d)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+e+i\,d}{c},\,1;\,\frac{e+i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+e+i\,d}{c},\,1;\,\frac{e+i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-i\,d+e)}\left(e^{(c-i\,d+e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d+e}{c},\,1;\,\frac{e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d+e}{c},\,1;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\cos(d\,z)\cosh(e\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.3403.01

$$\int \frac{\cos(d\,z)\cosh(e\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-e+i\,d)}\left(e^{(c-e+i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-e+i\,d}{c},\,1;\,\frac{i\,d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-e+i\,d}{c},\,2;\right.\right.$$
$$\left.\left.\left.\left.\frac{i\,d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-e+i\,d}{c},\,2;\,\frac{i\,d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\right.\right.$$

$$\left({}_2F_1\left(\frac{c-e+i\,d}{c},\,2;\,\frac{i\,d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(\frac{c-e+i\,d}{c},\,2;\,\frac{i\,d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-i\,d-e)}\left(e^{(c-i\,d-e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d-e}{c},\,1;\,\frac{-e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c-i\,d-e}{c},\,1;\,\frac{-e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)$$

$$\left({}_2F_1\left(\frac{c-i\,d-e}{c},\,2;\,\frac{-e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c-i\,d-e}{c},\,2;\,\frac{-e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i\,d-e}{c},\,2;\,\frac{-e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(\frac{c-i\,d-e}{c},\,2;\,\frac{-e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+e+i\,d)}\left(e^{(c+e+i\,d)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+e+i\,d}{c},\,1;\,\frac{e+i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c+e+i\,d}{c},\,1;\,\frac{e+i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)$$

$$\left({}_2F_1\left(\frac{c+e+i\,d}{c},\,2;\,\frac{e+i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c+e+i\,d}{c},\,2;\,\frac{e+i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+e+i\,d}{c},\,2;\,\frac{e+i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(\frac{c+e+i\,d}{c},\,2;\,\frac{e+i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-i\,d+e)}\left(e^{(c-i\,d+e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d+e}{c},\,1;\,\frac{e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d+e}{c},\,1;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-i\,d+e}{c},\,2;\,\frac{e-i\,d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\cos(d\,z)\cosh(e\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.3404.01

$$\int\frac{\cos(d\,z)\cosh(e\,z)}{a+b\cosh^2(c\,z)}\,dz==$$

$$\frac{1}{4}\left(-\left(e^{(2\,c-e+i\,d)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i\,d-e}{2\,c}+1,\,1;\,\frac{i\,d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i\,d-e}{2\,c}+1,\,1;\,\frac{i\,d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-e+i\,d)\right)-\left(e^{(2\,c-i\,d-e)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e-i\,d}{2\,c}+1,\,1;\,\frac{-e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-e-i\,d}{2\,c}+1,\,1;\,\frac{-e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-i\,d-e)\right)-\left(e^{(2\,c+e+i\,d)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e+i\,d}{2\,c}+1,\,1;\,\frac{e+i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e+i\,d}{2\,c}+1,\,1;\,\frac{e+i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c+e+i\,d)\right)-\left(e^{(2\,c-i\,d+e)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-i\,d}{2\,c}+1,\,1;\,\frac{e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-i\,d}{2\,c}+1,\,1;\,\frac{e-i\,d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-i\,d+e)\right)\right)$$

Involving $\cos(d\,z)\cosh(e\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.3405.01

$$\int \frac{\cos(d\,z)\cosh(e\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}\left(-\left(e^{(2c-e+i\,d)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i\,d-e}{2c}+1,1;\frac{i\,d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i\,d-e}{2c}+1,1;\frac{i\,d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{i\,d-e}{2c}+1,2;\frac{i\,d-e}{2c}+2;\right.\right.$$
$$\left.-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{i\,d-e}{2c}+1,2;\frac{i\,d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-e+i\,d)\right)-$$
$$\left(e^{(2c-i\,d-e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-e-i\,d}{2c}+1,1;\frac{-e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e-i\,d}{2c}+1,1;\frac{-e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-e-i\,d}{2c}+1,2;\frac{-e-i\,d}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{-e-i\,d}{2c}+1,2;\frac{-e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-i\,d-e)\right)-$$
$$\left(e^{(2c+e+i\,d)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e+i\,d}{2c}+1,1;\frac{e+i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e+i\,d}{2c}+1,1;\frac{e+i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e+i\,d}{2c}+1,2;\frac{e+i\,d}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{e+i\,d}{2c}+1,2;\frac{e+i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c+e+i\,d)\right)-$$
$$\left(e^{(2c-i\,d+e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-i\,d}{2c}+1,1;\frac{e-i\,d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{e-id}{2c}+1,\ 1;\ \frac{e-id}{2c}+2;\ -\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\ a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e-id}{2c}+1,\ 2;\ \frac{e-id}{2c}+\right.\right.$$
$$\left.2;\ -\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\ a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{e-id}{2c}+1,\ 2;\ \frac{e-id}{2c}+2;\ -\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c-id+e)\right)\Bigg)$$

Involving algebraic functions of the direct function and trigonometric functions

Involving sin

Involving $\sin(dz)(a+b\cosh(cz))^{\beta}$

01.20.21.3406.01

$$\int \sin(dz)\,(a+b\cosh(cz))^{\beta}\,dz == -\frac{1}{2\left(d^2+c^2\beta^2\right)}\,e^{-idz}\left(\frac{e^{cz}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{cz}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}$$
$$\left(a+\frac{1}{2}\,b\,e^{-cz}\left(1+e^{2cz}\right)\right)^{\beta}\left(e^{2idz}\,(d-ic\beta)\,F_1\left(\frac{id}{c}-\beta;\ -\beta,\ -\beta;\ 1+\frac{id}{c}-\beta;\ -\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}},\ \frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\left.(d+ic\beta)\,F_1\left(-\frac{id}{c}-\beta;\ -\beta,\ -\beta;\ 1-\frac{id}{c}-\beta;\ -\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}},\ \frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $\sin(dz)\left(a+b\cosh^2(cz)\right)^{\beta}$

01.20.21.3407.01

$$\int \sin(dz)\left(a+b\cosh^2(cz)\right)^{\beta}\,dz ==$$
$$-\frac{1}{\left(-1+e^{2idz}\right)\left(d^2+4c^2\beta^2\right)}\left(i\left(\frac{2\,e^{2cz}\,b}{2a+b-2\sqrt{a(a+b)}}+2\right)^{-\beta}\left(\frac{e^{2cz}\,b}{2a+b+2\sqrt{a(a+b)}}+1\right)^{-\beta}\right.$$
$$\left(e^{2idz}\,(d-2ic\beta)\,F_1\left(\frac{id}{2c}-\beta;\ -\beta,\ -\beta;\ 1+\frac{id}{2c}-\beta;\ -\frac{b\,e^{2cz}}{2a+b+2\sqrt{a(a+b)}},\ -\frac{b\,e^{2cz}}{2a+b-2\sqrt{a(a+b)}}\right)+\right.$$
$$\left.\left.(d+2ic\beta)\,F_1\left(-\frac{id}{2c}-\beta;\ -\beta,\ -\beta;\ 1-\frac{id}{2c}-\beta;\ -\frac{b\,e^{2cz}}{2a+b+2\sqrt{a(a+b)}},\ -\frac{b\,e^{2cz}}{2a+b-2\sqrt{a(a+b)}}\right)\right)\right.$$
$$\left.(2a+b+b\cosh(2cz))^{\beta}\,\sin(dz)\right)$$

Involving $\sin(d\,z)\cosh(e\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.3408.01

$$\int \sin(d\,z)\cosh(e\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz == -\frac{1}{4}\,i\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(e-i\,d)\,z}}{-e+i\,d+c\,\beta}\,F_1\left(\frac{e-i\,d-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-i\,d+e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\frac{e^{(e+i\,d)\,z}}{e+i\,d-c\,\beta}\,F_1\left(\frac{e+i\,d-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+e+i\,d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\frac{e^{i\,d\,z-e\,z}}{e-i\,d+c\,\beta}\,F_1\left(-\frac{e-i\,d+c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-e+i\,d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-$$
$$\left.\frac{i\,e^{-(e+i\,d)\,z}}{d-i\,(e+c\,\beta)}\,F_1\left(-\frac{e+i\,d+c\,\beta}{c};-\beta,-\beta;-\frac{e+i\,d+c\,(\beta-1)}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $\sin(d\,z)\cosh(e\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.3409.01

$$\int \sin(d\,z)\cosh(e\,z)\,\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz ==$$
$$-\frac{1}{4}\,i\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\,\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\,\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}$$
$$\left(\frac{e^{(e-i\,d)\,z}}{-e+i\,d+2\,c\,\beta}\,F_1\left(\frac{e-i\,d-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{e-i\,d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)+\right.$$
$$\frac{e^{(e+i\,d)\,z}}{e+i\,d-2\,c\,\beta}\,F_1\left(\frac{e+i\,d-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{e+i\,d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)+$$
$$\frac{e^{i\,d\,z-e\,z}}{-e+i\,d-2\,c\,\beta}\,F_1\left(-\frac{e-i\,d+2\,c\,\beta}{2\,c};-\beta,-\beta;1+\frac{i\,(d+i\,e)}{2\,c}-\beta;\right.$$
$$\left.-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)-\frac{i\,e^{-(e+i\,d)\,z}}{d-i\,(e+2\,c\,\beta)}$$
$$\left.F_1\left(-\frac{e+i\,d+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{e+i\,d+2\,c\,(\beta-1)}{2\,c};-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)\right)$$

Involving cos

Involving $\cos(d\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.3410.01

$$\int \cos(d\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz == \frac{1}{2\,(d+i\,c\,\beta)\,(i\,d+c\,\beta)}\,e^{-i\,d\,z}\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}$$
$$\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\left(e^{2\,i\,d\,z}\,(d-i\,c\,\beta)\,F_1\left(\frac{i\,d}{c}-\beta;\,-\beta,\,-\beta;\,1+\frac{i\,d}{c}-\beta;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\left.(d+i\,c\,\beta)\,F_1\left(-\frac{i\,d}{c}-\beta;\,-\beta,\,-\beta;\,1-\frac{i\,d}{c}-\beta;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $\cos(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.3411.01

$$\int \cos(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz ==$$
$$\frac{1}{\left(1+e^{2\,i\,d\,z}\right)\left(-d^2-4\,c^2\,\beta^2\right)}\left(\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\,\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\,\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$
$$\left(e^{2\,i\,d\,z}\,(i\,d+2\,c\,\beta)\,F_1\left(\frac{i\,d}{2\,c}-\beta;\,-\beta,\,-\beta;\,1+\frac{i\,d}{2\,c}-\beta;\,-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},\,-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)-\right.$$
$$\left.\left.(i\,d-2\,c\,\beta)\,F_1\left(-\frac{i\,d+2\,c\,\beta}{2\,c};\,-\beta,\,-\beta;\,1-\frac{i\,d}{2\,c}-\beta;\,-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},\,-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)\right)\cos(d\,z)\right)$$

Involving $\cos(d\,z)\cosh(e\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.3412.01

$$\int \cos(d\,z)\cosh(e\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz == \frac{1}{4}\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(e-i\,d)\,z}}{e-i\,d\,-c\,\beta}F_1\left(\frac{e-i\,d\,-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-i\,d+e}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$
$$\frac{e^{(e+i\,d)\,z}}{e+i\,d\,-c\,\beta}F_1\left(\frac{e+i\,d\,-c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c+e+i\,d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-$$
$$\frac{e^{i\,d\,z-e\,z}}{e-i\,d\,+c\,\beta}F_1\left(-\frac{e-i\,d\,+c\,\beta}{c};-\beta,-\beta;\frac{-\beta\,c+c-e+i\,d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-$$
$$\left.\frac{e^{-(e+i\,d)\,z}}{e+i\,d\,+c\,\beta}F_1\left(-\frac{e+i\,d\,+c\,\beta}{c};-\beta,-\beta;-\frac{e+i\,d\,+c\,(\beta-1)}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)\right)$$

Involving $\cos(d\,z)\cosh(e\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.3413.01

$$\int \cos(d\,z)\cosh(e\,z)\,\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz ==$$
$$\frac{1}{4}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}$$
$$\left(\frac{e^{(e-i\,d)\,z}}{e-i\,d\,-2\,c\,\beta}F_1\left(\frac{e-i\,d\,-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{e-i\,d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+\right.$$
$$\frac{e^{(e+i\,d)\,z}}{e+i\,d\,-2\,c\,\beta}F_1\left(\frac{e+i\,d\,-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{e+i\,d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)+$$
$$\frac{e^{i\,d\,z-e\,z}}{-e+i\,d\,-2\,c\,\beta}F_1\left(-\frac{e-i\,d\,+2\,c\,\beta}{2\,c};-\beta,-\beta;1+\frac{i\,(d+i\,e)}{2\,c}-\beta;\right.$$
$$\left.-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)-\frac{e^{-(e+i\,d)\,z}}{e+i\,d\,+2\,c\,\beta}$$
$$\left.F_1\left(-\frac{e+i\,d\,+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{e+i\,d\,+2\,c\,(\beta-1)}{2\,c};-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)$$

Involving functions of the direct function, trigonometric and a power functions

Involving powers of the direct function, trigonometric and a power functions

Involving sin and power

Involving $z^{\alpha-1}\sin(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3414.01

$$\int z^{\alpha-1}\sin(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu-1}\,i\binom{\nu}{\frac{\nu}{2}}\left((-i\,c\,z)^{-\alpha}\,\Gamma(\alpha,\,-i\,c\,z)-(i\,c\,z)^{-\alpha}\,\Gamma(\alpha,\,i\,c\,z)\right)(1-\nu \bmod 2)\,z^{\alpha}-$$

$$2^{-\nu-1}\,i\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-\Gamma(\alpha,\,(-i\,c-2\,a\,s+a\,\nu)\,z)\left((-i\,c-2\,a\,s+a\,\nu)\,z\right)^{-\alpha}+\left((i\,c-2\,a\,s+a\,\nu)\,z\right)^{-\alpha}\Gamma(\alpha,\,(i\,c-2\,a\,s+a\,\nu)\,z)-\right.$$

$$\left.\left((-i\,c+2\,a\,s-a\,\nu)\,z\right)^{-\alpha}\Gamma(\alpha,\,(-i\,c+2\,a\,s-a\,\nu)\,z)+\left((i\,c+2\,a\,s-a\,\nu)\,z\right)^{-\alpha}\Gamma(\alpha,\,(i\,c+2\,a\,s-a\,\nu)\,z)\right)\Big/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3415.01

$$\int z^{n}\sin(c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{2}\,i\left(1+e^{-2\,a\,z}\right)^{-\nu}n!\cosh^{\nu}(a\,z)$$

$$\left(e^{-i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\,\ldots,\,\frac{i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{i\,c-a\,\nu}{2\,a}+1,\,\ldots,\,\frac{i\,c-a\,\nu}{2\,a}+1;\,-e^{-2\,a\,z}\right)-\right.$$

$$\left.e^{i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\,\ldots,\,\frac{-i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{-i\,c-a\,\nu}{2\,a}+1,\,\ldots,\,\frac{-i\,c-a\,\nu}{2\,a}+1;\,-e^{-2\,a\,z}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sin(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3416.01

$$\int z^{\alpha-1}\sin(d+c\,z)\cosh^{\nu}(a\,z)\,dz ==$$

$$2^{-\nu-1}\,i\,e^{-i\,d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,i\,d}\,(-i\,c\,z)^{-\alpha}\,\Gamma(\alpha,\,-i\,c\,z)-(i\,c\,z)^{-\alpha}\,\Gamma(\alpha,\,i\,c\,z)\right)(1-\nu \bmod 2)\,z^{\alpha}-2^{-\nu-1}\,i\,e^{-i\,d}\,z^{\alpha}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{2\,i\,d}\,\Gamma(\alpha,\,(-i\,c-2\,a\,s+a\,\nu)\,z)\left((-i\,c-2\,a\,s+a\,\nu)\,z\right)^{-\alpha}+\left((i\,c-2\,a\,s+a\,\nu)\,z\right)^{-\alpha}\Gamma(\alpha,\,(i\,c-2\,a\,s+a\,\nu)\,z)-\right.$$

$$\left.e^{2\,i\,d}\left((-i\,c+2\,a\,s-a\,\nu)\,z\right)^{-\alpha}\Gamma(\alpha,\,(-i\,c+2\,a\,s-a\,\nu)\,z)+\left((i\,c+2\,a\,s-a\,\nu)\,z\right)^{-\alpha}\Gamma(\alpha,\,(i\,c+2\,a\,s-a\,\nu)\,z)\right)\Big/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3417.01

$$\int z^{n}\sin(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{2}\,i\left(1+e^{-2\,a\,z}\right)^{-\nu}n!\cosh^{\nu}(a\,z)$$

$$\left(e^{-i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\,\ldots,\,\frac{i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{i\,c-a\,\nu}{2\,a}+1,\,\ldots,\,\frac{i\,c-a\,\nu}{2\,a}+1;\,-e^{-2\,a\,z}\right)-\right.$$

$$\left.e^{i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}\;{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\,\ldots,\,\frac{-i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{-i\,c-a\,\nu}{2\,a}+1,\,\ldots,\,\frac{-i\,c-a\,\nu}{2\,a}+1;\,-e^{-2\,a\,z}\right)\right)\Big/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sin(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.3418.01

$$\int z^{\alpha-1}\sin(c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu-1}\,i\binom{\nu}{\frac{\nu}{2}}\left((-i\,c\,z)^{-\alpha}\,\Gamma(\alpha,-i\,c\,z)-(i\,c\,z)^{-\alpha}\,\Gamma(\alpha,i\,c\,z)\right)(1-\nu \bmod 2)\,z^{\alpha}-$$

$$2^{-\nu-1}\,i\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\Big(-e^{4\,b\,s}\,\Gamma(\alpha,(-i\,c-2\,a\,s+a\,\nu)\,z)\,((-i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}+$$

$$e^{4\,b\,s}\,((i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c-2\,a\,s+a\,\nu)\,z)+e^{2\,b\,\nu}$$

$$(((i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c+2\,a\,s-a\,\nu)\,z)-((-i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(-i\,c+2\,a\,s-a\,\nu)\,z))\Big)\,/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3419.01

$$\int z^{n}\sin(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{2}\,i\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}n!\cosh^{\nu}(b+a\,z)$$

$$\left(e^{-i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\ldots,\frac{i\,c-a\,\nu}{2\,a},-\nu;\frac{i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)-\right.$$

$$e^{i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\ldots,\frac{-i\,c-a\,\nu}{2\,a},-\nu;\frac{-i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{-i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sin(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.3420.01

$$\int z^{\alpha-1}\sin(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu-1}\,i\,e^{-i\,d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,i\,d}\,(-i\,c\,z)^{-\alpha}\,\Gamma(\alpha,-i\,c\,z)-(i\,c\,z)^{-\alpha}\,\Gamma(\alpha,i\,c\,z)\right)(1-\nu \bmod 2)\,z^{\alpha}-$$

$$2^{-\nu-1}\,i\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-i\,d-2\,b\,s-b\,\nu}\binom{\nu}{s}\Big(-e^{2\,i\,d+4\,b\,s}\,\Gamma(\alpha,(-i\,c-2\,a\,s+a\,\nu)\,z)\,((-i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}+$$

$$e^{4\,b\,s}\,((i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c-2\,a\,s+a\,\nu)\,z)+e^{2\,b\,\nu}\left(((i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c+2\,a\,s-a\,\nu)\,z)-\right.$$

$$\left.e^{2\,i\,d}\,((-i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(-i\,c+2\,a\,s-a\,\nu)\,z)\right)\Big)\,/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3421.01

$$\int z^{n}\sin(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{2}\,i\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}n!\cosh^{\nu}(b+a\,z)$$

$$\left(e^{-i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\ldots,\frac{i\,c-a\,\nu}{2\,a},-\nu;\frac{i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)-\right.$$

$$e^{i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\ldots,\frac{-i\,c-a\,\nu}{2\,a},-\nu;\frac{-i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{-i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \sin(b z^r) \cosh^v(c z)$

01.20.21.3422.01

$$\int z^n \sin\left(b z^2\right) \cosh^v(c z)\, dz ==$$

$$i\, 2^{-v-2}\, z^{n+1} \binom{v}{\frac{v}{2}} \left(\left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - v \bmod 2) -$$

$$i\, 2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{i c^2 (v-2k)^2}{4b}} \left(\sum_{j=0}^{n} 2^{j-n} (c(v-2k))^{n-j} (-c(v-2k) - 2 i b z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{i (-c(v-2k) - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-c(v-2k) - 2 i b z)^2}{4b}\right)\right) (-i b)^{-n-1} +$$

$$e^{-\frac{i c^2 (v-2k)^2}{4b}} \left(\sum_{j=0}^{n} 2^{j-n} (-c(v-2k))^{n-j} (c(v-2k) - 2 i b z)^{j+1} \left(-\frac{i (c(v-2k) - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right.$$

$$\left. \Gamma\left(\frac{j+1}{2}, -\frac{i (c(v-2k) - 2 i b z)^2}{4b}\right)\right) (-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{i c^2 (v-2k)^2}{4b}} \sum_{j=0}^{n} 2^{j-n} (c(v-2k))^{n-j}$$

$$(2 i b z - c(v-2k))^{j+1} \left(\frac{i (2 i b z - c(v-2k))^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b z - c(v-2k))^2}{4b}\right) -$$

$$(i b)^{-n-1} e^{\frac{c^2 i (v-2k)^2}{4b}} \sum_{j=0}^{n} 2^{j-n} (-c(v-2k))^{n-j} (c(v-2k) + 2 i b z)^{j+1} \left(\frac{i (c(v-2k) + 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (c(v-2k) + 2 i b z)^2}{4b}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3423.01

$$\int z^n \sin\left(b \sqrt{z}\right) \cosh^v(c z)\, dz ==$$

$$(-1)^n\, i\, 2^{-v} \binom{v}{\frac{v}{2}} \left(\Gamma\left(2(n+1), i b \sqrt{z}\right) - \Gamma\left(2(n+1), -i b \sqrt{z}\right)\right) (1 - v \bmod 2)\, b^{-2(n+1)} + 2^{-2n-v-2}\, i \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (c(v-2k))^{-2(n+1)} \binom{v}{k}$$

$$\left(e^{-\frac{b^2}{4c(v-2k)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i b)^{-h-j+2n} \left(-i b - 2c(v-2k)\sqrt{z}\right)^{h+j} \left(\frac{\left(-i b - 2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)-$$

$$e^{-\frac{b^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,c\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)-$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+2\,c\,(v-2\,k)\right.$$

$$\left.\sqrt{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}\ \left(\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)\right)$$

Involving $z^n \sin(b z^r + e) \cosh^v(c z)$

01.20.21.3424.01

$$\int z^n \sin\left(b z^2 + e\right) \cosh^v(c z)\, dz ==$$

$$i\, 2^{-v-2}\, z^{n+1} \binom{v}{\frac{v}{2}} \left(e^{i e} \left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - e^{-i e} \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - v \bmod 2) -$$

$$i\, 2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{i c^2 (v-2k)^2}{4b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (c(v-2k))^{n-j} (-c(v-2k) - 2 i b z)^{j+1} \right.\right.$$

$$\left.\left(-\frac{i (-c(v-2k) - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-c(v-2k) - 2 i b z)^2}{4b}\right)\right) (-i b)^{-n-1} +$$

$$e^{-\frac{i c^2 (v-2k)^2}{4b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (-c(v-2k))^{n-j} (c(v-2k) - 2 i b z)^{j+1} \left(-\frac{i (c(v-2k) - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left.\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (c(v-2k) - 2 i b z)^2}{4b}\right)\right) (-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{c^2 i (v-2k)^2}{4b} + i e} \sum_{j=0}^{n} 2^{j-n} (c(v-2k))^{n-j}$$

$$(2 i b z - c(v-2k))^{j+1} \left(\frac{i (2 i b z - c(v-2k))^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b z - c(v-2k))^2}{4b}\right) -$$

$$(i b)^{-n-1} e^{\frac{c^2 i (v-2k)^2}{4b} + i e} \sum_{j=0}^{n} 2^{j-n} (-c(v-2k))^{n-j} (c(v-2k) + 2 i b z)^{j+1} \left(\frac{i (c(v-2k) + 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (c(v-2k) + 2 i b z)^2}{4b}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3425.01

$$\int z^n \sin\left(\sqrt{z}\, b + e\right) \cosh^v(c z)\, dz ==$$

$$(-1)^n\, i\, 2^{-v} \binom{v}{\frac{v}{2}} \left(e^{-i e} \Gamma\left(2(n+1), i b \sqrt{z}\right) - e^{i e} \Gamma\left(2(n+1), -i b \sqrt{z}\right)\right) (1 - v \bmod 2)\, b^{-2(n+1)} +$$

$$2^{-2n-v-2}\, i \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (c(v-2k))^{-2(n+1)} \binom{v}{k}$$

$$\left(e^{-\frac{b^2}{4c(v-2k)} - i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i b)^{-h-j+2n} \left(-i b - 2c(v-2k)\sqrt{z}\right)^{h+j} \left(\frac{\left(-i b - 2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)-$$

$$e^{-\frac{b^2}{4\,c\,(v-2\,k)}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,c\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)-$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+2\,c\,(v-2\,k)\right.$$

$$\left.\sqrt{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}\ \left(\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)\right)$$

Involving $z^n \sin(b z^r + d z) \cosh^v(c z)$

01.20.21.3426.01

$$\int z^n \sin\left(b z^2 + d z\right) \cosh^v(c z)\, dz == i\, 2^{-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left((i b)^{-n-1} e^{-\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b} \right) - \right.$$

$$(-i b)^{-n-1} e^{\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b} \right) \Bigg) -$$

$$i\, 2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{i (-i d + c (v-2k))^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d - c (v-2k))^{n-j} (-i d + c (v-2k) - 2 i b z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{i (-i d + c (v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d + c (v-2k) - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i (-i d - c (v-2k))^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d + c (v-2k))^{n-j} (-i d - c (v-2k) - 2 i b z)^{j+1} \right.$$

$$\left. \left(-\frac{i (-i d - c (v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - c (v-2k) - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} -$$

$$(i b)^{-n-1} e^{\frac{i (i d + c (v-2k))^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d - c (v-2k))^{n-j} (i d + c (v-2k) + 2 i b z)^{j+1}$$

$$\left(\frac{i (i d + c (v-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + c (v-2k) + 2 i b z)^2}{4 b} \right) -$$

$$(i b)^{-n-1} e^{\frac{i (i d - c (v-2k))^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d + c (v-2k))^{n-j} (i d - c (v-2k) + 2 i b z)^{j+1}$$

$$\left. \left(\frac{i (i d - c (v-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d - c (v-2k) + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3427.01

$$\int z^n \sin\left(\sqrt{z}\, b + d\, z\right) \cosh^{\nu}(c\, z)\, dz ==$$

$$(-1)^{n-1}\, 2^{-2\,n-\nu-2}\, i \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(e^{\frac{i\,b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^{h+j} \right.$$

$$\left(-\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b \left(-i\,b - 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) - \right.$$

$$\left. 2\,i\,d \sqrt{-\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) -$$

$$e^{-\frac{i\,b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b)^{-h-j+2\,n} \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^{h+j} \left(\frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\,i \left(i\,b + 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) + \right.$$

$$\left. \left. 2 \sqrt{\frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2), \frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) \right) d^{-2(n+1)} +$$

$$2^{-2\,n-\nu-2}\, i \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{\frac{b^2}{4(-i\,d + c(\nu-2\,k))}} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-i\,b + 2\left(-i\,d + c(\nu-2\,k)\right)\sqrt{z}\right)^{h+j} \right.\right.$$

$$\left(-\frac{\left(-i\,b + 2\left(-i\,d + c(\nu-2\,k)\right)\sqrt{z}\right)^2}{-i\,d + c(\nu-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2\left(-i\,d + c(\nu-2\,k)\right) \right.$$

$$\left. \sqrt{-\frac{\left(-i\,b + 2\left(-i\,d + c(\nu-2\,k)\right)\sqrt{z}\right)^2}{-i\,d + c(\nu-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(-i\,b + 2\left(-i\,d + c(\nu-2\,k)\right)\sqrt{z}\right)^2}{4\left(-i\,d + c(\nu-2\,k)\right)} \right) - \right.$$

$$i\,b\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+c\,(v-2\,k))}\right)\Bigg)\Bigg)$$

$$(-i\,d+c\,(v-2\,k))^{-2\,(n+1)}-e^{\frac{b^2}{4\,(i\,d+c\,(v-2\,k))}}\,(i\,d+c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}$$

$$\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+c\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+c\,(v-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+c\,(v-2\,k)}}\;(i\,d+c\,(v-2\,k))\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+c\,(v-2\,k))}\Bigg)\Bigg)+$$

$$e^{\frac{b^2}{4\,(-i\,d-c\,(v-2\,k))}}\,(-i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(-i\,d-c\,(v-2\,k))$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-c\,(v-2\,k))}\right)-$$

$$i\,b\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-c\,(v-2\,k))}\right)\Bigg)-$$

$$e^{\frac{b^2}{4\,(i\,d-c\,(v-2\,k))}}\,(i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-c\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-c\,(v-2\,k)}}\,(i\,d-c\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-c\,(v-2\,k))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

01.20.21.3428.01

$$\int z^n \sin\left(b z^2+d z+e\right)\cosh^{\nu}(c z)\,dz == i\,2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left((i b)^{-n-1} e^{i e-\frac{i d^2}{4 b}}\sum_{j=0}^{n} 2^{j-n}(-i d)^{n-j}(i d+2 i b z)^{j+1}\left(\frac{i (i d+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (i d+2 i b z)^2}{4 b}\right)-\right.$$

$$\left.(-i b)^{-n-1} e^{\frac{i d^2}{4 b}-i e}\sum_{j=0}^{n} 2^{j-n}(i d)^{n-j}(-i d-2 i b z)^{j+1}\left(-\frac{i (-i d-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-i d-2 i b z)^2}{4 b}\right)\right)-$$

$$i\,2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{i (-i d+c (\nu-2 k))^2}{4 b}-i e}\left(\sum_{j=0}^{n} 2^{j-n}(i d-c (\nu-2 k))^{n-j}(-i d+c (\nu-2 k)-2 i b z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i (-i d+c (\nu-2 k)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-i d+c (\nu-2 k)-2 i b z)^2}{4 b}\right)\right)(-i b)^{-n-1}+$$

$$e^{-\frac{i (-i d-c (\nu-2 k))^2}{4 b}-i e}\left(\sum_{j=0}^{n} 2^{j-n}(i d+c (\nu-2 k))^{n-j}(-i d-c (\nu-2 k)-2 i b z)^{j+1}\right.$$

$$\left.\left(-\frac{i (-i d-c (\nu-2 k)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-i d-c (\nu-2 k)-2 i b z)^2}{4 b}\right)\right)(-i b)^{-n-1}-$$

$$(i b)^{-n-1} e^{\frac{i (i d+c (\nu-2 k))^2}{4 b}+i e}\sum_{j=0}^{n} 2^{j-n}(-i d-c (\nu-2 k))^{n-j}(i d+c (\nu-2 k)+2 i b z)^{j+1}$$

$$\left(\frac{i (i d+c (\nu-2 k)+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (i d+c (\nu-2 k)+2 i b z)^2}{4 b}\right)-$$

$$(i b)^{-n-1} e^{\frac{i (i d-c (\nu-2 k))^2}{4 b}+i e}\sum_{j=0}^{n} 2^{j-n}(-i d+c (\nu-2 k))^{n-j}(i d-c (\nu-2 k)+2 i b z)^{j+1}$$

$$\left.\left(\frac{i (i d-c (\nu-2 k)+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (i d-c (\nu-2 k)+2 i b z)^2}{4 b}\right)\right)\Big/; n\in\mathbb{N}\bigwedge \nu\in\mathbb{N}^+$$

01.20.21.3429.01

$$\int z^n \sin\left(\sqrt{z}\ b+d z+e\right)\cosh^{\nu}(c z)\,dz ==$$

$$(-1)^{n-1}\,2^{-2 n-\nu-2}\,i\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{i b^2}{4 d}-i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i b)^{-h-j+2 n}\left(-i b-2 i d\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)d^{-2(n+1)}+$$

$$2^{-2\,n-v-2}\,i\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{b^2}{4(-i\,d+c(v-2k))}-i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d+c\,(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+c\,(v-2\,k))}\right)-$$

$$\left.\left.\left.i\,b\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+c\,(v-2\,k))}\right)\right)\right)$$

$$(-i\,d+c\,(v-2\,k))^{-2(n+1)}-e^{\frac{b^2}{4(i\,d+c(v-2k))}+i\,e}\,(i\,d+c\,(v-2\,k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+c\,(v-2\,k))}\right)+\right.$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+c\,(v-2\,k)}}\;(i\,d+c\,(v-2\,k))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+c\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^{2}}{4\,(-i\,d-c\,(v-2\,k))}-i\,e}\,(-i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d-c\,(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-c\,(v-2\,k))}\right)-$$

$$\left.\left.i\,b\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-c\,(v-2\,k))}\right)\right)-$$

$$e^{\frac{b^{2}}{4\,(i\,d-c\,(v-2\,k))}+i\,e}\,(i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d-c\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-c\,(v-2\,k)}}\right.$$

$$\left.\left.\right.\right.$$

Involving $z^n \sin(b z^r) \cosh^v(f z+g)$

01.20.21.3430.01

$$\int z^n \sin\left(b z^2\right) \cosh^v(f z+g)\, dz ==$$

$$i\, 2^{-v-2} z^{n+1} \binom{v}{\frac{v}{2}} \left(\left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - v \bmod 2) -$$

$$i\, 2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{i f^2 (v-2k)^2}{4b} - g(v-2k)} \left(\sum_{j=0}^{n} 2^{j-n} (f(v-2k))^{n-j} (-f(v-2k) - 2 i b z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{i (-f(v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-f(v-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i f^2 (v-2k)^2}{4b} + g(v-2k)} \left(\sum_{j=0}^{n} 2^{j-n} (-f(v-2k))^{n-j} (f(v-2k) - 2 i b z)^{j+1} \left(-\frac{i (f(v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (f(v-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{f^2 i (v-2k)^2}{4b} - g(v-2k)} \sum_{j=0}^{n} 2^{j-n} (f(v-2k))^{n-j}$$

$$(2 i b z - f(v-2k))^{j+1} \left(\frac{i (2 i b z - f(v-2k))^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b z - f(v-2k))^2}{4b}\right) -$$

$$(i b)^{-n-1} e^{\frac{f^2 i (v-2k)^2}{4b} + g(v-2k)} \sum_{j=0}^{n} 2^{j-n} (-f(v-2k))^{n-j} (f(v-2k) + 2 i b z)^{j+1}$$

$$\left(\frac{i (f(v-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (f(v-2k) + 2 i b z)^2}{4b}\right) \Bigg) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3431.01

$$\int z^n \sin\left(b \sqrt{z}\right) \cosh^v(g + f z)\, dz ==$$

$$(-1)^n 2^{-v} i \binom{v}{\frac{v}{2}} \left(\Gamma\left(2(n+1), i b \sqrt{z}\right) - \Gamma\left(2(n+1), -i b \sqrt{z}\right)\right) (1 - v \bmod 2)\, b^{-2(n+1)} + 2^{-2n-v-2} i \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (f(v-2k))^{-2(n+1)}$$

$$\left(e^{-\frac{b^2}{4 f (v-2k)} - g(v-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b)^{-h-j+2n} \left(-i b - 2 f (v-2k) \sqrt{z}\right)^{h+j} \left(\frac{\left(-i b - 2 f (v-2k) \sqrt{z}\right)^2}{f (v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-\right.$$

$$\left.2\,f\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)-$$

$$e^{-\frac{b^2}{4\,f\,(v-2\,k)}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\right.$$

$$\left.\sqrt{\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)+e^{\frac{b^2}{4\,f\,(v-2\,k)}+g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,f\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)-$$

$$e^{\frac{b^2}{4\,f\,(v-2\,k)}+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\right.$$

$$\left.\sqrt{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}\ \left(\frac{1}{}\right.\right.\qquad\left.\left.\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2\right)\right)$$

Involving $z^n \sin(b z^r + e) \cosh^v(f z + g)$

01.20.21.3432.01

$$\int z^n \sin\left(b z^2 + e\right) \cosh^v(f z + g)\, dz ==$$

$$i\, 2^{-v-2} z^{n+1} \binom{v}{\frac{v}{2}} \left(e^{i e} \left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - e^{-i e} \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - v \bmod 2) -$$

$$i\, 2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{i f^2 (v-2k)^2}{4b} - g(v-2k) - i e} \left(\sum_{j=0}^{n} 2^{j-n} (f(v-2k))^{n-j} (-f(v-2k) - 2 i b z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{i (-f(v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-f(v-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i f^2 (v-2k)^2}{4b} + g(v-2k) - i e} \left(\sum_{j=0}^{n} 2^{j-n} (-f(v-2k))^{n-j} (f(v-2k) - 2 i b z)^{j+1} \left(-\frac{i (f(v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right.$$

$$\left. \Gamma\left(\frac{j+1}{2}, -\frac{i (f(v-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} - (i b)^{-n-1} e^{\frac{f^2 i (v-2k)^2}{4b} - g(v-2k) + i e} \sum_{j=0}^{n} 2^{j-n} (f(v-2k))^{n-j}$$

$$(2 i b z - f(v-2k))^{j+1} \left(\frac{i (2 i b z - f(v-2k))^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b z - f(v-2k))^2}{4b}\right) -$$

$$(i b)^{-n-1} e^{\frac{f^2 i (v-2k)^2}{4b} + g(v-2k) + i e} \sum_{j=0}^{n} 2^{j-n} (-f(v-2k))^{n-j} (f(v-2k) + 2 i b z)^{j+1}$$

$$\left(\frac{i (f(v-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (f(v-2k) + 2 i b z)^2}{4b}\right) \Bigg) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3433.01

$$\int z^n \sin\left(\sqrt{z}\ b + e\right) \cosh^v(g + f z)\, dz ==$$

$$(-1)^n 2^{-v} i \binom{v}{\frac{v}{2}} \left(e^{-i e} \Gamma\left(2(n+1), i b \sqrt{z}\right) - e^{i e} \Gamma\left(2(n+1), -i b \sqrt{z}\right)\right) (1 - v \bmod 2)\, b^{-2(n+1)} +$$

$$2^{-2n-v-2} i \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (f(v-2k))^{-2(n+1)} \left(e^{-\frac{b^2}{4 f (v-2k)} - i e - g(v-2k)} \right.$$

$$\left. \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b)^{-h-j+2n} \left(-i b - 2 f (v-2k) \sqrt{z}\right)^{h+j} \left(\frac{\left(-i b - 2 f (v-2k) \sqrt{z}\right)^2}{f (v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-\right.$$

$$\left.2\,f\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)-$$

$$e^{-\frac{b^2}{4\,f\,(v-2\,k)}+i\,e-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\right.$$

$$\left.\sqrt{\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)+e^{\frac{b^2}{4\,f\,(v-2\,k)}-i\,e+g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,f\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)-$$

$$e^{\frac{b^2}{4\,f\,(v-2\,k)}+i\,e+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\right.$$

$$\left.\sqrt{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}\ \left(\Gamma_1\right.\right.\qquad\left.\left.\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2\right)\right)$$

Involving $z^n \sin(b z^r + d z) \cosh^v(f z + g)$

01.20.21.3434.01

$$\int z^n \sin\left(b z^2 + d z\right) \cosh^{\nu}(g + f z)\, dz == -i\, 2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left((-i b)^{-n-1} e^{\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b} \right) - \right.$$

$$\left. (i b)^{-n-1} e^{-\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b} \right) \right) -$$

$$i\, 2^{-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{g(\nu-2k) - \frac{i(-i d + f(\nu-2k))^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d - f(\nu-2k))^{n-j} (-i d + f(\nu-2k) - 2 i b z)^{j+1} \right.\right.\right.$$

$$\left.\left.\left. \left(-\frac{i (-i d + f(\nu-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d + f(\nu-2k) - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + \right.$$

$$e^{-\frac{i(-i d - f(\nu-2k))^2}{4 b} - g(\nu-2k)} \left(\sum_{j=0}^{n} 2^{j-n} (i d + f(\nu-2k))^{n-j} (-i d - f(\nu-2k) - 2 i b z)^{j+1} \right.$$

$$\left. \left(-\frac{i (-i d - f(\nu-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - f(\nu-2k) - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} -$$

$$(i b)^{-n-1} e^{\frac{i(i d + f(\nu-2k))^2}{4 b} + g(\nu-2k)} \sum_{j=0}^{n} 2^{j-n} (-i d - f(\nu-2k))^{n-j} (i d + f(\nu-2k) + 2 i b z)^{j+1}$$

$$\left(\frac{i (i d + f(\nu-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + f(\nu-2k) + 2 i b z)^2}{4 b} \right) -$$

$$(i b)^{-n-1} e^{\frac{i(i d - f(\nu-2k))^2}{4 b} - g(\nu-2k)} \sum_{j=0}^{n} 2^{j-n} (-i d + f(\nu-2k))^{n-j} (i d - f(\nu-2k) + 2 i b z)^{j+1}$$

$$\left. \left(\frac{i (i d - f(\nu-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d - f(\nu-2k) + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3435.01

$$\int z^n \sin\left(\sqrt{z}\, b + d\, z\right) \cosh^{\nu}(g + f\, z)\, dz ==$$

$$(-1)^{n-1}\, 2^{-2\,n-\nu-2}\, i \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(e^{\frac{i\,b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^{h+j} \right.$$

$$\left(-\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b \left(-i\,b - 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) - \right.$$

$$\left. 2\,i\,d \sqrt{-\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) -$$

$$e^{-\frac{i\,b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b)^{-h-j+2\,n} \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^{h+j} \left(\frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\,i \left(i\,b + 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) + \right.$$

$$\left. \left. 2 \sqrt{\frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2), \frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) \right) d^{-2\,(n+1)} +$$

$$2^{-2\,n-\nu-2}\, i \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{\frac{b^2}{4\,(-i\,d + f\,(\nu-2\,k))} + g\,(\nu-2\,k)} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j} \right.\right.$$

$$\left(-\frac{\left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d + f\,(\nu-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2\,(-i\,d + f\,(\nu-2\,k)) \right.$$

$$\left. \left. \sqrt{-\frac{\left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d + f\,(\nu-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d + f\,(\nu-2\,k))} \right) - \right.$$

$$i\,b\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,k))}\right)\Bigg)\Bigg)$$

$$(-i\,d+f\,(v-2\,k))^{-2\,(n+1)}-e^{\frac{b^2}{4\,(i\,d+f\,(v-2\,k))}+g\,(v-2\,k)}\,(i\,d+f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(b\,i\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}}\;(i\,d+f\,(v-2\,k))\,\Gamma\Bigg(\frac{1}{2}\,(h+j+2),$$

$$-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\Bigg)\Bigg)+e^{\frac{b^2}{4\,(-i\,d-f\,(v-2\,k))}-g\,(v-2\,k)}$$

$$(-i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(-i\,d-f\,(v-2\,k))$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-f\,(v-2\,k))}\right)-$$

$$i\,b\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-f\,(v-2\,k))}\right)\Bigg)-$$

$$e^{\frac{b^2}{4\,(i\,d-f\,(v-2\,k))}-g\,(v-2\,k)}\,(i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-f\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-f\,(v-2\,k)}}\,(i\,d-f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-f\,(v-2\,k))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin\left(b\,z^r+d\,z+e\right)\cosh^v(f\,z+g)$

01.20.21.3436.01

$$\int z^n \sin\left(b z^2+d z+e\right)\cosh^{\nu}(g+f z)\,dz == 2^{-\nu-2}\,i\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left((i b)^{-n-1} e^{i e-\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n}(-i d)^{n-j}(i d+2 i b z)^{j+1}\left(\frac{i (i d+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (i d+2 i b z)^2}{4 b}\right)-\right.$$

$$\left.(-i b)^{-n-1} e^{\frac{i d^2}{4 b}-i e}\sum_{j=0}^{n} 2^{j-n}(i d)^{n-j}(-i d-2 i b z)^{j+1}\left(-\frac{i (-i d-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-i d-2 i b z)^2}{4 b}\right)\right)-$$

$$2^{-\nu-2} i \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{i (-i d+f (\nu-2 k))^2}{4 b}-i e+g (\nu-2 k)}\left(\sum_{j=0}^{n} 2^{j-n}(i d-f (\nu-2 k))^{n-j}(-i d+f (\nu-2 k)-2 i b z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i (-i d+f (\nu-2 k)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-i d+f (\nu-2 k)-2 i b z)^2}{4 b}\right)\right)(-i b)^{-n-1}+$$

$$e^{-\frac{i (-i d-f (\nu-2 k))^2}{4 b}-i e-g (\nu-2 k)}\left(\sum_{j=0}^{n} 2^{j-n}(i d+f (\nu-2 k))^{n-j}(-i d-f (\nu-2 k)-2 i b z)^{j+1}\right.$$

$$\left.\left(-\frac{i (-i d-f (\nu-2 k)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i (-i d-f (\nu-2 k)-2 i b z)^2}{4 b}\right)\right)(-i b)^{-n-1}-$$

$$(i b)^{-n-1} e^{\frac{i (i d+f (\nu-2 k))^2}{4 b}+i e+g (\nu-2 k)}\sum_{j=0}^{n} 2^{j-n}(-i d-f (\nu-2 k))^{n-j}(i d+f (\nu-2 k)+2 i b z)^{j+1}$$

$$\left(\frac{i (i d+f (\nu-2 k)+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (i d+f (\nu-2 k)+2 i b z)^2}{4 b}\right)-$$

$$(i b)^{-n-1} e^{\frac{i (i d-f (\nu-2 k))^2}{4 b}+i e-g (\nu-2 k)}\sum_{j=0}^{n} 2^{j-n}(-i d+f (\nu-2 k))^{n-j}(i d-f (\nu-2 k)+2 i b z)^{j+1}$$

$$\left.\left(\frac{i (i d-f (\nu-2 k)+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i (i d-f (\nu-2 k)+2 i b z)^2}{4 b}\right)\right)/;\, n\in\mathbb{N}\bigwedge \nu\in\mathbb{N}^+$$

01.20.21.3437.01

$$\int z^n \sin\left(\sqrt{z}\ b+d z+e\right)\cosh^{\nu}(f z+g)\,dz ==$$

$$(-1)^{n-1} 2^{-2 n-\nu-2} i\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{\frac{i b^2}{4 d}-i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (-i b)^{-h-j+2 n}\left(-i b-2 i d\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)d^{-2(n+1)}+$$

$$2^{-2\,n-v-2}\,i\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{b^2}{4(-i\,d+f(v-2\,k))}-i\,e+g(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d+f(v-2\,k))\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d+f(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d+f(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d+f(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-i\,b+2\,(-i\,d+f(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f(v-2\,k))}\right)-$$

$$\left.\left.i\,b\left(-i\,b+2\,(-i\,d+f(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-i\,b+2\,(-i\,d+f(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f(v-2\,k))}\right)\right)\right)$$

$$(-i\,d+f(v-2\,k))^{-2(n+1)}-e^{\frac{b^2}{4(i\,d+f(v-2\,k))}+i\,e+g(v-2\,k)}\,(i\,d+f(v-2\,k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)+\right.$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}}\;(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)\right)+e^{\frac{b^{2}}{4\,(-i\,d-f\,(v-2\,k))}-i\,e-g\,(v-2\,k)}$$

$$(-i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d-f\,(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-f\,(v-2\,k))}\right)-$$

$$\left.i\,b\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-f\,(v-2\,k))}\right)\right)-$$

$$e^{\frac{b^{2}}{4\,(i\,d-f\,(v-2\,k))}+i\,e-g\,(v-2\,k)}\,(i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\right.\left(\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d-f\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-f\,(v-2\,k)}}$$

$$\left(\qquad\qquad\qquad

Involving $z^n \sin(b\,z)\cosh^{\nu}(c\,z^r)$

01.20.21.3438.01

$$\int z^n \sin(b\,z)\cosh^{\nu}\left(c\,z^2\right)dz == (-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,b)^{-n-1}\,\Gamma(n+1,\,i\,b\,z)-(i\,b)^{-n-1}\,\Gamma(n+1,\,-i\,b\,z)\right)(1-\nu \bmod 2)-$$

$$i\,2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{b^2}{4\,c\,(\nu-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,b)^{n-j}\,(-i\,b-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,b-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,b-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}-e^{-\frac{b^2}{4\,c\,(\nu-2\,s)}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,b)^{n-j}\,(i\,b-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,b-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,b-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{b^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,b)^{n-j}\,(-i\,b+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,b+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,b+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)-$$

$$e^{\frac{b^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,b)^{n-j}\,(i\,b+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,b+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,b+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3439.01

$$\int z^n \sin(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\,i\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{\frac{i\,c^2\,(\nu-2\,s)^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(\frac{i\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left.\left(2\,i\,b\sqrt{\frac{i\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-c\right.\right.$$

$$(v-2s)\left(-c(v-2s)+2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(-c(v-2s)+2ib\sqrt{z}\right)^2}{4b}\right)\Bigg)-$$

$$e^{\frac{ic^2(v-2s)^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)+2ib\sqrt{z}\right)^{h+j}\left(\frac{i\left(c(v-2s)+2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c(v-2s)\left(c(v-2s)+2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(c(v-2s)+2ib\sqrt{z}\right)^2}{4b}\right)+2$$

$$\sqrt{\frac{i\left(c(v-2s)+2ib\sqrt{z}\right)^2}{b}}\ b\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(c(v-2s)+2ib\sqrt{z}\right)^2}{4b}\right)\Bigg)+e^{-\frac{ic^2(v-2s)^2}{4b}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2s))^{-h-j+2n}\left(-c(v-2s)-2ib\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c(v-2s)-2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(-c(v-2s)\left(-c(v-2s)-2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-c(v-2s)-2ib\sqrt{z}\right)^2}{4b}\right)-2$$

$$ib\sqrt{-\frac{i\left(-c(v-2s)-2ib\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-c(v-2s)-2ib\sqrt{z}\right)^2}{4b}\right)\Bigg)+$$

$$e^{-\frac{ic^2(v-2s)^2}{4b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)-2ib\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c(v-2s)-2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c(v-2s)\left(c(v-2s)-2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(c(v-2s)-2ib\sqrt{z}\right)^2}{4b}\right)-2$$

$$ib\sqrt{-\frac{i\left(c(v-2s)-2ib\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(c(v-2s)-2ib\sqrt{z}\right)^2}{4b}\right)\Bigg)\Bigg)\Bigg)$$

$$b^{-2(n+1)} + (-1)^n\, 2^{-\nu-1}\, i \binom{\nu}{\frac{\nu}{2}} \left((-i\,b)^{-n-1}\,\Gamma(n+1,\, i\,b\,z) - (i\,b)^{-n-1}\,\Gamma(n+1,\, -i\,b\,z)\right)$$

$$(1 - \nu \bmod 2) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^n \sin(d\,z+e)\cosh^{\nu}(c\,z^r)$

01.20.21.3440.01

$$\int z^n \sin(e+d\,z)\cosh^{\nu}\left(c\,z^2\right) dz == (-1)^n\, i\, 2^{-\nu-1} \binom{\nu}{\frac{\nu}{2}} \left((-i\,d)^{-n-1}\, e^{-i\,e}\,\Gamma(n+1,\, i\,d\,z) - (i\,d)^{-n-1}\, e^{i\,e}\,\Gamma(n+1,\, -i\,d\,z)\right)(1-\nu \bmod 2) -$$

$$i\, 2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{d^2}{4\,c\,(\nu-2\,s)} - i\,e} \left(\sum_{j=0}^{n} 2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1} \left(\frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right) (-c\,(\nu-2\,s))^{-n-1} - e^{-\frac{d^2}{4\,c\,(\nu-2\,s)} + i\,e} \right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1} \left(\frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right)$$

$$(-c\,(\nu-2\,s))^{-n-1} + e^{\frac{d^2}{4\,c\,(\nu-2\,s)} - i\,e}\,(c\,(\nu-2\,s))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) -$$

$$e^{\frac{d^2}{4\,c\,(\nu-2\,s)} + i\,e}\,(c\,(\nu-2\,s))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1} \left(-\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right) \right) \Bigg/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3441.01

$$\int z^n \sin(e+d\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right) dz ==$$

$$(-1)^{n-1}\, 2^{-2\,n-\nu-2}\, i \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{\frac{c^2\, i\,(\nu-2\,s)^2}{4\,d} + i\,e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c\,(\nu-2\,s))^{-h-j+2\,n} \left(-c\,(\nu-2\,s) + 2\,i\,d\,\sqrt{z} \right)^{h+j} \right.\right.$$

$$\left.\left. \left(\frac{i\left(-c\,(\nu-2\,s) + 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \right) \right.$$

$$\left(2\,i\,d\sqrt{\frac{i\left(-c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(-c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-c\,(v-2\,s)\right.$$

$$\left.\left(-c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(-c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)-e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d}+i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^{h+j}\left(\frac{i\left(c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+2\right.$$

$$\left.\sqrt{\frac{i\left(c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(c\,(v-2\,s)+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}-i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\left(-c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\right.$$

$$\left.\sqrt{-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\right)+e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}-i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{i\left(c\,(v-2\,s)-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)-2\right.$$

$$i\,d\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)$$

$$d^{-2\,(n+1)}+(-1)^n\,2^{-v-1}\,i\binom{v}{\frac{v}{2}}\left((-i\,d)^{-n-1}\,e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)$$

$$(1-v \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3442.01

$$\int z^{\alpha-1}\sin(b\,z^r)\cosh^v(c\,z^r)\,dz==\frac{i\,2^{-v-1}\,z^\alpha}{r}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,(-i\,b-2\,c\,s+c\,v)\,z^r\right)\left((-i\,b-2\,c\,s+c\,v)\,z^r\right)^{-\frac{\alpha}{r}}-\left((i\,b-2\,c\,s+c\,v)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(i\,b-2\,c\,s+c\,v)\,z^r\right)+\right.$$

$$\left.\left((-i\,b+2\,c\,s-c\,v)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(-i\,b+2\,c\,s-c\,v)\,z^r\right)-\left((i\,b+2\,c\,s-c\,v)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(i\,b+2\,c\,s-c\,v)\,z^r\right)\right)+$$

$$\frac{2^{-v-1}\,i\,z^\alpha}{r}\binom{v}{\frac{v}{2}}\left((-i\,b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-i\,b\,z^r\right)-(i\,b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,i\,b\,z^r\right)\right)(1-v \bmod 2)\ /;\ v\in\mathbb{N}^+$$

01.20.21.3443.01

$$\int z^n\sin\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz==$$

$$i\,2^{-v-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{n+1}{2},\,(-i\,b-2\,c\,s+c\,v)\,z^2\right)\left((-i\,b-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}-\left((i\,b-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},\,(i\,b-2\,c\,s+c\,v)\,z^2\right)+\left((-i\,b+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-i\,b+2\,c\,s-c\,v)\,z^2\right)-$$

$$\left.\left((i\,b+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b+2\,c\,s-c\,v)\,z^2\right)\right)+$$

$$i\,2^{-v-2}\,z^{n+1}\binom{v}{\frac{v}{2}}\left(\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,-i\,b\,z^2\right)-\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,z^2\right)\right)(1-v \bmod 2)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3444.01

$$\int z^n\sin\left(b\,\sqrt{z}\right)\cosh^v\left(c\,\sqrt{z}\right)dz==(-1)^{n-1}\,2^{-v}\,i\binom{v}{\frac{v}{2}}\left(\Gamma\left(2\,(n+1),\,-i\,b\,\sqrt{z}\right)-\Gamma\left(2\,(n+1),\,i\,b\,\sqrt{z}\right)\right)(1-v \bmod 2)\,b^{-2\,(n+1)}+$$

$$2^{-v}\,i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,(-i\,b-2\,c\,s+c\,v)\,\sqrt{z}\right)(-i\,b-2\,c\,s+c\,v)^{-2\,(n+1)}-(i\,b-2\,c\,s+c\,v)^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\,(i\,b-2\,c\,s+c\,v)\,\sqrt{z}\right)+(-i\,b+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-i\,b+2\,c\,s-c\,v)\,\sqrt{z}\right)-$$

$$\left.(i\,b+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(i\,b+2\,c\,s-c\,v)\,\sqrt{z}\right)\right)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin(b\,z^r+e)\cosh^\nu(c\,z^r)$

01.20.21.3445.01

$$\int z^{\alpha-1}\sin(b\,z^r+e)\cosh^\nu(c\,z^r)\,dz ==$$

$$\frac{i\,2^{-\nu-1}\,z^\alpha}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(\frac{\alpha}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}-e^{-i\,e}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\right.$$
$$\left.\Gamma\left(\frac{\alpha}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{i\,e}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)-\right.$$
$$\left.e^{-i\,e}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)+$$
$$\frac{2^{-\nu-1}\,i\,z^\alpha}{r}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,(-i\,b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},-i\,b\,z^r\right)-e^{-i\,e}\,(i\,b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},i\,b\,z^r\right)\right)(1-\nu\bmod 2)\;/;\;\nu\in\mathbb{N}^+$$

01.20.21.3446.01

$$\int z^n\sin\left(b\,z^2+e\right)\cosh^\nu\left(c\,z^2\right)dz ==$$

$$i\,2^{-\nu-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(\frac{n+1}{2},(-i\,b-2\,c\,s+c\,\nu)\,z^2\right)\left((-i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}-e^{-i\,e}\left((i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$
$$\left.\Gamma\left(\frac{n+1}{2},(i\,b-2\,c\,s+c\,\nu)\,z^2\right)+e^{i\,e}\left((-i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(-i\,b+2\,c\,s-c\,\nu)\,z^2\right)-\right.$$
$$\left.e^{-i\,e}\left((i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b+2\,c\,s-c\,\nu)\,z^2\right)\right)+$$
$$i\,2^{-\nu-2}\,z^{n+1}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},-i\,b\,z^2\right)-e^{-i\,e}\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},i\,b\,z^2\right)\right)(1-\nu\bmod 2)\;/;\;n\in$$
$$\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3447.01

$$\int z^n\sin\left(\sqrt{z}\;b+e\right)\cosh^\nu\left(c\,\sqrt{z}\right)dz ==$$

$$(-1)^{n-1}\,2^{-\nu}\,i\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(2\,(n+1),-i\,b\,\sqrt{z}\right)-e^{-i\,e}\,\Gamma\left(2\,(n+1),i\,b\,\sqrt{z}\right)\right)(1-\nu\bmod 2)\,b^{-2\,(n+1)}+$$
$$2^{-\nu}\,i\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(2\,(n+1),(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)(-i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}-e^{-i\,e}\,(i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}\right.$$
$$\left.\Gamma\left(2\,(n+1),(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)+e^{i\,e}\,(-i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-\right.$$
$$\left.e^{-i\,e}\,(i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)\right)/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^n\sin(b\,z^r+d\,z)\cosh^\nu(c\,z^r)$

01.20.21.3448.01

$$\int z^n \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2\right)dz == i\,2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left((i\,b)^{-n-1}\,e^{-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.(-i\,b)^{-n-1}\,e^{\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)-$$

$$i\,2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{i\,d^2}{4\,(-b+2\,i\,c\,k-i\,c\,\nu)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{-i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b+c\,(\nu-2\,k))}\right)\right)$$

$$(-i\,b+c\,(\nu-2\,k))^{-n-1}-e^{\frac{i\,d^2}{4\,(-b-2\,i\,c\,k+i\,c\,\nu)}}\,(i\,b+c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(i\,b+c\,(\nu-2\,k))}\right)+$$

$$e^{-\frac{i\,d^2}{4\,(-b-2\,i\,c\,k+i\,c\,\nu)}}\,(-i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{-i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b-c\,(\nu-2\,k))}\right)-$$

$$e^{\frac{i\,d^2}{4\,(-b+2\,i\,c\,k-i\,c\,\nu)}}\,(i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(i\,b-c\,(\nu-2\,k))}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3449.01

$$\int z^n \sin\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-2\,n-\nu-2}\,i\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,(i\,d)^{-2\,(n+1)}\left(e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$2^{-2\,n-v-2}\,i\,(i\,d)^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(-e^{\frac{i\,(i\,b+c\,(v-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$\left.e^{\frac{i\,(i\,b-c\,(v-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right)$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b+c\,(v-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b-c\,(v-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(b z^r + d z + e) \cosh^v(c z^r)$

01.20.21.3450.01

$$\int z^n \sin\left(b z^2 + d z + e\right) \cosh^v\left(c z^2\right) dz == \frac{1}{b^{2n+1}} \left(2^{-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)\, e^{-\frac{i\left(d^2+4be\right)}{4b}} \right.$$

$$\left(e^{2ie} \left(\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i (d + 2bz))^{j+1} \left(-\frac{i (d+2bz)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (d+2bz)^2}{4b} \right) \right) (-ib)^n + (ib)^n e^{\frac{id^2}{2b}} \right.$$

$$\left. \left. \sum_{j=0}^{n} 2^{j-n} (id)^{n-j} (-i (d+2bz))^{j+1} \left(\frac{i (d+2bz)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (d+2bz)^2}{4b} \right) \right) \right) - i\, 2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k}$$

$$\left(e^{-\frac{1}{4} i \left(\frac{d^2}{-b+2ick-icv} + 4e \right)} \left(\sum_{j=0}^{n} 2^{j-n} (id)^{n-j} (-id + 2(-ib + c(v-2k)) z)^{j+1} \left(-\frac{(-id + 2(-ib + c(v-2k)) z)^2}{-ib + c(v-2k)} \right)^{\frac{1}{2}(-j-1)} \right. \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-id + 2(-ib + c(v-2k)) z)^2}{4(-ib + c(v-2k))} \right) \right) (-ib + c(v-2k))^{-n-1} -$$

$$e^{-\frac{1}{4} i \left(-\frac{d^2}{-b-2ick+icv} - 4e \right)} (ib + c(v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-id)^{n-j} (id + 2(ib + c(v-2k)) z)^{j+1}$$

$$\left(-\frac{(id + 2(ib + c(v-2k)) z)^2}{ib + c(v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(id + 2(ib + c(v-2k)) z)^2}{4(ib + c(v-2k))} \right) +$$

$$e^{\frac{1}{4} i \left(-\frac{d^2}{-b-2ick+icv} - 4e \right)} (-ib - c(v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (id)^{n-j} (-id + 2(-ib - c(v-2k)) z)^{j+1}$$

$$\left(-\frac{(-id + 2(-ib - c(v-2k)) z)^2}{-ib - c(v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-id + 2(-ib - c(v-2k)) z)^2}{4(-ib - c(v-2k))} \right) -$$

$$e^{\frac{1}{4} i \left(\frac{d^2}{-b+2ick-icv} + 4e \right)} (ib - c(v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-id)^{n-j} (id + 2(ib - c(v-2k)) z)^{j+1}$$

$$\left. \left(-\frac{(id + 2(ib - c(v-2k)) z)^2}{ib - c(v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(id + 2(ib - c(v-2k)) z)^2}{4(ib - c(v-2k))} \right) \right) /;\ n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3451.01

$$\int z^n \sin\left(\sqrt{z}\ b + d\,z + e\right) \cosh^{\nu}\left(c\,\sqrt{z}\right) dz ==$$

$$2^{-2\,n-\nu-2}\, i \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)\, (i\,d)^{-2\,(n+1)} \left(e^{\frac{i\,b^2}{4\,d} - i\,e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^{h+j} \right.$$

$$\left(-\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b \left(-i\,b - 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right) - \right.$$

$$\left. 2\,i\,d \sqrt{-\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i\left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right) \right) -$$

$$e^{i\,e - \frac{i\,b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b)^{-h-j+2\,n} \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^{h+j} \left(\frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j} \left(b\,i \left(i\,b + 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right) + \right.$$

$$\left. \left. 2 \sqrt{\frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2), \frac{i\left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right) \right) \right) +$$

$$2^{-2\,n-\nu-2}\, i\, (i\,d)^{-2\,(n+1)} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(-e^{\frac{i\,(i\,b + c\,(\nu-2\,k))^2}{4\,d} + i\,e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b + c\,(\nu - 2\,k))^{-h-j+2\,n} \right.$$

$$\left(i\,b + c\,(\nu - 2\,k) + 2\,i\,d\,\sqrt{z}\right)^{h+j} \left(\frac{i\left(i\,b + c\,(\nu-2\,k) + 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i\,b + c\,(\nu - 2\,k)) \left(i\,b + c\,(\nu-2\,k) + 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(i\,b + c\,(\nu-2\,k) + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right) + \right.$$

$$2\sqrt{\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{\frac{i\,(i\,b-c\,(v-2\,k))^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,(-i\,b+c\,(v-2\,k))^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-$$

$$2\,i\,d\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,(-i\,b-c\,(v-2\,k))^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3452.01

$$\int z^n\sin(d\,z)\cosh^v\left(c\,z^2+g\right)dz==(-1)^n\,i\,2^{-v-1}\binom{v}{\frac{v}{2}}\left((-i\,d)^{-n-1}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-v\bmod 2)-$$

$$i\,2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{d^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}-e^{-\frac{d^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(i\,d-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,(v-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)-$$

$$e^{\frac{d^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3453.01

$$\int z^n \sin(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\,i\,d^{-2\,(n+1)}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,d}-g\,(\nu-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\right.$$

$$\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,i\,d\,\sqrt{\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.c\,(\nu-2\,s)\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,d}+g\,(\nu-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(\nu-2\,s)\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\,\sqrt{\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+e^{-\frac{i\,c^2\,(\nu-2\,s)^2}{4\,d}-g\,(\nu-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-c\,(\nu-2\,s)\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{i\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$2\,i\,d\,\sqrt{-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\,\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\Bigg)+$$

$$(-1)^n\,2^{-v-1}\,i\binom{v}{\frac{v}{2}}\left((-i\,d)^{-n-1}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)$$

$$(1-v\bmod 2)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3454.01

$$\int z^n \sin(e+d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$(-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,d)^{-n-1}\,e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-$$

$$i\,2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{4\,c\,(\nu-2\,s)}-i\,e-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}-e^{-\frac{d^2}{4\,c\,(\nu-2\,s)}+i\,e-g\,(\nu-2\,s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{d^2}{4\,c\,(\nu-2\,s)}-i\,e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)-$$

$$e^{\frac{d^2}{4\,c\,(\nu-2\,s)}+i\,e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left.\left(-\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3455.01

$$\int z^n \sin(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\,i\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,d}-g\,(\nu-2\,s)+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left.\left(2\,i\,d\sqrt{\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-c\,(\nu-2\,s)\right.\right.$$

$$\left(-c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)+i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{\frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \ d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}-g\,(v-2\,s)-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(-c\,(v-2\,s)\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\,\sqrt{-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)-i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2$$

$$i\,d\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)$$

$$d^{-2\,(n+1)}+(-1)^n\,2^{-v-1}\,i\binom{v}{\frac{v}{2}}\left((-i\,d)^{-n-1}\,e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)$$

$$(1-v \bmod 2)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin\left(b\,z^r\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3456.01

$$\int z^{\alpha-1}\sin(b\,z^r)\cosh^v(c\,z^r+g)\,dz==$$

$$\frac{i\,2^{-v-1}\,z^\alpha}{r}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-i\,b-2\,c\,s+c\,v)\,z^r\right)\left((-i\,b-2\,c\,s+c\,v)\,z^r\right)^{-\frac{\alpha}{r}}-e^{2\,g\,s-g\,v}\left((i\,b-2\,c\,s+c\,v)\,z^r\right)^{-\frac{\alpha}{r}}\right.$$
$$\Gamma\left(\frac{\alpha}{r},\,(i\,b-2\,c\,s+c\,v)\,z^r\right)+e^{g\,v-2\,g\,s}\left((-i\,b+2\,c\,s-c\,v)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(-i\,b+2\,c\,s-c\,v)\,z^r\right)-$$
$$\left.e^{g\,v-2\,g\,s}\left((i\,b+2\,c\,s-c\,v)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(i\,b+2\,c\,s-c\,v)\,z^r\right)\right)+$$
$$\frac{2^{-v-1}\,i\,z^\alpha}{r}\binom{v}{\frac{v}{2}}\left(\left(-i\,b\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,-i\,b\,z^r\right)-\left(i\,b\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,i\,b\,z^r\right)\right)(1-v \bmod 2)\;/;\;v\in\mathbb{N}^+$$

01.20.21.3457.01

$$\int z^n\sin\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz==$$

$$i\,2^{-v-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{n+1}{2},\,(-i\,b-2\,c\,s+c\,v)\,z^2\right)\left((-i\,b-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}-e^{2\,g\,s-g\,v}\right.$$
$$\left(\left(i\,b-2\,c\,s+c\,v\right)z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b-2\,c\,s+c\,v)\,z^2\right)+e^{g\,v-2\,g\,s}\left(\left(-i\,b+2\,c\,s-c\,v\right)z^2\right)^{\frac{1}{2}(-n-1)}$$
$$\Gamma\left(\frac{n+1}{2},\,(-i\,b+2\,c\,s-c\,v)\,z^2\right)-e^{g\,v-2\,g\,s}\left(\left(i\,b+2\,c\,s-c\,v\right)z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b+2\,c\,s-c\,v)\,z^2\right)\Bigg)+$$
$$i\,2^{-v-2}\,z^{n+1}\binom{v}{\frac{v}{2}}\left(\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,-i\,b\,z^2\right)-\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,z^2\right)\right)(1-v \bmod 2)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3458.01

$$\int z^n\sin\left(b\,\sqrt{z}\right)\cosh^v\left(\sqrt{z}\;c+g\right)dz==(-1)^{n-1}\,2^{-v}\,i\binom{v}{\frac{v}{2}}\left(\Gamma\left(2\,(n+1),\,-i\,b\,\sqrt{z}\right)-\Gamma\left(2\,(n+1),\,i\,b\,\sqrt{z}\right)\right)(1-v \bmod 2)\,b^{-2\,(n+1)}+$$

$$2^{-v}\,i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(2\,(n+1),\,(-i\,b-2\,c\,s+c\,v)\,\sqrt{z}\right)(-i\,b-2\,c\,s+c\,v)^{-2\,(n+1)}-e^{2\,g\,s-g\,v}\,(i\,b-2\,c\,s+c\,v)^{-2\,(n+1)}\right.$$
$$\Gamma\left(2\,(n+1),\,(i\,b-2\,c\,s+c\,v)\,\sqrt{z}\right)+e^{g\,v-2\,g\,s}\,(-i\,b+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-i\,b+2\,c\,s-c\,v)\,\sqrt{z}\right)-$$
$$\left.e^{g\,v-2\,g\,s}\,(i\,b+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(i\,b+2\,c\,s-c\,v)\,\sqrt{z}\right)\right)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin(b\,z^r+e)\cosh^\nu(c\,z^r+g)$

01.20.21.3459.01

$$\int z^{\alpha-1}\sin(b\,z^r+e)\cosh^\nu(c\,z^r+g)\,dz ==$$

$$\frac{i\,2^{-\nu-1}\,z^\alpha}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{\alpha}{r},\,(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}-e^{-i\,e+2\,g\,s-g\,\nu}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\right.$$
$$\Gamma\left(\frac{\alpha}{r},\,(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{i\,e-2\,g\,s+g\,\nu}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)-$$
$$\left.e^{-i\,e-2\,g\,s+g\,\nu}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)+$$
$$\frac{2^{-\nu-1}\,i\,z^\alpha}{r}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,(-i\,b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-i\,b\,z^r\right)-e^{-i\,e}\,(i\,b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,i\,b\,z^r\right)\right)(1-\nu\bmod 2)\;/;\;\nu\in\mathbb{N}^+$$

01.20.21.3460.01

$$\int z^n\sin\left(b\,z^2+e\right)\cosh^\nu\left(c\,z^2+g\right)dz ==$$

$$i\,2^{-\nu-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{n+1}{2},\,(-i\,b-2\,c\,s+c\,\nu)\,z^2\right)\left((-i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}-\right.$$
$$e^{-i\,e+2\,g\,s-g\,\nu}\left((i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b-2\,c\,s+c\,\nu)\,z^2\right)+e^{i\,e-2\,g\,s+g\,\nu}\left((-i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}$$
$$\left.\Gamma\left(\frac{n+1}{2},\,(-i\,b+2\,c\,s-c\,\nu)\,z^2\right)-e^{-i\,e-2\,g\,s+g\,\nu}\left((i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b+2\,c\,s-c\,\nu)\,z^2\right)\right)+$$
$$i\,2^{-\nu-2}\,z^{n+1}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,-i\,b\,z^2\right)-e^{-i\,e}\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,z^2\right)\right)(1-\nu\bmod 2)\;/;\;n\in$$
$$\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3461.01

$$\int z^n\sin\left(\sqrt{z}\;b+e\right)\cosh^\nu\left(\sqrt{z}\;c+g\right)dz ==$$

$$(-1)^{n-1}\,2^{-\nu}\,i\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(2\,(n+1),\,-i\,b\,\sqrt{z}\right)-e^{-i\,e}\,\Gamma\left(2\,(n+1),\,i\,b\,\sqrt{z}\right)\right)(1-\nu\bmod 2)\,b^{-2\,(n+1)}+2^{-\nu}\,i$$
$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(2\,(n+1),\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)(-i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}-e^{-i\,e+2\,g\,s-g\,\nu}\,(i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}\right.$$
$$\Gamma\left(2\,(n+1),\,(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)+e^{i\,e-2\,g\,s+g\,\nu}\,(-i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-$$
$$\left.e^{-i\,e-2\,g\,s+g\,\nu}\,(i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)\right)/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^n\sin(b\,z^r+d\,z)\cosh^\nu(c\,z^r+g)$

01.20.21.3462.01

$$\int z^n \sin\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == i\,2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left((i\,b)^{-n-1}\,e^{-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.(-i\,b)^{-n-1}\,e^{\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)-$$

$$i\,2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{1}{4}i\left(\frac{d^2}{-b+2\,i\,c\,k-i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{-i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b+c\,(\nu-2\,k))}\right)\right)$$

$$(-i\,b+c\,(\nu-2\,k))^{-n-1}-e^{-\frac{1}{4}i\left(-\frac{d^2}{-b-2\,i\,c\,k+i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}(i\,b+c\,(\nu-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^{j+1}\left(-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(i\,b+c\,(\nu-2\,k))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{d^2}{-b-2\,i\,c\,k+i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}(-i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{-i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b-c\,(\nu-2\,k))}\right)-$$

$$e^{\frac{1}{4}i\left(\frac{d^2}{-b+2\,i\,c\,k-i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}(i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left.\left(-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(i\,b-c\,(\nu-2\,k))}\right)\right)/;\,n\in\mathbb{N}\wedge\nu\in\mathbb{N}^+$$

01.20.21.3463.01

$$\int z^n \sin\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-2\,n-\nu-2}\,i\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,(i\,d)^{-2\,(n+1)}\left(e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$2^{-2\,n-v-2}\,i\,(i\,d)^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(-e^{\frac{i\,(i\,b+c\,(v-2\,k))^2}{4\,d}+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$\left.e^{\frac{i\,(i\,b-c\,(v-2\,k))^2}{4\,d}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b+c\,(v-2\,k))^2}{4\,d}+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b-c\,(v-2\,k))^2}{4\,d}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(b z^r + d z + e) \cosh^\nu(c z^r + g)$

01.20.21.3464.01

$$\int z^n \sin\left(b z^2 + d z + e\right) \cosh^\nu\left(c z^2 + g\right) dz == i\, 2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left((i b)^{-n-1} e^{i e - \frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b} \right) - \right.$$

$$(-i b)^{-n-1} e^{\frac{i d^2}{4 b} - i e} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b} \right) \Bigg) -$$

$$i\, 2^{-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-\frac{1}{4} i \left(\frac{d^2}{-b+2 i c k - i c \nu} + 4 e + 4 g i (\nu - 2 k) \right)} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-i b + c (\nu - 2 k)) z)^{j+1} \right. \right.$$

$$\left. \left(-\frac{(-i d + 2 (-i b + c (\nu - 2 k)) z)^2}{-i b + c (\nu - 2 k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-i b + c (\nu - 2 k)) z)^2}{4 (-i b + c (\nu - 2 k))} \right) \right)$$

$$(-i b + c (\nu - 2 k))^{-n-1} - e^{-\frac{1}{4} i \left(-\frac{d^2}{-b-2 i c k + i c \nu} - 4 e + 4 g i (\nu - 2 k) \right)} (i b + c (\nu - 2 k))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b + c (\nu - 2 k)) z)^{j+1} \left(-\frac{(i d + 2 (i b + c (\nu - 2 k)) z)^2}{i b + c (\nu - 2 k)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b + c (\nu - 2 k)) z)^2}{4 (i b + c (\nu - 2 k))} \right) +$$

$$e^{\frac{1}{4} i \left(-\frac{d^2}{-b-2 i c k + i c \nu} - 4 e + 4 g i (\nu - 2 k) \right)} (-i b - c (\nu - 2 k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-i b - c (\nu - 2 k)) z)^{j+1}$$

$$\left(-\frac{(-i d + 2 (-i b - c (\nu - 2 k)) z)^2}{-i b - c (\nu - 2 k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-i b - c (\nu - 2 k)) z)^2}{4 (-i b - c (\nu - 2 k))} \right) -$$

$$e^{\frac{1}{4} i \left(\frac{d^2}{-b+2 i c k - i c \nu} + 4 e + 4 g i (\nu - 2 k) \right)} (i b - c (\nu - 2 k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b - c (\nu - 2 k)) z)^{j+1}$$

$$\left. \left. \left(-\frac{(i d + 2 (i b - c (\nu - 2 k)) z)^2}{i b - c (\nu - 2 k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b - c (\nu - 2 k)) z)^2}{4 (i b - c (\nu - 2 k))} \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3465.01

$$\int z^n \sin\left(\sqrt{z}\, b + d\, z + e\right) \cosh^{\nu}\left(\sqrt{z}\, c + g\right) dz =$$

$$2^{-2n-\nu-2}\, i \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(e^{\frac{i b^2}{4d} - i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i b)^{-h-j+2n} \left(-i b - 2 i d \sqrt{z}\right)^{h+j} \left(-\frac{i \left(-i b - 2 i d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h} \binom{n}{j} \left(-i b \left(-i b - 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i \left(-i b - 2 i d \sqrt{z}\right)^2}{4d} \right) - \right.$$

$$\left. \left. 2 i d \sqrt{-\frac{i \left(-i b - 2 i d \sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i \left(-i b - 2 i d \sqrt{z}\right)^2}{4d} \right) \right) - \right.$$

$$e^{i e - \frac{i b^2}{4d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i b)^{-h-j+2n} \left(i b + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(i b + 2 i d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j} \left(b\, i \left(i b + 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i \left(i b + 2 i d \sqrt{z}\right)^2}{4d} \right) + \right.$$

$$\left. \left. 2 \sqrt{\frac{i \left(i b + 2 i d \sqrt{z}\right)^2}{d}}\ d\, i\, \Gamma\left(\frac{1}{2}(h+j+2), \frac{i \left(i b + 2 i d \sqrt{z}\right)^2}{4d} \right) \right) \right) (i d)^{-2(n+1)} +$$

$$2^{-2n-\nu-2}\, i \left(\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(-e^{\frac{i (i b + c(\nu-2k))^2}{4d} + i e + g(\nu-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i b + c(\nu-2k))^{-h-j+2n} \right. \right.$$

$$\left(i b + c(\nu-2k) + 2 i d \sqrt{z}\right)^{h+j} \left(\frac{i \left(i b + c(\nu-2k) + 2 i d \sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left. \left((i b + c(\nu-2k)) \left(i b + c(\nu-2k) + 2 i d \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i \left(i b + c(\nu-2k) + 2 i d \sqrt{z}\right)^2}{4d} \right) + 2 \right. \right.$$

$$\sqrt{\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{\frac{i\,(i\,b-c\,(v-2\,k))^2}{4\,d}+i\,e-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,(-i\,b+c\,(v-2\,k))^2}{4\,d}-i\,e+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((-i\,b+c\,(v-2\,k))$$

$$\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d$$

$$\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,(-i\,b-c\,(v-2\,k))^2}{4\,d}-i\,e-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\,\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)(i\,d)^{-2\,(n+1)}\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3466.01

$$\int z^n \sin(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$(-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,d)^{-n-1}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-i\,2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,s))^{n-j}\,(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}-e^{\frac{(i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,s))^{n-j}\,(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,s))^{n-j}\,(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)-e^{-\frac{(i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,s))^{n-j}\,(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3467.01

$$\int z^n \sin(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == (-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,d)^{-n-1}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)+$$

$$i\,2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d+f\,(\nu-2\,s))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left.\left.\left(c\,(\nu-2\,s)+2\,(-i\,d+f\,(\nu-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(\nu-2\,s)+2\,(-i\,d+f\,(\nu-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(\nu-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\Bigg)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}-e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.\right.$$

$$-\frac{\left(2\left(-i\,d-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d-f\,(v-2\,s)\right)}\Bigg)-c\,(v-2\,s)\left(2\left(-i\,d-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),\,-\frac{\left(2\left(-i\,d-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d-f\,(v-2\,s)\right)}\Bigg)\Bigg)-e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d-f\,(v-2\,s))}}$$

$$(i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(i\,d-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d-f\,(v-2\,s)}}\;\Gamma\Bigg(\frac{1}{2}(h+j+2),\right.$$

$$-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(i\,d-f\,(v-2\,s))}\Bigg)-c\,(v-2\,s)\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\Bigg($$

$$\left.\frac{1}{2}(h+j+1),\,-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(i\,d-f\,(v-2\,s))}\Bigg)\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3468.01

$$\int z^n \sin(e + d\,z)\cosh^{\nu}\left(c\,z^2 + f\,z\right) dz ==$$

$$(-1)^n\, i\, 2^{-\nu-1} \binom{\nu}{\frac{\nu}{2}} \left((-i\,d)^{-n-1}\, e^{-i\,e}\, \Gamma(n+1,\, i\,d\,z) - (i\,d)^{-n-1}\, e^{i\,e}\, \Gamma(n+1,\, -i\,d\,z)\right)(1 - \nu \bmod 2) -$$

$$i\, 2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{\frac{(-i\,d - f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)} - i\,e} \left(\sum_{j=0}^{n} 2^{j-n}\, (i\,d + f\,(\nu-2\,s))^{n-j}\, (-i\,d - f\,(\nu-2\,s) - 2\,c\,(\nu-2\,s)\,z)^{j+1} \right.\right.$$

$$\left. \left(\frac{(-i\,d - f\,(\nu-2\,s) - 2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(-i\,d - f\,(\nu-2\,s) - 2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right)$$

$$(-c\,(\nu-2\,s))^{-n-1} - e^{\frac{(i\,d - f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)} + i\,e} \left(\sum_{j=0}^{n} 2^{j-n}\, (-i\,d + f\,(\nu-2\,s))^{n-j}\, (i\,d - f\,(\nu-2\,s) - 2\,c\,(\nu-2\,s)\,z)^{j+1} \right.$$

$$\left. \left(\frac{(i\,d - f\,(\nu-2\,s) - 2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, \frac{(i\,d - f\,(\nu-2\,s) - 2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right)$$

$$(-c\,(\nu-2\,s))^{-n-1} + e^{-\frac{(-i\,d + f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)} - i\,e}\, (c\,(\nu-2\,s))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (i\,d - f\,(\nu-2\,s))^{n-j}$$

$$(-i\,d + f\,(\nu-2\,s) + 2\,c\,(\nu-2\,s)\,z)^{j+1} \left(-\frac{(-i\,d + f\,(\nu-2\,s) + 2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(-i\,d + f\,(\nu-2\,s) + 2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) - e^{-\frac{(i\,d + f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)} + i\,e}\, (c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n}\, (-i\,d - f\,(\nu-2\,s))^{n-j}\, (i\,d + f\,(\nu-2\,s) + 2\,c\,(\nu-2\,s)\,z)^{j+1} \left(-\frac{(i\,d + f\,(\nu-2\,s) + 2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(i\,d + f\,(\nu-2\,s) + 2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)} \right) \right) \right) /;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3469.01

$$\int z^n \sin(d\,z + e)\cosh^{\nu}\left(\sqrt{z}\;c + f\,z\right) dz ==$$

$$(-1)^n\, i\, 2^{-\nu-1} \binom{\nu}{\frac{\nu}{2}} \left((-i\,d)^{-n-1}\, e^{-i\,e}\, \Gamma(n+1,\, i\,d\,z) - (i\,d)^{-n-1}\, e^{i\,e}\, \Gamma(n+1,\, -i\,d\,z)\right)(1 - \nu \bmod 2) +$$

$$i\, 2^{-2\,n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d + f\,(\nu-2\,s))} - i\,e} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(\nu-2\,s))^{-h-j+2\,n} \right.\right.$$

$$\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\right)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}-e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}+i\,e}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}-i\,e}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-i\,d-f(v-2s))\sqrt{-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{-i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)-c(v-2s)\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)\right)-$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d-f(v-2s))}+i\,e}\,(i\,d-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2s))^{-h-j+2n}$$

$$\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}\left(-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f(v-2s))\sqrt{-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)-c(v-2s)\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(b\,z^r)\cosh^v(c\,z^r+f\,z)$

01.20.21.3470.01

$$\int z^n \sin\left(b z^2\right) \cosh^v\left(c z^2 + f z\right) dz ==$$

$$i\, 2^{-v-2}\, z^{n+1} \binom{v}{\frac{v}{2}} \left(\left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - v \bmod 2) -$$

$$i\, 2^{-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{i f^2 (v-2s)^2}{4(-b+2ics-icv)}} \left(\sum_{j=0}^{n} 2^{j-n} (-f(v-2s))^{n-j} (f(v-2s) + 2(-ib + c(v-2s)) z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{(f(v-2s) + 2(-ib + c(v-2s)) z)^2}{-ib + c(v-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f(v-2s) + 2(-ib + c(v-2s)) z)^2}{4(-ib + c(v-2s))}\right) \right)$$

$$(-ib + c(v-2s))^{-n-1} - e^{\frac{i f^2 (v-2s)^2}{4(b+2ics-icv)}} (ib + c(v-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-f(v-2s))^{n-j}$$

$$(f(v-2s) + 2(ib + c(v-2s)) z)^{j+1} \left(-\frac{(f(v-2s) + 2(ib + c(v-2s)) z)^2}{ib + c(v-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(f(v-2s) + 2(ib + c(v-2s)) z)^2}{4(ib + c(v-2s))}\right) + e^{-\frac{i f^2 (v-2s)^2}{4(b+2ics-icv)}} (-ib - c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (f(v-2s))^{n-j} (2(-ib - c(v-2s)) z - f(v-2s))^{j+1} \left(-\frac{(2(-ib - c(v-2s)) z - f(v-2s))^2}{-ib - c(v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(-ib - c(v-2s)) z - f(v-2s))^2}{4(-ib - c(v-2s))}\right) - e^{-\frac{i f^2 (v-2s)^2}{4(-b+2ics-icv)}} (ib - c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (f(v-2s))^{n-j} (2(ib - c(v-2s)) z - f(v-2s))^{j+1} \left(-\frac{(2(ib - c(v-2s)) z - f(v-2s))^2}{ib - c(v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(ib - c(v-2s)) z - f(v-2s))^2}{4(ib - c(v-2s))}\right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3471.01

$$\int z^n \sin\left(b \sqrt{z}\right) \cosh^v\left(\sqrt{z}\, c + f z\right) dz ==$$

$$(-1)^n\, i\, 2^{-v} \binom{v}{\frac{v}{2}} \left(\Gamma\left(2(n+1), i b \sqrt{z}\right) - \Gamma\left(2(n+1), -i b \sqrt{z}\right)\right) (1 - v \bmod 2)\, b^{-2(n+1)} + 2^{-2n-v-2}\, i \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (f(v-2s))^{-2(n+1)}$$

$$\binom{v}{s} \left(e^{\frac{(-ib - c(v-2s))^2}{4 f (v-2s)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-ib - c(v-2s))^{-h-j+2n} \left(-ib - c(v-2s) - 2 f (v-2s) \sqrt{z}\right)^{h+j} \right.$$

$$\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)-$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2 f (v-2 s) \sqrt{-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) -$$

$$e^{-\frac{(i b + c (v-2 s))^2}{4 f (v-2 s)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b + c (v-2 s))^{-h-j+2 n} \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i b + c (v-2 s)) \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) + 2 f (v-2 s) \sqrt{-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \sin\left(b z^r + e\right) \cosh^v\left(c z^r + f z\right)$

01.20.21.3472.01

$$\int z^n \sin\left(b z^2+e\right) \cosh^v\left(c z^2+f z\right) dz ==$$

$$i\, 2^{-v-2}\, z^{n+1} \binom{v}{\frac{v}{2}} \left(e^{i e} \left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - e^{-i e} \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - v \bmod 2) -$$

$$i\, 2^{-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{1}{4} i \left(-\frac{f^2 (v-2s)^2}{-b+2 i c s-i c v}+4e\right)} \left(\sum_{j=0}^{n} 2^{j-n} \left(-f (v-2s)\right)^{n-j} \left(f (v-2s) + 2 (-i b + c (v-2s)) z\right)^{j+1} \right.\right.$$

$$\left.\left(-\frac{\left(f (v-2s) + 2 (-i b + c (v-2s)) z\right)^2}{-i b + c (v-2s)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(f (v-2s) + 2 (-i b + c (v-2s)) z\right)^2}{4 (-i b + c (v-2s))}\right)\right)$$

$$(-i b + c (v-2s))^{-n-1} - e^{\frac{1}{4} i \left(\frac{f^2 (v-2s)^2}{b+2 i c s-i c v}+4e\right)} (i b + c (v-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} \left(-f (v-2s)\right)^{n-j} \left(f (v-2s) + 2 (i b + c (v-2s)) z\right)^{j+1} \left(-\frac{\left(f (v-2s) + 2 (i b + c (v-2s)) z\right)^2}{i b + c (v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(f (v-2s) + 2 (i b + c (v-2s)) z\right)^2}{4 (i b + c (v-2s))}\right) + e^{-\frac{1}{4} i \left(\frac{f^2 (v-2s)^2}{b+2 i c s-i c v}+4e\right)} (-i b - c (v-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} \left(f (v-2s)\right)^{n-j} \left(2 (-i b - c (v-2s)) z - f (v-2s)\right)^{j+1} \left(-\frac{\left(2 (-i b - c (v-2s)) z - f (v-2s)\right)^2}{-i b - c (v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(2 (-i b - c (v-2s)) z - f (v-2s)\right)^2}{4 (-i b - c (v-2s))}\right) - e^{\frac{1}{4} i \left(-\frac{f^2 (v-2s)^2}{-b+2 i c s-i c v}+4e\right)} (i b - c (v-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} \left(f (v-2s)\right)^{n-j} \left(2 (i b - c (v-2s)) z - f (v-2s)\right)^{j+1} \left(-\frac{\left(2 (i b - c (v-2s)) z - f (v-2s)\right)^2}{i b - c (v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(2 (i b - c (v-2s)) z - f (v-2s)\right)^2}{4 (i b - c (v-2s))}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3473.01

$$\int z^n \sin\left(\sqrt{z}\ b+e\right) \cosh^v\left(\sqrt{z}\ c+f z\right) dz ==$$

$$(-1)^n\, 2^{-v}\, i \binom{v}{\frac{v}{2}} \left(e^{-i e}\, \Gamma\left(2 (n+1), i b \sqrt{z}\right) - e^{i e}\, \Gamma\left(2 (n+1), -i b \sqrt{z}\right)\right) (1 - v \bmod 2)\, b^{-2 (n+1)} +$$

$$2^{-2 n-v-2}\, i \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(f (v-2s)\right)^{-2 (n+1)} \binom{v}{s} \left(e^{\frac{(-i b-c (v-2s))^2}{4 f (v-2s)} - i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j \left(-i b - c (v-2s)\right)^{-h-j+2 n}\right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)-$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left.\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+\right.$$

$$2\,f\,(v-2\,s)\sqrt{-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$e^{i\,e-\frac{(i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b+c\,(v-2\,s))\left(i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+2\,f\,(v-2\,s)\sqrt{-\frac{\left(i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3474.01

$$\int z^n\sin\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z\right)dz==-i\,2^{-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left((-i\,b)^{-n-1}\,e^{\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.(i\,b)^{-n-1}\,e^{-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)\right)-$$

$$2^{-v-2}\,i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(-i\,d+f\,(2\,s-v))^2}{4\,(-i\,b+c\,(2\,s-v))}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(2\,s-v))^{n-j}\,(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{j+1}\right.\right.$$

$$\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{4\,(-i\,b+c\,(2\,s-v))}\right)\Bigg)(-i\,b+c\,(2\,s-v))^{-n-1}-$$

$$e^{-\frac{(i\,d+f\,(2\,s-v))^2}{4\,(i\,b+c\,(2\,s-v))}}(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}\,(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}}(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}\,(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)-$$

$$e^{-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}}(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}\,(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\Bigg)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3475.01

$$\int z^n\sin\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$i\,(-1)^{n-1}\,2^{-2\,n-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\,d^{-2\,n-2}\left(e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\left(i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+2^{-2\,n-\nu-2}\,i$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\Bigg(e^{-\frac{(-i\,b+c\,(2\,k-\nu))^2}{4\,(-i\,d+f\,(2\,k-\nu))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-\nu))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-\nu)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-i\,b+c\,(2\,k-\nu))\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-\nu))}\right)+2$$

$$(-i\,d+f\,(2\,k-\nu))\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-\nu))}\right)$$

$$\sqrt{-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-\nu)}}\Bigg)\Bigg)(-i\,d+f\,(2\,k-\nu))^{-2\,n-2}-e^{-\frac{(i\,b+c\,(2\,k-\nu))^2}{4\,(i\,d+f\,(2\,k-\nu))}}$$

$$(i\,d+f\,(2\,k-v))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(2\,k-v))\left(i\,b+c\,(2\,k-v)+\right.\right.$$

$$\left.2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}}\,(i\,d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)\right)+e^{-\frac{(-i\,b+c\,(v-2\,k))^{2}}{4\,(-i\,d+f\,(v-2\,k))}}\,(-i\,d+f\,(v-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(-i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}}\right)-e^{-\frac{(i\,b+c\,(v-2\,k))^{2}}{4\,(i\,d+f\,(v-2\,k))}}\,(i\,d+f\,(v-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+\right.$$

$$\left.2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}}\right)\Bigg);\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \sin\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^{n}\sin\left(b\,z^{2}+d\,z+e\right)\cosh^{v}\left(c\,z^{2}+f\,z\right)dz==-i\,2^{-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\Bigg((-i\,b)^{-n-1}\,e^{\frac{i\,d^{2}}{4\,b}-i\,e}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^{2}}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d-2\,i\,b\,z)^{2}}{4\,b}\right)-$$

$$(i\,b)^{-n-1}\,e^{i\,e-\frac{i\,d^{2}}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^{2}}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(i\,d+2\,i\,b\,z)^{2}}{4\,b}\right)\Bigg)-$$

$$2^{-v-2}\,i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(-i\,d+f\,(2\,s-v))^{2}}{4\,(-i\,b+c\,(2\,s-v))}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(2\,s-v))^{n-j}\,(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{j+1}\right.$$

$$\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{2}}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{2}}{4\,(-i\,b+c\,(2\,s-v))}\right)\right)(-i\,b+c\,(2\,s-v))^{-n-1}-$$

$$e^{i\,e-\frac{(i\,d+f\,(2\,s-v))^{2}}{4\,(i\,b+c\,(2\,s-v))}}\,(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}\,(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}-i\,e}\,(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}\,(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)-$$

$$e^{i\,e-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}}\,(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}\,(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin\left(\sqrt{z}\;b+d\,z+e\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$i\,(-1)^{n-1}\,2^{-2\,n-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\,d^{-2\,n-2}\left(e^{\frac{i\,b^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-$$

$$\left.e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\right)$$

$$\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+2^{-2\,n-v-2}\,i$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{(-i\,b+c\,(2\,k-v))^2}{4\,(-i\,d+f\,(2\,k-v))}-i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(2\,k-v))\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)+2$$

$$(-i\,d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)$$

$$\left.\left.\sqrt{-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}}\right)\right)(-i\,d+f\,(2\,k-v))^{-2\,n-2}-e^{i\,e-\frac{(i\,b+c\,(2\,k-v))^2}{4\,(i\,d+f\,(2\,k-v))}}$$

$$(i\,d+f\,(2\,k-v))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(2\,k-v))\left(i\,b+c\,(2\,k-v)+\right.\right.$$

$$\left.\left.2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(2\,k-v))}\right)+\right.$$

$$2\sqrt{-\frac{\left(i\,b+c\,(2\,k-\nu)+2\,(i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{i\,d+f\,(2\,k-\nu)}}\;(i\,d+f\,(2\,k-\nu))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{\left(i\,b+c\,(2\,k-\nu)+2\,(i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(2\,k-\nu))}\right)+e^{-\frac{(-i\,b+c\,(\nu-2\,k))^2}{4\,(-i\,d+f\,(\nu-2\,k))}-i\,e}\;(-i\,d+f\,(\nu-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(\nu-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(\nu-2\,k))\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(\nu-2\,k))}\right)+$$

$$2\,(-i\,d+f\,(\nu-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(\nu-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(\nu-2\,k)}}\right)-e^{i\,e-\frac{(i\,b+c\,(\nu-2\,k))^2}{4\,(i\,d+f\,(\nu-2\,k))}}\,(i\,d+f\,(\nu-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(\nu-2\,k))^{-h-j+2\,n}\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(\nu-2\,k))\left(i\,b+c\,(\nu-2\,k)+\right.\right.$$

$$2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\,\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}}\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \sin(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$(-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,d)^{-n-1}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-i\,2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,s))^{n-j}\,(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}-e^{\frac{(i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,s))^{n-j}\,(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+$$

$$e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,s))^{n-j}\,(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)-$$

$$e^{-\frac{(i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,s))^{n-j}\,(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3479.01

$$\int z^n \sin(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z+g\right)dz == (-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,d)^{-n-1}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)+$$

$$i\,2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d+f\,(\nu-2\,s))}+g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\right)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}-e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}+g\,(v-2\,s)}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}-g\,(v-2\,s)}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-i\,d-f(v-2s))\sqrt{-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{-i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)-c(v-2s)\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)\right)-$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d-f(v-2s))}-g(v-2s)}(i\,d-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2s))^{-h-j+2n}$$

$$\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}\left(-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f(v-2s))\sqrt{-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)-c(v-2s)\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3480.01

$$\int z^n \sin(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$(-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,d)^{-n-1}\,e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-$$

$$i\,2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-i\,e-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,s))^{n-j}\,(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}-e^{\frac{(i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+i\,e-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,s))^{n-j}\,(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-i\,e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,s))^{n-j}$$

$$(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)-e^{-\frac{(i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+i\,e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,s))^{n-j}\,(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3481.01

$$\int z^n \sin(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z+g\right)dz ==$$

$$(-1)^n\,i\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i\,d)^{-n-1}\,e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)-(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)+$$

$$i\,2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d+f\,(\nu-2\,s))}+g\,(\nu-2\,s)-i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\right)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}-e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}+g\,(v-2\,s)+i\,e}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}-g\,(v-2\,s)-i\,e}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-i\,d-f(v-2s))\sqrt{-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{-i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)-c(v-2s)\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)\right)-$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d-f(v-2s))}-g(v-2s)+i\,e}(i\,d-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2s))^{-h-j+2n}$$

$$\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}\left(-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f(v-2s))\sqrt{-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)-c(v-2s)\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3482.01

$$\int z^n \sin\left(b z^2\right) \cosh^{\nu}\left(c z^2 + f z + g\right) dz ==$$

$$i\, 2^{-\nu-2}\, z^{n+1} \binom{\nu}{\frac{\nu}{2}} \left(\left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - \nu \bmod 2) -$$

$$2^{-\nu-2}\, i \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{1}{4} i \left(-\frac{f^2 (\nu-2s)^2}{-b+2 i c s - i c \nu} + 4 g i (\nu-2s)\right)} \left(\sum_{j=0}^{n} 2^{j-n} \left(-f (\nu-2s)\right)^{n-j} \left(f (\nu-2s) + 2\left(-i b + c (\nu-2s)\right) z\right)^{j+1} \right.\right.$$

$$\left.\left. \left(-\frac{\left(f (\nu-2s) + 2\left(-i b + c (\nu-2s)\right) z\right)^2}{-i b + c (\nu-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(f (\nu-2s) + 2\left(-i b + c (\nu-2s)\right) z\right)^2}{4\left(-i b + c (\nu-2s)\right)}\right) \right)\right.$$

$$\left. \left(-i b + c (\nu-2s)\right)^{-n-1} - e^{\frac{1}{4} i \left(\frac{f^2 (\nu-2s)^2}{b+2 i c s - i c \nu} - 4 i g (\nu-2s)\right)} \left(i b + c (\nu-2s)\right)^{-n-1} \right.$$

$$\left. \sum_{j=0}^{n} 2^{j-n} \left(-f (\nu-2s)\right)^{n-j} \left(f (\nu-2s) + 2\left(i b + c (\nu-2s)\right) z\right)^{j+1} \left(-\frac{\left(f (\nu-2s) + 2\left(i b + c (\nu-2s)\right) z\right)^2}{i b + c (\nu-2s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(f (\nu-2s) + 2\left(i b + c (\nu-2s)\right) z\right)^2}{4\left(i b + c (\nu-2s)\right)}\right) + e^{-\frac{1}{4} i \left(\frac{f^2 (\nu-2s)^2}{b+2 i c s - i c \nu} - 4 i g (\nu-2s)\right)} \left(-i b - c (\nu-2s)\right)^{-n-1} \right.$$

$$\left. \sum_{j=0}^{n} 2^{j-n} \left(f (\nu-2s)\right)^{n-j} \left(2\left(-i b - c (\nu-2s)\right) z - f (\nu-2s)\right)^{j+1} \left(-\frac{\left(2\left(-i b - c (\nu-2s)\right) z - f (\nu-2s)\right)^2}{-i b - c (\nu-2s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(2\left(-i b - c (\nu-2s)\right) z - f (\nu-2s)\right)^2}{4\left(-i b - c (\nu-2s)\right)}\right) - e^{\frac{1}{4} i \left(-\frac{f^2 (\nu-2s)^2}{-b+2 i c s - i c \nu} + 4 g i (\nu-2s)\right)} \left(i b - c (\nu-2s)\right)^{-n-1} \right.$$

$$\left. \sum_{j=0}^{n} 2^{j-n} \left(f (\nu-2s)\right)^{n-j} \left(2\left(i b - c (\nu-2s)\right) z - f (\nu-2s)\right)^{j+1} \left(-\frac{\left(2\left(i b - c (\nu-2s)\right) z - f (\nu-2s)\right)^2}{i b - c (\nu-2s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{\left(2\left(i b - c (\nu-2s)\right) z - f (\nu-2s)\right)^2}{4\left(i b - c (\nu-2s)\right)}\right) \right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3483.01

$$\int z^n \sin\left(b \sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\ c + f z + g\right) dz ==$$

$$(-1)^n\, i\, 2^{-\nu} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2 (n+1), i b \sqrt{z}\right) - \Gamma\left(2 (n+1), -i b \sqrt{z}\right)\right) (1 - \nu \bmod 2)\, b^{-2 (n+1)} +$$

$$2^{-2 n-\nu-2}\, i \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(f (\nu-2s)\right)^{-2 (n+1)} \binom{\nu}{s} \left(e^{\frac{(-i b - c (\nu-2s))^2}{4 f (\nu-2s)} - g (\nu-2s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j \left(-i b - c (\nu-2s)\right)^{-h-j+2 n} \right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)-$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left.\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+\right.$$

$$2 f (v-2 s) \sqrt{-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) -$$

$$e^{-\frac{(i b + c (v-2 s))^2}{4 f (v-2 s)} + g (v-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i b + c (v-2 s))^{-h-j+2 n} \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i b + c (v-2 s)) \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) + 2 f (v-2 s) \sqrt{-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right) /;\ n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \sin(b z^r + e) \cosh^v(c z^r + f z + g)$

01.20.21.3484.01

$$\int z^n \sin\left(b z^2+e\right) \cosh^v\left(c z^2+f z+g\right) dz ==$$

$$i\, 2^{-v-2} \binom{v}{\frac{v}{2}} \left(e^{i e} z^{n+1} \left(-i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -i b z^2\right) - e^{-i e} z^{n+1} \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1-v \bmod 2) -$$

$$2^{-v-2} i \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{1}{4} i \left(-\frac{f^2 (v-2s)^2}{-b+2 i c s-i c v}+4 g i (v-2s)+4 e\right)} \left(\sum_{j=0}^{n} 2^{j-n} (-f (v-2s))^{n-j} (f (v-2s)+2 (-i b+c (v-2s)) z)^{j+1} \right.\right.$$

$$\left(-\frac{(f (v-2s)+2 (-i b+c (v-2s)) z)^2}{-i b+c (v-2s)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (v-2s)+2 (-i b+c (v-2s)) z)^2}{4 (-i b+c (v-2s))}\right)$$

$$(-i b+c (v-2s))^{-n-1} - e^{\frac{1}{4} i \left(\frac{f^2 (v-2s)^2}{b+2 i c s-i c v}-4 i g (v-2s)+4 e\right)} (i b+c (v-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (-f (v-2s))^{n-j} (f (v-2s)+2 (i b+c (v-2s)) z)^{j+1} \left(-\frac{(f (v-2s)+2 (i b+c (v-2s)) z)^2}{i b+c (v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (v-2s)+2 (i b+c (v-2s)) z)^2}{4 (i b+c (v-2s))}\right) + e^{-\frac{1}{4} i \left(\frac{f^2 (v-2s)^2}{b+2 i c s-i c v}-4 i g (v-2s)+4 e\right)} (-i b-c (v-2s))^{-n-1}\right.$$

$$\sum_{j=0}^{n} 2^{j-n} (f (v-2s))^{n-j} (2 (-i b-c (v-2s)) z-f (v-2s))^{j+1} \left(-\frac{(2 (-i b-c (v-2s)) z-f (v-2s))^2}{-i b-c (v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2 (-i b-c (v-2s)) z-f (v-2s))^2}{4 (-i b-c (v-2s))}\right) - e^{\frac{1}{4} i \left(-\frac{f^2 (v-2s)^2}{-b+2 i c s-i c v}+4 g i (v-2s)+4 e\right)} (i b-c (v-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (f (v-2s))^{n-j} (2 (i b-c (v-2s)) z-f (v-2s))^{j+1} \left(-\frac{(2 (i b-c (v-2s)) z-f (v-2s))^2}{i b-c (v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2 (i b-c (v-2s)) z-f (v-2s))^2}{4 (i b-c (v-2s))}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3485.01

$$\int z^n \sin\left(\sqrt{z}\ b+e\right) \cosh^v\left(\sqrt{z}\ c+f z+g\right) dz ==$$

$$(-1)^n i\, 2^{-v} \binom{v}{\frac{v}{2}} \left(e^{-i e} \Gamma\left(2 (n+1), i b \sqrt{z}\right) - e^{i e} \Gamma\left(2 (n+1), -i b \sqrt{z}\right)\right) (1-v \bmod 2)\, b^{-2 (n+1)} +$$

$$2^{-2 n-v-2} i \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (f (v-2s))^{-2 (n+1)} \binom{v}{s} \left(e^{\frac{(-i b-c (v-2s))^2}{4 f (v-2s)}-i e-g (v-2s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b-c (v-2s))^{-h-j+2 n}\right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)-$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+i\,e-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-i\,e+g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left.\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+\right.$$

$$2 f (v-2 s) \sqrt{-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) -$$

$$e^{-\frac{(i b + c (v-2 s))^2}{4 f (v-2 s)} + i e + g (v-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b + c (v-2 s))^{-h-j+2 n} \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i b + c (v-2 s)) \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) + 2 f (v-2 s) \sqrt{-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \sin(b z^r + d z) \cosh^v(c z^r + f z + g)$

01.20.21.3486.01

$$\int z^n \sin(b z^2 + d z) \cosh^v(c z^2 + f z + g)\, dz == -i 2^{-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left((-i b)^{-n-1} e^{\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b}\right) -\right.$$

$$\left.(i b)^{-n-1} e^{-\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b}\right)\right) -$$

$$2^{-v-2} i \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{(-i d + f (2 s - v))^2}{4 (-i b + c (2 s - v))} + g (2 s - v)} \left(\sum_{j=0}^{n} 2^{j-n} (i d - f (2 s - v))^{n-j} (-i d + f (2 s - v) + 2 (-i b + c (2 s - v)) z)^{j+1}\right.\right.$$

$$\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{4\,(-i\,b+c\,(2\,s-v))}\right)\Bigg)(-i\,b+c\,(2\,s-v))^{-n-1}-$$

$$e^{-\frac{(i\,d+f\,(2\,s-v))^2}{4\,(i\,b+c\,(2\,s-v))}+g\,(2\,s-v)}\,(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}$$

$$(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}+g\,(v-2\,s)}\,(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}$$

$$(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)-$$

$$e^{-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}+g\,(v-2\,s)}\,(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}$$

$$(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\Bigg)\text{/; }n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3487.01

$$\int z^n\sin\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z+g\right)dz==$$

$$i\,(-1)^{n-1}\,2^{-2\,n-\nu-2}\,d^{-2\,n-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\Bigg(e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-$$

$$2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-i\,b-2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\left(i\,b+2\,i\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(i\,b+2\,i\,d\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$2^{-2\,n-\nu-2}\,i\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\Bigg(e^{g\,(2\,k-\nu)-\frac{(-i\,b+c\,(2\,k-\nu))^2}{4\,(-i\,d+f\,(2\,k-\nu))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-\nu))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-\nu)+\right.$$

$$\left.2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-\nu)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((-i\,b+c\,(2\,k-\nu))\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-\nu))}\right)+2$$

$$(-i\,d+f\,(2\,k-\nu))\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-\nu))}\right)$$

$$\sqrt{-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-\nu)}}\Bigg)\Bigg)(-i\,d+f\,(2\,k-\nu))^{-2\,n-2}-$$

$$e^{g(2k-v)-\frac{(ib+c(2k-v))^2}{4(id+f(2k-v))}}(id+f(2k-v))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib+c(2k-v))^{-h-j+2n}$$

$$\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{id+f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((ib+c(2k-v))\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{4(id+f(2k-v))}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{id+f(2k-v)}}\,(id+f(2k-v))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{4(id+f(2k-v))}\right)\right)+e^{g(v-2k)-\frac{(-ib+c(v-2k))^2}{4(-id+f(v-2k))}}(-id+f(v-2k))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib+c(v-2k))^{-h-j+2n}\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^2}{-id+f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-ib+c(v-2k))\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^2}{4(-id+f(v-2k))}\right)+\right.$$

$$\left.2(-id+f(v-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^2}{4(-id+f(v-2k))}\right)\right)$$

$$\sqrt{-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,k)}}\Bigg)-e^{g\,(v-2\,k)-\frac{(i\,b+c\,(v-2\,k))^2}{4\,(i\,d+f\,(v-2\,k))}}\,(i\,d+f\,(v-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(\Bigg(i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+\right.$$

$$\left.2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}}\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\sin\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==-i\,2^{-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left((-i\,b)^{-n-1}\,e^{\frac{i\,d^2}{4\,b}-i\,e}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.(i\,b)^{-n-1}\,e^{i\,e-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)\right)-$$

$$2^{-v-2}\,i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(-i\,d+f\,(2\,s-v))^2}{4\,(-i\,b+c\,(2\,s-v))}-i\,e+g\,(2\,s-v)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(2\,s-v))^{n-j}\,(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right)$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{4\,(-i\,b+c\,(2\,s-v))}\right)(-i\,b+c\,(2\,s-v))^{-n-1}-$$

$$e^{-\frac{(i\,d+f\,(2\,s-v))^2}{4\,(i\,b+c\,(2\,s-v))}+i\,e+g\,(2\,s-v)}\,(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}$$

$$(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}-i\,e+g\,(v-2\,s)}\,(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}$$

$$(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)-$$

$$e^{-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}+i\,e+g\,(v-2\,s)}\,(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}$$

$$(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin\left(\sqrt{z}\;b+d\,z+e\right)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z+g\right)dz==$$

$$i\,(-1)^{n-1}\,2^{-2\,n-\nu-2}\,d^{-2\,n-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{\frac{i\,b^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$2\,i\,d\,\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$2^{-2\,n-\nu-2}\,i\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\Bigg(e^{-\frac{(-i\,b+c\,(2\,k-\nu))^2}{4\,(-i\,d+f\,(2\,k-\nu))}-i\,e+g\,(2\,k-\nu)}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-\nu))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-\nu)+\right.$$

$$\left.2\,(-i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-\nu)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((-i\,b+c\,(2\,k-\nu))\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-\nu))}\right)+2$$

$$(-i\,d+f\,(2\,k-\nu))\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-\nu))}\right)$$

$$\sqrt{-\frac{\left(-i\,b+c\,(2\,k-\nu)+2\,(-i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-\nu)}}\Bigg)\Bigg)$$

$$(-i\,d+f\,(2\,k-\nu))^{-2\,n-2}-e^{-\frac{(i\,b+c\,(2\,k-\nu))^2}{4\,(i\,d+f\,(2\,k-\nu))}+i\,e+g\,(2\,k-\nu)}\,(i\,d+f\,(2\,k-\nu))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(2\,k-v))\left(i\,b+c\,(2\,k-v)+\right.\right.$$

$$\left.2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}}\,(i\,d+f\,(2\,k-v))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+2),-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,k))^{2}}{4\,(-i\,d+f\,(v-2\,k))}-i\,e+g\,(v-2\,k)}\,(-i\,d+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(-i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}}\right)-$$

$$e^{-\frac{(i\,b+c\,(\nu-2\,k))^2}{4\,(i\,d+f\,(\nu-2\,k))}+i\,e+g\,(\nu-2\,k)}\,(i\,d+f\,(\nu-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(\nu-2\,k))^{-h-j+2\,n}$$

$$\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(\nu-2\,k))\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(\nu-2\,k))}\right)+$$

$$2\,(i\,d+f\,(\nu-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(\nu-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(\nu-2\,k)}}\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving powers of sin and power

Involving $z^{\alpha-1}\sin^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

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$$\int z^{\alpha-1}\sin^m(c\,z)\cosh^{\nu}(a\,z)\,dz==\frac{2^{-m-\nu}\,z^{\alpha}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m\bmod 2)\,(1-\nu\bmod 2)}{\alpha}-2^{-m-\nu}\,i^{-m}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\Gamma(\alpha,\,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+(-1)^m\,((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,\,(i\,c\,m-2\,i\,c\,k)\,z)\right)-$$

$$2^{-m-\nu}\,z^{\alpha}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(\Gamma(\alpha,\,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a\,\nu-2\,a\,s)\,z))+$$

$$2^{-m-\nu}\,i^{-m}\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-(-1)^m\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-\right.$$

$$((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)-$$

$$(-1)^m\,((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)-$$

$$\left.((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

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$$\int z^n \sin^\mu(c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}} n!\,(1-\nu \bmod 2)\sin^\mu(c\,z)\left(\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};e^{2\,i\,c\,z}\right)\right)$$

$$\left(1-e^{2\,i\,c\,z}\right)^{-\mu}+2^{-\nu}\,n!\sin^\mu(c\,z)\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2k-\nu)\,a\,z}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-a\,(\nu-2k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a\,(\nu-2k)}{2\,c},\right.\right.\right.$$

$$\left.\ldots,-\frac{c\,\mu-i\,a\,(\nu-2k)}{2\,c},-\mu;1-\frac{c\,\mu-i\,a\,(\nu-2k)}{2\,c},\ldots,1-\frac{c\,\mu-i\,a\,(\nu-2k)}{2\,c};e^{2\,i\,c\,z}\right)+$$

$$e^{-(2k-\nu)\,a\,z}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,(\nu-2k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a\,(\nu-2k)+c\,\mu}{2\,c},\ldots,-\frac{i\,a\,(\nu-2k)+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;1-\frac{i\,a\,(\nu-2k)+c\,\mu}{2\,c},\ldots,1-\frac{i\,a\,(\nu-2k)+c\,\mu}{2\,c};e^{2\,i\,c\,z}\right)\right)\right)\left(1-e^{2\,i\,c\,z}\right)^{-\mu}/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

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$$\int z^n \sin^m(c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(a\,z)\,n!\,(1-m \bmod 2)\left(\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,a\,z}\right)\right)$$

$$\left(1+e^{-2\,a\,z}\right)^{-\nu}+2^{-m}\cosh^\nu(a\,z)\,n!\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\right.$$

$$\left(e^{-\frac{1}{2}i\,(4\,c\,z\,k-2\,c\,m\,z+m\,\pi)}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(c\,i\,(m-2k)+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\right.\right.$$

$$\left.-\nu;\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1;-e^{-2\,a\,z}\right)+e^{\frac{1}{2}i\,(4\,c\,z\,k-2\,c\,m\,z+m\,\pi)}$$

$$\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,\nu-i\,c\,(m-2k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2\,a},-\nu;\right.$$

$$\left.\left.\left.\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2\,a}+1;-e^{-2\,a\,z}\right)\right)\right)\left(1+e^{-2\,a\,z}\right)^{-\nu}/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^\mu(c\,z+d)\cosh^\nu(a\,z)$

01.20.21.3493.01

$$\int z^{\alpha-1}\sin^m(d+c\,z)\cosh^\nu(a\,z)\,dz == -2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,d\,i\,k-i\,d\,m-\frac{i\,\pi\,m}{2}}\binom{m}{k}$$

$$\left(e^{2\,i\,d\,m}\,\Gamma(\alpha,\,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+e^{4\,i\,d\,k+i\,m\,\pi}\,((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,\,(i\,c\,m-2\,i\,c\,k)\,z)\right)-$$

$$2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^\alpha\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(\Gamma(\alpha,\,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a\,\nu-2\,a\,s)\,z))+$$

$$2^{-m-\nu}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,d\,i\,k-i\,d\,m-\frac{i\,m\,\pi}{2}}\binom{\nu}{s}\left(-e^{4\,i\,d\,k+i\,m\,\pi}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-\right.$$

$$e^{2\,i\,d\,m}\,((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)-$$

$$e^{4\,i\,d\,k+i\,m\,\pi}\,((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)-$$

$$\left.e^{2\,i\,d\,m}\,((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\right)+$$

$$\frac{2^{-m-\nu}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}\;/;\;m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3494.01

$$\int z^n\sin^\mu(d+c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}}n!\,(1-\nu \bmod 2)\sin^\mu(d+c\,z)\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\,\ldots,\,-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2},\,\ldots,\,1-\frac{\mu}{2};\,e^{2\,i\,(d+c\,z)}\right)\right)$$

$$\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}+2^{-\nu}\,n!\sin^\mu(d+c\,z)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2\,k-\nu)\,a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\right.\right.\right.$$

$$\left.-\mu;\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c};\,e^{2\,i\,(d+c\,z)}\right)+$$

$$e^{-(2\,k-\nu)\,a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c};\,e^{2\,i\,(d+c\,z)}\right)\right)\right)\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}\;/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3495.01

$$\int z^n \sin^m(d+c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(a\,z)\,n!\,(1-m \bmod 2)\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,a\,z}\right)\right)$$

$$\left(1+e^{-2\,a\,z}\right)^{-\nu}+2^{-m}\cosh^\nu(a\,z)\,n!\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{1}{2}i\,(4\,d\,k+4\,c\,z\,k-2\,d\,m-2\,c\,m\,z+m\,\pi)}\right.\right.$$

$$\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c\,i\,(m-2\,k)+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},-\nu;\right.$$

$$\left.\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1;-e^{-2\,a\,z}\right)+e^{\frac{1}{2}i\,(4\,d\,k+4\,c\,z\,k-2\,d\,m-2\,c\,m\,z+m\,\pi)}$$

$$\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-i\,c\,(m-2\,k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},-\nu;\right.$$

$$\left.\left.\left.\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1;-e^{-2\,a\,z}\right)\right)\right)\left(1+e^{-2\,a\,z}\right)^{-\nu}\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^\mu(c\,z)\cosh^\nu(a\,z+b)$

01.20.21.3496.01

$$\int z^{\alpha-1}\sin^m(c\,z)\cosh^\nu(b+a\,z)\,dz == -2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^\alpha$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{1}{2}i\,\pi\,m}\binom{m}{k}\left(\Gamma(\alpha,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+e^{i\,m\,\pi}\,((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c\,m-2\,i\,c\,k)\,z)\right)-$$

$$2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^\alpha$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(e^{2\,b\,\nu}\,\Gamma(\alpha,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+e^{4\,b\,s}\,((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,(a\,\nu-2\,a\,s)\,z)\right)+$$

$$2^{-m-\nu}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{1}{2}i\,\pi\,m-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(-e^{i\,\pi\,m+4\,b\,s}\,\Gamma(\alpha,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\right.$$

$$((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-e^{4\,b\,s}\,((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)$$

$$z)+e^{2\,b\,\nu}\left(-e^{i\,m\,\pi}\,\Gamma(\alpha,(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}-\right.$$

$$\left.\left.((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\right)\right)+$$

$$\frac{2^{-m-\nu}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}\Big/;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3497.01

$$\int z^n \sin^\mu(c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-\nu}\binom{\nu}{\frac{\nu}{2}} n!\,(1-\nu \bmod 2)\sin^\mu(c\,z)$$
$$\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};e^{2\,i\,c\,z}\right)\right)\left(1-e^{2\,i\,c\,z}\right)^{-\mu}+$$
$$2^{-\nu}\,n!\sin^\mu(c\,z)\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\right.\right.\right.$$
$$\left.\ldots,-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},-\mu;1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\ldots,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c};e^{2\,i\,c\,z}\right)+$$
$$e^{-(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\ldots,-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$
$$\left.\left.\left.-\mu;1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\ldots,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c};e^{2\,i\,c\,z}\right)\right)\right)\left(1-e^{2\,i\,c\,z}\right)^{-\mu}\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3498.01

$$\int z^n \sin^m(c\,z)\cosh^\nu(b+a\,z)\,dz ==$$
$$2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(b+a\,z)\,n!\,(1-m \bmod 2)\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,(b+a\,z)}\right)\right)$$
$$\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}+2^{-m}\cosh^\nu(b+a\,z)\,n!\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{1}{2}i\,(-2\,c\,z\,m+\pi\,m+4\,c\,k\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c\,i\,(m-2\,k)+a\,\nu)^{-j-1}}{(n-j)!}\right.\right.$$
$$\left.{}_{j+2}F_{j+1}\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1,\ldots,\right.$$
$$\left.\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)+e^{\frac{1}{2}i\,(-2\,c\,z\,m+\pi\,m+4\,c\,k\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-i\,c\,(m-2\,k))^{-j-1}}{(n-j)!}$$
$$\left.{}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1,\right.\right.$$
$$\left.\left.\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^\mu(c\,z+d)\cosh^\nu(a\,z+b)$

01.20.21.3499.01

$$\int z^{\alpha-1} \sin^m(d+c\,z) \cosh^\nu(b+a\,z)\,dz ==$$

$$-2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^\alpha \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,d\,i\,k-i\,d\,m-\frac{i\,\pi\,m}{2}}\binom{m}{k}\Big(e^{2\,i\,d\,m}\,\Gamma(\alpha,\,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+$$

$$e^{4\,i\,d\,k+i\,m\,\pi}\,((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,\,(i\,c\,m-2\,i\,c\,k)\,z)\Big)-2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^\alpha$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\Big(e^{2\,b\,\nu}\,\Gamma(\alpha,\,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+e^{4\,b\,s}\,((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a\,\nu-2\,a\,s)\,z)\Big)+$$

$$2^{-m-\nu}\,z^\alpha \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-2\,d\,i\,k-i\,d\,m-2\,b\,s-b\,\nu-\frac{i\,m\,\pi}{2}}\binom{\nu}{s}$$

$$\Big(-e^{4\,i\,d\,k+4\,b\,s+i\,m\,\pi}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-$$

$$e^{2\,i\,d\,m+4\,b\,s}\,((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)+$$

$$e^{2\,b\,\nu}\Big(-e^{4\,i\,d\,k+i\,m\,\pi}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}-$$

$$e^{2\,i\,d\,m}\,((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\Big)\Big)+$$

$$\frac{2^{-m-\nu}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}\;/;\; m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3500.01

$$\int z^n \sin^\mu(d+c\,z)\cosh^\nu(b+a\,z)\,dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}}n!\,(1-\nu \bmod 2)\sin^\mu(d+c\,z)\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\,\ldots,\,-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2},\,\ldots,\,1-\frac{\mu}{2};\,e^{2\,i\,(d+c\,z)}\right)\right)$$

$$\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}+2^{-\nu}\,n!\sin^\mu(d+c\,z)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\right.\right.\right.$$

$$\left.-\mu;\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c};\,e^{2\,i\,(d+c\,z)}\right)+$$

$$e^{-(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c};\,e^{2\,i\,(d+c\,z)}\right)\right)\right)\left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}\;/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3501.01

$$\int z^n \sin^m(d+c\,z)\cosh^\nu(b+a\,z)\,dz ==$$

$$2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(b+a\,z)\,n!\,(1-m \bmod 2)\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,(b+a\,z)}\right)\right)$$

$$\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}+2^{-m}\cosh^\nu(b+a\,z)\,n!$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{1}{2}i\,(4\,d\,k+4\,c\,z\,k-2\,d\,m-2\,c\,m\,z+m\,\pi)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c\,i\,(m-2\,k)+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\ldots,\right.\right.\right.$$

$$\left.\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)+$$

$$e^{\frac{1}{2}i\,(4\,d\,k+4\,c\,z\,k-2\,d\,m-2\,c\,m\,z+m\,\pi)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-i\,c\,(m-2\,k))^{-j-1}}{(n-j)!}$$

$${}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1,\right.$$

$$\left.\left.\left.\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)\right)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r)\cosh^\nu(c\,z)$

01.20.21.3502.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh^\nu(c\,z)\,dz ==$$

$$-2^{-m-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{n+1}{2},-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{\frac{i\,m\,\pi}{2}}\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},i\,b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-\nu}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{n+1}+(-1)^n\,2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\Gamma(n+1,c\,(\nu-2\,k)\,z)\,(-c\,(\nu-2\,k))^{-n-1}+(c\,(\nu-2\,k))^{-n-1}\,\Gamma(n+1,-c\,(\nu-2\,k)\,z)\right)-$$

$$2^{-m-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{\frac{i\,m\,\pi}{2}-\frac{i\,c^2\,(\nu-2\,k)^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(c\,(\nu-2\,k))^{n-j}\,(-c\,(\nu-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left(-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\Bigg)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,m\,\pi}{2}-\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left(-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\Bigg)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k))^{n-j}$$

$$(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)+2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}\left(e^{-\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\,-i\,b\,(m-2\,k)\,\sqrt{z}\right)+e^{\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}(c\,(v-2\,k))^{-2\,(n+1)}$$

$$\left(e^{\frac{i\,m\,\pi}{2}-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-2\,c\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-2\,c\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,c\,(v-2\,k)\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,c\,(v-2\,k)\,\sqrt{-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)-i\,b\,(m-2\,s)\right.$$

$$\left(2\,c\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+$$

$$2\,c\,(v-2\,k)\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r+e\right)\cosh^v(c\,z)$

01.20.21.3504.01

$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh^v(c\,z)\,dz ==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k))^{n-j}\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{c^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k))^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{c^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3505.01

$$\int z^n \sin^m\left(\sqrt{z}\, b+e\right)\cosh^v(c\,z)\,dz == \frac{2^{-m-v}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\, 2^{-m-v}\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\, c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1} + (c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\, -c\,(v-2\,k)\,z)\right) +$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left(e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\, -i\,b\,(m-2\,k)\,\sqrt{z}\right) + e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\, i\,b\,(m-2\,k)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}(c\,(v-2\,k))^{-2\,(n+1)}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\right.$$

$$\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\, \frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right) - 2\,c\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\, \frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right) +$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\, \frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right) - 2\,c\,(v-2\,k)\right)\Bigg)\Bigg)$$

$$\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,c\,(v-2\,k)\,\sqrt{-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)-i\,b\,(m-2\,s)$$

$$\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+$$

$$2\,c\,(v-2\,k)\,\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)\right)\Big/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b z^r + d z) \cosh^v(c z)$

01.20.21.3506.01

$$\int z^n \sin^m\left(b z^2 + d z\right) \cosh^v(c z)\, dz == \frac{2^{-m-v} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{n+1} + (-1)^n 2^{-m-v} \binom{m}{\frac{m}{2}}$$

$$(1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\Gamma(n+1,\, c\,(v-2k)\,z)\,(-c\,(v-2k))^{-n-1} + (c\,(v-2k))^{-n-1}\,\Gamma(n+1,\, -c\,(v-2k)\,z)\right) -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i\,(m-2k)\,d^2}{4b} + \frac{i m \pi}{2}} \right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n}\, (i\,d\,(m-2k))^{n-j}\, (-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^{j+1} \left(-\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{4\,b\,(m-2k)} \right) \right) (-i\,b\,(m-2k))^{-n-1} +$$

$$e^{-\frac{i\,(m-2k)\,d^2}{4b} - \frac{i m \pi}{2}}\, (i\,b\,(m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (-i\,d\,(m-2k))^{n-j}\, (d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{4\,b\,(m-2k)} \right) \Bigg) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s \binom{m}{s} \left(e^{\frac{i\pi m}{2} - \frac{i\,(c\,(v-2k) - i\,d\,(m-2s))^2}{4\,b\,(m-2s)}} \left(\sum_{j=0}^{n} 2^{j-n}\, (i\,d\,(m-2s) - c\,(v-2k))^{n-j}\, (-i\,d\,(m-2s) - \right. \right.$$

$$\left. 2\,i\,b\,z\,(m-2s) + c\,(v-2k))^{j+1} \left(-\frac{i\,(-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) + c\,(v-2k))^2}{b\,(m-2s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\,(-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) + c\,(v-2k))^2}{4\,b\,(m-2s)} \right) \right) (-i\,b\,(m-2s))^{-n-1} +$$

$$e^{\frac{i\pi m}{2} - \frac{i\,(-i\,d\,(m-2s) - c\,(v-2k))^2}{4\,b\,(m-2s)}} \left(\sum_{j=0}^{n} 2^{j-n}\, (d\,i\,(m-2s) + c\,(v-2k))^{n-j}\, (-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) - c\,(v-2k))^{j+1} \right.$$

$$\left. \left(-\frac{i\,(-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) - c\,(v-2k))^2}{b\,(m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right.$$

$$\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{\frac{i\,(d\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-\frac{i\,\pi\,m}{2}}(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+c\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-\frac{i\,\pi\,m}{2}}(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k)-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\Bigg)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v(c\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n-1}\,(d\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+\right.$$

$$\left.\left.2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)\right.$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(-i\,b\,(m-2\,k)$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\Bigg(e^{\frac{b^2\,(m-2\,s)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\right.\right.$$

$$\left.\sqrt{z}\ -i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\ -i\,b\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(c(v-2k)-i\,d(m-2s))\sqrt{z}-i\,b(m-2s)\right)^2}{4(c(v-2k)-i\,d(m-2s))}\right)\Bigg)\Bigg)$$

$$(c(v-2k)-i\,d(m-2s))^{-2(n+1)}+e^{\frac{b^2(m-2s)^2}{4(d\,i(m-2s)+c(v-2k))}-\frac{i\pi m}{2}}(d\,i(m-2s)+c(v-2k))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i\,b(m-2s))^{-h-j+2n}\left(b\,i(m-2s)+2(d\,i(m-2s)+c(v-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i(m-2s)+2(d\,i(m-2s)+c(v-2k))\sqrt{z}\right)^2}{d\,i(m-2s)+c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(b\,i(m-2s)\left(b\,i(m-2s)+2(d\,i(m-2s)+c(v-2k))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i(m-2s)+2(d\,i(m-2s)+c(v-2k))\sqrt{z}\right)^2}{4(d\,i(m-2s)+c(v-2k))}\right)+$$

$$2(d\,i(m-2s)+c(v-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i(m-2s)+2(d\,i(m-2s)+c(v-2k))\sqrt{z}\right)^2}{4(d\,i(m-2s)+c(v-2k))}\right)$$

$$\sqrt{-\frac{\left(b\,i(m-2s)+2(d\,i(m-2s)+c(v-2k))\sqrt{z}\right)^2}{d\,i(m-2s)+c(v-2k)}}\Bigg)+$$

$$e^{\frac{b^2(m-2s)^2}{4(-i\,d(m-2s)-c(v-2k))}+\frac{i\pi m}{2}}(-i\,d(m-2s)-c(v-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-i\,b(m-2s))^{-h-j+2n}$$

$$\left(2(-i\,d(m-2s)-c(v-2k))\sqrt{z}-i\,b(m-2s)\right)^{h+j}$$

$$\left(-\frac{\left(2(-i\,d(m-2s)-c(v-2k))\sqrt{z}-i\,b(m-2s)\right)^2}{-i\,d(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2(-i\,d(m-2s)-c(v-2k))\sqrt{-\frac{\left(2(-i\,d(m-2s)-c(v-2k))\sqrt{z}-i\,b(m-2s)\right)^2}{-i\,d(m-2s)-c(v-2k)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-i\,d(m-2s)-c(v-2k))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-i\,d(m-2s)-c(v-2k))}\right)-$$

$$i\,b(m-2s)\left(2(-i\,d(m-2s)-c(v-2k))\sqrt{z}-i\,b(m-2s)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d(m-2s)-c(v-2k))\sqrt{z}-i\,b(m-2s)\right)^2}{4(-i\,d(m-2s)-c(v-2k))}\right)\Bigg)+$$

$$e^{\frac{b^2(m-2s)^2}{4(i\,d(m-2s)-c(v-2k))}-\frac{i\pi m}{2}}(i\,d(m-2s)-c(v-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b(m-2s))^{-h-j+2n}$$

$$\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{i\,d(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(b\,i(m-2s)\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{4(i\,d(m-2s)-c(v-2k))}\right)+$$

$$2(i\,d(m-2s)-c(v-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{4(i\,d(m-2s)-c(v-2k))}\right)$$

$$\sqrt{-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{i\,d(m-2s)-c(v-2k)}}\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z+e)\cosh^v(c\,z)$

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$$\int z^n\sin^m\left(b\,z^2+d\,z+e\right)\cosh^v(c\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Big(\Gamma(n+1,\,c(v-2k)z)\,(-c(v-2k))^{-n-1}+(c(v-2k))^{-n-1}\,\Gamma(n+1,\,-c(v-2k)z)\Big)-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i(m-2k)d^2}{4b}-ie(m-2k)+\frac{im\pi}{2}}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}(id(m-2k))^{n-j}(-id(m-2k)-2ibz(m-2k))^{j+1}\left(-\frac{i(-id(m-2k)-2ibz(m-2k))^2}{b(m-2k)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-id(m-2k)-2ibz(m-2k))^2}{4b(m-2k)}\right)\right)(-ib(m-2k))^{-n-1}+\right.$$

$$e^{-\frac{i(m-2k)d^2}{4b}+ei(m-2k)-\frac{im\pi}{2}}(ib(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-id(m-2k))^{n-j}(did(m-2k)+2bibz(m-2k))^{j+1}$$

$$\left(\frac{i(did(m-2k)+2bibz(m-2k))^2}{b(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(did(m-2k)+2bibz(m-2k))^2}{4b(m-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i(c(v-2k)-id(m-2s))^2}{4b(m-2s)}-ie(m-2s)+\frac{im\pi}{2}}\right.\left(\sum_{j=0}^{n}2^{j-n}(id(m-2s)-c(v-2k))^{n-j}(-id(m-2s)-\right.$$

$$\left.2ibz(m-2s)+c(v-2k))^{j+1}\left(-\frac{i(-id(m-2s)-2ibz(m-2s)+c(v-2k))^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-id(m-2s)-2ibz(m-2s)+c(v-2k))^2}{4b(m-2s)}\right)\right)(-ib(m-2s))^{-n-1}+\right.$$

$$e^{-\frac{i(-id(m-2s)-c(v-2k))^2}{4b(m-2s)}-ie(m-2s)+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(did(m-2s)+c(v-2k))^{n-j}(-id(m-2s)-\right.$$

$$\left.2ibz(m-2s)-c(v-2k))^{j+1}\left(-\frac{i(-id(m-2s)-2ibz(m-2s)-c(v-2k))^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i(-id(m-2s)-2ibz(m-2s)-c(v-2k))^2}{4b(m-2s)}\right)\right)(-ib(m-2s))^{-n-1}+\right.$$

$$e^{\frac{i(did(m-2s)+c(v-2k))^2}{4b(m-2s)}-\frac{i\pi m}{2}+ei(m-2s)}(ib(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-id(m-2s)-c(v-2k))^{n-j}$$

$$(did(m-2s)+2bibz(m-2s)+c(v-2k))^{j+1}\left(\frac{i(did(m-2s)+2bibz(m-2s)+c(v-2k))^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k)-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v(c\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n-1}\,(d\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,k)\right.$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}\right)\right)\right)$$

$$(c\,(v-2\,k)-i\,d\,(m-2\,s))^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}+e\,i\,(m-2\,s)-\frac{i\,\pi\,m}{2}}\,(d\,i\,(m-2\,s)+c\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}\right)+$$

$$2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+c\,(v-2\,k)}}\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-c\,(v-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 (i d (m-2 s)-c (v-2 k))}+e i (m-2 s)-\frac{i \pi m}{2}} (i d (m-2 s)-c (v-2 k))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j$$

$$(i b (m-2 s))^{-h-j+2 n} \left(b i (m-2 s)+2 (i d (m-2 s)-c (v-2 k)) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c (v-2 k)) \sqrt{z}\right)^2}{i d (m-2 s)-c (v-2 k)}\right)^{\frac{1}{2} (-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j} \left(b i (m-2 s) \left(b i (m-2 s)+2 (i d (m-2 s)-c (v-2 k)) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2} (h+j+1), -\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c (v-2 k)) \sqrt{z}\right)^2}{4 (i d (m-2 s)-c (v-2 k))}\right)+$$

$$2 (i d (m-2 s)-c (v-2 k)) \Gamma\left(\frac{1}{2} (h+j+2), -\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c (v-2 k)) \sqrt{z}\right)^2}{4 (i d (m-2 s)-c (v-2 k))}\right)$$

$$\left.\sqrt{-\frac{\left(b i (m-2 s)+2 (i d (m-2 s)-c (v-2 k)) \sqrt{z}\right)^2}{i d (m-2 s)-c (v-2 k)}}\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \sin^m(b z^r) \cosh^v(f z+g)$

01.20.21.3510.01

$$\int z^n \sin^m\left(b\,z^2\right) \cosh^v(g+f\,z)\,dz ==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{\frac{i\,m\,\pi}{2}}\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i\,f^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{i\,f^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{f^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{f^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3511.01

$$\int z^n \sin^m\left(b\sqrt{z}\right)\cosh^v(g+f\,z)\,dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1} + e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right) +$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left(e^{-\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\,-i\,b\,(m-2\,k)\,\sqrt{z}\right) + e^{\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\left.\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right) - 2\,f\,(v-2\,k)\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)(-f\,(v-2\,k))^{-2\,(n+1)} +$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}-g\,(v-2\,k)-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-\right.\right.$$

$$2 f (v-2k) \sqrt{z}\Big) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(i b (m-2s) - 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right) - 2 f (v-2k)$$

$$\sqrt{\frac{\left(i b (m-2s) - 2 f (v-2k) \sqrt{z}\right)^2}{f (v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(i b (m-2s) - 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right)\Bigg)\Bigg)$$

$$(-f (v-2k))^{-2(n+1)} + e^{\frac{b^2 (m-2s)^2}{4 f (v-2k)} + g (v-2k) + \frac{i m \pi}{2}} (f (v-2k))^{-2(n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2s))^{-h-j+2n}$$

$$\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^{h+j} \left(-\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{f (v-2k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2 f (v-2k) \sqrt{-\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{f (v-2k)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{4 f (v-2k)}\right) - i b (m-2s)$$

$$\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{4 f (v-2k)}\right)\Bigg) +$$

$$e^{\frac{b^2 (m-2s)^2}{4 f (v-2k)} + g (v-2k) - \frac{i m \pi}{2}} (f (v-2k))^{-2(n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2s))^{-h-j+2n}$$

$$\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^{h+j} \left(-\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{f (v-2k)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}$$

$$\Bigg(b i (m-2s) \left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right) +$$

$$2 f (v-2k) \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right)$$

$$\sqrt{-\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{\quad}}\Bigg)\Bigg) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \sin^m(b z^r + e) \cosh^v(f z + g)$

01.20.21.3512.01

$$\int z^n \sin^m\left(b z^2 + e\right) \cosh^v(g + f z)\, dz ==$$

$$-2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{i e (m-2k) - \frac{i m \pi}{2}} \Gamma\left(\frac{n+1}{2}, -i b (m-2k) z^2 \right) \left(-i b (m-2k) z^2 \right)^{\frac{1}{2}(-n-1)} + \right.\right.$$

$$\left.\left. e^{\frac{i m \pi}{2} - i e (m-2k)} \left(i b (m-2k) z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b (m-2k) z^2 \right) \right) \right) z^{n+1} +$$

$$\frac{2^{-m-v} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{n+1} + (-1)^n 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-g(v-2k)} \Gamma(n+1, f(v-2k) z) (-f(v-2k))^{-n-1} + e^{g(v-2k)} (f(v-2k))^{-n-1} \Gamma(n+1, -f(v-2k) z) \right) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s \binom{m}{s} \left(e^{-\frac{i f^2 (v-2k)^2}{4 b (m-2s)} - g(v-2k) - i e (m-2s) + \frac{i m \pi}{2}} \right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n} (f(v-2k))^{n-j} (-f(v-2k) - 2 i b (m-2s) z)^{j+1} \left(-\frac{i (-f(v-2k) - 2 i b (m-2s) z)^2}{b (m-2s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-f(v-2k) - 2 i b (m-2s) z)^2}{4 b (m-2s)} \right) \right) (-i b (m-2s))^{-n-1} +$$

$$e^{-\frac{i f^2 (v-2k)^2}{4 b (m-2s)} + g(v-2k) - i e (m-2s) + \frac{i m \pi}{2}} \left(\sum_{j=0}^{n} 2^{j-n} (-f(v-2k))^{n-j} (f(v-2k) - 2 i b (m-2s) z)^{j+1} \right.$$

$$\left. \left(-\frac{i (f(v-2k) - 2 i b (m-2s) z)^2}{b (m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (f(v-2k) - 2 i b (m-2s) z)^2}{4 b (m-2s)} \right) \right)$$

$$(-i b (m-2s))^{-n-1} + e^{\frac{f^2 i (v-2k)^2}{4 b (m-2s)} - g(v-2k) + e i (m-2s) - \frac{i m \pi}{2}} (i b (m-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (f(v-2k))^{n-j} (2 i b (m-2s) z - f(v-2k))^{j+1} \left(\frac{i (2 i b (m-2s) z - f(v-2k))^2}{b (m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\ \frac{i\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{f^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\Bigg)\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\ b+e\right)\cosh^v(g+f\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\ f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\ -f\,(v-2\,k)\,z)\right)+$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\,(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left(e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\ -i\,b\,(m-2\,k)\,\sqrt{z}\right)+e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\ i\,b\,(m-2\,k)\,\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\Bigg(e^{-\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}-i\,e\,(m-2\,s)-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\right.$$

$$\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(h+j+1),$$

$$\left.\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)\Bigg)(-f\,(v-2\,k))^{-2\,(n+1)}+\right.$$

$$e^{-\frac{b^2 (m-2 s)^2}{4 f (v-2 k)}+e i (m-2 s)-g (v-2 k)-\frac{i m \pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (i b (m-2 s))^{-h-j+2 n}\left(i b (m-2 s)-2 f (v-2 k)\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(i b (m-2 s)-2 f (v-2 k)\sqrt{z}\right)^2}{f (v-2 k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(i b (m-2 s)\left(i b (m-2 s)-2 f (v-2 k)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(i b (m-2 s)-2 f (v-2 k)\sqrt{z}\right)^2}{4 f (v-2 k)}\right)-\right.$$

$$2 f (v-2 k)\sqrt{\frac{\left(i b (m-2 s)-2 f (v-2 k)\sqrt{z}\right)^2}{f (v-2 k)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(i b (m-2 s)-2 f (v-2 k)\sqrt{z}\right)^2}{4 f (v-2 k)}\right)\right)\right)(-f (v-2 k))^{-2 (n+1)}+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 f (v-2 k)}-i e (m-2 s)+g (v-2 k)+\frac{i m \pi}{2}}(f (v-2 k))^{-2 (n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (-i b (m-2 s))^{-h-j+2 n}$$

$$\left(2 f (v-2 k)\sqrt{z}-i b (m-2 s)\right)^{h+j}\left(-\frac{\left(2 f (v-2 k)\sqrt{z}-i b (m-2 s)\right)^2}{f (v-2 k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2 f (v-2 k)\sqrt{-\frac{\left(2 f (v-2 k)\sqrt{z}-i b (m-2 s)\right)^2}{f (v-2 k)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(2 f (v-2 k)\sqrt{z}-i b (m-2 s)\right)^2}{4 f (v-2 k)}\right)-i b (m-2 s)$$

$$\left.\left(2 f (v-2 k)\sqrt{z}-i b (m-2 s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(2 f (v-2 k)\sqrt{z}-i b (m-2 s)\right)^2}{4 f (v-2 k)}\right)\right)+$$

$$e^{\frac{b^2 (m-2 s)^2}{4 f (v-2 k)}+e i (m-2 s)+g (v-2 k)-\frac{i m \pi}{2}}(f (v-2 k))^{-2 (n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h} 4^j (i b (m-2 s))^{-h-j+2 n}$$

$$\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)+\right.$$

$$2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r+d\,z\right)\cosh^v(f\,z+g)$

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$$\int z^n\sin^m\left(b\,z^2+d\,z\right)\cosh^v(g+f\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,(m-2\,k)\,d^2}{4\,b}+\frac{i\,m\,\pi}{2}}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\right)(-i\,b\,(m-2\,k))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{i\,(f\,(v-2\,k)-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-\right.\right.$$

$$2\,i\,b\,z\,(m-2\,s)+f\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)+f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+\right.$$

$$e^{-\frac{i\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-\right.$$

$$2\,i\,b\,z\,(m-2\,s)-f\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+\right.$$

$$e^{\frac{i\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+\right.$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-\frac{i\,\pi\,m}{2}-g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k)-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\, b + d\, z\right) \cosh^v(g + f\, z)\, dz == \frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{n+1} + (-1)^n\, 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-g\,(v-2\,k)}\, \Gamma(n+1,\, f\,(v-2\,k)\, z)\, (-f\,(v-2\,k))^{-n-1} + e^{g\,(v-2\,k)}\, (f\,(v-2\,k))^{-n-1}\, \Gamma(n+1,\, -f\,(v-2\,k)\, z)\right) +$$

$$2^{-m-2\,n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{k+n-1}\, (d\,(m-2\,k))^{-2\,(n+1)} \binom{m}{k}$$

$$\left(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d} - \frac{i\,m\,\pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b\,(m-2\,k))^{-h-j+2\,n} \left(b\, i\,(m-2\,k) + 2\, d\, i\, \sqrt{z}\, (m-2\,k)\right)^{h+j} \right.$$

$$\left(\frac{i \left(b\, i\,(m-2\,k) + 2\, d\, i\, \sqrt{z}\, (m-2\,k)\right)^2}{d\,(m-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\, i\,(m-2\,k) \left(b\, i\,(m-2\,k) + \right.\right.$$

$$\left.\left. 2\, d\, i\, \sqrt{z}\, (m-2\,k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, \frac{i \left(b\, i\,(m-2\,k) + 2\, d\, i\, \sqrt{z}\, (m-2\,k)\right)^2}{4\, d\,(m-2\,k)}\right) + 2\, d\, i\,(m-2\,k) \right.$$

$$\left.\left. \sqrt{\frac{i \left(b\, i\,(m-2\,k) + 2\, d\, i\, \sqrt{z}\, (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\, \frac{i \left(b\, i\,(m-2\,k) + 2\, d\, i\, \sqrt{z}\, (m-2\,k)\right)^2}{4\, d\,(m-2\,k)}\right) \right) +$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d} + \frac{i\,m\,\pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\, b\,(m-2\,k))^{-h-j+2\,n} \left(-i\, b\,(m-2\,k) - 2\, i\, d\, \sqrt{z}\, (m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i \left(-i\, b\,(m-2\,k) - 2\, i\, d\, \sqrt{z}\, (m-2\,k)\right)^2}{d\,(m-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\, b\,(m-2\,k) \right.$$

$$\left.\left(-i\, b\,(m-2\,k) - 2\, i\, d\, \sqrt{z}\, (m-2\,k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, -\frac{i \left(-i\, b\,(m-2\,k) - 2\, i\, d\, \sqrt{z}\, (m-2\,k)\right)^2}{4\, d\,(m-2\,k)}\right) - \right.$$

$$\left. 2\, i\, d\,(m-2\,k) \sqrt{-\frac{i \left(-i\, b\,(m-2\,k) - 2\, i\, d\, \sqrt{z}\, (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right. \right.$$

$$-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\Bigg(e^{\frac{b^2\,(m-2\,s)^2}{4\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))}+g\,(\nu-2\,k)+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f\,(\nu-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f\,(\nu-2\,k)-i\,d\,(m-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(2\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(f\,(\nu-2\,k)-i\,d\,(m-2\,s))}\right)\Bigg)\Bigg)$$

$$(f\,(\nu-2\,k)-i\,d\,(m-2\,s))^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(d\,i\,(m-2\,s)+f\,(\nu-2\,k))}-\frac{i\,\pi\,m}{2}+g\,(\nu-2\,k)}\,(d\,i\,(m-2\,s)+f\,(\nu-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(\nu-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+f\,(\nu-2\,k))}\right)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+f\,(v-2\,k)}}\,\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}-\frac{i\,\pi\,m}{2}-g\,(v-2\,k)}\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)+$$

$$2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f\,(v-2\,k)}}\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z+e)\cosh^v(f\,z+g)$

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$$\int z^n \sin^m\left(b\,z^2+d\,z+e\right)\cosh^v(g+f\,z)\,dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{\frac{i\,(m-2\,k)\,d^2}{4\,b}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\right)(-i\,b\,(m-2\,k))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\Bigg)-2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\Bigg(e^{-\frac{i\,(f\,(v-2\,k)-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)+g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-\right.$$

$$2\,i\,b\,z\,(m-2\,s)+f\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)+f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\Bigg)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-$$

$$2\,i\,b\,z\,(m-2\,s)-f\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\Bigg)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{\frac{i\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,s)+g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,s)-g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k)-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\Bigg)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh^v(g+f\,z)\,dz==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right)+$$

$$2^{-m-2n-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n-1}(d(m-2k))^{-2(n+1)}\binom{m}{k}$$

$$\left(e^{-\frac{i(m-2k)b^2}{4d}+ei(m-2k)-\frac{im\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2k))^{-h-j+2n}\left(bi(m-2k)+2di\sqrt{z}\,(m-2k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(bi(m-2k)+2di\sqrt{z}\,(m-2k)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(bi(m-2k)\left(bi(m-2k)+\right.\right.$$

$$\left.2di\sqrt{z}\,(m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(bi(m-2k)+2di\sqrt{z}\,(m-2k)\right)^2}{4d(m-2k)}\right)+2di(m-2k)$$

$$\left.\left.\sqrt{\frac{i\left(bi(m-2k)+2di\sqrt{z}\,(m-2k)\right)^2}{d(m-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(bi(m-2k)+2di\sqrt{z}\,(m-2k)\right)^2}{4d(m-2k)}\right)\right)+\right.$$

$$e^{\frac{i(m-2k)b^2}{4d}-ie(m-2k)+\frac{im\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib(m-2k))^{-h-j+2n}\left(-ib(m-2k)-2id\sqrt{z}\,(m-2k)\right)^{h+j}$$

$$\left(-\frac{i\left(-ib(m-2k)-2id\sqrt{z}\,(m-2k)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-ib(m-2k)\right.$$

$$\left(-ib(m-2k)-2id\sqrt{z}\,(m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-ib(m-2k)-2id\sqrt{z}\,(m-2k)\right)^2}{4d(m-2k)}\right)-$$

$$2id(m-2k)\sqrt{-\frac{i\left(-ib(m-2k)-2id\sqrt{z}\,(m-2k)\right)^2}{d(m-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-ib(m-2k)-2id\sqrt{z}\,(m-2k)\right)^2}{4d(m-2k)}\right)\right)\right)+$$

$$2^{-m-2n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{\frac{b^2(m-2s)^2}{4(f(\nu-2k)-id(m-2s))}-ie(m-2s)+g(\nu-2k)+\frac{im\pi}{2}}\right.$$

$$\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\right.$$

$$\left(-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{f\,(v-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{f\,(v-2\,k)-i\,d\,(m-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}\right)\right)\right)$$

$$(f\,(v-2\,k)-i\,d\,(m-2\,s))^{-2\,(n+1)}+e^{\frac{b^{2}\,(m-2\,s)^{2}}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+e\,i\,(m-2\,s)-\frac{i\,\pi\,m}{2}+g\,(v-2\,k)}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d\,i\,(m-2\,s)+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}\right)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+f\,(v-2\,k)}}\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}-i\,e\,(m-2\,s)-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}+e\,i\,(m-2\,s)-\frac{i\,\pi\,m}{2}-g\,(v-2\,k)}\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)+$$

$$2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f\,(v-2\,k)}}\Bigg)\Bigg) /;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z)\cosh^v\left(c\,z^r\right)$

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$$\int z^n \sin^m(d\,z)\cosh^v\left(c\,z^2\right) dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,(v-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{i\,m\,\pi}{2}-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^{j+1}$$

$$\left(-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m(d\,z)\cosh^v\left(c\sqrt{z}\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1} + e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{i\,m\,\pi}{2}-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\right.\right.$$

$$\left.\left(-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\right.\right.$$

$$\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\sqrt{z}\right)^{h+j}\right.$$

$$\left.\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{d\,(m-2\,k)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left.\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}$$

$$\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\left.\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right)\Big/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z+e)\cosh^v\left(c\,z^r\right)$

01.20.21.3520.01

$$\int z^n \sin^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+$$

$$(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+\right.$$

$$\left.e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}$$

$$(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3521.01

$$\int z^n \sin^m(e+d\,z)\cosh^v\left(c\sqrt{z}\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} +$$

$$(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1} +\right.$$

$$\left.e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-\right.\right.$$

$$\left.\left.c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)} +$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left.\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{d\,(m-2\,k)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left.\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\left.\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^m(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.3522.01

$$\int z^{\alpha-1}\sin^m(b\,z^r)\cosh^v(c\,z^r)\,dz==\frac{(-1)^m\,2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{\alpha}-$$

$$\frac{i^{-m}\,2^{-m-v}\,z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.((2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-\frac{(-1)^m\,2^{-m-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{\alpha}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-\frac{\alpha}{r}}+((2\,c\,k-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)-$$

$$\frac{2^{-m-v}\,i^{-m}\,z^\alpha}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3523.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz == \frac{(-1)^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$i^{-m}\,2^{-m-v-1}\,z^{n+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{n+1}{2},\,(i\,b\,m-2\,i\,b\,k)\,z^2\right)\left((i\,b\,m-2\,i\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.\left((2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)-(-1)^m\,2^{-m-v-1}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},\,(c\,v-2\,c\,k)\,z^2\right)\left((c\,v-2\,c\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((2\,c\,k-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,c\,k-c\,v)\,z^2\right)\right)-i^{-m}$$

$$2^{-m-v-1}\,z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)\left((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)+$$

$$(-1)^m\left((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)+$$

$$\left.\left((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3524.01

$$\int z^n \sin^m\left(b\,\sqrt{z}\right)\cosh^v\left(c\,\sqrt{z}\right)dz == \frac{(-1)^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$i^{-m}\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}(2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}$$

$$\left((-1)^m\,\Gamma\left(2\,(n+1),\,(i\,b\,m-2\,i\,b\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)-(-1)^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(2\,c\,k-c\,v)^{-2\,(n+1)}\left(\Gamma\left(2\,(n+1),\,(c\,v-2\,c\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,(2\,c\,k-c\,v)\,\sqrt{z}\right)\right)-i^{-m}\,2^{-m-v+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}+\right.$$

$$(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)+$$

$$(-1)^m\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)+$$

$$\left.(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^m(b\,z^r+e)\cosh^v(c\,z^r)$

01.20.21.3525.01

$$\int z^{\alpha-1}\sin^m(b\,z^r+e)\cosh^v(c\,z^r)\,dz == \frac{(-1)^m\,2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{\alpha} -$$

$$\frac{i^{-m}\,2^{-m-v}\,z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2iek-iem}\,\Gamma\left(\frac{\alpha}{r},(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.e^{iem-2iek}\,((2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-\frac{(-1)^m\,2^{-m-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{\alpha}{r},(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-\frac{\alpha}{r}}+((2\,c\,k-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,k-c\,v)\,z^r\right)\right)-\frac{2^{-m-v}\,i^{-m}\,z^\alpha}{r}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2iek-iem}\,\Gamma\left(\frac{\alpha}{r},(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-2eik+iem}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,e^{2iek-iem}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.e^{-2eik+iem}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3526.01

$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2\right)dz == \frac{(-1)^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} - i^{-m}\,2^{-m-v-1}\,z^{n+1}\binom{v}{\frac{v}{2}}$$

$$(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,(i\,b\,m-2\,i\,b\,k)\,z^2\right)\left((i\,b\,m-2\,i\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{i\,e\,m-2\,i\,e\,k}\left((2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)-(-1)^m\,2^{-m-v-1}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},\,(c\,v-2\,c\,k)\,z^2\right)\left((c\,v-2\,c\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((2\,c\,k-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,c\,k-c\,v)\,z^2\right)\right)-$$

$$i^{-m}\,2^{-m-v-1}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)\right.$$

$$\left((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-2\,e\,i\,k+i\,e\,m}\left((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)+(-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\left((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)+e^{-2\,e\,i\,k+i\,e\,m}\left((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\left.\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3527.01

$$\int z^n \sin^m\left(\sqrt{z}\;b+e\right)\cosh^v\left(\sqrt{z}\;c\right)dz == \frac{(-1)^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$i^{-m}\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}(2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}$$

$$\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(i\,b\,m-2\,i\,b\,k)\,\sqrt{z}\right)+e^{i\,e\,m-2\,i\,e\,k}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)-(-1)^m\,2^{-m-v+1}$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(2\,c\,k-c\,v)^{-2\,(n+1)}\left(\Gamma\left(2\,(n+1),\,(c\,v-2\,c\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,(2\,c\,k-c\,v)\,\sqrt{z}\right)\right)-$$

$$i^{-m}\,2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)\right.$$

$$(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}+e^{-2\,e\,i\,k+i\,e\,m}\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}$$

$$\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)+(-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}$$

$$\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)+e^{-2\,e\,i\,k+i\,e\,m}\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}$$

$$\left.\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b z^r + d z) \cosh^v(c z^r)$

01.20.21.3528.01

$$\int z^n \sin^m\left(b z^2 + d z\right) \cosh^v\left(c z^2\right) dz == -2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\Gamma\left(\frac{n+1}{2}, -c\,(v-2k)\,z^2\right)\left(-c\,(v-2k)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left(c\,(v-2k)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c\,(v-2k)\,z^2\right)\right)\right) z^{n+1} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} - 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i\,(m-2k)\,d^2}{4b} + \frac{i m \pi}{2}}\right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n} (i\,d\,(m-2k))^{n-j} (-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^{j+1} \left(-\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{b\,(m-2k)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\left.\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{4\,b\,(m-2k)}\right)\right) (-i\,b\,(m-2k))^{-n-1} +\right.$$

$$e^{-\frac{i\,(m-2k)\,d^2}{4b} - \frac{i m \pi}{2}} (i\,b\,(m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-i\,d\,(m-2k))^{n-j} (d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{b\,(m-2k)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{4\,b\,(m-2k)}\right)\Bigg) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s \binom{m}{s} \left(e^{-\frac{1}{4} i \left(\frac{d^2 (m-2s)^2}{2\,i\,c\,k - b\,m + 2\,b\,s - i\,c\,v} - 2\pi m\right)}\right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n} (i\,d\,(m-2s))^{n-j} (2\,(c\,(v-2k) - i\,b\,(m-2s))\,z -\right.$$

$$\left.i\,d\,(m-2s))^{j+1} \left(-\frac{(2\,(c\,(v-2k) - i\,b\,(m-2s))\,z - i\,d\,(m-2s))^2}{c\,(v-2k) - i\,b\,(m-2s)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2}, -\frac{(2\,(c\,(v-2k) - i\,b\,(m-2s))\,z - i\,d\,(m-2s))^2}{4\,(c\,(v-2k) - i\,b\,(m-2s))}\right)\right) (c\,(v-2k) - i\,b\,(m-2s))^{-n-1} +$$

$$e^{-\frac{1}{4} i \left(2\pi m - \frac{d^2 (m-2s)^2}{-2\,c\,i\,k - b\,m + 2\,b\,s + i\,c\,v}\right)} (b\,i\,(m-2s) + c\,(v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-i\,d\,(m-2s))^{n-j} (d\,i\,(m-2s) +$$

$$\left.2\,(b\,i\,(m-2s) + c\,(v-2k))\,z)^{j+1} \left(-\frac{(d\,i\,(m-2s) + 2\,(b\,i\,(m-2s) + c\,(v-2k))\,z)^2}{b\,i\,(m-2s) + c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}\right)$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2}{4\,(b\,i\,(m-2\,s)+c\,(v-2\,k))}\right)+e^{\frac{1}{4}i\left(2\,\pi\,m-\frac{d^2\,(m-2\,s)^2}{-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v}\right)}$$

$$(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^{j+1}$$

$$\left(-\frac{(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2}{-i\,b\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2}{4\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))}\right)+e^{\frac{1}{4}i\left(\frac{d^2\,(m-2\,s)^2}{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v}-2\,\pi\,m\right)}$$

$$(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2}{i\,b\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2}{4\,(i\,b\,(m-2\,s)-c\,(v-2\,k))}\right)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(\sqrt{z}\ c\right)dz==$$

$$-2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2\,k)^{-2\,(n+1)}\binom{v}{k}\left(\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right)\right)$$

$$c^{-2\,(n+1)}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$(i\,d\,(m-2\,k))^{-2\,(n+1)}\left(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+\right.\right.$$

$$\left.\left.2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)\right.$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(-i\,b\,(m-2\,k)$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}(i\,d\,(m-2\,s))^{-2\,(n+1)}\Bigg(e^{-\frac{i\,(c\,(\nu-2\,k)-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,k)-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)+c\,(\nu-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)+c\,(\nu-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c\,(\nu-2\,k)-i\,b\,(m-2\,s))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)+c\,(\nu-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)+c\,(\nu-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-\frac{i\,\pi\,m}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)+c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)+$$

$$2\,d\,i\,(m-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)+c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)+c\,(v-2k)\right)^2}{d\,(m-2s)}}\Bigg)+e^{\frac{i\,(i\,b\,(m-2s)-c\,(v-2k))^2}{4\,d\,(m-2s)}-\frac{i\,\pi\,m}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2s)-c\,(v-2k))^{-h-j+2n}\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{d\,(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2s)-c\,(v-2k))\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)+$$

$$2\,d\,i\,(m-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{d\,(m-2s)}}\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r\right)$

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$$\int z^n \sin^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},\ -c\,(v-2k)\,z^2\right)\left(-c\,(v-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,(v-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\ c\,(v-2k)\,z^2\right)\right)+$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{n+1} - 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i\,(m-2k)\,d^2}{4b} - i\,e\,(m-2k) + \frac{i\,m\,\pi}{2}} \left(\sum_{j=0}^{n} 2^{j-n}\, (i\,d\,(m-2k))^{n-j}\, (-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^{j+1} \right.\right.$$

$$\left.\left(-\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{4\,b\,(m-2k)} \right) \right)$$

$$(-i\,b\,(m-2k))^{-n-1} + e^{-\frac{i\,(m-2k)\,d^2}{4b} + e\,i\,(m-2k) - \frac{i\,m\,\pi}{2}}\, (i\,b\,(m-2k))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n}\, (-i\,d\,(m-2k))^{n-j}\, (d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^{j+1} \left(\frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{4\,b\,(m-2k)} \right) \right) - 2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s \binom{m}{s} \left(e^{-\frac{1}{4} i \left(\frac{d^2\,(m-2s)^2}{2\,i\,c\,k - b\,m + 2\,b\,s - i\,c\,v} + 4\,e\,(m-2s) - 2\,\pi\,m \right)} \left(\sum_{j=0}^{n} 2^{j-n}\, (i\,d\,(m-2s))^{n-j}\, (2\,(c\,(v-2k) - i\,b\,(m-2s))\,z - \right.\right.$$

$$\left. i\,d\,(m-2s))^{j+1} \left(-\frac{(2\,(c\,(v-2k) - i\,b\,(m-2s))\,z - i\,d\,(m-2s))^2}{c\,(v-2k) - i\,b\,(m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right.$$

$$\left. \Gamma\left(\frac{j+1}{2}, -\frac{(2\,(c\,(v-2k) - i\,b\,(m-2s))\,z - i\,d\,(m-2s))^2}{4\,(c\,(v-2k) - i\,b\,(m-2s))} \right) \right) (c\,(v-2k) - i\,b\,(m-2s))^{-n-1} +$$

$$e^{-\frac{1}{4} i \left(-\frac{d^2\,(m-2s)^2}{-2\,c\,i\,k - b\,m + 2\,b\,s + i\,c\,v} - 4\,e\,(m-2s) + 2\,m\,\pi \right)} (b\,i\,(m-2s) + c\,(v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (-i\,d\,(m-2s))^{n-j}\, (d\,i\,(m-2s) +$$

$$2\,(b\,i\,(m-2s) + c\,(v-2k))\,z)^{j+1} \left(-\frac{(d\,i\,(m-2s) + 2\,(b\,i\,(m-2s) + c\,(v-2k))\,z)^2}{b\,i\,(m-2s) + c\,(v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\,i\,(m-2s) + 2\,(b\,i\,(m-2s) + c\,(v-2k))\,z)^2}{4\,(b\,i\,(m-2s) + c\,(v-2k))} \right) + e^{\frac{1}{4} i \left(-\frac{d^2\,(m-2s)^2}{-2\,c\,i\,k - b\,m + 2\,b\,s + i\,c\,v} - 4\,e\,(m-2s) + 2\,m\,\pi \right)}$$

$$(-i\,b\,(m-2s) - c\,(v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (i\,d\,(m-2s))^{n-j}\, (2\,(-i\,b\,(m-2s) - c\,(v-2k))\,z - i\,d\,(m-2s))^{j+1}$$

$$\left(-\frac{(2\,(-i\,b\,(m-2s) - c\,(v-2k))\,z - i\,d\,(m-2s))^2}{-i\,b\,(m-2s) - c\,(v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(2(-i\,b(m-2s)-c(v-2k))z-i\,d(m-2s))^2}{4(-i\,b(m-2s)-c(v-2k))}\right)+e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{2icck-bm+2bs-icv}+4e(m-2s)-2\pi m\right)}$$

$$(i\,b(m-2s)-c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-i\,d(m-2s))^{n-j}(d\,i(m-2s)+2(i\,b(m-2s)-c(v-2k))z)^{j+1}$$

$$\left(-\frac{(d\,i(m-2s)+2(i\,b(m-2s)-c(v-2k))z)^2}{i\,b(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2}, -\frac{(d\,i(m-2s)+2(i\,b(m-2s)-c(v-2k))z)^2}{4(i\,b(m-2s)-c(v-2k))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c\right)dz == -2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2k)^{-2(n+1)}\binom{v}{k}\left(\Gamma\left(2(n+1),-c(v-2k)\sqrt{z}\right)+\Gamma\left(2(n+1),c(v-2k)\sqrt{z}\right)\right)\right)c^{-2(n+1)}+$$

$$\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+2^{-m-2n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}(i\,d(m-2k))^{-2(n+1)}$$

$$\left(e^{-\frac{i(m-2k)b^2}{4d}+e\,i(m-2k)-\frac{i\,m\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(i\,b(m-2k))^{-h-j+2n}\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i(m-2k)\left(b\,i(m-2k)+\right.\right.$$

$$\left.2d\,i\sqrt{z}\ (m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{4d(m-2k)}\right)+2d\,i(m-2k)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{d(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{4d(m-2k)}\right)\right)+\right.$$

$$\left.e^{\frac{i(m-2k)b^2}{4d}-i\,e(m-2k)+\frac{i\,m\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-i\,b(m-2k))^{-h-j+2n}\left(-i\,b(m-2k)-2i\,d\sqrt{z}\ (m-2k)\right)^{h+j}\right.$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,k)\right.$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}(i\,d\,(m-2\,s))^{-2\,(n+1)}\left(e^{-\frac{i\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,k)-i\,b\,(m-2\,s))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)\right)+e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{2}}{4\,d\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\Bigg)+e^{\frac{i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,s)-c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\Bigg)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3532.01

$$\int z^n \sin^m(d\,z)\cosh^v\left(c\,z^2+g\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\right.$$

$$\left.\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3533.01

$$\int z^n \sin^m(d\,z)\cosh^v\left(\sqrt{z}\,c+g\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1} + e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right) + e^{-g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-\right.\right.\right.$$

$$\left.\left.\left.c\,(v-2\,s)\right)^{h+j}\left(-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\right.\right.\right.$$

$$\left.\left.\left.\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-\right.\right.\right.$$

$$\left.\left.\left.2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.\right.\right.$$

$$\left.\left.\left.\left.-\frac{i\left(-2\,i\,d\,\sqrt{z}\,(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)} +$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left.\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{d\,(m-2\,k)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left.\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\left.\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right)\Big/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3534.01

$$\int z^n \sin^m(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+\right.$$

$$\left.e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)-g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\right.$$

$$(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.\left.\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3535.01

$$\int z^n \sin^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} +$$

$$(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1} +\right.$$

$$\left. e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right) - 2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right) + e^{-g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-\right.\right.$$

$$\left.c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right) -$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)} +$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left.\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,d\,i\,\sqrt{z}\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\left.\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sin^m(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.3536.01

$$\int z^{\alpha-1}\sin^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz==\frac{(-1)^m\,2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{\alpha}-\frac{i^{-m}\,2^{-m-v}\,z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-\frac{\alpha}{r}}+((2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-$$

$$\frac{(-1)^m\,2^{-m-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-\frac{\alpha}{r}}+e^{g\,v-2\,g\,k}\,((2\,c\,k-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)-\frac{2^{-m-v}\,i^{-m}\,z^\alpha}{r}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{2\,g\,s-g\,v}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,e^{g\,v-2\,g\,s}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.e^{g\,v-2\,g\,s}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3537.01

$$\int z^n \sin^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz == \frac{(-1)^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$i^{-m}\,2^{-m-v-1}\,z^{n+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{n+1}{2},\,(i\,b\,m-2\,i\,b\,k)\,z^2\right)\left((i\,b\,m-2\,i\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.\left((2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)-$$

$$(-1)^m\,2^{-m-v-1}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{n+1}{2},\,(c\,v-2\,c\,k)\,z^2\right)\left((c\,v-2\,c\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{g\,v-2\,g\,k}\left((2\,c\,k-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,c\,k-c\,v)\,z^2\right)\right)-i^{-m}\,2^{-m-v-1}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)\left((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$e^{2\,g\,s-g\,v}\left((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)+$$

$$(-1)^m\,e^{g\,v-2\,g\,s}\left((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)+$$

$$e^{g\,v-2\,g\,s}\left((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\left.\left.\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3538.01

$$\int z^n \sin^m\left(\sqrt{z}\, b\right) \cosh^v\left(\sqrt{z}\, c + g\right) dz ==$$

$$\frac{(-1)^m\, 2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{n+1} - i^{-m}\, 2^{-m-v+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} (2\, i\, b\, k - i\, b\, m)^{-2\,(n+1)} \left((-1)^m\, \Gamma\left(2\,(n+1),\, (i\, b\, m - 2\, i\, b\, k)\, \sqrt{z}\right) + \Gamma\left(2\,(n+1),\, (2\, i\, b\, k - i\, b\, m)\, \sqrt{z}\right)\right) -$$

$$(-1)^m\, 2^{-m-v+1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (2\, c\, k - c\, v)^{-2\,(n+1)} \left(e^{2\,g\,k - g\,v}\, \Gamma\left(2\,(n+1),\, (c\, v - 2\, c\, k)\, \sqrt{z}\right) + e^{g\,v - 2\,g\,k}\, \Gamma\left(2\,(n+1),\, (2\, c\, k - c\, v)\, \sqrt{z}\right)\right) -$$

$$i^{-m}\, 2^{-m-v+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left((-1)^m\, e^{2\,g\,s - g\,v}\, \Gamma\left(2\,(n+1),\, (-2\, b\, i\, k + i\, b\, m - 2\, c\, s + c\, v)\, \sqrt{z}\right)\right.$$

$$(-2\, b\, i\, k + i\, b\, m - 2\, c\, s + c\, v)^{-2\,(n+1)} + e^{2\,g\,s - g\,v}\, (2\, i\, b\, k - i\, b\, m - 2\, c\, s + c\, v)^{-2\,(n+1)}$$

$$\Gamma\left(2\,(n+1),\, (2\, i\, b\, k - i\, b\, m - 2\, c\, s + c\, v)\, \sqrt{z}\right) + (-1)^m\, e^{-2\,g\,s + g\,v}\, (-2\, b\, i\, k + i\, b\, m + 2\, c\, s - c\, v)^{-2\,(n+1)}$$

$$\Gamma\left(2\,(n+1),\, (-2\, b\, i\, k + i\, b\, m + 2\, c\, s - c\, v)\, \sqrt{z}\right) + e^{-2\,g\,s + g\,v}\, (2\, i\, b\, k - i\, b\, m + 2\, c\, s - c\, v)^{-2\,(n+1)}$$

$$\left.\Gamma\left(2\,(n+1),\, (2\, i\, b\, k - i\, b\, m + 2\, c\, s - c\, v)\, \sqrt{z}\right)\right) /;\, n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^{\alpha-1} \sin^m\left(b\, z^r + e\right) \cosh^v\left(c\, z^r + g\right)$

01.20.21.3539.01

$$\int z^{\alpha-1} \sin^m(b\,z^r+e) \cosh^v(c\,z^r+g)\,dz == \frac{(-1)^m\,2^{-m-v}\,z^\alpha \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{\alpha} -$$

$$\frac{i^{-m}\,2^{-m-v}\,z^\alpha}{r} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{\alpha}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-\frac{\alpha}{r}} +$$

$$e^{i\,e\,m-2\,i\,e\,k}\,((2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right) - \frac{(-1)^m\,2^{-m-v}\,z^\alpha}{r} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{k} \left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-\frac{\alpha}{r}} + e^{g\,v-2\,g\,k}\,((2\,c\,k-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right) -$$

$$\frac{2^{-m-v}\,i^{-m}\,z^\alpha}{r} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m+2\,g\,s-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)\right.$$

$$((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}} + e^{-2\,e\,i\,k+i\,e\,m+2\,g\,s-g\,v}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right) + (-1)^m\,e^{2\,i\,e\,k-i\,e\,m-2\,g\,s+g\,v}$$

$$((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right) + e^{-2\,e\,i\,k+i\,e\,m-2\,g\,s+g\,v}$$

$$\left.((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right) /;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3540.01

$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+g\right)dz == \frac{(-1)^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$i^{-m}\,2^{-m-v-1}\,z^{n+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,(i\,b\,m-2\,i\,b\,k)\,z^2\right)\right.$$

$$\left.\left((i\,b\,m-2\,i\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{i\,e\,m-2\,i\,e\,k}\left((2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m)\,z^2\right)\right) -$$

$$(-1)^m\,2^{-m-v-1}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{n+1}{2},\,(c\,v-2\,c\,k)\,z^2\right)\left((c\,v-2\,c\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{g\,v-2\,g\,k}\left((2\,c\,k-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,c\,k-c\,v)\,z^2\right)\right) -$$

$$i^{-m}\,2^{-m-v-1}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{2\,i\,e\,k-i\,e\,m+2\,g\,s-g\,v}\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)\right.$$

$$\left((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-2\,e\,i\,k+i\,e\,m+2\,g\,s-g\,v}\left((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)+(-1)^m\,e^{2\,i\,e\,k-i\,e\,m-2\,g\,s+g\,v}\left((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)+e^{-2\,e\,i\,k+i\,e\,m-2\,g\,s+g\,v}\left((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\left.\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3541.01

$$\int z^n \sin^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == \frac{(-1)^m\, 2^{-m-v}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$i^{-m}\, 2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}(2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}\left((-1)^m\, e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(i\,b\,m-2\,i\,b\,k)\,\sqrt{z}\right)+\right.$$

$$\left.e^{i\,e\,m-2\,i\,e\,k}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)-(-1)^m\, 2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(2\,c\,k-c\,v)^{-2\,(n+1)}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(2\,(n+1),\,(c\,v-2\,c\,k)\,\sqrt{z}\right)+e^{g\,v-2\,g\,k}\,\Gamma\left(2\,(n+1),\,(2\,c\,k-c\,v)\,\sqrt{z}\right)\right)-$$

$$i^{-m}\, 2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\, e^{2\,i\,e\,k-i\,e\,m+2\,g\,s-g\,v}\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)\right.$$

$$(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}+e^{-2\,e\,i\,k+i\,e\,m+2\,g\,s-g\,v}\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}$$

$$\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)+(-1)^m\, e^{2\,i\,e\,k-i\,e\,m-2\,g\,s+g\,v}\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}$$

$$\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)+e^{-2\,e\,i\,k+i\,e\,m-2\,g\,s+g\,v}\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}$$

$$\left.\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+g\right)$

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$$\int z^n \sin^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+g\right)dz ==$$

$$-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(e^{\frac{i\,(m-2\,k)\,d^2}{4\,b}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\left(-\left(i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2\right)\right)/\right.\right.$$

$$\left.\left.(b\,(m-2\,k))^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\left(i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2\right)/(4\,b\,(m-2\,k))\right)\right)\right)$$

$$(-i\,b\,(m-2\,k))^{-n-1}+e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}$$

$$(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}\left(\left(i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2\right)\Big/(b\,(m-2\,k))\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\Bigg)-2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}$$

$$\left(e^{-\frac{1}{4}i\left(\frac{d^2\,(m-2\,s)^2}{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v}-2\,\pi\,m+4\,g\,i\,(v-2\,k)\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^{j+1}\right.\right.$$

$$\left(-(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2\Big/(c\,(v-2\,k)-i\,b\,(m-2\,s))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},\,-(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2\Big/(4\,(c\,(v-2\,k)-i\,b\,(m-2\,s)))\right)\right)$$

$$(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{1}{4}i\left(-\frac{d^2\,(m-2\,s)^2}{-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v}+4\,g\,i\,(v-2\,k)+2\,m\,\pi\right)}\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2\Big/(b\,i\,(m-2\,s)+c\,(v-2\,k))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2\Big/(4\,(b\,i\,(m-2\,s)+c\,(v-2\,k)))\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{d^2\,(m-2\,s)^2}{-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v}+4\,g\,i\,(v-2\,k)+2\,m\,\pi\right)}\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^{j+1}$$

$$\left(-(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2\Big/(-i\,b\,(m-2\,s)-c\,(v-2\,k))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2\Big/(4\,(-i\,b\,(m-2\,s)-c\,(v-2\,k)))\right)+$$

$$e^{\frac{1}{4}i\left(\frac{d^2\,(m-2\,s)^2}{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v}-2\,\pi\,m+4\,g\,i\,(v-2\,k)\right)}\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2\Big/(i\,b\,(m-2\,s)-c\,(v-2\,k))\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2\Big/\right.$$

$$\left.\left.(4\,(i\,b\,(m-2\,s)-c\,(v-2\,k)))\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(\sqrt{z}\ c + g\right) dz == -2^{-m-v+1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (v-2k)^{-2(n+1)} \binom{v}{k} \left(e^{g(v-2k)}\, \Gamma\left(2(n+1),\, -c(v-2k)\sqrt{z}\right) + e^{-g(v-2k)}\, \Gamma\left(2(n+1),\, c(v-2k)\sqrt{z}\right)\right)\right) c^{-2(n+1)} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$(i\,d\,(m-2k))^{-2(n+1)} \left(e^{-\frac{i(m-2k)b^2}{4d} - \frac{i m \pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(m-2k))^{-h-j+2n} \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^{h+j} \right.$$

$$\left(\frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\,i\,(m-2k) \left(b\,i\,(m-2k) + \right.\right.$$

$$\left.\left. 2\,d\,i\,\sqrt{z}\ (m-2k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, \frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)}\right) + 2\,d\,i\,(m-2k) \right.$$

$$\left. \sqrt{\frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\, \frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)}\right) \right) +$$

$$e^{\frac{i(m-2k)b^2}{4d} + \frac{i m \pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b\,(m-2k))^{-h-j+2n} \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b\,(m-2k) \right.$$

$$\left. \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, -\frac{i\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)}\right) - \right.$$

$$\left. 2\,i\,d\,(m-2k) \sqrt{-\frac{i\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}(i\,d\,(m-2\,s))^{-2\,(n+1)}\Bigg(e^{-\frac{i\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c\,(v-2\,k)-i\,b\,(m-2\,s))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\;\Gamma\Bigg(\frac{1}{2}\,(h+j+2),$$

$$-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\Bigg)\Bigg)+e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)-c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\left.\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\right)+e^{\frac{i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-\frac{i\,\pi\,m}{2}-g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,s)-c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\left.\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+g\right)$

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$$\int z^n \sin^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+g\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,(m-2\,k)\,d^2}{4\,b}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\right)$$

$$(-i\,b\,(m-2\,k))^{-n-1}+e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\right)-2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{2icbk-bm+2bs-icv}+4e(m-2s)-2\pi m+4gi(v-2k)\right)}\left(\sum_{j=0}^{n}2^{j-n}(id(m-2s))^{n-j}(2(c(v-2k)-ib(m-2s))z-\right.\right.$$

$$id(m-2s))^{j+1}\left(-\frac{(2(c(v-2k)-ib(m-2s))z-id(m-2s))^2}{c(v-2k)-ib(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(2(c(v-2k)-ib(m-2s))z-id(m-2s))^2}{4(c(v-2k)-ib(m-2s))}\right)\right)(c(v-2k)-ib(m-2s))^{-n-1}+$$

$$e^{-\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{-2cik-bm+2bs+icv}-4e(m-2s)+4gi(v-2k)+2m\pi\right)}(bi(m-2s)+c(v-2k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-id(m-2s))^{n-j}(di(m-2s)+2(bi(m-2s)+c(v-2k))z)^{j+1}$$

$$\left(-\frac{(di(m-2s)+2(bi(m-2s)+c(v-2k))z)^2}{bi(m-2s)+c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-\frac{(di(m-2s)+2(bi(m-2s)+c(v-2k))z)^2}{4(bi(m-2s)+c(v-2k))}\right)+e^{\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{-2cik-bm+2bs+icv}-4e(m-2s)+4gi(v-2k)+2m\pi\right)}$$

$$(-ib(m-2s)-c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(id(m-2s))^{n-j}(2(-ib(m-2s)-c(v-2k))z-id(m-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2s)-c(v-2k))z-id(m-2s))^2}{-ib(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\right.$$

$$\left.-\frac{(2(-ib(m-2s)-c(v-2k))z-id(m-2s))^2}{4(-ib(m-2s)-c(v-2k))}\right)+e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{2icbk-bm+2bs-icv}+4e(m-2s)-2\pi m+4gi(v-2k)\right)}$$

$$(ib(m-2s)-c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-id(m-2s))^{n-j}(di(m-2s)+2(ib(m-2s)-c(v-2k))z)^{j+1}$$

$$\left(-\frac{(di(m-2s)+2(ib(m-2s)-c(v-2k))z)^2}{ib(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(di(m-2s)+2(ib(m-2s)-c(v-2k))z)^2}{4(ib(m-2s)-c(v-2k))}\right)\right)/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\;b+e+dz\right)\cosh^v\left(\sqrt{z}\;c+g\right)dz==-2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2k)^{-2(n+1)}\binom{v}{k}\left(e^{g(v-2k)}\Gamma\left(2(n+1),-c(v-2k)\sqrt{z}\right)+e^{-g(v-2k)}\Gamma\left(2(n+1),c(v-2k)\sqrt{z}\right)\right)\right)c^{-2(n+1)}+$$

$$\frac{2^{-m-\nu}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1-m \bmod 2)\,(1-\nu \bmod 2)}{n+1} + 2^{-m-2n-\nu-1} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} (i\,d\,(m-2k))^{-2(n+1)}$$

$$\left(e^{-\frac{i(m-2k)b^2}{4d} + e\,i\,(m-2k) - \frac{i m \pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(m-2k))^{-h-j+2n} \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k) \right)^{h+j} \right.$$

$$\left(\frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k) \right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\,i\,(m-2k) \left(b\,i\,(m-2k) + \right. \right.$$

$$\left. 2\,d\,i\,\sqrt{z}\,(m-2k) \right) \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k) \right)^2}{4\,d\,(m-2k)} \right) + 2\,d\,i\,(m-2k)$$

$$\left. \left. \sqrt{\frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k) \right)^2}{d\,(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k) \right)^2}{4\,d\,(m-2k)} \right) \right) +$$

$$e^{\frac{i(m-2k)b^2}{4d} - i\,e\,(m-2k) + \frac{i m \pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b\,(m-2k))^{-h-j+2n} \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k) \right)^{h+j}$$

$$\left(-\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k) \right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b\,(m-2k) \right.$$

$$\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k) \right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k) \right)^2}{4\,d\,(m-2k)} \right) -$$

$$2\,i\,d\,(m-2k) \sqrt{-\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k) \right)^2}{d\,(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), \right.$$

$$\left. \left. \left. -\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k) \right)^2}{4\,d\,(m-2k)} \right) \right) \right) +$$

$$2^{-m-2n-\nu-1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^s \binom{m}{s} (i\,d\,(m-2s))^{-2(n+1)} \left(e^{-\frac{i(c(\nu-2k) - i\,b(m-2s))^2}{4d(m-2s)} - i\,e\,(m-2s) + g(\nu-2k) + \frac{i m \pi}{2}} \right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,k)-i\,b\,(m-2\,s))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)\right)+$$

$$e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{2}}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)-g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)\Bigg)+$$

$$e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,s)+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\right.$$

$$\left.i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{h+j}\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\Bigg)+e^{\frac{i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,s)-g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,s)-c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)+$$

$$2\,d\,i\,(m-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{d\,(m-2s)}}\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n \sin^m(d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2k)\,z)\,(-i\,d\,(m-2k))^{-n-1}+e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2k)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2k)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2k))^{n-j}\,(-f\,(v-2k)-2\,c\,z\,(v-2k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)$$

$$(-c\,(v-2k))^{-n-1}+e^{-\frac{f^2\,(v-2k)}{4\,c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left.\left.\left(-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ -\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(-i\,d\,(m-2k)-f\,(v-2s))^2}{4\,c\,(v-2s)}+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2k)+f\,(v-2s))^{n-j}\,(-i\,d\,(m-2k)-f\,(v-2s)-\right.\right.$$

$$\left.2\,c\,(v-2s)\,z)^{j+1}\left(\frac{1}{c\,(v-2s)}\left((-i\,d\,(m-2k)-f\,(v-2s)-2\,c\,(v-2s)\,z)^2\right)\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},\ (-i\,d\,(m-2k)-f\,(v-2s)-2\,c\,(v-2s)\,z)^2\Big/(4\,c\,(v-2s))\right)\right)(-c\,(v-2s))^{-n-1}+$$

$$e^{\frac{(i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left((d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2\big/(c\,(v-2\,s))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2\big/(4\,c\,(v-2\,s))\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f\,(v-2\,s)-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}+\frac{i\,m\,\pi}{2}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}\,(-i\,d\,(m-2\,k)+f\,(v-2\,s)+$$

$$2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{1}{c\,(v-2\,s)}\left((-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2\right)\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2\big/(4\,c\,(v-2\,s))\right)+e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-\frac{i\,m\,\pi}{2}}$$

$$(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}\,(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}$$

$$\left(-(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2\big/(c\,(v-2\,s))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,-(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2\big/(4\,c\,(v-2\,s))\right)\right)\text{/;}\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m(d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\right)$$

$$\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\Bigg)+2\,f\,(v-2\,k)$$

$$\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)+$$

$$2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)$$

$$\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}}\Bigg)\Bigg)$$

$$(f\,(v-2\,s)-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}-\frac{i\,m\,\pi}{2}}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}+\frac{i\,m\,\pi}{2}}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(-i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d(m-2k)-f(v-2s))}\right)-$$

$$c(v-2s)\left(2(-i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d(m-2k)-f(v-2s))}\right)\right)+$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d(m-2k)-f(v-2s))}-\frac{i\,m\,\pi}{2}}(i\,d(m-2k)-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2s))^{-h-j+2n}$$

$$\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}$$

$$\left(-\frac{\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d(m-2k)-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2(i\,d(m-2k)-f(v-2s))\sqrt{-\frac{\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d(m-2k)-f(v-2s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d(m-2k)-f(v-2s))}\right)-$$

$$c(v-2s)\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d(m-2k)-f(v-2s))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n\sin^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+$$

$$(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2k)}\,\Gamma(n+1,\,i\,d\,(m-2k)\,z)\,(-i\,d\,(m-2k))^{-n-1}+\right.$$

$$e^{i e (m-2k)-\frac{i m \pi}{2}} (i d (m-2k))^{-n-1} \Gamma(n+1, -i d (m-2k) z)\Big) -$$

$$2^{-m-v-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \Bigg(e^{\frac{f^2 (v-2k)}{4c}} \Bigg(\sum_{j=0}^{n} 2^{j-n} (f (v-2k))^{n-j} (-f (v-2k) - 2 c z (v-2k))^{j+1}$$

$$\left(\frac{(-f (v-2k) - 2 c z (v-2k))^2}{c (v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(-f (v-2k) - 2 c z (v-2k))^2}{4 c (v-2k)} \right) \Bigg)$$

$$(-c (v-2k))^{-n-1} + e^{-\frac{f^2 (v-2k)}{4c}} (c (v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-f (v-2k))^{n-j} (f (v-2k) + 2 c z (v-2k))^{j+1}$$

$$\left(-\frac{(f (v-2k) + 2 c z (v-2k))^2}{c (v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f (v-2k) + 2 c z (v-2k))^2}{4 c (v-2k)} \right) \Bigg) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \Bigg(e^{\frac{(-i d (m-2k) - f (v-2s))^2}{4 c (v-2s)} - i e (m-2k) + \frac{i m \pi}{2}} \Bigg(\sum_{j=0}^{n} 2^{j-n} (d i (m-2k) + f (v-2s))^{n-j}$$

$$(-i d (m-2k) - f (v-2s) - 2 c (v-2s) z)^{j+1} \left(\frac{(-i d (m-2k) - f (v-2s) - 2 c (v-2s) z)^2}{c (v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(-i d (m-2k) - f (v-2s) - 2 c (v-2s) z)^2}{4 c (v-2s)} \right) \Bigg)$$

$$(-c (v-2s))^{-n-1} + e^{\frac{(i d (m-2k) - f (v-2s))^2}{4 c (v-2s)} - \frac{i \pi m}{2} + e i (m-2k)} \Bigg(\sum_{j=0}^{n} 2^{j-n} (f (v-2s) - i d (m-2k))^{n-j}$$

$$(d i (m-2k) - f (v-2s) - 2 c (v-2s) z)^{j+1} \left(\frac{(d i (m-2k) - f (v-2s) - 2 c (v-2s) z)^2}{c (v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{(d i (m-2k) - f (v-2s) - 2 c (v-2s) z)^2}{4 c (v-2s)} \right) \Bigg) (-c (v-2s))^{-n-1} +$$

$$e^{-\frac{(f (v-2s) - i d (m-2k))^2}{4 c (v-2s)} - i e (m-2k) + \frac{i m \pi}{2}} (c (v-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (i d (m-2k) - f (v-2s))^{n-j}$$

$$(-i d (m-2k) + f (v-2s) + 2 c (v-2s) z)^{j+1} \left(-\frac{(-i d (m-2k) + f (v-2s) + 2 c (v-2s) z)^2}{c (v-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d (m-2k) + f (v-2s) + 2 c (v-2s) z)^2}{4 c (v-2s)} \right) +$$

$$e^{-\frac{(d\,i\,(m-2k)+f\,(v-2s))^2}{4\,c\,(v-2s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2k)}\,(c\,(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k)-f\,(v-2s))^{n-j}$$

$$(d\,i\,(m-2k)+f\,(v-2s)+2\,c\,(v-2s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,c\,(v-2s)\,z)^2}{c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,c\,(v-2s)\,z)^2}{4\,c\,(v-2s)}\right)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+$$

$$(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2k)}\,\Gamma(n+1,\,i\,d\,(m-2k)\,z)\,(-i\,d\,(m-2k))^{-n-1}+\right.$$

$$\left.e^{i\,e\,(m-2k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2k)\,z)\right)+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2k))^{-2(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2k))^{-h-j+2n}\right.$$

$$\left(-c\,(v-2k)-2\,f\,\sqrt{z}\;(v-2k)\right)^{h+j}\left(\frac{\left(-c\,(v-2k)-2\,f\,\sqrt{z}\;(v-2k)\right)^2}{f\,(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2k)\right.$$

$$\left(-c\,(v-2k)-2\,f\,\sqrt{z}\;(v-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c\,(v-2k)-2\,f\,\sqrt{z}\;(v-2k)\right)^2}{4\,f\,(v-2k)}\right)-2\,f\,(v-2k)$$

$$\left.\left.\sqrt{\frac{\left(-c\,(v-2k)-2\,f\,\sqrt{z}\;(v-2k)\right)^2}{f\,(v-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c\,(v-2k)-2\,f\,\sqrt{z}\;(v-2k)\right)^2}{4\,f\,(v-2k)}\right)\right)+\right.$$

$$e^{-\frac{c^2\,(v-2k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2k))^{-h-j+2n}\left(c\,(v-2k)+2\,f\,\sqrt{z}\;(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2k)+2\,f\,\sqrt{z}\;(v-2k)\right)^2}{f\,(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2k)\left(c\,(v-2k)+2\,f\,\sqrt{z}\;(v-2k)\right)\Gamma\right($$

$$\frac{1}{2}(h+j+1),-\frac{\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^2}{4f(v-2k)}\Bigg)+2f(v-2k)$$

$$\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^2}{f(v-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2k)+2f\sqrt{z}\,(v-2k)\right)^2}{4f(v-2k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{c^2(v-2s)^2}{4(f(v-2s)-id(m-2k))}-ie(m-2k)+\frac{im\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}$$

$$\left(c(v-2s)+2(f(v-2s)-id(m-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2s)+2(f(v-2s)-id(m-2k))\sqrt{z}\right)^2}{f(v-2s)-id(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(c(v-2s)\left(c(v-2s)+2(f(v-2s)-id(m-2k))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c(v-2s)+2(f(v-2s)-id(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-id(m-2k))}\right)+$$

$$2(f(v-2s)-id(m-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2s)+2(f(v-2s)-id(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-id(m-2k))}\right)$$

$$\sqrt{-\frac{\left(c(v-2s)+2(f(v-2s)-id(m-2k))\sqrt{z}\right)^2}{f(v-2s)-id(m-2k)}}\Bigg)\Bigg)$$

$$(f(v-2s)-id(m-2k))^{-2(n+1)}+e^{-\frac{c^2(v-2s)^2}{4(di(m-2k)+f(v-2s))}-\frac{i\pi m}{2}+ei(m-2k)}(di(m-2k)+f(v-2s))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)+2(di(m-2k)+f(v-2s))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2s)+2(di(m-2k)+f(v-2s))\sqrt{z}\right)^2}{di(m-2k)+f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)-$$

$$c\,(v-2\,s)\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d\,(m-2\,k)-f\,(v-2\,s))}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r)\cosh^v(c\,z^r+f\,z)$

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$$\int z^n\sin^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{n+1}{2},-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{\frac{i\,m\,\pi}{2}}\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},i\,b\,(m-2\,k)\,z^2\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2(v-2\,k)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)$$

$$(-c\,(v-2\,k))^{-n-1}+e^{-\frac{f^2(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}-2\pi m\right)}\left(\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}\right.\right.$$

$$(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^{j+1}\left(-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{c(v-2s)-ib(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{4(c(v-2s)-ib(m-2k))}\right)\right)(c(v-2s)-ib(m-2k))^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-2\pi m\right)}(bi(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}\left(-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-2\pi m\right)}$$

$$(-ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{-ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-ib(m-2k)-c(v-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}-2\pi m\right)}(ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(ib(m-2k)-c(v-2s))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\ b\right) \cosh^v\left(\sqrt{z}\ c + f\ z\right) dz == (-1)^n\, 2^{-m-v+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k\, (m-2k)^{-2(n+1)} \binom{m}{k} \left(e^{-\frac{i m \pi}{2}}\, \Gamma\left(2(n+1),\, -i\, b\, (m-2k)\, \sqrt{z}\right) + e^{\frac{i m \pi}{2}}\, \Gamma\left(2(n+1),\, i\, b\, (m-2k)\, \sqrt{z}\right)\right)\right) b^{-2(n+1)} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (f\,(v-2k))^{-2(n+1)} \left(e^{\frac{c^2 (v-2k)}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c\,(v-2k))^{-h-j+2n} \left(-c\,(v-2k) - 2\, f\, \sqrt{z}\ (v-2k)\right)^{h+j} \right.$$

$$\left(\frac{\left(-c\,(v-2k) - 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-c\,(v-2k) \left(-c\,(v-2k) - 2\, f\, \sqrt{z}\ (v-2k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}(h+j+1),\, \frac{\left(-c\,(v-2k) - 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{4\, f\, (v-2k)} \right) - 2\, f\, (v-2k) \right.$$

$$\left. \sqrt{\frac{\left(-c\,(v-2k) - 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\, \frac{\left(-c\,(v-2k) - 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{4\, f\, (v-2k)} \right) \right) +$$

$$e^{-\frac{c^2 (v-2k)}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(v-2k))^{-h-j+2n} \left(c\,(v-2k) + 2\, f\, \sqrt{z}\ (v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2k) + 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(c\,(v-2k) \left(c\,(v-2k) + 2\, f\, \sqrt{z}\ (v-2k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}(h+j+1),\, -\frac{\left(c\,(v-2k) + 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{4\, f\, (v-2k)} \right) + 2\, f\, (v-2k)\, \Gamma\left(\frac{1}{2}(h+j+2), \right.\right.$$

$$\left.\left. -\frac{\left(c\,(v-2k) + 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{4\, f\, (v-2k)} \right) \sqrt{-\frac{\left(c\,(v-2k) + 2\, f\, \sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)}}\ \right) \right) +$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f(v-2s))^{-2(n+1)}\left(e^{\frac{(-ib(m-2k)-c(v-2s))^2}{4f(v-2s)}+\frac{im\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j\right.$$

$$(-ib(m-2k)-c(v-2s))^{-h-j+2n}\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-ib(m-2k)-c(v-2s))\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2f(v-2s)\sqrt{\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)+e^{\frac{(ib(m-2k)-c(v-2s))^2}{4f(v-2s)}-\frac{i\pi m}{2}}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2k)-c(v-2s))^{-h-j+2n}\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((ib(m-2k)-c(v-2s))\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2f(v-2s)\sqrt{\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\Bigg)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\Bigg)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-\frac{i\,\pi\,m}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)+$$

$$2\,f\,(v-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{f\,(v-2s)}}\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z)$

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$$\int z^n \sin^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{i\,e\,(m-2k)-\frac{i\,m\,\pi}{2}}\,z^{n+1}\,\Gamma\left(\frac{n+1}{2},-i\,b\,(m-2k)\,z^2\right)\left(-i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2k)}\,z^{n+1}\left(i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},i\,b\,(m-2k)\,z^2\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2k)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2k))^{n-j}\,(-f\,(v-2k)-2\,c\,z\,(v-2k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)$$

$$(-c\,(v-2k))^{-n-1}+e^{-\frac{f^2\,(v-2k)}{4\,c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{1}{4}i\left(-\frac{f^2\,(v-2s)^2}{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}-2\,\pi\,m+4\,e\,(m-2k)\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2s))^{n-j}\right.\right.$$

$$\left.\left.(f\,(v-2s)+2\,(c\,(v-2s)-i\,b\,(m-2k))\,z)^{j+1}\left(-\frac{(f\,(v-2s)+2\,(c\,(v-2s)-i\,b\,(m-2k))\,z)^2}{c\,(v-2s)-i\,b\,(m-2k)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{4(c(v-2s)-ib(m-2k))}\right)(c(v-2s)-ib(m-2k))^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-2\pi m+4e(m-2k)\right)}(bi(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}\left(-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-2\pi m+4e(m-2k)\right)}$$

$$(-ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{-ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-ib(m-2k)-c(v-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}-2\pi m+4e(m-2k)\right)}(ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(ib(m-2k)-c(v-2s))}\right)\Bigg)/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz==(-1)^n\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k(m-2k)^{-2(n+1)}\binom{m}{k}\right.$$

$$\left.\left(e^{ie(m-2k)-\frac{im\pi}{2}}\Gamma\left(2(n+1),-ib(m-2k)\sqrt{z}\right)+e^{\frac{im\pi}{2}-ie(m-2k)}\Gamma\left(2(n+1),ib(m-2k)\sqrt{z}\right)\right)\right)b^{-2(n+1)}+$$

$$\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f\,(v-2\,k))^{-2\,(n+1)}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-2\,(n+1)}\left(e^{\frac{(-i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b\,(m-2\,k)-c\,(v-2\,s))\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{\frac{(i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,k)-c\,(v-2\,s))\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b z^r + d z) \cosh^v(c z^r + f z)$

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$$\int z^n \sin^m\left(b z^2 + d z\right) \cosh^v\left(c z^2 + f z\right) dz ==$$

$$\frac{\left(2^{-m-v} z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)(1 - v \bmod 2)}{n+1} - 2^{-m-v-1}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i(2k-m)d^2}{4b}+\frac{i m\pi}{2}}\right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n}(-i d(2k-m))^{n-j}(d i(2k-m)+2 b i z(2k-m))^{j+1}\left(\frac{i(d i(2k-m)+2 b i z(2k-m))^2}{b(2k-m)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i(d i(2k-m)+2 b i z(2k-m))^2}{4 b(2k-m)}\right)\right)(i b(2k-m))^{-n-1} +$$

$$e^{-\frac{i(m-2k)d^2}{4b}-\frac{i m\pi}{2}}(i b(m-2k))^{-n-1}\sum_{j=0}^{n} 2^{j-n}(-i d(m-2k))^{n-j}(d i(m-2k)+2 b i z(m-2k))^{j+1}$$

$$\left(\frac{i(d i(m-2k)+2 b i z(m-2k))^2}{b(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i(d i(m-2k)+2 b i z(m-2k))^2}{4 b(m-2k)}\right)\Bigg) -$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{f^2(2k-v)}{4c}}\left(\sum_{j=0}^{n} 2^{j-n}(-f(2k-v))^{n-j}(f(2k-v)+2 c z(2k-v))^{j+1}\right.\right.$$

$$\left.\left(-\frac{(f(2k-v)+2 c z(2k-v))^2}{c(2k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f(2k-v)+2 c z(2k-v))^2}{4 c(2k-v)}\right)\right)(c(2k-v))^{-n-1} +$$

$$e^{-\frac{f^2(v-2k)}{4c}}(c(v-2k))^{-n-1}\sum_{j=0}^{n} 2^{j-n}(-f(v-2k))^{n-j}(f(v-2k)+2 c z(v-2k))^{j+1}$$

$$\left(-\frac{(f(v-2k)+2 c z(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f(v-2k)+2 c z(v-2k))^2}{4 c(v-2k)}\right)\Bigg) -$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d i(2k-m)+f(2s-v))^2}{4(b i(2k-m)+c(2s-v))}+\frac{i m\pi}{2}}\left(\sum_{j=0}^{n} 2^{j-n}(-i d(2k-m)-f(2s-v))^{n-j}\right.\right.$$

$$(d i(2k-m)+f(2s-v)+2(b i(2k-m)+c(2s-v))z)^{j+1}$$

$$\left(-(d i(2k-m)+f(2s-v)+2(b i(2k-m)+c(2s-v))z)^2 / (b i(2k-m)+c(2s-v))\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d i(2k-m)+f(2s-v)+2(b i(2k-m)+c(2s-v))z)^2}{4(b i(2k-m)+c(2s-v))}\right)\right)$$

$$(b\,i\,(2\,k-m)+c\,(2\,s-v))^{-n-1}+e^{-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v))^2}{4\,(b\,i\,(m-2\,k)+c\,(2\,s-v))}-\frac{i\,\pi\,m}{2}}\,(b\,i\,(m-2\,k)+c\,(2\,s-v))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(2\,s-v))^{n-j}\,(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^2}{b\,i\,(m-2\,k)+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^2}{4\,(b\,i\,(m-2\,k)+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s))^2}{4\,(b\,i\,(2\,k-m)+c\,(v-2\,s))}+\frac{i\,m\,\pi}{2}}\,(b\,i\,(2\,k-m)+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^2}{b\,i\,(2\,k-m)+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^2}{4\,(b\,i\,(2\,k-m)+c\,(v-2\,s))}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,(b\,i\,(m-2\,k)+c\,(v-2\,s))}-\frac{i\,m\,\pi}{2}}\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2}{b\,i\,(m-2\,k)+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2}{4\,(b\,i\,(m-2\,k)+c\,(v-2\,s))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^{n-1}\,2^{-m-2\,n-v-1}\,d^{-2\,n-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$(2\,k-m)^{-2\,n-2}\left(e^{-\frac{i\,(2\,k-m)\,b^2}{4\,d}+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(2\,k-m))^{-h-j+2\,n}\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^2}{d\,(2\,k-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(2\,k-m)\left(b\,i\,(2\,k-m)+\right.\right.$$

$$2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)+2\,d\,i\,(2\,k-m)$$

$$\sqrt{\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{d\,(2\,k-m)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)\Bigg)+$$

$$e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}}\,\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+2),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f\,(2\,k-v))^{-2\,n-2}\Bigg(e^{-\frac{c^2\,(2\,k-v)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^{h+j}\left(-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(c\,(2\,k-v)\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{4\,f\,(2\,k-v)}\right)+2\,f\,(2\,k-$$

$$v)\sqrt{-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{f\,(2\,k-v)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{4\,f\,(2\,k-v)}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\Bigg)+2\,f\,(v-2\,k)$$

$$\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\Bigg(e^{-\frac{(b\,i\,(2\,s-m)+c\,(2\,k-v))^2}{4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))}+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\Bigg(-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\Bigg)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(2\,s-m)+c\,(2\,k-v))\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)$$

$$\Gamma\Bigg(\frac{1}{2}\,(h+j+1),\,-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/$$

$$\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\right)\Bigg)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))$$

$$\Gamma\Bigg(\frac{1}{2}\,(h+j+2),\,-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/$$

$$\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\right)\Bigg)\sqrt{\Bigg(-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\Bigg)}\Bigg)\Bigg)$$

$$(d\,i\,(2\,s-m)+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}-\frac{i\,m\,\pi}{2}}\,(d\,i\,(m-2\,s)+f\,(2\,k-v))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(m-2\,s)+c\,(2\,k-v)\right)\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\right)\right)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\right)\right)\sqrt{\left(-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)\right)}+$$

$$e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}+\frac{i\,m\,\pi}{2}}\,(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(v-2\,k)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(2\,s-m)+c\,(v-2\,k)\right)\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\right)\right)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\right)\right)\sqrt{\left(-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(v-2\,k)\right)\right)}+$$

$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}-\frac{i\,m\,\pi}{2}}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(v-2\,k)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(m-2\,s)+c\,(v-2\,k)\right)\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/}$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n \sin^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{i\,(2\,k-m)\,d^2}{4\,b}+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}$$

$$\Bigg(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m))^{n-j}\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^{j+1}\left(\frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{4\,b\,(2\,k-m)}\right)\Bigg)(i\,b\,(2\,k-m))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{f^2\,(2\,k-v)}{4\,c}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,k-v))^{n-j}\,(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^{j+1}$$

$$\left(-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{4\,c\,(2\,k-v)}\right)\Bigg)(c\,(2\,k-v))^{-n-1}+$$

$$e^{-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d\,i\,(2k-m)+f\,(2s-v))^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}+e\,i\,(2k-m)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m)-f\,(2s-v))^{n-j}\right.\right.$$
$$(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^{j+1}$$
$$\left(-(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2\Big/(b\,i\,(2k-m)+c\,(2s-v))\right)^{\frac{1}{2}(-j-1)}$$
$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}\right)\right)\right.$$
$$(b\,i\,(2k-m)+c\,(2s-v))^{-n-1}+e^{-\frac{(d\,i\,(m-2k)+f\,(2s-v))^2}{4\,(b\,i\,(m-2k)+c\,(2s-v))}+e\,i\,(m-2k)-\frac{i\,\pi\,m}{2}}\,(b\,i\,(m-2k)+c\,(2s-v))^{-n-1}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k)-f\,(2s-v))^{n-j}\,(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^2}{b\,i\,(m-2k)+c\,(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^2}{4\,(b\,i\,(m-2k)+c\,(2s-v))}\right)+$$
$$e^{-\frac{(d\,i\,(2k-m)+f\,(v-2s))^2}{4\,(b\,i\,(2k-m)+c\,(v-2s))}+e\,i\,(2k-m)+\frac{i\,m\,\pi}{2}}\,(b\,i\,(2k-m)+c\,(v-2s))^{-n-1}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m)-f\,(v-2s))^{n-j}\,(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^2}{b\,i\,(2k-m)+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^2}{4\,(b\,i\,(2k-m)+c\,(v-2s))}\right)+$$
$$e^{-\frac{(d\,i\,(m-2k)+f\,(v-2s))^2}{4\,(b\,i\,(m-2k)+c\,(v-2s))}+e\,i\,(m-2k)-\frac{i\,m\,\pi}{2}}\,(b\,i\,(m-2k)+c\,(v-2s))^{-n-1}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k)-f\,(v-2s))^{n-j}\,(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{b\,i\,(m-2k)+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{4\,(b\,i\,(m-2k)+c\,(v-2s))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^{n-1}\,2^{-m-2\,n-v-1}\,d^{-2\,n-2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$(2\,k-m)^{-2\,n-2}\left(e^{-\frac{i\,(2\,k-m)\,b^2}{4\,d}+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(2\,k-m))^{-h-j+2\,n}\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{d\,(2\,k-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(2\,k-m)\left(b\,i\,(2\,k-m)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)+2\,d\,i\,(2\,k-m)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{d\,(2\,k-m)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)\right)+\right.$$

$$e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(2k-v))^{-2n-2}\left(e^{-\frac{c^2(2k-v)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(2k-v))^{-h-j+2n}\right.$$

$$\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^{h+j}\left(-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c(2k-v)\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{4f(2k-v)}\right)+2f(2k-\right.$$

$$\left.v)\sqrt{-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{f(2k-v)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{4f(2k-v)}\right)\right)+$$

$$e^{-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c(v-2k)\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)+2f(v-2k)$$

$$\left.\left.\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{(bi(2s-m)+c(2k-v))^2}{4(di(2s-m)+f(2k-v))}+ei(2s-m)+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(bi(2s-m)+c(2k-v))^{-h-j+2n}\right.\right.$$

$$\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\left(bi(2s-m)+c(2k-v)+\right.\right.$$

$$\left.\left.2(di(2s-m)+f(2k-v))\sqrt{z}\right)^2\Big/(di(2s-m)+f(2k-v))\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(bi(2s-m)+c(2k-v)\right)\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$
$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(2\,s-m)+f\,(2\,k-v))\Big)\Big)\Big)$$

$$(d\,i\,(2\,s-m)+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(d\,i\,(m-2\,s)+f\,(2\,k-v))^{-2\,n-2}$$
$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$
$$\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^{h+j}\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$
$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$
$$\Big((b\,i\,(m-2\,s)+c\,(2\,k-v))\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$
$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)\Big)+$$

$$e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}+e\,i\,(2\,s-m)+\frac{i\,m\,\pi}{2}}\,(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$
$$(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^{h+j}$$
$$\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$
$$\Big((b\,i\,(2\,s-m)+c\,(v-2\,k))\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)}+$$

$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+e\,i\,(m-2\,s)-\frac{i\,m\,\pi}{2}}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/\right.$$

$$\left.(d\,i\,(m-2\,s)+f\,(v-2\,k))\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\sin^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Big(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\Big)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{\frac{f^2\,(v-2\,k)}{4\,c}-g\,(v-2\,k)}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)$$

$$(-c\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{(-id(m-2k)-f(v-2s))^2}{4c(v-2s)}-g(v-2s)+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(di(m-2k)+f(v-2s))^{n-j}\right.$$

$$(-id(m-2k)-f(v-2s)-2c(v-2s)z)^{j+1}\left(\frac{(-id(m-2k)-f(v-2s)-2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-id(m-2k)-f(v-2s)-2c(v-2s)z)^2}{4c(v-2s)}\right)\right)$$

$$(-c(v-2s))^{-n-1}+e^{\frac{(id(m-2k)-f(v-2s))^2}{4c(v-2s)}-g(v-2s)-\frac{im\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}(f(v-2s)-id(m-2k))^{n-j}\right.$$

$$(di(m-2k)-f(v-2s)-2c(v-2s)z)^{j+1}\left(\frac{(di(m-2k)-f(v-2s)-2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(di(m-2k)-f(v-2s)-2c(v-2s)z)^2}{4c(v-2s)}\right)\right)(-c(v-2s))^{-n-1}+$$

$$e^{-\frac{(f(v-2s)-id(m-2k))^2}{4c(v-2s)}+g(v-2s)+\frac{im\pi}{2}}(c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(id(m-2k)-f(v-2s))^{n-j}$$

$$(-id(m-2k)+f(v-2s)+2c(v-2s)z)^{j+1}\left(-\frac{(-id(m-2k)+f(v-2s)+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-id(m-2k)+f(v-2s)+2c(v-2s)z)^2}{4c(v-2s)}\right)+$$

$$e^{-\frac{(di(m-2k)+f(v-2s))^2}{4c(v-2s)}+g(v-2s)-\frac{im\pi}{2}}(c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-id(m-2k)-f(v-2s))^{n-j}$$

$$(di(m-2k)+f(v-2s)+2c(v-2s)z)^{j+1}\left(-\frac{(di(m-2k)+f(v-2s)+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(di(m-2k)+f(v-2s)+2c(v-2s)z)^2}{4c(v-2s)}\right)\right);n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m(d\,z)\cosh^v\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2(v-2s)^2}{4(f(v-2s)-i\,d(m-2k))}+g(v-2s)+\frac{i\,m\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\right.\right.$$

$$\left(c(v-2s)+2(f(v-2s)-i\,d(m-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2s)+2(f(v-2s)-i\,d(m-2k))\sqrt{z}\right)^2}{f(v-2s)-i\,d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c(v-2s)\left(c(v-2s)+2(f(v-2s)-i\,d(m-2k))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c(v-2s)+2(f(v-2s)-i\,d(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-i\,d(m-2k))}\right)+$$

$$2(f(v-2s)-i\,d(m-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2s)+2(f(v-2s)-i\,d(m-2k))\sqrt{z}\right)^2}{4(f(v-2s)-i\,d(m-2k))}\right)$$

$$\left.\left.\sqrt{-\frac{\left(c(v-2s)+2(f(v-2s)-i\,d(m-2k))\sqrt{z}\right)^2}{f(v-2s)-i\,d(m-2k)}}\right)\right)$$

$$(f(v-2s)-i\,d(m-2k))^{-2(n+1)}+e^{-\frac{c^2(v-2s)^2}{4(d\,i(m-2k)+f(v-2s))}+g(v-2s)-\frac{i\,m\pi}{2}}(d\,i(m-2k)+f(v-2s))^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)+2(d\,i(m-2k)+f(v-2s))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2s)+2(d\,i(m-2k)+f(v-2s))\sqrt{z}\right)^2}{d\,i(m-2k)+f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c(v-2s)\left(c(v-2s)+2(d\,i(m-2k)+f(v-2s))\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c(v-2s)+2(d\,i(m-2k)+f(v-2s))\sqrt{z}\right)^2}{4(d\,i(m-2k)+f(v-2s))}\right)+\right.$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\,\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)-$$

$$c\,(v-2\,s)\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{-\frac{\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d(m-2k)-f(v-2s))}\right)-$$

$$c(v-2s)\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2(i\,d(m-2k)-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d(m-2k)-f(v-2s))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3560.01

$$\int z^n\sin^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+$$

$$(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2k)}\,\Gamma(n+1,\,i\,d\,(m-2k)\,z)\,(-i\,d\,(m-2k))^{-n-1}+\right.$$

$$\left.e^{i\,e\,(m-2k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2k)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2(v-2k)}{4c}-g(v-2k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f(v-2k))^{n-j}\,(-f(v-2k)-2\,c\,z(v-2k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f(v-2k)-2\,c\,z(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f(v-2k)-2\,c\,z(v-2k))^2}{4\,c(v-2k)}\right)\right)$$

$$(-c(v-2k))^{-n-1}+e^{g(v-2k)-\frac{f^2(v-2k)}{4c}}\,(c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f(v-2k))^{n-j}\,(f(v-2k)+2\,c\,z(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f(v-2k)+2\,c\,z(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f(v-2k)+2\,c\,z(v-2k))^2}{4\,c(v-2k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(-i\,d(m-2k)-f(v-2s))^2}{4c(v-2s)}-i\,e\,(m-2k)-g(v-2s)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2k)+f(v-2s))^{n-j}\right.\right.$$

$$\left.\left.(-i\,d\,(m-2k)-f(v-2s)-2\,c\,(v-2s)\,z)^{j+1}\left(\frac{(-i\,d\,(m-2k)-f(v-2s)-2\,c\,(v-2s)\,z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-i\,d\,(m-2\,k))^{n-j}\right.$$

$$(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f\,(v-2\,s)-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)+g\,(v-2\,s)}(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+$$

$$(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+\right.$$

$$\left.e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}+g\,(v-2\,s)-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\right.$$

$$\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\right.$$

$$\left.\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\right.$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)+$$

$$2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}}\right)(f\,(v-2\,s)-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}+g\,(v-2\,s)-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)-i\,e\,(m-2\,k)+\frac{i\,m\,\pi}{2}}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)+$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d\,(m-2k)-f\,(v-2s))}-g\,(v-2\,s)-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)}\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)^{-2(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^n \sin^m\left(b\,z^2\right) \cosh^v\left(c\,z^2+f\,z+g\right) dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i m \pi}{2}}\,\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2k)\,z^2\right)\left(-i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{\frac{i m \pi}{2}}\left(i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2k)\,z^2\right)\right) -$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2(v-2k)}{4c}-g(v-2k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2k))^{n-j}\,(-f\,(v-2k)-2\,c\,z\,(v-2k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)$$

$$(-c\,(v-2k))^{-n-1}+e^{g(v-2k)-\frac{f^2(v-2k)}{4c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right) -$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}+4g\,i\,(v-2s)-2\pi m\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2s))^{n-j}\right.\right.$$

$$(f\,(v-2s)+2\,(c\,(v-2s)-i\,b\,(m-2k))\,z)^{j+1}\left(-\frac{(f\,(v-2s)+2\,(c\,(v-2s)-i\,b\,(m-2k))\,z)^2}{c\,(v-2s)-i\,b\,(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2s)+2\,(c\,(v-2s)-i\,b\,(m-2k))\,z)^2}{4\,(c\,(v-2s)-i\,b\,(m-2k))}\right)\right)(c\,(v-2s)-i\,b\,(m-2k))^{-n-1}+\right.$$

$$e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)-2\pi m\right)}\,(b\,i\,(m-2k)+c\,(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2s))^{n-j}$$

$$(f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^{j+1}\left(-\frac{(f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{b\,i\,(m-2k)+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{4\,(b\,i\,(m-2k)+c\,(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)-2\pi m\right)}\right.$$

$$(-i\,b\,(m-2k)-c\,(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2s))^{n-j}\,(2\,(-i\,b\,(m-2k)-c\,(v-2s))\,z-f\,(v-2s))^{j+1}$$

$$\left(-\frac{(2(-i b(m-2k)-c(v-2s))z-f(v-2s))^2}{-i b(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-i b(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-i b(m-2k)-c(v-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}+4gi(v-2s)-2\pi m\right)}(i b(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(i b(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(i b(m-2k)-c(v-2s))z-f(v-2s))^2}{i b(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(i b(m-2k)-c(v-2s))z-f(v-2s))^2}{4(i b(m-2k)-c(v-2s))}\right)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sin^m\left(\sqrt{z}\ b\right)\cosh^v\left(\sqrt{z}\ c+g+f z\right)dz==(-1)^n\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k(m-2k)^{-2(n+1)}\binom{m}{k}\left(e^{-\frac{i m\pi}{2}}\Gamma\left(2(n+1),-i b(m-2k)\sqrt{z}\right)+e^{\frac{i m\pi}{2}}\Gamma\left(2(n+1),i b(m-2k)\sqrt{z}\right)\right)\right)b^{-2(n+1)}+$$

$$\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(v-2k))^{-2(n+1)}\left(e^{\frac{c^2(v-2k)}{4f}-g(v-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c(v-2k)\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{4f(v-2k)}\right)-2f(v-2k)$$

$$\left.\sqrt{\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{f(v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c(v-2k)-2f\sqrt{z}\ (v-2k)\right)^2}{4f(v-2k)}\right)\right)+$$

$$e^{g(v-2k)-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}\ (v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-2\,(n+1)}\left(e^{\frac{(-i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b\,(m-2\,k)-c\,(v-2\,s))\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\left.\right)+e^{\frac{(i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-\frac{i\,\pi\,m}{2}-g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,k)-c\,(v-2\,s))\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-\frac{i\,\pi\,m}{2}+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{2}}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{2}}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{2}}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{2}}{f\,(v-2\,s)}}\right)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \sin^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^{n}\sin^{m}\left(b\,z^{2}+e\right)\cosh^{v}\left(c\,z^{2}+f\,z+g\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,z^{n+1}\,\Gamma\left(\frac{n+1}{2},-i\,b\,(m-2\,k)\,z^{2}\right)\left(-i\,b\,(m-2\,k)\,z^{2}\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,z^{n+1}\left(i\,b\,(m-2\,k)\,z^{2}\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},i\,b\,(m-2\,k)\,z^{2}\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^{2}\,(v-2\,k)}{4\,c}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{2}}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{2}}{4\,c\,(v-2\,k)}\right)\right)$$

$$\left.(-c\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)-\frac{f^{2}\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}\right)$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}+4gi(v-2s)-2\pi m+4e(m-2k)\right)}\Bigg(\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^{j+1}\left(-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{c(v-2s)-ib(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{4(c(v-2s)-ib(m-2k))}\right)\Bigg)(c(v-2s)-ib(m-2k))^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)-2\pi m+4e(m-2k)\right)}(bi(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}\left(-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)+$$

$$e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)-2\pi m+4e(m-2k)\right)}(-ib(m-2k)-c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{-ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-ib(m-2k)-c(v-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}+4gi(v-2s)-2\pi m+4e(m-2k)\right)}(ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(ib(m-2k)-c(v-2s))}\right)\Bigg);n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g+f\ z\right)dz == (-1)^n\, 2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-2\,(n+1)}\binom{m}{k}\right.$$

$$\left.\left(e^{i\,e\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,\Gamma\left(2\,(n+1),\,-i\,b\,(m-2\,k)\,\sqrt{z}\right)+e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\right)\right)b^{-2\,(n+1)}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f\,(v-2\,k))^{-2\,(n+1)}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\ (v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\ (v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\ (v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\ (v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\ (v-2\,k)\right)^2}{f\,(v-2\,k)}}\right)\right)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f(v-2s))^{-2(n+1)}\left(e^{\frac{(-ib(m-2k)-c(v-2s))^2}{4f(v-2s)}-ie(m-2k)-g(v-2s)+\frac{im\pi}{2}}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib(m-2k)-c(v-2s))^{-h-j+2n}\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-ib(m-2k)-c(v-2s))\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2f(v-2s)\sqrt{\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)+e^{\frac{(ib(m-2k)-c(v-2s))^2}{4f(v-2s)}-\frac{i\pi m}{2}+ei(m-2k)-g(v-2s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2k)-c(v-2s))^{-h-j+2n}\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((ib(m-2k)-c(v-2s))\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}-i\,e\,(m-2\,k)+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-\frac{i\,\pi\,m}{2}+e\,i\,(m-2\,k)+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)+$$

$$2\,f\,(v-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{f\,(v-2s)}}\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^n \sin^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{i\,(2k-m)\,d^2}{4b}+\frac{i\,m\,\pi}{2}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m))^{n-j}\,(d\,i\,(2k-m)+2\,b\,i\,z\,(2k-m))^{j+1}\left(\frac{i\,(d\,i\,(2k-m)+2\,b\,i\,z\,(2k-m))^2}{b\,(2k-m)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(2k-m)+2\,b\,i\,z\,(2k-m))^2}{4\,b\,(2k-m)}\right)\right)(i\,b\,(2k-m))^{-n-1}+$$

$$e^{-\frac{i\,(m-2k)\,d^2}{4b}-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(d\,i\,(m-2k)+2\,b\,i\,z\,(m-2k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2k)+2\,b\,i\,z\,(m-2k))^2}{b\,(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2k)+2\,b\,i\,z\,(m-2k))^2}{4\,b\,(m-2k)}\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{g\,(2k-v)-\frac{f^2\,(2k-v)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2k-v))^{n-j}\,(f\,(2k-v)+2\,c\,z\,(2k-v))^{j+1}\right.$$

$$\left.\left(-\frac{(f\,(2k-v)+2\,c\,z\,(2k-v))^2}{c\,(2k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2k-v)+2\,c\,z\,(2k-v))^2}{4\,c\,(2k-v)}\right)\right)(c\,(2k-v))^{-n-1}+$$

$$e^{g\,(v-2k)-\frac{f^2\,(v-2k)}{4c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(di(2k-m)+f(2s-v))^2}{4(bi(2k-m)+c(2s-v))}+g(2s-v)+\frac{im\pi}{2}}\Bigg(\sum_{j=0}^{n}2^{j-n}(-idi(2k-m)-f(2s-v))^{n-j}$$

$$(di(2k-m)+f(2s-v)+2(bi(2k-m)+c(2s-v))z)^{j+1}$$

$$\left(-(di(2k-m)+f(2s-v)+2(bi(2k-m)+c(2s-v))z)^2\Big/(bi(2k-m)+c(2s-v))\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(di(2k-m)+f(2s-v)+2(bi(2k-m)+c(2s-v))z)^2}{4(bi(2k-m)+c(2s-v))}\right)\Bigg)$$

$$(bi(2k-m)+c(2s-v))^{-n-1}+e^{-\frac{(di(m-2k)+f(2s-v))^2}{4(bi(m-2k)+c(2s-v))}+g(2s-v)-\frac{i\pi m}{2}}(bi(m-2k)+c(2s-v))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-idi(m-2k)-f(2s-v))^{n-j}(di(m-2k)+f(2s-v)+2(bi(m-2k)+c(2s-v))z)^{j+1}$$

$$\left(-\frac{(di(m-2k)+f(2s-v)+2(bi(m-2k)+c(2s-v))z)^2}{bi(m-2k)+c(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(di(m-2k)+f(2s-v)+2(bi(m-2k)+c(2s-v))z)^2}{4(bi(m-2k)+c(2s-v))}\right)+$$

$$e^{-\frac{(di(2k-m)+f(v-2s))^2}{4(bi(2k-m)+c(v-2s))}+g(v-2s)+\frac{im\pi}{2}}(bi(2k-m)+c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-idi(2k-m)-f(v-2s))^{n-j}(di(2k-m)+f(v-2s)+2(bi(2k-m)+c(v-2s))z)^{j+1}$$

$$\left(-\frac{(di(2k-m)+f(v-2s)+2(bi(2k-m)+c(v-2s))z)^2}{bi(2k-m)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(di(2k-m)+f(v-2s)+2(bi(2k-m)+c(v-2s))z)^2}{4(bi(2k-m)+c(v-2s))}\right)+$$

$$e^{-\frac{(di(m-2k)+f(v-2s))^2}{4(bi(m-2k)+c(v-2s))}+g(v-2s)-\frac{im\pi}{2}}(bi(m-2k)+c(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-idi(m-2k)-f(v-2s))^{n-j}(di(m-2k)+f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}$$

$$\left(-\frac{(di(m-2k)+f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(di(m-2k)+f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(\sqrt{z}\ c + g + f\,z\right) dz ==$$

$$\frac{\left(2^{-m-v}\, z^{n+1}\right) \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} + (-1)^{n-1}\, 2^{-m-2n-v-1}\, d^{-2n-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$(2k-m)^{-2n-2} \left(e^{-\frac{i\,(2k-m)\,b^2}{4d} + \frac{i\,m\,\pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(2k-m))^{-h-j+2n} \left(b\,i\,(2k-m) + 2\,d\,i\,\sqrt{z}\ (2k-m)\right)^{h+j} \right.$$

$$\left(\frac{i \left(b\,i\,(2k-m) + 2\,d\,i\,\sqrt{z}\ (2k-m)\right)^2}{d\,(2k-m)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\,i\,(2k-m) \left(b\,i\,(2k-m) + \right.\right.$$

$$\left. 2\,d\,i\,\sqrt{z}\ (2k-m)\right) \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i \left(b\,i\,(2k-m) + 2\,d\,i\,\sqrt{z}\ (2k-m)\right)^2}{4\,d\,(2k-m)} \right) + 2\,d\,i\,(2k-m)$$

$$\left. \left. \sqrt{\frac{i \left(b\,i\,(2k-m) + 2\,d\,i\,\sqrt{z}\ (2k-m)\right)^2}{d\,(2k-m)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i \left(b\,i\,(2k-m) + 2\,d\,i\,\sqrt{z}\ (2k-m)\right)^2}{4\,d\,(2k-m)} \right) \right) +$$

$$e^{-\frac{i\,(m-2k)\,b^2}{4d} - \frac{i\,m\,\pi}{2}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(m-2k))^{-h-j+2n} \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^{h+j}$$

$$\left(\frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left(b\,i\,(m-2k) \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)} \right) + \right.$$

$$2\,d\,i\,(m-2k) \sqrt{\frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)}}\ \Gamma\left(\right.$$

$$\left. \left. \left. \frac{1}{2}(h+j+2),\ \frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)} \right) \right) \right) +$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(2k-v))^{-2n-2}\left(e^{g(2k-v)-\frac{c^2(2k-v)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(2k-v))^{-h-j+2n}\right.$$

$$\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^{h+j}\left(-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c(2k-v)\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{4f(2k-v)}\right)+2f(2k-\right.$$

$$\left.v)\sqrt{-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{f(2k-v)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{4f(2k-v)}\right)\right)+$$

$$e^{g(v-2k)-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c(v-2k)\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)+2f(v-2k)$$

$$\left.\left.\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{(bi(2s-m)+c(2k-v))^2}{4(di(2s-m)+f(2k-v))}+g(2k-v)+\frac{im\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(bi(2s-m)+c(2k-v))^{-h-j+2n}\right.\right.$$

$$\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\left(bi(2s-m)+c(2k-v)+\right.\right.$$

$$\left.\left.2(di(2s-m)+f(2k-v))\sqrt{z}\right)^2\Big/(di(2s-m)+f(2k-v))\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(bi(2s-m)+c(2k-v)\right)\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(2\,s-m)+f\,(2\,k-v))\Big)\Big)\Big)$$

$$(d\,i\,(2\,s-m)+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}+g\,(2\,k-v)-\frac{i\,m\,\pi}{2}}\,(d\,i\,(m-2\,s)+f\,(2\,k-v))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^{h+j}\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(m-2\,s)+c\,(2\,k-v))\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)\Big)+$$

$$e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}+g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}\,(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^{h+j}$$

$$\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(2\,s-m)+c\,(v-2\,k))\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)}+$$

$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+g\,(v-2\,k)-\frac{i\,m\,\pi}{2}}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(v-2\,k))\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sin^m(b\,z^r+d\,z+e)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^n\sin^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{i\,(2\,k-m)\,d^2}{4\,b}+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m))^{n-j}\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{4\,b\,(2\,k-m)}\right)\Bigg)$$

$$(i\,b\,(2\,k-m))^{-n-1}+e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{g\,(2\,k-v)-\frac{f^2\,(2\,k-v)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,k-v))^{n-j}\,(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^{j+1}\right.$$

$$\left.\left(-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{4\,c\,(2\,k-v)}\right)\right)(c\,(2\,k-v))^{-n-1}+$$

$$e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d\,i\,(2\,k-m)+f\,(2\,s-v))^2}{4\,(b\,i\,(2\,k-m)+c\,(2\,s-v))}+e\,i\,(2\,k-m)+g\,(2\,s-v)+\frac{i\,m\,\pi}{2}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m)-f\,(2\,s-v))^{n-j}\,(d\,i\,(2\,k-m)+f\,(2\,s-v)+2\,(b\,i\,(2\,k-m)+c\,(2\,s-v))\,z)^{j+1}\right.$$

$$\left(-(d\,i\,(2\,k-m)+f\,(2\,s-v)+2\,(b\,i\,(2\,k-m)+c\,(2\,s-v))\,z)^2\Big/(b\,i\,(2\,k-m)+c\,(2\,s-v))\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2\,k-m)+f\,(2\,s-v)+2\,(b\,i\,(2\,k-m)+c\,(2\,s-v))\,z)^2}{4\,(b\,i\,(2\,k-m)+c\,(2\,s-v))}\right)\right)$$

$$(b\,i\,(2\,k-m)+c\,(2\,s-v))^{-n-1}+e^{-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v))^2}{4\,(b\,i\,(m-2\,k)+c\,(2\,s-v))}+e\,i\,(m-2\,k)+g\,(2\,s-v)-\frac{i\,\pi\,m}{2}}\,(b\,i\,(m-2\,k)+c\,(2\,s-v))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(2\,s-v))^{n-j}\,(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^2}{b\,i\,(m-2\,k)+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^2}{4\,(b\,i\,(m-2\,k)+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s))^2}{4\,(b\,i\,(2\,k-m)+c\,(v-2\,s))}+e\,i\,(2\,k-m)+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\,(b\,i\,(2\,k-m)+c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m)-f\,(v-2\,s))^{n-j}\,(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^2}{b\,i\,(2\,k-m)+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^2}{4\,(b\,i\,(2\,k-m)+c\,(v-2\,s))}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,(b\,i\,(m-2\,k)+c\,(v-2\,s))}+e\,i\,(m-2\,k)+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}\,(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2}{b\,i\,(m-2\,k)+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2}{4\,(b\,i\,(m-2\,k)+c\,(v-2\,s))}\right)\Bigg) /; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sin^m\left(\sqrt{z}\;b+e+d\,z\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^{n-1}\,2^{-m-2\,n-v-1}\,d^{-2\,n-2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$(2\,k-m)^{-2\,n-2}\left(e^{-\frac{i\,(2\,k-m)\,b^2}{4\,d}+e\,i\,(2\,k-m)+\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(2\,k-m))^{-h-j+2\,n}\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^2}{d\,(2\,k-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(2\,k-m)\left(b\,i\,(2\,k-m)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)+2\,d\,i\,(2\,k-m)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^2}{d\,(2\,k-m)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)\right)+$$

$$e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}+e\,i\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}\,(h+j+2),\;\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-\nu-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}(f\,(2\,k-\nu))^{-2\,n-2}\left(\right.$$

$$e^{g\,(2\,k-\nu)-\frac{c^2\,(2\,k-\nu)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-\nu))^{-h-j+2\,n}$$

$$\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\;(2\,k-\nu)\right)^{h+j}\left(-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\;(2\,k-\nu)\right)^2}{f\,(2\,k-\nu)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(2\,k-\nu)\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\;(2\,k-\nu)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\;(2\,k-\nu)\right)^2}{4\,f\,(2\,k-\nu)}\right)+2\,f\,(2\,k-\right.$$

$$\left.\left.\nu)\sqrt{-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\;(2\,k-\nu)\right)^2}{f\,(2\,k-\nu)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\;(2\,k-\nu)\right)^2}{4\,f\,(2\,k-\nu)}\right)\right)+$$

$$e^{g\,(\nu-2\,k)-\frac{c^2\,(\nu-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,k))^{-h-j+2\,n}\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\;(\nu-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\;(\nu-2\,k)\right)^2}{f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(\nu-2\,k)\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\;(\nu-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\;(\nu-2\,k)\right)^2}{4\,f\,(\nu-2\,k)}\right)+\right.$$

$$2\,f\,(v-2\,k)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^s\binom{m}{s}\left(e^{-\frac{(b\,i\,(2\,s-m)+c\,(2\,k-v))^2}{4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))}+e\,i\,(2\,s-m)+g\,(2\,k-v)+\frac{i\,m\,\pi}{2}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(2\,k-v))^{-h-j+2\,n}\right.\right.$$

$$\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+\right.\right.$$

$$\left.\left.2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(2\,s-m)+c\,(2\,k-v))\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\right)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\right)\sqrt{\left(-\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+\right.\right.\right.$$

$$\left.\left.\left.2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\right)}\Bigg)\Bigg)$$

$$\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}+e\,i\,(m-2\,s)+g\,(2\,k-v)-\frac{i\,m\,\pi}{2}}$$

$$\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+\right.\right.$$

$$\left.\left.2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,s)+c\,(2\,k-v))\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\right)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$
$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)\Big)+$$
$$e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}+e\,i\,(2\,s-m)+g\,(v-2\,k)+\frac{i\,m\,\pi}{2}}(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$
$$(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^{h+j}$$
$$\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$
$$\Big((b\,i\,(2\,s-m)+c\,(v-2\,k))\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}(h+j+1),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))$$
$$\Gamma\Big(\frac{1}{2}(h+j+2),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+$$
$$2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)\Big)+$$
$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+e\,i\,(m-2\,s)+g\,(v-2\,k)-\frac{i\,m\,\pi}{2}}(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$
$$(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^{h+j}$$
$$\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$
$$\Big((b\,i\,(m-2\,s)+c\,(v-2\,k))\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}(h+j+2),$$
$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$
$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving cos and power

Involving $z^{\alpha-1}\cos(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3570.01

$$\int z^{\alpha-1}\cos(c\,z)\cosh^{\nu}(a\,z)\,dz == -2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(\alpha,-i\,c\,z)\,(-i\,c\,z)^{-\alpha}+(i\,c\,z)^{-\alpha}\,\Gamma(\alpha,i\,c\,z)\right)(1-\nu \bmod 2)\,z^{\alpha}-$$

$$2^{-\nu-1}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Big(\Gamma(\alpha,(-i\,c-2\,a\,s+a\,\nu)\,z)\,((-i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}+((i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c-2\,a\,s+a\,\nu)\,z)+$$

$$\left(\Gamma(\alpha,(-i\,c+2\,a\,s-a\,\nu)\,z)\,((-i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}+((i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c+2\,a\,s-a\,\nu)\,z)\right)\Big)\;/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.3571.01

$$\int z^{n}\cos(c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{2}\left(1+e^{-2\,a\,z}\right)^{-\nu}n!\cosh^{\nu}(a\,z)$$

$$\left(e^{i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\ldots,\frac{-i\,c-a\,\nu}{2\,a},-\nu;\frac{-i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{-i\,c-a\,\nu}{2\,a}+1;-e^{-2\,a\,z}\right)+\right.$$

$$\left.e^{-i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\ldots,\frac{i\,c-a\,\nu}{2\,a},-\nu;\frac{i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{i\,c-a\,\nu}{2\,a}+1;-e^{-2\,a\,z}\right)\right)\;/;\;n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.3572.01

$$\int z^{\alpha-1}\cos(d+c\,z)\cosh^{\nu}(a\,z)\,dz ==$$

$$-2^{-\nu-1}\,e^{-i\,d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,i\,d}\,\Gamma(\alpha,-i\,c\,z)\,(-i\,c\,z)^{-\alpha}+(i\,c\,z)^{-\alpha}\,\Gamma(\alpha,i\,c\,z)\right)(1-\nu \bmod 2)\,z^{\alpha}-2^{-\nu-1}\,e^{-i\,d}\,z^{\alpha}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Big(e^{2\,i\,d}\,\Gamma(\alpha,(-i\,c-2\,a\,s+a\,\nu)\,z)\,((-i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}+((i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c-2\,a\,s+a\,\nu)\,z)+$$

$$\left(e^{2\,i\,d}\,\Gamma(\alpha,(-i\,c+2\,a\,s-a\,\nu)\,z)\,((-i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}+\right.$$
$$\left.((i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c+2\,a\,s-a\,\nu)\,z)\right)\Big)\;/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.3573.01

$$\int z^{n}\cos(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{2}\left(1+e^{-2\,a\,z}\right)^{-\nu}n!\cosh^{\nu}(a\,z)$$

$$\left(e^{i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\ldots,\frac{-i\,c-a\,\nu}{2\,a},-\nu;\frac{-i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{-i\,c-a\,\nu}{2\,a}+1;-e^{-2\,a\,z}\right)+\right.$$

$$\left.e^{-i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\ldots,\frac{i\,c-a\,\nu}{2\,a},-\nu;\frac{i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{i\,c-a\,\nu}{2\,a}+1;-e^{-2\,a\,z}\right)\right)\;/;\;n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.3574.01

$$\int z^{\alpha-1}\cos(c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$-2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(\Gamma(\alpha,-i\,c\,z)(-i\,c\,z)^{-\alpha}+(i\,c\,z)^{-\alpha}\Gamma(\alpha,i\,c\,z))(1-\nu\bmod 2)\,z^{\alpha}-2^{-\nu-1}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}$$

$$\left(e^{4\,b\,s}\,\Gamma(\alpha,(-i\,c-2\,a\,s+a\,\nu)\,z)((-i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}+e^{4\,b\,s}((i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}\Gamma(\alpha,(i\,c-2\,a\,s+a\,\nu)\,z)+e^{2\,b\,\nu}\right.$$
$$\left.(\Gamma(\alpha,(-i\,c+2\,a\,s-a\,\nu)\,z)((-i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}+((i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\Gamma(\alpha,(i\,c+2\,a\,s-a\,\nu)\,z))\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3575.01

$$\int z^{n}\cos(c\,z)\cosh^{\nu}(b+a\,z)\,dz==\frac{1}{2}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}n!\cosh^{\nu}(b+a\,z)$$

$$\left(e^{-i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\ldots,\frac{i\,c-a\,\nu}{2\,a},-\nu;\frac{i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)+\right.$$
$$e^{i\,c\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}$$
$$\left.{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\ldots,\frac{-i\,c-a\,\nu}{2\,a},-\nu;\frac{-i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{-i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^{\alpha-1}\cos(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.3576.01

$$\int z^{\alpha-1}\cos(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz==-2^{-\nu-1}\,e^{-i\,d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,i\,d}\,\Gamma(\alpha,-i\,c\,z)(-i\,c\,z)^{-\alpha}+(i\,c\,z)^{-\alpha}\Gamma(\alpha,i\,c\,z)\right)(1-\nu\bmod 2)\,z^{\alpha}-$$

$$2^{-\nu-1}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-i\,d-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(e^{2\,i\,d+4\,b\,s}\,\Gamma(\alpha,(-i\,c-2\,a\,s+a\,\nu)\,z)((-i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}+\right.$$
$$e^{4\,b\,s}((i\,c-2\,a\,s+a\,\nu)\,z)^{-\alpha}\Gamma(\alpha,(i\,c-2\,a\,s+a\,\nu)\,z)+e^{2\,b\,\nu}\left(e^{2\,i\,d}\,\Gamma(\alpha,(-i\,c+2\,a\,s-a\,\nu)\,z)\right.$$
$$\left.\left.((-i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}+((i\,c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\Gamma(\alpha,(i\,c+2\,a\,s-a\,\nu)\,z)\right)\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.3577.01

$$\int z^{n}\cos(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz==\frac{1}{2}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}n!\cosh^{\nu}(b+a\,z)$$

$$\left(e^{-i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,c-a\,\nu}{2\,a},\ldots,\frac{i\,c-a\,\nu}{2\,a},-\nu;\frac{i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)+\right.$$
$$e^{i\,(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(i\,c+a\,\nu)^{-j-1}}{(n-j)!}$$
$$\left.{}_{j+2}F_{j+1}\left(\frac{-i\,c-a\,\nu}{2\,a},\ldots,\frac{-i\,c-a\,\nu}{2\,a},-\nu;\frac{-i\,c-a\,\nu}{2\,a}+1,\ldots,\frac{-i\,c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)/;\,n\in\mathbb{N}$$

Involving $z^n \cos(b z^r) \cosh^v(c z)$

01.20.21.3578.01

$$\int z^n \cos\left(b z^2\right) \cosh^v(c z)\, dz ==$$

$$-2^{-v-2}\binom{v}{\frac{v}{2}}\left(\Gamma\left(\frac{n+1}{2}, -i b z^2\right)\left(-i b z^2\right)^{\frac{1}{2}(-n-1)} + \left(i b z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2}, i b z^2\right)\right)(1 - v \bmod 2)\, z^{n+1} -$$

$$2^{-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{i c^2 (v-2k)^2}{4b}}\left(\sum_{j=0}^{n} 2^{j-n}(c(v-2k))^{n-j}(-c(v-2k)-2 i b z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i(-c(v-2k)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{i(-c(v-2k)-2 i b z)^2}{4b}\right)\right)(-i b)^{-n-1} +$$

$$e^{-\frac{i c^2 (v-2k)^2}{4b}}\left(\sum_{j=0}^{n} 2^{j-n}(-c(v-2k))^{n-j}(c(v-2k)-2 i b z)^{j+1}\left(-\frac{i(c(v-2k)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2}, -\frac{i(c(v-2k)-2 i b z)^2}{4b}\right)\right)(-i b)^{-n-1} + (i b)^{-n-1} e^{\frac{i c^2 (v-2k)^2}{4b}}\sum_{j=0}^{n} 2^{j-n}(c(v-2k))^{n-j}$$

$$(2 i b z - c(v-2k))^{j+1}\left(\frac{i(2 i b z - c(v-2k))^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i(2 i b z - c(v-2k))^2}{4b}\right) +$$

$$(i b)^{-n-1} e^{\frac{c^2 i (v-2k)^2}{4b}}\sum_{j=0}^{n} 2^{j-n}(-c(v-2k))^{n-j}(c(v-2k)+2 i b z)^{j+1}\left(\frac{i(c(v-2k)+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i(c(v-2k)+2 i b z)^2}{4b}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3579.01

$$\int z^n \cos\left(b\sqrt{z}\right) \cosh^v(c z)\, dz ==$$

$$(-1)^n 2^{-v}\binom{v}{\frac{v}{2}}\left(\Gamma\left(2(n+1), -i b\sqrt{z}\right) + \Gamma\left(2(n+1), i b\sqrt{z}\right)\right)(1 - v \bmod 2)\, b^{-2(n+1)} + 2^{-2n-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c(v-2k))^{-2(n+1)}\binom{v}{k}$$

$$\left(e^{-\frac{b^2}{4c(v-2k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-i b)^{-h-j+2n}\left(-i b - 2c(v-2k)\sqrt{z}\right)^{h+j}\left(\frac{\left(-i b - 2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{b^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,c\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+2\,c\,(v-2\,k)\right.$$

$$\left.\sqrt{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}\ \left(\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)\right)$$

Involving $z^n \cos(b z^r + e) \cosh^v(c z)$

01.20.21.3580.01

$$\int z^n \cos\left(b z^2 + e\right) \cosh^v(c z)\, dz ==$$

$$-2^{-v-2} \binom{v}{\frac{v}{2}} \left(e^{i e}\, \Gamma\left(\frac{n+1}{2}, -i b z^2\right) \left(-i b z^2\right)^{\frac{1}{2}(-n-1)} + e^{-i e} \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - v \bmod 2)\, z^{n+1} -$$

$$2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{i c^2 (v-2k)^2}{4b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (c(v-2k))^{n-j} (-c(v-2k) - 2 i b z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{i (-c(v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-c(v-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i c^2 (v-2k)^2}{4b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (-c(v-2k))^{n-j} (c(v-2k) - 2 i b z)^{j+1} \left(-\frac{i (c(v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (c(v-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} + (i b)^{-n-1} e^{\frac{c^2 i (v-2k)^2}{4b} + i e} \sum_{j=0}^{n} 2^{j-n} (c(v-2k))^{n-j}$$

$$(2 i b z - c(v-2k))^{j+1} \left(\frac{i (2 i b z - c(v-2k))^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (2 i b z - c(v-2k))^2}{4b}\right) +$$

$$(i b)^{-n-1} e^{\frac{c^2 i (v-2k)^2}{4b} + i e} \sum_{j=0}^{n} 2^{j-n} (-c(v-2k))^{n-j} (c(v-2k) + 2 i b z)^{j+1} \left(\frac{i (c(v-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (c(v-2k) + 2 i b z)^2}{4b}\right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3581.01

$$\int z^n \cos\left(\sqrt{z}\ b + e\right) \cosh^v(c z)\, dz ==$$

$$(-1)^n 2^{-v} \binom{v}{\frac{v}{2}} \left(e^{i e}\, \Gamma\left(2(n+1), -i b \sqrt{z}\right) + e^{-i e}\, \Gamma\left(2(n+1), i b \sqrt{z}\right)\right) (1 - v \bmod 2)\, b^{-2(n+1)} +$$

$$2^{-2n-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (c(v-2k))^{-2(n+1)} \binom{v}{k}$$

$$\left(e^{-\frac{b^2}{4c(v-2k)} - i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b)^{-h-j+2n} \left(-i b - 2c(v-2k)\sqrt{z}\right)^{h+j} \left(\frac{\left(-i b - 2c(v-2k)\sqrt{z}\right)^2}{c(v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{b^2}{4\,c\,(v-2\,k)}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{\frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,c\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,c\,(v-2\,k)}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+2\,c\,(v-2\,k)\right.$$

$$\left.\sqrt{\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \left(\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(i\,b+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)\right)$$

Involving $z^n \cos\left(b z^r + d z\right) \cosh^v(c z)$

01.20.21.3582.01

$$\int z^n \cos\left(b z^2 + d z\right) \cosh^v(c z)\, dz == -2^{-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(e^{\frac{i d^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + \right.$$

$$(i b)^{-n-1} e^{-\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b} \right) -$$

$$2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{i (-i d + c (v-2k))^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d - c (v-2k))^{n-j} (-i d + c (v-2k) - 2 i b z)^{j+1} \right. \right.$$

$$\left(-\frac{i (-i d + c (v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d + c (v-2k) - 2 i b z)^2}{4 b} \right) \Bigg) (-i b)^{-n-1} +$$

$$e^{-\frac{i (-i d - c (v-2k))^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d + c (v-2k))^{n-j} (-i d - c (v-2k) - 2 i b z)^{j+1} \right.$$

$$\left. \left(-\frac{i (-i d - c (v-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - c (v-2k) - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} +$$

$$(i b)^{-n-1} e^{\frac{i (i d + c (v-2k))^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d - c (v-2k))^{n-j} (i d + c (v-2k) + 2 i b z)^{j+1}$$

$$\left(\frac{i (i d + c (v-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + c (v-2k) + 2 i b z)^2}{4 b} \right) +$$

$$(i b)^{-n-1} e^{\frac{i (i d - c (v-2k))^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d + c (v-2k))^{n-j} (i d - c (v-2k) + 2 i b z)^{j+1}$$

$$\left. \left. \left(\frac{i (i d - c (v-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d - c (v-2k) + 2 i b z)^2}{4 b} \right) \right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3583.01

$$\int z^n \cos\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}(c\,z)\,dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2\,(n+1)}+$$

$$2^{-2\,n-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{\frac{b^2}{4\,(-i\,d+c\,(\nu-2\,k))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d+c\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d+c\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d+c\,(\nu-2\,k))\right.$$

$$\left.\left.\sqrt{-\frac{\left(-i\,b+2\,(-i\,d+c\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d+c\,(\nu-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b+2\,(-i\,d+c\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+c\,(\nu-2\,k))}\right)-\right.\right.$$

$$i\,b\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+c\,(v-2\,k))}\right)\Bigg)\Bigg)$$

$$(-i\,d+c\,(v-2\,k))^{-2\,(n+1)}+e^{\frac{b^2}{4\,(i\,d+c\,(v-2\,k))}}\,(i\,d+c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}$$

$$\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+c\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+c\,(v-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+c\,(v-2\,k)}}\;(i\,d+c\,(v-2\,k))\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+c\,(v-2\,k))}\Bigg)\Bigg)+$$

$$e^{\frac{b^2}{4\,(-i\,d-c\,(v-2\,k))}}\,(-i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(-i\,d-c\,(v-2\,k))$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-c\,(v-2\,k))}\right)-$$

$$i\,b\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-c\,(v-2\,k))}\right)\Bigg)+$$

$$e^{\frac{b^2}{4\,(i\,d-c\,(v-2\,k))}}\,(i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-c\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-c\,(v-2\,k)}}\,(i\,d-c\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-c\,(v-2\,k))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

01.20.21.3584.01

$$\int z^n \cos\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(c\,z)\,dz == -2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{i\,d^2}{4\,b}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+\right.$$

$$(i\,b)^{-n-1}\,e^{i\,e-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{i\,(-i\,d+c\,(\nu-2\,k))^2}{4\,b}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-c\,(\nu-2\,k))^{n-j}\,(-i\,d+c\,(\nu-2\,k)-2\,i\,b\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-i\,d+c\,(\nu-2\,k)-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d+c\,(\nu-2\,k)-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+$$

$$e^{-\frac{i\,(-i\,d-c\,(\nu-2\,k))^2}{4\,b}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+c\,(\nu-2\,k))^{n-j}\,(-i\,d-c\,(\nu-2\,k)-2\,i\,b\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(-i\,d-c\,(\nu-2\,k)-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d-c\,(\nu-2\,k)-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+$$

$$(i\,b)^{-n-1}\,e^{\frac{i\,(i\,d+c\,(\nu-2\,k))^2}{4\,b}+i\,e}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-c\,(\nu-2\,k))^{n-j}\,(i\,d+c\,(\nu-2\,k)+2\,i\,b\,z)^{j+1}$$

$$\left(\frac{i\,(i\,d+c\,(\nu-2\,k)+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d+c\,(\nu-2\,k)+2\,i\,b\,z)^2}{4\,b}\right)+$$

$$(i\,b)^{-n-1}\,e^{\frac{i\,(i\,d-c\,(\nu-2\,k))^2}{4\,b}+i\,e}\sum_{j=0}^{n}2^{j-n}\,(-i\,d+c\,(\nu-2\,k))^{n-j}\,(i\,d-c\,(\nu-2\,k)+2\,i\,b\,z)^{j+1}$$

$$\left.\left(\frac{i\,(i\,d-c\,(\nu-2\,k)+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d-c\,(\nu-2\,k)+2\,i\,b\,z)^2}{4\,b}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3585.01

$$\int z^n \cos\left(\sqrt{z}\;b+e+d\,z\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,b^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2\,(n+1)}+$$

$$2^{-2\,n-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{b^2}{4\,(-i\,d+c\,(v-2\,k))}-i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d+c\,(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+c\,(v-2\,k))}\right)-$$

$$\left.\left.\left.i\,b\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-i\,b+2\,(-i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+c\,(v-2\,k))}\right)\right)\right)$$

$$(-i\,d+c\,(v-2\,k))^{-2\,(n+1)}+e^{\frac{b^2}{4\,(i\,d+c\,(v-2\,k))}+i\,e}\ (i\,d+c\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+c\,(v-2\,k))}\right)+\right.$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+c\,(v-2\,k)}}\;(i\,d+c\,(v-2\,k))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+2\,(i\,d+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+c\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^{2}}{4\,(-i\,d-c\,(v-2\,k))}-i\,e}\,(-i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d-c\,(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-c\,(v-2\,k))}\right)-$$

$$\left.i\,b\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-c\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^{2}}{4\,(i\,d-c\,(v-2\,k))}+i\,e}\,(i\,d-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d-c\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-c\,(v-2\,k)}}$$

Involving $z^n \cos(b z^r) \cosh^v(f z + g)$

01.20.21.3586.01

$$\int z^n \cos\left(b z^2\right) \cosh^{\nu}(g + f z)\, dz ==$$

$$-2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(\frac{n+1}{2}, -i b z^2\right)\left(-i b z^2\right)^{\frac{1}{2}(-n-1)} + \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right)(1 - \nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-\frac{i f^2 (\nu-2k)^2}{4b} - g(\nu-2k)} \left(\sum_{j=0}^{n} 2^{j-n} (f(\nu-2k))^{n-j} (-f(\nu-2k) - 2 i b z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{i(-f(\nu-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i(-f(\nu-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i f^2 (\nu-2k)^2}{4b} + g(\nu-2k)} \left(\sum_{j=0}^{n} 2^{j-n} (-f(\nu-2k))^{n-j} (f(\nu-2k) - 2 i b z)^{j+1} \left(-\frac{i(f(\nu-2k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i(f(\nu-2k) - 2 i b z)^2}{4b}\right) \right) (-i b)^{-n-1} + (i b)^{-n-1} e^{\frac{f^2 i (\nu-2k)^2}{4b} - g(\nu-2k)} \sum_{j=0}^{n} 2^{j-n} (f(\nu-2k))^{n-j}$$

$$(2 i b z - f(\nu-2k))^{j+1} \left(\frac{i(2 i b z - f(\nu-2k))^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i(2 i b z - f(\nu-2k))^2}{4b}\right) +$$

$$(i b)^{-n-1} e^{\frac{f^2 i (\nu-2k)^2}{4b} + g(\nu-2k)} \sum_{j=0}^{n} 2^{j-n} (-f(\nu-2k))^{n-j} (f(\nu-2k) + 2 i b z)^{j+1}$$

$$\left. \left(\frac{i(f(\nu-2k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i(f(\nu-2k) + 2 i b z)^2}{4b}\right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3587.01

$$\int z^n \cos\left(b \sqrt{z}\right) \cosh^{\nu}(g + f z)\, dz ==$$

$$(-1)^n 2^{-\nu} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2(n+1), -i b \sqrt{z}\right) + \Gamma\left(2(n+1), i b \sqrt{z}\right)\right)(1 - \nu \bmod 2)\, b^{-2(n+1)} + 2^{-2n-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} (f(\nu-2k))^{-2(n+1)}$$

$$\left(e^{-\frac{b^2}{4 f(\nu-2k)} - g(\nu-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b)^{-h-j+2n} \left(-i b - 2 f(\nu-2k)\sqrt{z}\right)^{h+j} \left(\frac{\left(-i b - 2 f(\nu-2k)\sqrt{z}\right)^2}{f(\nu-2k)} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-\right.$$

$$\left.2\,f\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{b^2}{4\,f\,(v-2\,k)}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\right.$$

$$\left.\sqrt{\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)+e^{\frac{b^2}{4\,f\,(v-2\,k)}+g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,f\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,f\,(v-2\,k)}+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\right.$$

$$\left.\sqrt{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}\ \left(\frac{1}{}\right.\right.\qquad\left.\left.\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2\right)\right)$$

Involving $z^n \cos(b z^r + e) \cosh^\nu(f z + g)$

01.20.21.3588.01

$$\int z^n \cos\left(b z^2 + e\right) \cosh^\nu(f z + g)\, dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^{i e}\,\Gamma\left(\frac{n+1}{2}, -i b z^2\right)\left(-i b z^2\right)^{\frac{1}{2}(-n-1)} + e^{-i e}\left(i b z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2}, i b z^2\right)\right)(1 - \nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{i f^2 (\nu-2k)^2}{4b} - g(\nu-2k) - i e}\left(\sum_{j=0}^{n} 2^{j-n}\,(f(\nu-2k))^{n-j}\,(-f(\nu-2k) - 2 i b z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-f(\nu-2k) - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{i\,(-f(\nu-2k) - 2 i b z)^2}{4b}\right)\right)(-i b)^{-n-1} +$$

$$e^{-\frac{i f^2 (\nu-2k)^2}{4b} + g(\nu-2k) - i e}\left(\sum_{j=0}^{n} 2^{j-n}\,(-f(\nu-2k))^{n-j}\,(f(\nu-2k) - 2 i b z)^{j+1}\left(-\frac{i\,(f(\nu-2k) - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2}, -\frac{i\,(f(\nu-2k) - 2 i b z)^2}{4b}\right)\right)(-i b)^{-n-1} + (i b)^{-n-1}\, e^{\frac{f^2\, i\,(\nu-2k)^2}{4b} - g(\nu-2k) + i e}\sum_{j=0}^{n} 2^{j-n}\,(f(\nu-2k))^{n-j}$$

$$(2 i b z - f(\nu-2k))^{j+1}\left(\frac{i\,(2 i b z - f(\nu-2k))^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i\,(2 i b z - f(\nu-2k))^2}{4b}\right) +$$

$$(i b)^{-n-1}\, e^{\frac{f^2\, i\,(\nu-2k)^2}{4b} + g(\nu-2k) + i e}\sum_{j=0}^{n} 2^{j-n}\,(-f(\nu-2k))^{n-j}\,(f(\nu-2k) + 2 i b z)^{j+1}$$

$$\left.\left(\frac{i\,(f(\nu-2k) + 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i\,(f(\nu-2k) + 2 i b z)^2}{4b}\right)\right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3589.01

$$\int z^n \cos\left(\sqrt{z}\ b + e\right) \cosh^\nu(g + f z)\, dz ==$$

$$(-1)^n\, 2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(e^{i e}\,\Gamma\left(2(n+1), -i b\sqrt{z}\right) + e^{-i e}\,\Gamma\left(2(n+1), i b\sqrt{z}\right)\right)(1 - \nu \bmod 2)\, b^{-2(n+1)} +$$

$$2^{-2n-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{b^2}{4 f(\nu-2k)} - i e - g(\nu-2k)}\right.$$

$$\left.\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i b)^{-h-j+2n}\left(-i b - 2 f(\nu-2k)\sqrt{z}\right)^{h+j}\left(\frac{\left(-i b - 2 f(\nu-2k)\sqrt{z}\right)^2}{f(\nu-2k)}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\,\sqrt{\frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)$$

$$(-f\,(v-2\,k))^{-2\,(n+1)}+e^{-\frac{b^2}{4\,f\,(v-2\,k)}+i\,e-g\,(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\,\sqrt{\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(i\,b-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)(-f\,(v-2\,k))^{-2\,(n+1)}+e^{\frac{b^2}{4\,f\,(v-2\,k)}-i\,e+g\,(v-2\,k)}\,(f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,f\,(v-2\,k)\,\sqrt{-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-i\,b\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{\frac{b^2}{4\,f\,(v-2\,k)}+i\,e+g\,(v-2\,k)}\,(f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\right.$$

$$\left.\sqrt{-\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(i\,b+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos\left(b\,z^r+d\,z\right)\cosh^v(f\,z+g)$

01.20.21.3590.01

$$\int z^n \cos\left(b\,z^2+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz == -2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{i\,d^2}{4\,b}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+\right.$$

$$(i\,b)^{-n-1}\,e^{-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{i\,(-i\,d+f\,(\nu-2\,k))^2}{4\,b}+g\,(\nu-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,k))^{n-j}\,(-i\,d+f\,(\nu-2\,k)-2\,i\,b\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-i\,d+f\,(\nu-2\,k)-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d+f\,(\nu-2\,k)-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+$$

$$e^{-\frac{i\,(-i\,d-f\,(\nu-2\,k))^2}{4\,b}-g\,(\nu-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,k))^{n-j}\,(-i\,d-f\,(\nu-2\,k)-2\,i\,b\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(-i\,d-f\,(\nu-2\,k)-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d-f\,(\nu-2\,k)-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+$$

$$(i\,b)^{-n-1}\,e^{\frac{i\,(i\,d+f\,(\nu-2\,k))^2}{4\,b}+g\,(\nu-2\,k)}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,k))^{n-j}\,(i\,d+f\,(\nu-2\,k)+2\,i\,b\,z)^{j+1}$$

$$\left(\frac{i\,(i\,d+f\,(\nu-2\,k)+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d+f\,(\nu-2\,k)+2\,i\,b\,z)^2}{4\,b}\right)+$$

$$(i\,b)^{-n-1}\,e^{\frac{i\,(i\,d-f\,(\nu-2\,k))^2}{4\,b}-g\,(\nu-2\,k)}\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,k))^{n-j}\,(i\,d-f\,(\nu-2\,k)+2\,i\,b\,z)^{j+1}$$

$$\left.\left.\left(\frac{i\,(i\,d-f\,(\nu-2\,k)+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d-f\,(\nu-2\,k)+2\,i\,b\,z)^2}{4\,b}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3591.01

$$\int z^n \cos\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2\,(n+1)}+$$

$$2^{-2\,n-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{b^2}{4\,(-i\,d+f\,(v-2\,k))}+g\,(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d+f\,(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,k))}\right)-$$

$$\left.\left.\left.i\,b\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,k))}\right)\right)\right)\right)$$

$$(-i\,d+f\,(v-2\,k))^{-2\,(n+1)}+e^{\frac{b^2}{4\,(i\,d+f\,(v-2\,k))}+g\,(v-2\,k)}\,(i\,d+f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)+\right.$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}}\;(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)\right)+e^{\frac{b^{2}}{4\,(-i\,d-f\,(v-2\,k))}-g\,(v-2\,k)}$$

$$(-i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d-f\,(v-2\,k))\right.$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d-f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-f\,(v-2\,k))}\right)-$$

$$\left.i\,b\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d-f\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^{2}}{4\,(i\,d-f\,(v-2\,k))}-g\,(v-2\,k)}\,(i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\right.\left(\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d-f\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d-f\,(v-2\,k)}}$$

$$\left(\qquad\qquad\qquad

Involving $z^n \cos\left(b z^r + d z + e\right) \cosh^{\nu}(f z + g)$

01.20.21.3592.01

$$\int z^n \cos\left(b z^2 + d z + e\right) \cosh^{\nu}(g + f z)\, dz == -2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left(e^{\frac{i d^2}{4 b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + \right.$$

$$\left. (i b)^{-n-1} e^{i e - \frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b} \right) \right) -$$

$$2^{-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-\frac{i (-i d + f (\nu - 2 k))^2}{4 b} - i e + g (\nu - 2 k)} \left(\sum_{j=0}^{n} 2^{j-n} (i d - f (\nu - 2 k))^{n-j} (-i d + f (\nu - 2 k) - 2 i b z)^{j+1} \right. \right.$$

$$\left. \left(-\frac{i (-i d + f (\nu - 2 k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d + f (\nu - 2 k) - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} +$$

$$e^{-\frac{i (-i d - f (\nu - 2 k))^2}{4 b} - i e - g (\nu - 2 k)} \left(\sum_{j=0}^{n} 2^{j-n} (i d + f (\nu - 2 k))^{n-j} (-i d - f (\nu - 2 k) - 2 i b z)^{j+1} \right.$$

$$\left. \left(-\frac{i (-i d - f (\nu - 2 k) - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - f (\nu - 2 k) - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} +$$

$$(i b)^{-n-1} e^{\frac{i (i d + f (\nu - 2 k))^2}{4 b} + i e + g (\nu - 2 k)} \sum_{j=0}^{n} 2^{j-n} (-i d - f (\nu - 2 k))^{n-j} (i d + f (\nu - 2 k) + 2 i b z)^{j+1}$$

$$\left(\frac{i (i d + f (\nu - 2 k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + f (\nu - 2 k) + 2 i b z)^2}{4 b} \right) +$$

$$(i b)^{-n-1} e^{\frac{i (i d - f (\nu - 2 k))^2}{4 b} + i e - g (\nu - 2 k)} \sum_{j=0}^{n} 2^{j-n} (-i d + f (\nu - 2 k))^{n-j} (i d - f (\nu - 2 k) + 2 i b z)^{j+1}$$

$$\left. \left(\frac{i (i d - f (\nu - 2 k) + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d - f (\nu - 2 k) + 2 i b z)^2}{4 b} \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3593.01

$$\int z^n \cos\left(\sqrt{z}\, b + e + d\, z\right) \cosh^{\nu}(g + f\, z)\, dz ==$$

$$(-1)^{n-1}\, 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \left(e^{i\,e - \frac{i\,b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b)^{-h-j+2\,n} \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^{h+j} \right.$$

$$\left(\frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\,i \left(i\,b + 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) + \right.$$

$$\left. 2 \sqrt{\frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i \left(i\,b + 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) +$$

$$e^{\frac{i\,b^2}{4\,d} - i\,e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^{h+j} \left(-\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h} \binom{n}{j} \left(-i\,b \left(-i\,b - 2\,i\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) - \right.$$

$$\left. \left. 2\,i\,d \sqrt{-\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i \left(-i\,b - 2\,i\,d\,\sqrt{z}\right)^2}{4\,d} \right) \right) \right) d^{-2\,(n+1)} +$$

$$2^{-2\,n-\nu-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{\frac{b^2}{4\,(-i\,d + f\,(\nu-2\,k))} - i\,e + g\,(\nu-2\,k)} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2\,n} \left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j} \right. \right.$$

$$\left(-\frac{\left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d + f\,(\nu-2\,k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(2\,(-i\,d + f\,(\nu-2\,k)) \right.$$

$$\left. \left. \sqrt{-\frac{\left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d + f\,(\nu-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b + 2\,(-i\,d + f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d + f\,(\nu-2\,k))} \right) - \right.$$

$$i\,b\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,k))}\right)\Bigg)\Bigg)$$

$$(-i\,d+f\,(v-2\,k))^{-2\,(n+1)}+e^{\frac{b^2}{4\,(i\,d+f\,(v-2\,k))}+i\,e+g\,(v-2\,k)}\,(i\,d+f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(b\,i\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}}\;(i\,d+f\,(v-2\,k))\,\Gamma\Bigg(\frac{1}{2}\,(h+j+2),$$

$$-\frac{\left(i\,b+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\Bigg)\Bigg)+e^{\frac{b^2}{4\,(-i\,d-f\,(v-2\,k))}-i\,e-g\,(v-2\,k)}$$

$$(-i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(2\,(-i\,d-f\,(v-2\,k))$$

$$\sqrt{-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d-f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-f\,(v-2\,k))}\right)-$$

$$i\,b\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+2\,(-i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d-f\,(v-2\,k))}\right)\Bigg)+$$

$$e^{\frac{b^2}{4\,(i\,d-f\,(v-2\,k))}+i\,e-g\,(v-2\,k)}\,(i\,d-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-f\,(v-2\,k))}\right)+2\sqrt{-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d-f\,(v-2\,k)}}\,(i\,d-f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{\left(i\,b+2\,(i\,d-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d-f\,(v-2\,k))}\right)\right)\Big/;\,n\in\mathbb{N}\wedge v\in\mathbb{N}^+$$

Involving $z^n \cos(b\,z)\cosh^v(c\,z^r)$

01.20.21.3594.01

$$\int z^n\cos(b\,z)\cosh^v\left(c\,z^2\right)dz==(-1)^n\,2^{-v-1}\binom{v}{\frac{v}{2}}\left(\Gamma(n+1,\,i\,b\,z)\,(-i\,b)^{-n-1}+(i\,b)^{-n-1}\,\Gamma(n+1,\,-i\,b\,z)\right)(1-v\bmod 2)-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{b^2}{4\,c\,(v-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,b)^{n-j}\,(-i\,b-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,b-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,b-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{-\frac{b^2}{4\,c\,(v-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,b)^{n-j}\,(i\,b-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(i\,b-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,b-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{b^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,b)^{n-j}\,(-i\,b+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-i\,b+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,b+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{\frac{b^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,b)^{n-j}\,(i\,b+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(i\,b+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,b+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\Big/;\,n\in\mathbb{N}\wedge v\in\mathbb{N}^+$$

01.20.21.3595.01

$$\int z^n \cos(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{i\,c^2\,(\nu-2\,s)^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(\frac{i\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,i\,b\sqrt{\frac{i\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-c\,(\nu-2\,s)\right.$$

$$\left.\left.\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)+e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,b}}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\left(c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(\nu-2\,s)\left(c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)+2\right.$$

$$\left.\sqrt{\frac{i\left(c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{b}}\;b\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(c\,(\nu-2\,s)+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)+e^{-\frac{i\,c^2\,(\nu-2\,s)^2}{4\,b}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)-2\,i\,b\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c\,(\nu-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-c\,(\nu-2\,s)\left(-c\,(\nu-2\,s)-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-c\,(\nu-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-2\right.$$

$$i\,b\sqrt{-\frac{i\left(-c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-2\right.$$

$$\left.i\,b\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\right)\Bigg)\Bigg)$$

$$b^{-2\,(n+1)}+(-1)^n\,2^{-v-1}\binom{v}{\frac{v}{2}}\left(\Gamma(n+1,\,i\,b\,z)\,(-i\,b)^{-n-1}+(i\,b)^{-n-1}\,\Gamma(n+1,\,-i\,b\,z)\right)$$

(1 −
$v \bmod 2$) /; $n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$

Involving $z^n \cos(d\,z+e) \cosh^v\left(c\,z^r\right)$

01.20.21.3596.01

$$\int z^n \cos(e+d\,z)\cosh^{\nu}\left(c\,z^2\right)dz == (-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{4\,c\,(\nu-2\,s)}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{d^2}{4\,c\,(\nu-2\,s)}+i\,e}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{d^2}{4\,c\,(\nu-2\,s)}-i\,e}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+$$

$$e^{\frac{d^2}{4\,c\,(\nu-2\,s)}+i\,e}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3597.01

$$\int z^n \cos(e+d\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left.\left.\left(2\,i\,d\sqrt{\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-c\,(\nu-2\,s)\right.\right.\right.$$

$$\left(-c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d}+i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{\frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}-i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(-c\,(v-2\,s)\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d$$

$$\sqrt{-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}-i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2$$

$$i\,d\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)$$

$$d^{-2(n+1)} + (-1)^n\, 2^{-\nu-1} \binom{\nu}{\frac{\nu}{2}} \left(e^{-i e}\, \Gamma(n+1,\, i\, d\, z)\, (-i\, d)^{-n-1} + (i\, d)^{-n-1}\, e^{i e}\, \Gamma(n+1,\, -i\, d\, z)\right)$$

$$(1 - \nu \bmod 2) \;/;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1} \cos(b\, z^r) \cosh^{\nu}(c\, z^r)$

01.20.21.3598.01

$$\int z^{\alpha-1} \cos(b\, z^r) \cosh^{\nu}(c\, z^r)\, dz == -\frac{1}{r}\left(2^{-\nu-1}\, z^{\alpha} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(\frac{\alpha}{r},\, -i\, b\, z^r\right) (-i\, b\, z^r)^{-\frac{\alpha}{r}} + (i\, b\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, i\, b\, z^r\right)\right) (1 - \nu \bmod 2) + \right.$$

$$2^{-\nu-1}\, z^{\alpha} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\Gamma\left(\frac{\alpha}{r},\, (-i\, b - 2\, c\, s + c\, \nu)\, z^r\right) ((-i\, b - 2\, c\, s + c\, \nu)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$((i\, b - 2\, c\, s + c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (i\, b - 2\, c\, s + c\, \nu)\, z^r\right) + ((-i\, b + 2\, c\, s - c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (-i\, b + 2\, c\, s - c\, \nu)\, z^r\right) +$$

$$\left.\left.((i\, b + 2\, c\, s - c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (i\, b + 2\, c\, s - c\, \nu)\, z^r\right)\right)\right) /;\; \nu \in \mathbb{N}^+$$

01.20.21.3599.01

$$\int z^n \cos\left(b\, z^2\right) \cosh^{\nu}\left(c\, z^2\right) dz ==$$

$$-2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(\frac{n+1}{2},\, -i\, b\, z^2\right) \left(-i\, b\, z^2\right)^{\frac{1}{2}(-n-1)} + \left(i\, b\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, i\, b\, z^2\right)\right) (1 - \nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu-2}\, z^{n+1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\Gamma\left(\frac{n+1}{2},\, (-i\, b - 2\, c\, s + c\, \nu)\, z^2\right) \left((-i\, b - 2\, c\, s + c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left((i\, b - 2\, c\, s + c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (i\, b - 2\, c\, s + c\, \nu)\, z^2\right) + \left((-i\, b + 2\, c\, s - c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\left.\left.\Gamma\left(\frac{n+1}{2},\, (-i\, b + 2\, c\, s - c\, \nu)\, z^2\right) + \left((i\, b + 2\, c\, s - c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (i\, b + 2\, c\, s - c\, \nu)\, z^2\right)\right) /;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3600.01

$$\int z^n \cos\left(b\, \sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\, c\right) dz == (-1)^n\, 2^{-\nu}\, b^{-2(n+1)} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2\,(n+1),\, -i\, b\, \sqrt{z}\right) + \Gamma\left(2\,(n+1),\, i\, b\, \sqrt{z}\right)\right) (1 - \nu \bmod 2) -$$

$$2^{-\nu} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\Gamma\left(2\,(n+1),\, (-i\, b - 2\, c\, s + c\, \nu)\, \sqrt{z}\right) (-i\, b - 2\, c\, s + c\, \nu)^{-2(n+1)} + \right.$$

$$\Gamma\left(2\,(n+1),\, (i\, b - 2\, c\, s + c\, \nu)\, \sqrt{z}\right) + (-i\, b + 2\, c\, s - c\, \nu)^{-2(n+1)}\, \Gamma\left(2\,(n+1),\, (-i\, b + 2\, c\, s - c\, \nu)\, \sqrt{z}\right) +$$

$$\left.(i\, b + 2\, c\, s - c\, \nu)^{-2(n+1)}\, \Gamma\left(2\,(n+1),\, (i\, b + 2\, c\, s - c\, \nu)\, \sqrt{z}\right)\right) /;\; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1} \cos(b\, z^r + e) \cosh^{\nu}(c\, z^r)$

01.20.21.3601.01

$$\int z^{\alpha-1}\cos(b\,z^r+e)\cosh^\nu(c\,z^r)\,dz ==$$

$$-\frac{1}{r}\left(2^{-\nu-1}\,z^\alpha\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(\frac{\alpha}{r},-i\,b\,z^r\right)(-i\,b\,z^r)^{-\frac{\alpha}{r}}+e^{-i\,e}\,(i\,b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},i\,b\,z^r\right)\right)(1-\nu\bmod 2)+\right.$$

$$2^{-\nu-1}\,z^\alpha\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(\frac{\alpha}{r},(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-i\,e}\,((i\,b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{i\,e}\,((-i\,b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-i\,e}\,((i\,b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3602.01

$$\int z^n\cos\left(b\,z^2+e\right)\cosh^\nu\left(c\,z^2\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(\frac{n+1}{2},-i\,b\,z^2\right)\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-i\,e}\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},i\,b\,z^2\right)\right)(1-\nu\bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(\frac{n+1}{2},(-i\,b-2\,c\,s+c\,\nu)\,z^2\right)\left((-i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-i\,e}\left((i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},(i\,b-2\,c\,s+c\,\nu)\,z^2\right)+e^{i\,e}\left((-i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(-i\,b+2\,c\,s-c\,\nu)\,z^2\right)+$$

$$\left.e^{-i\,e}\left((i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(i\,b+2\,c\,s-c\,\nu)\,z^2\right)\right)/;\,n\in\mathbb{N}\wedge\nu\in\mathbb{N}^+$$

01.20.21.3603.01

$$\int z^n\cos\left(\sqrt{z}\;b+e\right)\cosh^\nu\left(\sqrt{z}\;c\right)dz ==$$

$$(-1)^n\,2^{-\nu}\,b^{-2\,(n+1)}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(2\,(n+1),-i\,b\,\sqrt{z}\right)+e^{-i\,e}\,\Gamma\left(2\,(n+1),i\,b\,\sqrt{z}\right)\right)(1-\nu\bmod 2)-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e}\,\Gamma\left(2\,(n+1),(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)(-i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}+e^{-i\,e}\,(i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)+e^{i\,e}\,(-i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)+$$

$$\left.e^{-i\,e}\,(i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\wedge\nu\in\mathbb{N}^+$$

Involving $z^n\cos\left(b\,z^r+d\,z\right)\cosh^\nu\left(c\,z^r\right)$

01.20.21.3604.01

$$\int z^n \cos\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2\right)dz == -2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{i\,d^2}{4\,b}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+\right.$$

$$(i\,b)^{-n-1}\,e^{-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{i\,d^2}{4(-b+2\,i\,c\,k-i\,c\,\nu)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^{j+1}\left(-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{-i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b+c\,(\nu-2\,k))}\right)\right)(-i\,b+c\,(\nu-2\,k))^{-n-1}+$$

$$e^{\frac{i\,d^2}{4(-b-2\,i\,c\,k+i\,c\,\nu)}}\,(i\,b+c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(i\,b+c\,(\nu-2\,k))}\right)+$$

$$e^{-\frac{i\,d^2}{4(-b-2\,i\,c\,k+i\,c\,\nu)}}\,(-i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{-i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b-c\,(\nu-2\,k))}\right)+$$

$$e^{\frac{i\,d^2}{4(-b+2\,i\,c\,k-i\,c\,\nu)}}\,(i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(i\,b-c\,(\nu-2\,k))}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3605.01

$$\int z^n \cos\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c\right)dz ==$$

$$2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,(i\,d)^{-2\,(n+1)}\left(e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)+$$

$$2^{-2\,n-\nu-2}\,(i\,d)^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{\frac{i\,(i\,b+c\,(\nu-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(\nu-2\,k))^{-h-j+2\,n}\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b+c\,(\nu-2\,k))\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$\left.e^{\frac{i\,(i\,b-c\,(\nu-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(\nu-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b+c\,(v-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b-c\,(v-2\,k))^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos(b z^r + d z + e) \cosh^v(c z^r)$

01.20.21.3606.01

$$\int z^n \cos\left(b z^2 + d z + e\right) \cosh^v\left(c z^2\right) dz == -2^{-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(e^{\frac{i d^2}{4 b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + \right.$$

$$(i b)^{-n-1} e^{i e - \frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b} \right) -$$

$$2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{1}{4} i \left(\frac{d^2}{-b+2 i c k - i c v} + 4 e \right)} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-i b + c (v - 2 k)) z)^{j+1} \right. \right.$$

$$\left(-\frac{(-i d + 2 (-i b + c (v - 2 k)) z)^2}{-i b + c (v - 2 k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-i b + c (v - 2 k)) z)^2}{4 (-i b + c (v - 2 k))} \right)$$

$$(-i b + c (v - 2 k))^{-n-1} + e^{-\frac{1}{4} i \left(-\frac{d^2}{-b - 2 i c k + i c v} - 4 e \right)} (i b + c (v - 2 k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b + c (v - 2 k))$$

$$z)^{j+1} \left(-\frac{(i d + 2 (i b + c (v - 2 k)) z)^2}{i b + c (v - 2 k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b + c (v - 2 k)) z)^2}{4 (i b + c (v - 2 k))} \right) +$$

$$e^{\frac{1}{4} i \left(-\frac{d^2}{-b - 2 i c k + i c v} - 4 e \right)} (-i b - c (v - 2 k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-i b - c (v - 2 k)) z)^{j+1}$$

$$\left(-\frac{(-i d + 2 (-i b - c (v - 2 k)) z)^2}{-i b - c (v - 2 k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-i b - c (v - 2 k)) z)^2}{4 (-i b - c (v - 2 k))} \right) +$$

$$e^{\frac{1}{4} i \left(\frac{d^2}{-b + 2 i c k - i c v} + 4 e \right)} (i b - c (v - 2 k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b - c (v - 2 k)) z)^{j+1}$$

$$\left. \left. \left(-\frac{(i d + 2 (i b - c (v - 2 k)) z)^2}{i b - c (v - 2 k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b - c (v - 2 k)) z)^2}{4 (i b - c (v - 2 k))} \right) \right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3607.01

$$\int z^n \cos\left(\sqrt{z}\ b + e + d z\right) \cosh^v\left(\sqrt{z}\ c\right) dz ==$$

$$2^{-2n-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) (i d)^{-2(n+1)} \left(e^{i e - \frac{i b^2}{4 d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b)^{-h-j+2n} \left(i b + 2 i d \sqrt{z} \right)^{h+j} \right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,b^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)+$$

$$2^{-2\,n-v-2}\,(i\,d)^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{i\,(i\,b+c\,(v-2\,k))^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,(i\,b-c\,(v-2\,k))^2}{4\,d}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b+c\,(v-2\,k))^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b-c\,(v-2\,k))^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos(d\,z)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3608.01

$$\int z^n \cos(d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == (-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{d^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{d^2}{4\,c\,(\nu-2\,s)}+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+$$

$$e^{\frac{d^2}{4\,c\,(\nu-2\,s)}+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3609.01

$$\int z^n \cos(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,d}-g\,(\nu-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left.\left(2\,i\,d\sqrt{\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-c\,(\nu-2\,s)\right.\right.$$

$$\left(-c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(-c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{\frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \ d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(c\,(v-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(-c\,(v-2\,s)\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\,\sqrt{-\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{i\left(-c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d}+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2$$

$$i\,d\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)$$

$$d^{-2\,(n+1)}+(-1)^n\,2^{-v-1}\binom{v}{\frac{v}{2}}\left(\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)$$

$$(1-v \bmod 2)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3610.01

$$\int z^n\cos(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz=$$

$$(-1)^n\,2^{-v-1}\binom{v}{\frac{v}{2}}\left(e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-v \bmod 2)-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{d^2}{4\,c\,(v-2\,s)}-i\,e-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2}{4\,c\,(v-2\,s)}+i\,e-g\,(v-2\,s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(i\,d-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2}{4\,c\,(v-2\,s)}-i\,e+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,c\,(v-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{\frac{d^2}{4\,c\,(v-2\,s)}+i\,e+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,c\,(v-2\,s)\,z)^{j+1}$$

$$\left.\left(-\frac{(i\,d+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)\Bigg)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3611.01

$$\int z^n \cos(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,d}-g\,(\nu-2\,s)+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,i\,d\sqrt{\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-c\,(\nu-2\,s)\right.$$

$$\left.\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(-c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+e^{\frac{c^2\,i\,(\nu-2\,s)^2}{4\,d}+g\,(\nu-2\,s)+i\,e}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(\nu-2\,s)\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\right.$$

$$\left.\sqrt{\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(c\,(\nu-2\,s)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i\,c^2\,(\nu-2\,s)^2}{4\,d}-g\,(\nu-2\,s)-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(\nu-2\,s))^{-h-j+2\,n}\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(\nu-2\,s)\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-c\,(\nu-2\,s)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-c(v-2s)-2id\sqrt{z}\right)^2}{4d}\right)\Bigg)+e^{-\frac{ic^2(v-2s)^2}{4d}+g(v-2s)-ie}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2s))^{-h-j+2n}\left(c(v-2s)-2id\sqrt{z}\right)^{h+j}\left(-\frac{i\left(c(v-2s)-2id\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(c(v-2s)\left(c(v-2s)-2id\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(c(v-2s)-2id\sqrt{z}\right)^2}{4d}\right)-2$$

$$id\sqrt{-\frac{i\left(c(v-2s)-2id\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(c(v-2s)-2id\sqrt{z}\right)^2}{4d}\right)\Bigg)\Bigg)\Bigg)$$

$$d^{-2(n+1)}+(-1)^n2^{-v-1}\binom{v}{\frac{v}{2}}\left(e^{-ie}\Gamma(n+1,id\,z)(-id)^{-n-1}+(id)^{-n-1}e^{ie}\Gamma(n+1,-id\,z)\right)$$

$$(1-v\bmod 2)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.3612.01

$$\int z^{\alpha-1}\cos(b\,z^r)\cosh^v(c\,z^r+g)\,dz==-\frac{1}{r}\Bigg(2^{-v-1}z^\alpha\binom{v}{\frac{v}{2}}\left(\Gamma\left(\frac{\alpha}{r},-ib\,z^r\right)(-ib\,z^r)^{-\frac{\alpha}{r}}+(ib\,z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},ib\,z^r\right)\right)(1-v\bmod 2)+$$

$$2^{-v-1}z^\alpha\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{2gs-gv}\Gamma\left(\frac{\alpha}{r},(-ib-2cs+cv)z^r\right)((-ib-2cs+cv)z^r)^{-\frac{\alpha}{r}}+$$

$$e^{2gs-gv}((ib-2cs+cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(ib-2cs+cv)z^r\right)+e^{gv-2gs}((-ib+2cs-cv)z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-ib+2cs-cv)z^r\right)+e^{gv-2gs}((ib+2cs-cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(ib+2cs-cv)z^r\right)\Bigg)\Bigg)\;/;\;v\in\mathbb{N}^+$$

01.20.21.3613.01

$$\int z^n \cos\left(b\,z^2\right) \cosh^{\nu}\left(c\,z^2+g\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2},\,-i\,b\,z^2\right)\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-2^{-\nu-2}\,z^{n+1}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,g\,s-g\,\nu}\,\Gamma\left(\frac{n+1}{2},\,(-i\,b-2\,c\,s+c\,\nu)\,z^2\right)\left((-i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{2\,g\,s-g\,\nu}\left((i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},\,(i\,b-2\,c\,s+c\,\nu)\,z^2\right)+e^{g\,\nu-2\,g\,s}\left((-i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-i\,b+2\,c\,s-c\,\nu)\,z^2\right)+$$

$$\left.e^{g\,\nu-2\,g\,s}\left((i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b+2\,c\,s-c\,\nu)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3614.01

$$\int z^n \cos\left(b\,\sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\;c+g\right) dz == (-1)^n\,2^{-\nu}\,b^{-2\,(n+1)}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2\,(n+1),\,-i\,b\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,i\,b\,\sqrt{z}\right)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,g\,s-g\,\nu}\,\Gamma\left(2\,(n+1),\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)\left(-i\,b-2\,c\,s+c\,\nu\right)^{-2\,(n+1)}+e^{2\,g\,s-g\,\nu}\left(i\,b-2\,c\,s+c\,\nu\right)^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\,(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)+e^{g\,\nu-2\,g\,s}\left(-i\,b+2\,c\,s-c\,\nu\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(-i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)+$$

$$\left.e^{g\,\nu-2\,g\,s}\left(i\,b+2\,c\,s-c\,\nu\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3615.01

$$\int z^{\alpha-1}\cos(b\,z^r+e)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$-\frac{1}{r}\left(2^{-\nu-1}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(\frac{\alpha}{r},\,-i\,b\,z^r\right)\left(-i\,b\,z^r\right)^{-\frac{\alpha}{r}}+e^{-i\,e}\left(i\,b\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,i\,b\,z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$2^{-\nu-1}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{\alpha}{r},\,(-i\,b-2\,c\,s+c\,\nu)\,z^r\right)\left((-i\,b-2\,c\,s+c\,\nu)\,z^r\right)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-i\,e+2\,g\,s-g\,\nu}\left((i\,b-2\,c\,s+c\,\nu)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(i\,b-2\,c\,s+c\,\nu)\,z^r\right)+e^{i\,e-2\,g\,s+g\,\nu}\left((-i\,b+2\,c\,s-c\,\nu)\,z^r\right)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},\,(-i\,b+2\,c\,s-c\,\nu)\,z^r\right)+e^{-i\,e-2\,g\,s+g\,\nu}\left((i\,b+2\,c\,s-c\,\nu)\,z^r\right)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\,(i\,b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3616.01

$$\int z^n \cos\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(\frac{n+1}{2},\,-i\,b\,z^2\right)\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-i\,e}\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(\frac{n+1}{2},\,(-i\,b-2\,c\,s+c\,\nu)\,z^2\right)\left((-i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$e^{-i\,e+2\,g\,s-g\,\nu}\left((i\,b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b-2\,c\,s+c\,\nu)\,z^2\right)+$$

$$e^{i\,e-2\,g\,s+g\,\nu}\left((-i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-i\,b+2\,c\,s-c\,\nu)\,z^2\right)+$$

$$\left.e^{-i\,e-2\,g\,s+g\,\nu}\left((i\,b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(i\,b+2\,c\,s-c\,\nu)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3617.01

$$\int z^n \cos\left(\sqrt{z}\;b+e\right)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$(-1)^n\,2^{-\nu}\,b^{-2\,(n+1)}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e}\,\Gamma\left(2\,(n+1),\,-i\,b\,\sqrt{z}\right)+e^{-i\,e}\,\Gamma\left(2\,(n+1),\,i\,b\,\sqrt{z}\right)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{i\,e+2\,g\,s-g\,\nu}\,\Gamma\left(2\,(n+1),\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)(-i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}+e^{-i\,e+2\,g\,s-g\,\nu}\,(i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\,(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)+e^{i\,e-2\,g\,s+g\,\nu}\,(-i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)+$$

$$\left.e^{-i\,e-2\,g\,s+g\,\nu}\,(i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(i\,b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^n \cos\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3618.01

$$\int z^n \cos\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == -2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{\frac{i\,d^2}{4\,b}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+\right.$$

$$(i\,b)^{-n-1}\,e^{-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{1}{4}i\left(\frac{d^2}{-b+2\,i\,c\,k-i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{-i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,(-i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b+c\,(\nu-2\,k))}\right)\right)$$

$$(-i\,b+c\,(\nu-2\,k))^{-n-1}+e^{-\frac{1}{4}i\left(-\frac{d^2}{-b-2\,i\,c\,k+i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}(i\,b+c\,(\nu-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^{j+1}\left(-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{i\,b+c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,(i\,b+c\,(\nu-2\,k))\,z)^2}{4\,(i\,b+c\,(\nu-2\,k))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{d^2}{-b-2\,i\,c\,k+i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}(-i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{-i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+2\,(-i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(-i\,b-c\,(\nu-2\,k))}\right)+$$

$$e^{\frac{1}{4}i\left(\frac{d^2}{-b+2\,i\,c\,k-i\,c\,\nu}+4\,g\,i\,(\nu-2\,k)\right)}(i\,b-c\,(\nu-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^{j+1}$$

$$\left.\left.\left(-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{i\,b-c\,(\nu-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+2\,(i\,b-c\,(\nu-2\,k))\,z)^2}{4\,(i\,b-c\,(\nu-2\,k))}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3619.01

$$\int z^n \cos\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,(i\,d)^{-2\,(n+1)}\left(e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)+$$

$$2^{-2\,n-v-2}\,(i\,d)^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{i\,(i\,b+c\,(v-2\,k))^2}{4\,d}+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$\left.e^{\frac{i\,(i\,b-c\,(v-2\,k))^2}{4\,d}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\ d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b+c\,(v-2\,k))^2}{4\,d}+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{-\frac{i(-i\,b-c\,(v-2\,k))^2}{4\,d}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos(b z^r + d z + e) \cosh^v(c z^r + g)$

01.20.21.3620.01

$$\int z^n \cos\left(b z^2 + d z + e\right) \cosh^v\left(c z^2 + g\right) dz == -2^{-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(e^{\frac{i d^2}{4 b} - i e} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b} \right) \right) (-i b)^{-n-1} + \right.$$

$$\left. (i b)^{-n-1} e^{i e - \frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b} \right) \right) -$$

$$2^{-v-2} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{1}{4} i \left(\frac{d^2}{-b+2 i c k - i c v} + 4 e + 4 g i (v-2k) \right)} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-i b + c (v-2k)) z)^{j+1} \right. \right.$$

$$\left. \left(-\frac{(-i d + 2 (-i b + c (v-2k)) z)^2}{-i b + c (v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-i b + c (v-2k)) z)^2}{4 (-i b + c (v-2k))} \right) \right)$$

$$(-i b + c (v-2k))^{-n-1} + e^{-\frac{1}{4} i \left(-\frac{d^2}{-b-2 i c k + i c v} - 4 e + 4 g i (v-2k) \right)} (i b + c (v-2k))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b + c (v-2k)) z)^{j+1} \left(-\frac{(i d + 2 (i b + c (v-2k)) z)^2}{i b + c (v-2k)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b + c (v-2k)) z)^2}{4 (i b + c (v-2k))} \right) +$$

$$e^{\frac{1}{4} i \left(-\frac{d^2}{-b-2 i c k + i c v} - 4 e + 4 g i (v-2k) \right)} (-i b - c (v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d + 2 (-i b - c (v-2k)) z)^{j+1}$$

$$\left(-\frac{(-i d + 2 (-i b - c (v-2k)) z)^2}{-i b - c (v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(-i d + 2 (-i b - c (v-2k)) z)^2}{4 (-i b - c (v-2k))} \right) +$$

$$e^{\frac{1}{4} i \left(\frac{d^2}{-b+2 i c k - i c v} + 4 e + 4 g i (v-2k) \right)} (i b - c (v-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d + 2 (i b - c (v-2k)) z)^{j+1}$$

$$\left. \left(-\frac{(i d + 2 (i b - c (v-2k)) z)^2}{i b - c (v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(i d + 2 (i b - c (v-2k)) z)^2}{4 (i b - c (v-2k))} \right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.3621.01

$$\int z^n \cos\left(\sqrt{z}\, b+e+d\, z\right) \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz ==$$

$$2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,(i\,d)^{-2\,(n+1)}\left(e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$e^{\frac{i\,b^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)+$$

$$2^{-2\,n-\nu-2}\,(i\,d)^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{\frac{i\,(i\,b+c\,(\nu-2\,k))^2}{4\,d}+i\,e+g\,(\nu-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(\nu-2\,k))^{-h-j+2\,n}\right.$$

$$\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b+c\,(\nu-2\,k))\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+c\,(\nu-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$2\sqrt{\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(i\,b+c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{i\,(i\,b-c\,(v-2\,k))^2}{4\,d}+i\,e-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\;d\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(i\,b-c\,(v-2\,k)+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,(-i\,b+c\,(v-2\,k))^2}{4\,d}-i\,e+g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-$$

$$2\,i\,d\sqrt{-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{i\left(-i\,b+c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{-\frac{i\,(-i\,b-c\,(v-2\,k))^2}{4\,d}-i\,e-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,i\,d\sqrt{-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-c\,(v-2\,k)-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3622.01

$$\int z^n \cos(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,s))^{n-j}\,(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{(i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,s))^{n-j}\,(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,s))^{n-j}\,(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+e^{-\frac{(i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,s))^{n-j}\,(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3623.01

$$\int z^n \cos(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == (-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d+f\,(\nu-2\,s))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left.\left.\left(c\,(\nu-2\,s)+2\,(-i\,d+f\,(\nu-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(\nu-2\,s)+2\,(-i\,d+f\,(\nu-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(\nu-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\Bigg)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.\right.$$

$$-\frac{\left(2\left(-i\,d-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d-f\,(v-2\,s)\right)}\Bigg)-c\,(v-2\,s)\left(2\left(-i\,d-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),\,-\frac{\left(2\left(-i\,d-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d-f\,(v-2\,s)\right)}\Bigg)\Bigg)+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d-f\,(v-2\,s))}}$$

$$(i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(i\,d-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d-f\,(v-2\,s)}}\;\Gamma\Bigg(\frac{1}{2}(h+j+2),$$

$$-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(i\,d-f\,(v-2\,s))}\Bigg)-c\,(v-2\,s)\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1),\,-\frac{\left(2\,(i\,d-f\,(v-2\,s))\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(i\,d-f\,(v-2\,s))}\Bigg)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3624.01

$$\int z^n \cos(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,s))^{n-j}\,(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{(i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,s))^{n-j}\,(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-i\,e}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,s))^{n-j}$$

$$(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+e^{-\frac{(i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+i\,e}\,(c\,(\nu-2\,s))^{-n-1}\right.$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,s))^{n-j}\,(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3625.01

$$\int z^n \cos(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d+f\,(\nu-2\,s))}-i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\right)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}+i\,e}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}-i\,e}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-i\,d-f(v-2s))\sqrt{-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{-i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)-c(v-2s)\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)\right)+$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d-f(v-2s))}+i\,e}(i\,d-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2s))^{-h-j+2n}$$

$$\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}\left(-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f(v-2s))\sqrt{-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)-c(v-2s)\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos(b\,z^r)\cosh^v(c\,z^r+f\,z)$

01.20.21.3626.01

$$\int z^n \cos\left(b\,z^2\right) \cosh^{\nu}\left(c\,z^2+f\,z\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2},-i\,b\,z^2\right)\left(-i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(i\,b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},i\,b\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{i\,f^2(\nu-2s)^2}{4(-b+2ics-ic\nu)}}\left(\sum_{j=0}^{n}2^{j-n}\left(-f\,(\nu-2s)\right)^{n-j}\left(f\,(\nu-2s)+2\,(-i\,b+c\,(\nu-2s))\,z\right)^{j+1}\right.\right.$$

$$\left.\left(-\frac{\left(f\,(\nu-2s)+2\,(-i\,b+c\,(\nu-2s))\,z\right)^2}{-i\,b+c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(f\,(\nu-2s)+2\,(-i\,b+c\,(\nu-2s))\,z\right)^2}{4\,(-i\,b+c\,(\nu-2s))}\right)\right)$$

$$\left(-i\,b+c\,(\nu-2s)\right)^{-n-1}+e^{\frac{i\,f^2(\nu-2s)^2}{4(b+2ics-ic\nu)}}\left(i\,b+c\,(\nu-2s)\right)^{-n-1}\sum_{j=0}^{n}2^{j-n}\left(-f\,(\nu-2s)\right)^{n-j}$$

$$\left(f\,(\nu-2s)+2\,(i\,b+c\,(\nu-2s))\,z\right)^{j+1}\left(-\frac{\left(f\,(\nu-2s)+2\,(i\,b+c\,(\nu-2s))\,z\right)^2}{i\,b+c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{\left(f\,(\nu-2s)+2\,(i\,b+c\,(\nu-2s))\,z\right)^2}{4\,(i\,b+c\,(\nu-2s))}\right)+e^{-\frac{i\,f^2(\nu-2s)^2}{4(b+2ics-ic\nu)}}\left(-i\,b-c\,(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f\,(\nu-2s)\right)^{n-j}\left(2\,(-i\,b-c\,(\nu-2s))\,z-f\,(\nu-2s)\right)^{j+1}\left(-\frac{\left(2\,(-i\,b-c\,(\nu-2s))\,z-f\,(\nu-2s)\right)^2}{-i\,b-c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2\,(-i\,b-c\,(\nu-2s))\,z-f\,(\nu-2s)\right)^2}{4\,(-i\,b-c\,(\nu-2s))}\right)+e^{-\frac{i\,f^2(\nu-2s)^2}{4(-b+2ics-ic\nu)}}\left(i\,b-c\,(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f\,(\nu-2s)\right)^{n-j}\left(2\,(i\,b-c\,(\nu-2s))\,z-f\,(\nu-2s)\right)^{j+1}\left(-\frac{\left(2\,(i\,b-c\,(\nu-2s))\,z-f\,(\nu-2s)\right)^2}{i\,b-c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{\left(2\,(i\,b-c\,(\nu-2s))\,z-f\,(\nu-2s)\right)^2}{4\,(i\,b-c\,(\nu-2s))}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3627.01

$$\int z^n \cos\left(b\sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right) dz ==$$

$$(-1)^n\,2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2\,(n+1),-i\,b\sqrt{z}\right)+\Gamma\left(2\,(n+1),i\,b\sqrt{z}\right)\right)(1-\nu \bmod 2)\,b^{-2(n+1)}+2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(f\,(\nu-2s)\right)^{-2(n+1)}$$

$$\binom{\nu}{s}\left(e^{\frac{(-i\,b-c(\nu-2s))^2}{4\,f\,(\nu-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\left(-i\,b-c\,(\nu-2s)\right)^{-h-j+2n}\left(-i\,b-c\,(\nu-2s)-2\,f\,(\nu-2s)\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$2\,f\,(v-2\,s)\,\sqrt{z}\Big)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2 f (v-2 s) \sqrt{-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left. -\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) +$$

$$e^{-\frac{(i b + c (v-2 s))^2}{4 f (v-2 s)}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b + c (v-2 s))^{-h-j+2 n} \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i b + c (v-2 s)) \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left. -\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) + 2 f (v-2 s) \sqrt{-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cos\left(b z^r + e\right) \cosh^v\left(c z^r + f z\right)$

01.20.21.3628.01

$$\int z^n \cos\left(b z^2+e\right) \cosh^{\nu}\left(c z^2+f z\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^{i e}\,\Gamma\left(\frac{n+1}{2},\,-i b z^2\right)\left(-i b z^2\right)^{\frac{1}{2}(-n-1)}+e^{-i e}\left(i b z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i b z^2\right)\right)(1-\nu \bmod 2)\, z^{n+1}-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{1}{4}i\left(-\frac{f^2(\nu-2s)^2}{-b+2ics-ic\nu}+4e\right)}\left(\sum_{j=0}^{n}2^{j-n}\left(-f(\nu-2s)\right)^{n-j}\left(f(\nu-2s)+2\left(-i b+c(\nu-2s)\right)z\right)^{j+1}\right.\right.$$

$$\left.\left(-\frac{\left(f(\nu-2s)+2\left(-i b+c(\nu-2s)\right)z\right)^2}{-i b+c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(f(\nu-2s)+2\left(-i b+c(\nu-2s)\right)z\right)^2}{4\left(-i b+c(\nu-2s)\right)}\right)\right)$$

$$\left(-i b+c(\nu-2s)\right)^{-n-1}+e^{\frac{1}{4}i\left(\frac{f^2(\nu-2s)^2}{b+2ics-ic\nu}+4e\right)}\left(i b+c(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(-f(\nu-2s)\right)^{n-j}\left(f(\nu-2s)+2\left(i b+c(\nu-2s)\right)z\right)^{j+1}\left(-\frac{\left(f(\nu-2s)+2\left(i b+c(\nu-2s)\right)z\right)^2}{i b+c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(f(\nu-2s)+2\left(i b+c(\nu-2s)\right)z\right)^2}{4\left(i b+c(\nu-2s)\right)}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(\nu-2s)^2}{b+2ics-ic\nu}+4e\right)}\left(-i b-c(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(\nu-2s)\right)^{n-j}\left(2\left(-i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^{j+1}\left(-\frac{\left(2\left(-i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{-i b-c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(2\left(-i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{4\left(-i b-c(\nu-2s)\right)}\right)+e^{\frac{1}{4}i\left(-\frac{f^2(\nu-2s)^2}{-b+2ics-ic\nu}+4e\right)}\left(i b-c(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(\nu-2s)\right)^{n-j}\left(2\left(i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^{j+1}\left(-\frac{\left(2\left(i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{i b-c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(2\left(i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{4\left(i b-c(\nu-2s)\right)}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge \nu\in\mathbb{N}^+$$

01.20.21.3629.01

$$\int z^n \cos\left(\sqrt{z}\ b+e\right) \cosh^{\nu}\left(\sqrt{z}\ c+f z\right) dz ==$$

$$(-1)^n\, 2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(e^{i e}\,\Gamma\left(2(n+1),\,-i b\sqrt{z}\right)+e^{-i e}\,\Gamma\left(2(n+1),\,i b\sqrt{z}\right)\right)(1-\nu \bmod 2)\, b^{-2(n+1)}+$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(f(\nu-2s)\right)^{-2(n+1)}\binom{\nu}{s}\left(e^{\frac{(-i b-c(\nu-2s))^2}{4f(\nu-2s)}-i e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\left(-i b-c(\nu-2s)\right)^{-h-j+2n}\right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left.\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+\right.$$

$$2 f (v-2 s) \sqrt{-\frac{\left(-i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(-i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)+$$

$$e^{-\frac{(i b+c (v-2 s))^2}{4 f (v-2 s)}+i e} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b+c (v-2 s))^{-h-j+2 n} \left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i b+c (v-2 s)) \left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)+2 f (v-2 s) \sqrt{-\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cos\left(b z^r + d z\right) \cosh^v\left(c z^r + f z\right)$

01.20.21.3630.01

$$\int z^n \cos\left(b z^2+d z\right) \cosh^v\left(c z^2+f z\right) dz == -2^{-v-2} \binom{v}{\frac{v}{2}} (1-v \bmod 2)$$

$$\left(e^{\frac{i d^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d)^{n-j} (-i d-2 i b z)^{j+1} \left(-\frac{i (-i d-2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d-2 i b z)^2}{4 b}\right)\right) (-i b)^{-n-1} +\right.$$

$$(i b)^{-n-1} e^{-\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n} (-i d)^{n-j} (i d+2 i b z)^{j+1} \left(\frac{i (i d+2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d+2 i b z)^2}{4 b}\right)-$$

$$2^{-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{(-i d+f (2 s-v))^2}{4 (-i b+c (2 s-v))}} \left(\sum_{j=0}^{n} 2^{j-n} (i d-f (2 s-v))^{n-j} (-i d+f (2 s-v)+2 (-i b+c (2 s-v)) z)^{j+1}\right.\right.$$

$$\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{4\,(-i\,b+c\,(2\,s-v))}\right)\Bigg)(-i\,b+c\,(2\,s-v))^{-n-1}+$$

$$e^{-\frac{(i\,d+f\,(2\,s-v))^2}{4\,(i\,b+c\,(2\,s-v))}}(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}\,(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}}(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}\,(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)+$$

$$e^{-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}}(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}\,(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\Bigg)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3631.01

$$\int z^n\cos\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-$$

$$2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)d^{-2\,n-2}+2^{-2\,n-v-2}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{(-i\,b+c\,(2\,k-v))^2}{4\,(-i\,d+f\,(2\,k-v))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-i\,b+c\,(2\,k-v))\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)+2$$

$$(-i\,d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)$$

$$\sqrt{-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}}\Bigg)\Bigg)(-i\,d+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(i\,b+c\,(2\,k-v))^2}{4\,(i\,d+f\,(2\,k-v))}}$$

$$(i\,d+f\,(2\,k-v))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(2\,k-v))\left(i\,b+c\,(2\,k-v)+\right.\right.$$

$$\left.2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}}\,(i\,d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)\right)+e^{-\frac{(-i\,b+c\,(v-2\,k))^{2}}{4\,(-i\,d+f\,(v-2\,k))}}\,(-i\,d+f\,(v-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(-i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}}\right)+e^{-\frac{(i\,b+c\,(v-2\,k))^{2}}{4\,(i\,d+f\,(v-2\,k))}}\,(i\,d+f\,(v-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+\right.\right.$$

$$\left.2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{i\,d+f\,(v-2\,k)}}\right)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \cos\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.3632.01

$$\int z^{n}\cos\left(b\,z^{2}+d\,z+e\right)\cosh^{v}\left(c\,z^{2}+f\,z\right)dz==-2^{-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(e^{\frac{i\,d^{2}}{4\,b}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^{2}}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d-2\,i\,b\,z)^{2}}{4\,b}\right)\right)(-i\,b)^{-n-1}+\right.$$

$$(i\,b)^{-n-1}\,e^{i\,e-\frac{i\,d^{2}}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^{2}}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(i\,d+2\,i\,b\,z)^{2}}{4\,b}\right)-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(-i\,d+f\,(2\,s-v))^{2}}{4\,(-i\,b+c\,(2\,s-v))}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(2\,s-v))^{n-j}\,(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{j+1}\right.\right.$$

$$\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{2}}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{2}}{4\,(-i\,b+c\,(2\,s-v))}\right)\right)(-i\,b+c\,(2\,s-v))^{-n-1}+\right.$$

$$e^{i\,e-\frac{(i\,d+f\,(2\,s-v))^{2}}{4\,(i\,b+c\,(2\,s-v))}}\,(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}\,(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}-i\,e}\,(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}\,(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)+$$

$$e^{i\,e-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}}\,(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}\,(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3633.01

$$\int z^n\cos\left(\sqrt{z}\;b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+\right.$$

$$e^{\frac{i\,b^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)d^{-2\,n-2}+2^{-2\,n-v-2}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{(-i\,b+c\,(2\,k-v))^2}{4\,(-i\,d+f\,(2\,k-v))}-i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(2\,k-v))\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)+2$$

$$(-i\,d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)$$

$$\left.\left.\sqrt{-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}}\right)\right)(-i\,d+f\,(2\,k-v))^{-2\,n-2}+e^{i\,e-\frac{(i\,b+c\,(2\,k-v))^2}{4\,(i\,d+f\,(2\,k-v))}}$$

$$(i\,d+f\,(2\,k-v))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(2\,k-v))\left(i\,b+c\,(2\,k-v)+\right.\right.$$

$$\left.\left.2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(2\,k-v))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+c\,(2\,k-\nu)+2\,(i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{i\,d+f\,(2\,k-\nu)}}\;(i\,d+f\,(2\,k-\nu))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.-\frac{\left(i\,b+c\,(2\,k-\nu)+2\,(i\,d+f\,(2\,k-\nu))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(2\,k-\nu))}\right)+e^{-\frac{(-i\,b+c\,(\nu-2\,k))^2}{4\,(-i\,d+f\,(\nu-2\,k))}-i\,e}\;(-i\,d+f\,(\nu-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(\nu-2\,k))^{-h-j+2\,n}\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(\nu-2\,k))\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(\nu-2\,k))}\right)+$$

$$2\,(-i\,d+f\,(\nu-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(\nu-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,(-i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(\nu-2\,k)}}\right)+e^{i\,e-\frac{(i\,b+c\,(\nu-2\,k))^2}{4\,(i\,d+f\,(\nu-2\,k))}}\;(i\,d+f\,(\nu-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(\nu-2\,k))^{-h-j+2\,n}\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(\nu-2\,k)+2\,(i\,d+f\,(\nu-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(\nu-2\,k))\left(i\,b+c\,(\nu-2\,k)+\right.\right.$$

$$2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\,\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}}\Bigg)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3634.01

$$\int z^n \cos(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,s))^{n-j}\,(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{(i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-g\,(\nu-2\,s)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,s))^{n-j}\,(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\left(\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)(-c\,(\nu-2\,s))^{-n-1}+$$

$$e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,s))^{n-j}\,(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+$$

$$e^{-\frac{(i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,s))^{n-j}\,(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3635.01

$$\int z^n \cos(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz == (-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d+f\,(\nu-2\,s))}+g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\right)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}+g\,(v-2\,s)}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}-g\,(v-2\,s)}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-i\,d-f(v-2s))\sqrt{-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{-i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)-c(v-2s)\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)\right)+$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d-f(v-2s))}-g(v-2s)}(i\,d-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2s))^{-h-j+2n}$$

$$\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}\left(-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f(v-2s))\sqrt{-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)-c(v-2s)\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3636.01

$$\int z^n \cos(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-i\,e-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d+f\,(\nu-2\,s))^{n-j}\,(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{\frac{(i\,d-f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+i\,e-g\,(\nu-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d+f\,(\nu-2\,s))^{n-j}\,(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d-f\,(\nu-2\,s)-2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)$$

$$(-c\,(\nu-2\,s))^{-n-1}+e^{-\frac{(-i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}-i\,e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(\nu-2\,s))^{n-j}$$

$$(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-\frac{(-i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)+e^{-\frac{(i\,d+f\,(\nu-2\,s))^2}{4\,c\,(\nu-2\,s)}+i\,e+g\,(\nu-2\,s)}\,(c\,(\nu-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(\nu-2\,s))^{n-j}\,(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^{j+1}\left(-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{c\,(\nu-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(i\,d+f\,(\nu-2\,s)+2\,c\,(\nu-2\,s)\,z)^2}{4\,c\,(\nu-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

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$$\int z^n \cos(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$(-1)^n\,2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left(e^{-i\,e}\,\Gamma(n+1,\,i\,d\,z)\,(-i\,d)^{-n-1}+(i\,d)^{-n-1}\,e^{i\,e}\,\Gamma(n+1,\,-i\,d\,z)\right)(1-\nu \bmod 2)+$$

$$2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-i\,d+f\,(\nu-2\,s))}+g\,(\nu-2\,s)-i\,e}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,s)}}$$

$$\left.\left.(-i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(-i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(v-2\,s))}\right)\right)\right)$$

$$(-i\,d+f\,(v-2\,s))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d+f\,(v-2\,s))}+g\,(v-2\,s)+i\,e}\,(i\,d+f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,s)}}$$

$$\left.(i\,d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(i\,d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d-f\,(v-2\,s))}-g\,(v-2\,s)-i\,e}\,(-i\,d-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(-i\,d-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(-i\,d-f(v-2s))\sqrt{-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{-i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)-c(v-2s)\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(-i\,d-f(v-2s))}\right)\right)+$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d-f(v-2s))}-g(v-2s)+i\,e}(i\,d-f(v-2s))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c(v-2s))^{-h-j+2n}$$

$$\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^{h+j}\left(-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2(i\,d-f(v-2s))\sqrt{-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{i\,d-f(v-2s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$\left.-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)-c(v-2s)\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+1),-\frac{\left(2(i\,d-f(v-2s))\sqrt{z}-c(v-2s)\right)^2}{4(i\,d-f(v-2s))}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.3638.01

$$\int z^n \cos\left(b z^2\right) \cosh^{\nu}\left(c z^2 + f z + g\right) dz ==$$

$$-2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(\frac{n+1}{2}, -i b z^2\right) \left(-i b z^2\right)^{\frac{1}{2}(-n-1)} + \left(i b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, i b z^2\right)\right) (1 - \nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{1}{4} i \left(-\frac{f^2 (\nu-2s)^2}{-b+2 i c s - i c \nu} + 4 g i (\nu-2s)\right)} \left(\sum_{j=0}^{n} 2^{j-n} (-f(\nu-2s))^{n-j} (f(\nu-2s) + 2(-i b + c(\nu-2s)) z)^{j+1} \right.\right.$$

$$\left. \left(-\frac{(f(\nu-2s) + 2(-i b + c(\nu-2s)) z)^2}{-i b + c(\nu-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f(\nu-2s) + 2(-i b + c(\nu-2s)) z)^2}{4(-i b + c(\nu-2s))}\right) \right)$$

$$(-i b + c(\nu-2s))^{-n-1} + e^{\frac{1}{4} i \left(\frac{f^2 (\nu-2s)^2}{b+2 i c s - i c \nu} - 4 i g (\nu-2s)\right)} (i b + c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (-f(\nu-2s))^{n-j} (f(\nu-2s) + 2(i b + c(\nu-2s)) z)^{j+1} \left(-\frac{(f(\nu-2s) + 2(i b + c(\nu-2s)) z)^2}{i b + c(\nu-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(f(\nu-2s) + 2(i b + c(\nu-2s)) z)^2}{4(i b + c(\nu-2s))}\right) + e^{-\frac{1}{4} i \left(\frac{f^2 (\nu-2s)^2}{b+2 i c s - i c \nu} - 4 i g (\nu-2s)\right)} (-i b - c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (f(\nu-2s))^{n-j} (2(-i b - c(\nu-2s)) z - f(\nu-2s))^{j+1} \left(-\frac{(2(-i b - c(\nu-2s)) z - f(\nu-2s))^2}{-i b - c(\nu-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(-i b - c(\nu-2s)) z - f(\nu-2s))^2}{4(-i b - c(\nu-2s))}\right) + e^{\frac{1}{4} i \left(-\frac{f^2 (\nu-2s)^2}{-b+2 i c s - i c \nu} + 4 g i (\nu-2s)\right)} (i b - c(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (f(\nu-2s))^{n-j} (2(i b - c(\nu-2s)) z - f(\nu-2s))^{j+1} \left(-\frac{(2(i b - c(\nu-2s)) z - f(\nu-2s))^2}{i b - c(\nu-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(2(i b - c(\nu-2s)) z - f(\nu-2s))^2}{4(i b - c(\nu-2s))}\right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3639.01

$$\int z^n \cos\left(b \sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\, c + g + f z\right) dz ==$$

$$(-1)^n 2^{-\nu} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2(n+1), -i b \sqrt{z}\right) + \Gamma\left(2(n+1), i b \sqrt{z}\right)\right) (1 - \nu \bmod 2)\, b^{-2(n+1)} +$$

$$2^{-2n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} (f(\nu-2s))^{-2(n+1)} \binom{\nu}{s} \left(e^{\frac{(-i b - c(\nu-2s))^2}{4 f (\nu-2s)} - g(\nu-2s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b - c(\nu-2s))^{-h-j+2n} \right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left.\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+\right.$$

$$2 f (v-2 s) \sqrt{-\frac{\left(-i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(-i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)+$$

$$e^{-\frac{(i b+c (v-2 s))^2}{4 f (v-2 s)}+g (v-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b+c (v-2 s))^{-h-j+2 n} \left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i b+c (v-2 s)) \left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)+2 f (v-2 s) \sqrt{-\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i b+c (v-2 s)+2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cos\left(b z^r+e\right) \cosh^v\left(c z^r+f z+g\right)$

01.20.21.3640.01

$$\int z^n \cos\left(b z^2+e\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^{i e}\,\Gamma\left(\frac{n+1}{2},\,-i b z^2\right)\left(-i b z^2\right)^{\frac{1}{2}(-n-1)}+e^{-i e}\left(i b z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i b z^2\right)\right)(1-\nu \bmod 2)\, z^{n+1}-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{1}{4}i\left(-\frac{f^2(\nu-2s)^2}{-b+2ics-ic\nu}+4gi(\nu-2s)+4e\right)}\left(\sum_{j=0}^{n}2^{j-n}\left(-f(\nu-2s)\right)^{n-j}\left(f(\nu-2s)+2\left(-i b+c(\nu-2s)\right)z\right)^{j+1}\right.\right.$$

$$\left.\left(-\frac{\left(f(\nu-2s)+2\left(-i b+c(\nu-2s)\right)z\right)^2}{-i b+c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(f(\nu-2s)+2\left(-i b+c(\nu-2s)\right)z\right)^2}{4\left(-i b+c(\nu-2s)\right)}\right)\right)$$

$$\left(-i b+c(\nu-2s)\right)^{-n-1}+e^{\frac{1}{4}i\left(\frac{f^2(\nu-2s)^2}{b+2ics-ic\nu}-4ig(\nu-2s)+4e\right)}\left(i b+c(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(-f(\nu-2s)\right)^{n-j}\left(f(\nu-2s)+2\left(i b+c(\nu-2s)\right)z\right)^{j+1}\left(-\frac{\left(f(\nu-2s)+2\left(i b+c(\nu-2s)\right)z\right)^2}{i b+c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(f(\nu-2s)+2\left(i b+c(\nu-2s)\right)z\right)^2}{4\left(i b+c(\nu-2s)\right)}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(\nu-2s)^2}{b+2ics-ic\nu}-4ig(\nu-2s)+4e\right)}\left(-i b-c(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(\nu-2s)\right)^{n-j}\left(2\left(-i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^{j+1}\left(-\frac{\left(2\left(-i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{-i b-c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(2\left(-i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{4\left(-i b-c(\nu-2s)\right)}\right)+e^{\frac{1}{4}i\left(-\frac{f^2(\nu-2s)^2}{-b+2ics-ic\nu}+4gi(\nu-2s)+4e\right)}\left(i b-c(\nu-2s)\right)^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\left(f(\nu-2s)\right)^{n-j}\left(2\left(i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^{j+1}\left(-\frac{\left(2\left(i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{i b-c(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{\left(2\left(i b-c(\nu-2s)\right)z-f(\nu-2s)\right)^2}{4\left(i b-c(\nu-2s)\right)}\right)\right);\, n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3641.01

$$\int z^n \cos\left(\sqrt{z}\ b+e\right) \cosh^{\nu}\left(\sqrt{z}\ c+f z+g\right) dz ==$$

$$(-1)^n\, 2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(e^{i e}\,\Gamma\left(2(n+1),\,-i b\sqrt{z}\right)+e^{-i e}\,\Gamma\left(2(n+1),\,i b\sqrt{z}\right)\right)(1-\nu \bmod 2)\, b^{-2(n+1)}+$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(f(\nu-2s)\right)^{-2(n+1)}\binom{\nu}{s}\left(e^{\frac{(-i b-c(\nu-2s))^2}{4f(\nu-2s)}-ie-g(\nu-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\left(-i b-c(\nu-2s)\right)^{-h-j+2n}\right.$$

$$\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((-i\,b-c\,(v-2\,s))\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{\frac{(i\,b-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+i\,e-g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)-\right.\right.$$

$$\left.2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-2\,f\,(v-2\,s)$$

$$\left.\sqrt{\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(i\,b-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-i\,e+g\,(v-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((-i\,b+c\,(v-2\,s))\right.$$

$$\left.\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{\left(-i\,b+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+\right.$$

$$2 f (v-2 s) \sqrt{-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{\left(-i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) +$$

$$e^{-\frac{(i b + c (v-2 s))^2}{4 f (v-2 s)} + i e + g (v-2 s)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i b + c (v-2 s))^{-h-j+2 n} \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((i b + c (v-2 s)) \left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right) + 2 f (v-2 s) \sqrt{-\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{f (v-2 s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i b + c (v-2 s) + 2 f (v-2 s) \sqrt{z}\right)^2}{4 f (v-2 s)}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cos\left(b z^r + d z\right) \cosh^v\left(c z^r + f z + g\right)$

01.20.21.3642.01

$$\int z^n \cos\left(b z^2 + d z\right) \cosh^v\left(c z^2 + f z + g\right) dz == -2^{-v-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(e^{\frac{i d^2}{4 b}} \left(\sum_{j=0}^{n} 2^{j-n}\, (i d)^{n-j}\, (-i d - 2 i b z)^{j+1} \left(-\frac{i (-i d - 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i (-i d - 2 i b z)^2}{4 b}\right)\right) (-i b)^{-n-1} +\right.$$

$$(i b)^{-n-1} e^{-\frac{i d^2}{4 b}} \sum_{j=0}^{n} 2^{j-n}\, (-i d)^{n-j}\, (i d + 2 i b z)^{j+1} \left(\frac{i (i d + 2 i b z)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i (i d + 2 i b z)^2}{4 b}\right) -$$

$$2^{-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{g (2 s - v) - \frac{(-i d + f (2 s - v))^2}{4 (-i b + c (2 s - v))}} \left(\sum_{j=0}^{n} 2^{j-n}\, (i d - f (2 s - v))^{n-j}\, (-i d + f (2 s - v) + 2 (-i b + c (2 s - v)) z)^{j+1}\right.\right.$$

$$\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{4\,(-i\,b+c\,(2\,s-v))}\right)\Bigg)(-i\,b+c\,(2\,s-v))^{-n-1}+$$

$$e^{g\,(2\,s-v)-\frac{(i\,d+f\,(2\,s-v))^2}{4\,(i\,b+c\,(2\,s-v))}}(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}\,(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{g\,(v-2\,s)-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}}(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}$$

$$(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)+$$

$$e^{g\,(v-2\,s)-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}}(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}\,(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3643.01

$$\int z^n\cos\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$(-1)^{n-1}\,2^{-2\,n-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\Bigg(e^{-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-$$

$$2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)d^{-2\,n-2}+$$

$$2^{-2\,n-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{g\,(2\,k-v)-\frac{(-i\,b+c\,(2\,k-v))^2}{4\,(-i\,d+f\,(2\,k-v))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-v)+\right.$$

$$\left.2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((-i\,b+c\,(2\,k-v))\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)+2$$

$$(-i\,d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}}\right)\Bigg)(-i\,d+f\,(2\,k-v))^{-2\,n-2}+$$

$$e^{g(2k-v)-\frac{(ib+c(2k-v))^2}{4(id+f(2k-v))}}(id+f(2k-v))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib+c(2k-v))^{-h-j+2n}$$

$$\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{id+f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((ib+c(2k-v))\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{4(id+f(2k-v))}\right)+$$

$$2\sqrt{-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{id+f(2k-v)}}(id+f(2k-v))\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{\left(ib+c(2k-v)+2(id+f(2k-v))\sqrt{z}\right)^2}{4(id+f(2k-v))}\right)\right)+e^{g(v-2k)-\frac{(-ib+c(v-2k))^2}{4(-id+f(v-2k))}}(-id+f(v-2k))^{-2n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib+c(v-2k))^{-h-j+2n}\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^2}{-id+f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-ib+c(v-2k))\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^2}{4(-id+f(v-2k))}\right)+$$

$$2(-id+f(v-2k))\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-ib+c(v-2k)+2(-id+f(v-2k))\sqrt{z}\right)^2}{4(-id+f(v-2k))}\right)$$

$$\sqrt{-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{-i\,d+f\,(v-2\,k)}}\Bigg)+e^{g\,(v-2\,k)-\frac{(i\,b+c\,(v-2\,k))^2}{4\,(i\,d+f\,(v-2\,k))}}\,(i\,d+f\,(v-2\,k))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(\Bigg(i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+\right.$$

$$\left.2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}}\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.3644.01

$$\int z^n\cos\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==-2^{-v-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(e^{\frac{i\,d^2}{4\,b}-i\,e}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d)^{n-j}\,(-i\,d-2\,i\,b\,z)^{j+1}\left(-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d-2\,i\,b\,z)^2}{4\,b}\right)\right)(-i\,b)^{-n-1}+\right.$$

$$(i\,b)^{-n-1}\,e^{i\,e-\frac{i\,d^2}{4\,b}}\sum_{j=0}^{n}2^{j-n}\,(-i\,d)^{n-j}\,(i\,d+2\,i\,b\,z)^{j+1}\left(\frac{i\,(i\,d+2\,i\,b\,z)^2}{b}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(i\,d+2\,i\,b\,z)^2}{4\,b}\right)\Bigg)-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(-i\,d+f\,(2\,s-v))^2}{4\,(-i\,b+c\,(2\,s-v))}-i\,e+g\,(2\,s-v)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(2\,s-v))^{n-j}\,(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{-i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right)$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(2\,s-v)+2\,(-i\,b+c\,(2\,s-v))\,z)^2}{4\,(-i\,b+c\,(2\,s-v))}\right)(-i\,b+c\,(2\,s-v))^{-n-1}+$$

$$e^{-\frac{(i\,d+f\,(2\,s-v))^2}{4\,(i\,b+c\,(2\,s-v))}+i\,e+g\,(2\,s-v)}\,(i\,b+c\,(2\,s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(2\,s-v))^{n-j}$$

$$(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^{j+1}\left(-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{i\,b+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(2\,s-v)+2\,(i\,b+c\,(2\,s-v))\,z)^2}{4\,(i\,b+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(-i\,d+f\,(v-2\,s))^2}{4\,(-i\,b+c\,(v-2\,s))}-i\,e+g\,(v-2\,s)}\,(-i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d-f\,(v-2\,s))^{n-j}$$

$$(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^{j+1}\left(-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{-i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d+f\,(v-2\,s)+2\,(-i\,b+c\,(v-2\,s))\,z)^2}{4\,(-i\,b+c\,(v-2\,s))}\right)+$$

$$e^{-\frac{(i\,d+f\,(v-2\,s))^2}{4\,(i\,b+c\,(v-2\,s))}+i\,e+g\,(v-2\,s)}\,(i\,b+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d-f\,(v-2\,s))^{n-j}$$

$$(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^{j+1}\left(-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{i\,b+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(i\,d+f\,(v-2\,s)+2\,(i\,b+c\,(v-2\,s))\,z)^2}{4\,(i\,b+c\,(v-2\,s))}\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3645.01

$$\int z^n\cos\left(\sqrt{z}\;b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$(-1)^{n-1}\,2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{i\,e-\frac{i\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b)^{-h-j+2\,n}\left(i\,b+2\,i\,d\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\left(i\,b+2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$2\sqrt{\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{d}}\;d\,i\,\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{i\left(i\,b+2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{\frac{i\,b^2}{4\,d}-i\,e}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b)^{-h-j+2\,n}\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(-i\,b\left(-i\,b-2\,i\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)-$$

$$2\,i\,d\sqrt{-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{i\left(-i\,b-2\,i\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)d^{-2\,n-2}+$$

$$2^{-2\,n-v-2}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{(-i\,b+c\,(2\,k-v))^2}{4\,(-i\,d+f\,(2\,k-v))}-i\,e+g\,(2\,k-v)}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(-i\,b+c\,(2\,k-v)+\right.$$

$$\left.2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg((-i\,b+c\,(2\,k-v))\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\;-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)+2$$

$$(-i\,d+f\,(2\,k-v))\,\Gamma\left(\frac{1}{2}(h+j+2),\;-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{4\,(-i\,d+f\,(2\,k-v))}\right)$$

$$\sqrt{-\frac{\left(-i\,b+c\,(2\,k-v)+2\,(-i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^2}{-i\,d+f\,(2\,k-v)}}\Bigg)\Bigg)$$

$$(-i\,d+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(i\,b+c\,(2\,k-v))^2}{4\,(i\,d+f\,(2\,k-v))}+i\,e+g\,(2\,k-v)}\,(i\,d+f\,(2\,k-v))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b+c\,(2\,k-v))^{-h-j+2\,n}\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(2\,k-v))\left(i\,b+c\,(2\,k-v)+\right.\right.$$

$$\left.2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)+$$

$$2\sqrt{-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{i\,d+f\,(2\,k-v)}}\,(i\,d+f\,(2\,k-v))\,\Gamma\left(\right.$$

$$\left.\left.\frac{1}{2}(h+j+2),-\frac{\left(i\,b+c\,(2\,k-v)+2\,(i\,d+f\,(2\,k-v))\,\sqrt{z}\right)^{2}}{4\,(i\,d+f\,(2\,k-v))}\right)\right)+$$

$$e^{-\frac{(-i\,b+c\,(v-2\,k))^{2}}{4\,(-i\,d+f\,(v-2\,k))}-i\,e+g\,(v-2\,k)}\,(-i\,d+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b+c\,(v-2\,k))\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)+$$

$$2\,(-i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(-i\,d+f\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b+c\,(v-2\,k)+2\,(-i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{-i\,d+f\,(v-2\,k)}}\right)+$$

$$e^{-\frac{(i\,b+c\,(v-2\,k))^2}{4\,(i\,d+f\,(v-2\,k))}+i\,e+g\,(v-2\,k)}\,(i\,d+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)+\right.$$

$$\left.2\,(i\,d+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d+f\,(v-2\,k))}\right)\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,(i\,d+f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d+f\,(v-2\,k)}}\right)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving powers of cos and power

Involving $z^{\alpha-1}\cos^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3646.01

$$\int z^{\alpha-1}\cos^m(c\,z)\cosh^\nu(a\,z)\,dz == -2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^\alpha$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(\alpha,\,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,\,(i\,c\,m-2\,i\,c\,k)\,z)\right)-$$

$$2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^\alpha\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(\Gamma(\alpha,\,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a\,\nu-2\,a\,s)\,z))+$$

$$2^{-m-\nu}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-\right.$$
$$((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)-((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,$$
$$(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)-((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z))+$$

$$\frac{2^{-m-\nu}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}\;/;\;m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3647.01

$$\int z^n\cos^\mu(c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cos^\mu(c\,z)\,n!\,(1-\nu \bmod 2)\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\,\ldots,\,-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2},\,\ldots,\,1-\frac{\mu}{2};\,-e^{2\,i\,c\,z}\right)\right)$$

$$\left(1+e^{2\,i\,c\,z}\right)^{-\mu}+2^{-\nu}\cos^\mu(c\,z)\,n!\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2\,k-\nu)\,a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\right.\right.\right.$$
$$\left.\ldots,\,-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,-\mu;\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c};\,-e^{2\,i\,c\,z}\right)+$$
$$e^{-(2\,k-\nu)\,a\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$
$$\left.\left.\left.-\mu;\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c};\,-e^{2\,i\,c\,z}\right)\right)\right)\left(1+e^{2\,i\,c\,z}\right)^{-\mu}\;/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3648.01

$$\int z^n \cos^m(c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(a\,z)\,n!\,(1-m \bmod 2)\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,a\,z}\right)\right)$$

$$\left(1+e^{-2\,a\,z}\right)^{-\nu}+2^{-m}\cosh^\nu(a\,z)\,n!\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\right.$$

$$\left(e^{-\frac{1}{2}i\,(4\,c\,z\,k-2\,c\,m\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c\,i\,(m-2\,k)+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\right.\right.$$

$$\left.-\nu,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1;-e^{-2\,a\,z}\right)+e^{\frac{1}{2}i\,(4\,c\,z\,k-2\,c\,m\,z)}$$

$$\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-i\,c\,(m-2\,k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},-\nu;\right.$$

$$\left.\left.\left.\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1;-e^{-2\,a\,z}\right)\right)\right)\left(1+e^{-2\,a\,z}\right)^{-\nu}/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos^\mu(c\,z+d)\cosh^\nu(a\,z)$

01.20.21.3649.01

$$\int z^{\alpha-1}\cos^m(d+c\,z)\cosh^\nu(a\,z)\,dz == -2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{-2\,d\,i\,k-i\,d\,m}\binom{m}{k}$$

$$\left(e^{2\,i\,d\,m}\,\Gamma(\alpha,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+e^{4\,i\,d\,k}\,((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,(i\,c\,m-2\,i\,c\,k)\,z)\right)-$$

$$2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^\alpha\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(\Gamma(\alpha,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,(a\,\nu-2\,a\,s)\,z))+$$

$$2^{-m-\nu}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,d\,i\,k-i\,d\,m}\binom{\nu}{s}\left(-e^{4\,i\,d\,k}\,\Gamma(\alpha,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-\right.$$

$$e^{2\,i\,d\,m}\,((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)-$$

$$e^{4\,i\,d\,k}\,((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)-$$

$$\left.e^{2\,i\,d\,m}\,((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\right)+$$

$$\frac{2^{-m-\nu}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3650.01

$$\int z^n \cos^\mu(d+c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}} n!\,(1-\nu \bmod 2)\cos^\mu(d+c\,z)\left(\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};-e^{2i(d+cz)}\right)\right)$$
$$\left(1+e^{2i(d+cz)}\right)^{-\mu}+2^{-\nu}\,n!\cos^\mu(d+c\,z)$$
$$\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2k-\nu)az}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-a(\nu-2k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a(\nu-2k)}{2c},\ldots,-\frac{c\,\mu-i\,a(\nu-2k)}{2c},\right.\right.\right.$$
$$\left.-\mu;1-\frac{c\,\mu-i\,a(\nu-2k)}{2c},\ldots,1-\frac{c\,\mu-i\,a(\nu-2k)}{2c};-e^{2i(d+cz)}\right)+$$
$$e^{-(2k-\nu)az}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a(\nu-2k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a(\nu-2k)+c\,\mu}{2c},\ldots,-\frac{i\,a(\nu-2k)+c\,\mu}{2c},\right.$$
$$\left.\left.\left.-\mu;1-\frac{i\,a(\nu-2k)+c\,\mu}{2c},\ldots,1-\frac{i\,a(\nu-2k)+c\,\mu}{2c};-e^{2i(d+cz)}\right)\right)\right)\left(1+e^{2i(d+cz)}\right)^{-\mu}/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3651.01

$$\int z^n \cos^m(d+c\,z)\cosh^\nu(a\,z)\,dz ==$$

$$2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(a\,z)\,n!\,(1-m \bmod 2)\left(\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2az}\right)\right)$$
$$\left(1+e^{-2az}\right)^{-\nu}+2^{-m}\cosh^\nu(a\,z)\,n!\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{1}{2}i(4dk+4czk-2dm-2cmz)}\right.\right.$$
$$\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(c\,i\,(m-2k)+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(2ck-cm+i\,a\,\nu)}{2a},\ldots,\frac{i\,(2ck-cm+i\,a\,\nu)}{2a},-\nu;\right.$$
$$\left.\frac{i\,(2ck-cm+i\,a\,\nu)}{2a}+1,\ldots,\frac{i\,(2ck-cm+i\,a\,\nu)}{2a}+1;-e^{-2az}\right)+e^{\frac{1}{2}i(4dk+4czk-2dm-2cmz)}$$
$$\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,\nu-i\,c\,(m-2k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2a},\ldots,\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2a},-\nu;\right.$$
$$\left.\left.\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2a}+1,\ldots,\frac{i\,(c\,(m-2k)+i\,a\,\nu)}{2a}+1;-e^{-2az}\right)\right)\left(1+e^{-2az}\right)^{-\nu}/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos^\mu(c\,z)\cosh^\nu(a\,z+b)$

01.20.21.3652.01

$$\int z^{\alpha-1}\cos^m(c\,z)\cosh^\nu(b+a\,z)\,dz == -2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(\alpha,\,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,\,(i\,c\,m-2\,i\,c\,k)\,z)\right)\right)$$

$$z^\alpha-2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(e^{2\,b\,\nu}\,\Gamma(\alpha,\,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+e^{4\,b\,s}\,((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a\,\nu-2\,a\,s)\,z)\right)\right)z^\alpha+$$

$$2^{-m-\nu}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(-e^{4\,b\,s}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-\right.\right.$$
$$e^{4\,b\,s}\,((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)+$$
$$e^{2\,b\,\nu}\left(-\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}-\right.$$
$$\left.\left.\left.((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\right)\right)\right)$$

$$z^\alpha+\frac{2^{-m-\nu}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}\;/;\;m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3653.01

$$\int z^n\cos^\mu(c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-\nu}\binom{\nu}{\frac{\nu}{2}}n!\,(1-\nu \bmod 2)\cos^\mu(c\,z)$$

$$\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\,\ldots,\,-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2},\,\ldots,\,1-\frac{\mu}{2};\,-e^{2\,i\,c\,z}\right)\right)\left(1+e^{2\,i\,c\,z}\right)^{-\mu}+$$

$$2^{-\nu}\,n!\cos^\mu(c\,z)\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\right.\right.\right.$$
$$\left.\ldots,\,-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,-\mu;\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c};\,-e^{2\,i\,c\,z}\right)+$$
$$e^{-(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$
$$\left.\left.\left.-\mu;\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c};\,-e^{2\,i\,c\,z}\right)\right)\right)\left(1+e^{2\,i\,c\,z}\right)^{-\mu}\;/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3654.01

$$\int z^n \cos^m(c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(b+a\,z)\,n!\,(1-m \bmod 2)$$
$$\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,(b+a\,z)}\right)\right)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}+$$
$$2^{-m}\cosh^\nu(b+a\,z)\,n!\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-i\,c\,z\,(2\,k-m)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c\,i\,(m-2\,k)+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\ldots,\right.\right.\right.$$
$$\left.\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)+$$
$$e^{i\,c\,z\,(2\,k-m)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-i\,c\,(m-2\,k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\ldots,\right.$$
$$\left.\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1,\ldots,\right.$$
$$\left.\left.\left.\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)\right)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\ /;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos^\mu(c\,z+d)\cosh^\nu(a\,z+b)$

01.20.21.3655.01

$$\int z^{\alpha-1}\cos^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$-2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-2\,d\,i\,k-i\,d\,m}\binom{m}{k}\Big(e^{2\,i\,d\,m}\,\Gamma(\alpha,\,-i\,c\,(m-2\,k)\,z)\,(-i\,c\,(m-2\,k)\,z)^{-\alpha}+$$

$$e^{4\,i\,d\,k}\,((i\,c\,m-2\,i\,c\,k)\,z)^{-\alpha}\,\Gamma(\alpha,\,(i\,c\,m-2\,i\,c\,k)\,z)\Big)-2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{\alpha}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-2\,b\,s-b\,\nu}\binom{\nu}{s}\Big(e^{2\,b\,\nu}\,\Gamma(\alpha,\,-a\,(\nu-2\,s)\,z)\,(-a\,(\nu-2\,s)\,z)^{-\alpha}+e^{4\,b\,s}\,((a\,\nu-2\,a\,s)\,z)^{-\alpha}\,\Gamma(\alpha,\,(a\,\nu-2\,a\,s)\,z)\Big)+2^{-m-\nu}$$

$$z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-2\,d\,i\,k-i\,d\,m-2\,b\,s-b\,\nu}\binom{\nu}{s}\Big(-e^{4\,i\,d\,k+4\,b\,s}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}-$$

$$e^{2\,i\,d\,m+4\,b\,s}\,((2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)+$$
$$e^{2\,b\,\nu}\Big(-e^{4\,i\,d\,k}\,\Gamma(\alpha,\,(-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)\,((-2\,c\,i\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}-$$
$$e^{2\,i\,d\,m}\,((2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha,\,(2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\Big)\Big)+$$

$$\frac{2^{-m-\nu}\,z^{\alpha}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}\;/;\;m\in\mathbb{N}^{+}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.3656.01

$$\int z^{n}\cos^{\mu}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}}n!\,(1-\nu \bmod 2)\cos^{\mu}(d+c\,z)\left(\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\,\ldots,\,-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2},\,\ldots,\,1-\frac{\mu}{2};\,-e^{2\,i\,(d+c\,z)}\right)\right)$$

$$\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}+2^{-\nu}\,n!\cos^{\mu}(d+c\,z)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\right.\right.\right.$$

$$\left.-\mu;\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c},\,\ldots,\,1-\frac{c\,\mu-i\,a\,(\nu-2\,k)}{2\,c};\,-e^{2\,i\,(d+c\,z)}\right)+$$

$$e^{-(2\,k-\nu)\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,1-\frac{i\,a\,(\nu-2\,k)+c\,\mu}{2\,c};\,-e^{2\,i\,(d+c\,z)}\right)\right)\right)\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu}\;/;\;n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.3657.01

$$\int z^n \cos^m(d+c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-m}\binom{m}{\frac{m}{2}}\cosh^\nu(b+a\,z)\,n!\,(1-m \bmod 2)$$
$$\left(\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,(b+a\,z)}\right)\right)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}+2^{-m}\cosh^\nu(b+a\,z)$$
$$n!\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{1}{2}i\,(4\,d\,k+4\,c\,z\,k-2\,d\,m-2\,c\,m\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c\,i\,(m-2\,k)+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},\ldots,\right.\right.\right.$$
$$\left.\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1,\ldots,\frac{i\,(2\,c\,k-c\,m+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)+$$
$$e^{\frac{1}{2}i\,(4\,d\,k+4\,c\,z\,k-2\,d\,m-2\,c\,m\,z)}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-i\,c\,(m-2\,k))^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},\right.$$
$$\ldots,\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a},-\nu;\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1,\ldots,$$
$$\left.\left.\left.\frac{i\,(c\,(m-2\,k)+i\,a\,\nu)}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)\right)\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n\cos^m(b\,z^r)\cosh^\nu(c\,z)$

01.20.21.3658.01

$$\int z^n \cos^m\left(b\,z^2\right) \cosh^v(c\,z)\,dz == -2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k))^{n-j}\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k))^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^{j+1}$$

$$\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}$$

$$\left(\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3659.01

$$\int z^n \cos^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1} + (c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right) + (-1)^n$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}\left(\Gamma\left(2\,(n+1),\,-i\,b\,(m-2\,k)\,\sqrt{z}\right) + \Gamma\left(2\,(n+1),\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\right) + 2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(c\,(v-2\,k))^{-2\,(n+1)}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right) - 2\,c\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right) +$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right) - 2\,c\,(v-2\,k)\right)$$

$$\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,c\,(v-2\,k)\sqrt{-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)-i\,b\,(m-2\,s)$$

$$\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+$$

$$2\,c\,(v-2\,k)\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + e) \cosh^v(c z)$

01.20.21.3660.01

$$\int z^n \cos^m\left(b\,z^2+e\right)\cosh^v(c\,z)\,dz ==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{i\,e\,(m-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-i\,e\,(m-2\,k)}\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k))^{n-j}\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{i\,c^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{c^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k))^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{c^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-c\,(v-2\,k))^{n-j}\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b+e\right)\cosh^v(c\,z)\,dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)+(-1)^n\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}\left(e^{i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\,-i\,b\,(m-2\,k)\,\sqrt{z}\right)+e^{-i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(c\,(v-2\,k))^{-2\,(n+1)}$$

$$\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}-i\,e\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-\right.\right.$$

$$\left.2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-2\,c\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}+e\,i\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)-2\,c\,(v-2\,k)\right)$$

$$\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{\left(i\,b\,(m-2\,s)-2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}-i\,e\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,c\,(v-2\,k)\sqrt{-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)-i\,b\,(m-2\,s)$$

$$\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(2\,c\,(v-2\,k)\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,c\,(v-2\,k)}+e\,i\,(m-2\,s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)+$$

$$2\,c\,(v-2\,k)\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{c\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\;-\frac{\left(b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,c\,(v-2\,k)}\right)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + d z) \cosh^v(c z)$

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$$\int z^n \cos^m\left(b z^2 + d z\right) \cosh^v(c z)\, dz == \frac{2^{-m-v} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{n+1} + (-1)^n 2^{-m-v} \binom{m}{\frac{m}{2}}$$

$$(1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\Gamma(n+1,\, c\,(v-2k)\,z)\,(-c\,(v-2k))^{-n-1} + (c\,(v-2k))^{-n-1}\,\Gamma(n+1,\, -c\,(v-2k)\,z)\right) -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{\frac{i\,(m-2k)\,d^2}{4b}} \left(\sum_{j=0}^{n} 2^{j-n}\, (i\,d\,(m-2k))^{n-j}\, (-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^{j+1} \right.\right.$$

$$\left. \left(-\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\,(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k))^2}{4\,b\,(m-2k)} \right) \right)$$

$$(-i\,b\,(m-2k))^{-n-1} + e^{-\frac{i\,(m-2k)\,d^2}{4b}}\, (i\,b\,(m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n}\, (-i\,d\,(m-2k))^{n-j}\, (d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i\,(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k))^2}{4\,b\,(m-2k)} \right) \Bigg) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{-\frac{i\,(c\,(v-2k) - i\,d\,(m-2s))^2}{4\,b\,(m-2s)}} \left(\sum_{j=0}^{n} 2^{j-n}\, (i\,d\,(m-2s) - c\,(v-2k))^{n-j}\, (-i\,d\,(m-2s) - \right.\right.$$

$$\left. 2\,i\,b\,z\,(m-2s) + c\,(v-2k))^{j+1} \left(-\frac{i\,(-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) + c\,(v-2k))^2}{b\,(m-2s)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\,(-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) + c\,(v-2k))^2}{4\,b\,(m-2s)} \right) \right) (-i\,b\,(m-2s))^{-n-1} +$$

$$e^{-\frac{i\,(-i\,d\,(m-2s) - c\,(v-2k))^2}{4\,b\,(m-2s)}} \left(\sum_{j=0}^{n} 2^{j-n}\, (d\,i\,(m-2s) + c\,(v-2k))^{n-j}\, (-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) - c\,(v-2k))^{j+1} \right.$$

$$\left(-\frac{i\,(-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) - c\,(v-2k))^2}{b\,(m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\left. \Gamma\left(\frac{j+1}{2}, -\frac{i\,(-i\,d\,(m-2s) - 2\,i\,b\,z\,(m-2s) - c\,(v-2k))^2}{4\,b\,(m-2s)} \right) \right) (-i\,b\,(m-2s))^{-n-1} +$$

$$e^{\frac{i(d\,i(m-2s)+c(v-2k))^2}{4b(m-2s)}}(i\,b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-i\,d(m-2s)-c(v-2k))^{n-j}$$

$$(d\,i(m-2s)+2b\,i\,z(m-2s)+c(v-2k))^{j+1}\left(\frac{i(d\,i(m-2s)+2b\,i\,z(m-2s)+c(v-2k))^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(d\,i(m-2s)+2b\,i\,z(m-2s)+c(v-2k))^2}{4b(m-2s)}\right)+$$

$$e^{\frac{i(i\,d(m-2s)-c(v-2k))^2}{4b(m-2s)}}(i\,b(m-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(c(v-2k)-i\,d(m-2s))^{n-j}$$

$$(d\,i(m-2s)+2b\,i\,z(m-2s)-c(v-2k))^{j+1}\left(\frac{i(d\,i(m-2s)+2b\,i\,z(m-2s)-c(v-2k))^2}{b(m-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i(d\,i(m-2s)+2b\,i\,z(m-2s)-c(v-2k))^2}{4b(m-2s)}\right)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v(c\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,c(v-2k)z)(-c(v-2k))^{-n-1}+(c(v-2k))^{-n-1}\Gamma(n+1,-c(v-2k)z)\right)+$$

$$(-1)^{n-1}\,2^{-m-2n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(d(m-2k))^{-2(n+1)}\binom{m}{k}\left(e^{-\frac{i(m-2k)b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b(m-2k))^{-h-j+2n}\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i(m-2k)\left(b\,i(m-2k)+\right.\right.$$

$$\left.2d\,i\sqrt{z}\ (m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{4d(m-2k)}\right)+2d\,i(m-2k)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{d(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(b\,i(m-2k)+2d\,i\sqrt{z}\ (m-2k)\right)^2}{4d(m-2k)}\right)\right)+$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,k)\right.$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-\right.\right.\right.$$

$$\left.\left.i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}\right)\right)\right)$$

$$(c\,(v-2\,k)-i\,d\,(m-2\,s))^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}}\,(d\,i\,(m-2\,s)+c\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d\,i\,(m-2\,s)+c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}\right)+$$

$$2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d\,i\,(m-2\,s)+c\,(v-2\,k)}}\right)+$$

$$e^{\frac{b^{2}\,(m-2\,s)^{2}}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}}\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{-i\,d\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{-i\,d\,(m-2\,s)-c\,(v-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}\right)-$$

$$\left.i\,b\,(m-2\,s)\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2(-i\,d(m-2s)-c(v-2k))\sqrt{z}\,-i\,b(m-2s)\right)^2}{4(-i\,d(m-2s)-c(v-2k))}\right)+$$

$$e^{\frac{b^2(m-2s)^2}{4(i\,d(m-2s)-c(v-2k))}}(i\,d(m-2s)-c(v-2k))^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b(m-2s))^{-h-j+2n}$$

$$\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{i\,d(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i(m-2s)\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{4(i\,d(m-2s)-c(v-2k))}\right)+$$

$$2(i\,d(m-2s)-c(v-2k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{4(i\,d(m-2s)-c(v-2k))}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i(m-2s)+2(i\,d(m-2s)-c(v-2k))\sqrt{z}\right)^2}{i\,d(m-2s)-c(v-2k)}}\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

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$$\int z^n\cos^m\left(b\,z^2+d\,z+e\right)\cosh^v(c\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,c(v-2k)z)(-c(v-2k))^{-n-1}+(c(v-2k))^{-n-1}\Gamma(n+1,-c(v-2k)z)\right)-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{i(m-2k)d^2}{4b}-ie(m-2k)}\right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\right)(-i\,b\,(m-2\,k))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,(c\,(v-2\,k)-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-c\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,b\,z\,(m-2\,s)+c\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)+c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)+c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2\,s)+c\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-\right.$$

$$\left.c\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\right.$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{\frac{i\,(d\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+c\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(c\,(v-2\,k)-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v(c\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma(n+1,\,c\,(v-2\,k)\,z)\,(-c\,(v-2\,k))^{-n-1}+(c\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-c\,(v-2\,k)\,z)\right)+$$

$$(-1)^{n-1}\,2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(d\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}+e\,i\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)$$

$$\left.\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d}-i\,e\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,k)\right.$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\right.\right.\right.$$

$$\left.\left.\left.\sqrt{z}\;-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\right.\right.$$

$$\binom{n}{j}\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{c\,(v-2\,k)-i\,d\,(m-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(c\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(c\,(v-2\,k)-i\,d\,(m-2\,s))}\right)\right)\right)$$

$$(c\,(v-2\,k)-i\,d\,(m-2\,s))^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}+e\,i\,(m-2\,s)}\,(d\,i\,(m-2\,s)+c\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+c\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}\right)+$$

$$2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+c\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+c\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+c\,(v-2\,k)}}\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}-i\,e\,(m-2\,s)}\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-c\,(v-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-c\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-c\,(v-2\,k))}+e\,i\,(m-2\,s)}\,(i\,d\,(m-2\,s)-c\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c\,(v-2\,k))}\right)+$$

$$2\,(i\,d\,(m-2\,s)-c\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-c\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-c\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-c\,(v-2\,k)}}\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(b\,z^r)\cosh^v(f\,z+g)$

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$$\int z^n \cos^m\left(b\,z^2\right) \cosh^v(g+f\,z)\,dz == -2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,f^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{i\,f^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{f^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}$$

$$(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{f^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m\left(b\sqrt{z}\right)\cosh^v(g+f\,z)\,dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right)+(-1)^n\,2^{-m-v+1}$$

$$\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}\left(\Gamma\left(2\,(n+1),\,-i\,b\,(m-2\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\left.\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)(-f\,(v-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-\right.\right.$$

$$\left.\left.\left.2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)\right.\right.$$

$$\sqrt{\frac{\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)\Bigg)$$

$$(-f\,(v-2\,k))^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}+g\,(v-2\,k)}\,(f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,f\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,f\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,f\,(v-2\,k)\,\sqrt{-\frac{\left(2\,f\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,f\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,f\,(v-2\,k)}\right)-i\,b\,(m-2\,s)$$

$$\left(2\,f\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,f\,(v-2\,k)\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}+g\,(v-2\,k)}\,(f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)+$$

$$2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}\Bigg)\Bigg);\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + e) \cosh^v(f z + g)$

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$$\int z^n \cos^m\left(b\,z^2+e\right)\cosh^v(g+f\,z)\,dz ==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{i\,e\,(m-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-i\,e\,(m-2\,k)}\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\,f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\,-f\,(v-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,f^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{i\,f^2\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)-i\,e\,(m-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(-\frac{i\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(f\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)$$

$$(-i\,b\,(m-2\,s))^{-n-1}+e^{\frac{f^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^{j+1}\left(\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(2\,i\,b\,(m-2\,s)\,z-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{f^2\,i\,(v-2\,k)^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)+e\,i\,(m-2\,s)}\,(i\,b\,(m-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^{j+1}\left(\frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(f\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b+e\right)\cosh^v(g+f\,z)\,dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\ f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1} + e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\ -f\,(v-2\,k)\,z)\right) + (-1)^n$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}\left(e^{i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\ -i\,b\,(m-2\,k)\,\sqrt{z}\right) + e^{-i\,e\,(m-2\,k)}\,\Gamma\left(2\,(n+1),\ i\,b\,(m-2\,k)\,\sqrt{z}\right)\right) +$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}-i\,e\,(m-2\,s)-g\,(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\left(\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,s)\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.\right.$$

$$\left.\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right) - 2\,f\,(v-2\,k)\sqrt{\frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)(-f\,(v-2\,k))^{-2\,(n+1)} +$$

$$e^{-\frac{b^2\,(m-2\,s)^2}{4\,f\,(v-2\,k)}+e\,i\,(m-2\,s)-g\,(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(\frac{\left(i\,b\,(m-2\,s)-2\,f\,(v-2\,k)\,\sqrt{z}\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(i\,b\,(m-2\,s)\left(i\,b\,(m-2\,s)-\right.\right.$$

$$2 f (v-2k) \sqrt{z}\Big) \Gamma\left(\frac{1}{2}(h+j+1), \frac{\left(i b (m-2s) - 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right) - 2 f (v-2k)$$

$$\sqrt{\frac{\left(i b (m-2s) - 2 f (v-2k) \sqrt{z}\right)^2}{f (v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(i b (m-2s) - 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right)\Bigg)\Bigg)$$

$$(-f (v-2k))^{-2(n+1)} + e^{\frac{b^2 (m-2s)^2}{4 f (v-2k)} - i e (m-2s) + g (v-2k)} (f (v-2k))^{-2(n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (-i b (m-2s))^{-h-j+2n}$$

$$\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^{h+j} \left(-\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{f (v-2k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2 f (v-2k) \sqrt{-\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{f (v-2k)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{4 f (v-2k)}\right) - i b (m-2s)$$

$$\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(2 f (v-2k) \sqrt{z} - i b (m-2s)\right)^2}{4 f (v-2k)}\right)\Bigg) +$$

$$e^{\frac{b^2 (m-2s)^2}{4 f (v-2k)} + e i (m-2s) + g (v-2k)} (f (v-2k))^{-2(n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2s))^{-h-j+2n}$$

$$\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^{h+j} \left(-\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{f (v-2k)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}$$

$$\Bigg(b i (m-2s) \left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right) +$$

$$2 f (v-2k) \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{4 f (v-2k)}\right)$$

$$\sqrt{-\frac{\left(b i (m-2s) + 2 f (v-2k) \sqrt{z}\right)^2}{}}\Bigg)\Bigg) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + d z) \cosh^v(f z + g)$

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$$\int z^n \cos^m\left(b z^2 + d z\right) \cosh^v(g + f z)\, dz == \frac{2^{-m-v} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{n+1} + (-1)^n 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-g(v-2k)} \Gamma(n+1,\, f(v-2k) z) (-f(v-2k))^{-n-1} + e^{g(v-2k)} (f(v-2k))^{-n-1} \Gamma(n+1,\, -f(v-2k) z)\right) -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{\frac{i(m-2k)d^2}{4b}} \left(\sum_{j=0}^{n} 2^{j-n} (i d (m-2k))^{n-j} (-i d (m-2k) - 2 i b z (m-2k))^{j+1} \right.\right.$$

$$\left.\left. \left(-\frac{i(-i d (m-2k) - 2 i b z (m-2k))^2}{b (m-2k)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i(-i d (m-2k) - 2 i b z (m-2k))^2}{4 b (m-2k)}\right)\right)\right.$$

$$(-i b (m-2k))^{-n-1} + e^{-\frac{i(m-2k)d^2}{4b}} (i b (m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-i d (m-2k))^{n-j} (d i (m-2k) + 2 b i z (m-2k))^{j+1}$$

$$\left(\frac{i(d i (m-2k) + 2 b i z (m-2k))^2}{b (m-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i(d i (m-2k) + 2 b i z (m-2k))^2}{4 b (m-2k)}\right) \Bigg) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{-\frac{i(f(v-2k) - i d (m-2s))^2}{4 b (m-2s)} + g(v-2k)} \left(\sum_{j=0}^{n} 2^{j-n} (i d (m-2s) - f(v-2k))^{n-j} (-i d (m-2s) - \right.\right.$$

$$\left.\left. 2 i b z (m-2s) + f(v-2k))^{j+1} \left(-\frac{i(-i d (m-2s) - 2 i b z (m-2s) + f(v-2k))^2}{b (m-2s)} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\left.\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i(-i d (m-2s) - 2 i b z (m-2s) + f(v-2k))^2}{4 b (m-2s)}\right) \right) (-i b (m-2s))^{-n-1} + \right.$$

$$e^{-\frac{i(-i d (m-2s) - f(v-2k))^2}{4 b (m-2s)} - g(v-2k)} \left(\sum_{j=0}^{n} 2^{j-n} (d i (m-2s) + f(v-2k))^{n-j} (-i d (m-2s) - 2 i b z (m-2s) - \right.$$

$$\left. f(v-2k))^{j+1} \left(-\frac{i(-i d (m-2s) - 2 i b z (m-2s) - f(v-2k))^2}{b (m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right.$$

$$\left. \Gamma\left(\frac{j+1}{2}, -\frac{i(-i d (m-2s) - 2 i b z (m-2s) - f(v-2k))^2}{4 b (m-2s)}\right) \right) (-i b (m-2s))^{-n-1} +$$

$$e^{\frac{i\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}+g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k)-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v(g+f\,z)\,dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\ f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\ -f\,(v-2\,k)\,z)\right)+$$

$$(-1)^{n-1}\,2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(d\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}\Bigg(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+\right.$$

$$\left.2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,k)\right.$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\;(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}+g\,(v-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-\right.\right.\right.$$

$$\left.\left.i\,b\,(m-2\,s)\right)^{h+j}\left(-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{f\,(v-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{f\,(v-2\,k)-i\,d\,(m-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}\right)\right)\right)\right)$$

$$(f\,(v-2\,k)-i\,d\,(m-2\,s))^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+g\,(v-2\,k)}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d\,i\,(m-2\,s)+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}\right)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{2}}{d\,i\,(m-2\,s)+f\,(v-2\,k)}}\right)+$$

$$e^{\frac{b^{2}\,(m-2\,s)^{2}}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}-g\,(v-2\,k)}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{2}}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)\right)+$$

$$e^{\frac{b^2 (m-2s)^2}{4(i d (m-2s)-f (v-2k))}-g (v-2k)} (i d (m-2s)-f (v-2k))^{-2 (n+1)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (i b (m-2s))^{-h-j+2n}$$

$$\left(b i (m-2s)+2 (i d (m-2s)-f (v-2k)) \sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b i (m-2s)+2 (i d (m-2s)-f (v-2k)) \sqrt{z}\right)^2}{i d (m-2s)-f (v-2k)}\right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}$$

$$\binom{n}{j} \left(b i (m-2s) \left(b i (m-2s)+2 (i d (m-2s)-f (v-2k)) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b i (m-2s)+2 (i d (m-2s)-f (v-2k)) \sqrt{z}\right)^2}{4 (i d (m-2s)-f (v-2k))}\right)+$$

$$2 (i d (m-2s)-f (v-2k)) \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b i (m-2s)+2 (i d (m-2s)-f (v-2k)) \sqrt{z}\right)^2}{4 (i d (m-2s)-f (v-2k))}\right)$$

$$\left.\sqrt{-\frac{\left(b i (m-2s)+2 (i d (m-2s)-f (v-2k)) \sqrt{z}\right)^2}{i d (m-2s)-f (v-2k)}}\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^n \cos^m\left(b z^r + d z + e\right) \cosh^v(f z + g)$

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$$\int z^n \cos^m\left(b z^2 + d z + e\right) \cosh^v(g + f z)\, dz ==$$

$$\frac{2^{-m-v} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{n+1} + (-1)^n 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-g (v-2k)} \Gamma(n+1, f (v-2k) z) (-f (v-2k))^{-n-1} + e^{g (v-2k)} (f (v-2k))^{-n-1} \Gamma(n+1, -f (v-2k) z)\right) -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{\frac{i (m-2k) d^2}{4b} - i e (m-2k)} \right.$$

$$\left. \left(\sum_{j=0}^{n} 2^{j-n} (i d (m-2k))^{n-j} (-i d (m-2k) - 2 i b z (m-2k))^{j+1} \left(-\frac{i (-i d (m-2k) - 2 i b z (m-2k))^2}{b (m-2k)} \right)^{\frac{1}{2}(-j-1)} \right.\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)(-i\,b\,(m-2\,k))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,(f\,(v-2\,k)-i\,d\,(m-2\,s))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)+g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-\right.\right.$$

$$\left.2\,i\,b\,z\,(m-2\,s)+f\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,k)+f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,k)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{-\frac{i\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}-i\,e\,(m-2\,s)-g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{n-j}\,(-i\,d\,(m-2\,s)-\right.$$

$$\left.2\,i\,b\,z\,(m-2\,s)-f\,(v-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,k)-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{i\,(-i\,d\,(m-2\,s)-2\,i\,b\,z\,(m-2\,k)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)\right)(-i\,b\,(m-2\,s))^{-n-1}+$$

$$e^{\frac{i\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)+g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)+f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}\right)+$$

$$e^{\frac{i\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^2}{4\,b\,(m-2\,s)}+e\,i\,(m-2\,s)-g\,(v-2\,k)}\,(i\,b\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k)-i\,d\,(m-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^{j+1}\left(\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left(j+1,\frac{i\,(d\,i\,(m-2\,s)+2\,b\,i\,z\,(m-2\,s)-f\,(v-2\,k))^2}{\right)$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v(g+f\,z)\,dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-g\,(v-2\,k)}\,\Gamma(n+1,\ f\,(v-2\,k)\,z)\,(-f\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)}\,(f\,(v-2\,k))^{-n-1}\,\Gamma(n+1,\ -f\,(v-2\,k)\,z)\right)+$$

$$(-1)^{n-1}\,2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(d\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}+e\,i\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{i\,(m-2\,k)\,b^2}{4\,d}-i\,e\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2\,k)\right.$$

$$\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$\left.2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.\right.$$

$$-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{\frac{b^2\,(m-2\,s)^2}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}-i\,e\,(m-2\,s)+g\,(v-2\,k)}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f\,(v-2\,k)-i\,d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\sqrt{-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{f\,(v-2\,k)-i\,d\,(m-2\,s)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(2\,(f\,(v-2\,k)-i\,d\,(m-2\,s))\,\sqrt{z}\,-i\,b\,(m-2\,s)\right)^2}{4\,(f\,(v-2\,k)-i\,d\,(m-2\,s))}\right)\Bigg)\Bigg)$$

$$(f\,(v-2\,k)-i\,d\,(m-2\,s))^{-2\,(n+1)}+e^{\frac{b^2\,(m-2\,s)^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+e\,i\,(m-2\,s)+g\,(v-2\,k)}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}\right)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,s)+f\,(v-2\,k)}}\,\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}-i\,e\,(m-2\,s)-g\,(v-2\,k)}\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{-i\,d\,(m-2\,s)-f\,(v-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)-$$

$$i\,b\,(m-2\,s)\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\;-i\,b\,(m-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}+e\,i\,(m-2\,s)-g\,(v-2\,k)}\,(i\,d\,(m-2\,s)-f\,(v-2\,k))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\Bigg(b\,i\,(m-2\,s)\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)+$$

$$2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{4\,(i\,d\,(m-2\,s)-f\,(v-2\,k))}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2\,s)+2\,(i\,d\,(m-2\,s)-f\,(v-2\,k))\,\sqrt{z}\right)^2}{i\,d\,(m-2\,s)-f\,(v-2\,k)}}\Bigg)\Bigg) /;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.3674.01

$$\int z^n \cos^m(d\,z)\cosh^v\left(c\,z^2\right) dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,(v-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,-i\,d\,(m-2\,k)\,z)\right)-2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\right.$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\right.$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3675.01

$$\int z^n \cos^m(d\,z)\cosh^v\left(c\,\sqrt{z}\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1} + (i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\right.$$

$$\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)\Bigg)$$

$$(-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\Bigg(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}$$

$$\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{}}\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z+e)\cosh^v(c\,z^r)$

01.20.21.3676.01

$$\int z^n \cos^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},c\,(v-2\,k)\,z^2\right)\right)+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2\,k)}\,\Gamma(n+1,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{i\,e\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}$$

$$(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3677.01

$$\int z^n \cos^m(e+d\,z)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{i\,e\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\sqrt{z}\right)\right)+$$

$$2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\right.$$

$$\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.\left.-\frac{i\left(-2\,i\,d\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\sqrt{z}\right)^{h+j}\right.$$

$$\left.\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right)\right)\right)$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{d\,(m-2\,k)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+e\,i\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left.\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+e\,i\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\left.\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos^m(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.3678.01

$$\int z^{\alpha-1}\cos^m(b\,z^r)\cosh^v(c\,z^r)\,dz==\frac{2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{\alpha}-\frac{2^{-m-v}\,z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-\frac{\alpha}{r}}+((2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{\alpha}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-\frac{\alpha}{r}}+((2\,c\,k-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z^\alpha}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3679.01

$$\int z^n \cos^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} -$$

$$2^{-m-v-1}\,z^{n+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},\,(i\,b\,m-2\,i\,b\,k)\,z^2\right)\left((i\,b\,m-2\,i\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.\left((2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m)\,z^2\right)\right)-2^{-m-v-1}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},\,(c\,v-2\,c\,k)\,z^2\right)\left((c\,v-2\,c\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((2\,c\,k-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,c\,k-c\,v)\,z^2\right)\right)-$$

$$2^{-m-v-1}\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)\left((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)+$$

$$\left((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)+$$

$$\left.\left((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3680.01

$$\int z^n \cos^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} - 2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(2\,i\,b\,k-i\,b\,m)^{-2(n+1)}\left(\Gamma\left(2\,(n+1),\,(i\,b\,m-2\,i\,b\,k)\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m)\sqrt{z}\right)\right)-$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(2\,c\,k-c\,v)^{-2(n+1)}\left(\Gamma\left(2\,(n+1),\,(c\,v-2\,c\,k)\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,(2\,c\,k-c\,v)\sqrt{z}\right)\right)-$$

$$2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\sqrt{z}\right)(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-2(n+1)}+\right.$$

$$(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-2(n+1)}\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\sqrt{z}\right)+$$

$$(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-2(n+1)}\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\sqrt{z}\right)+$$

$$\left.(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)^{-2(n+1)}\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3681.01

$$\int z^{\alpha-1}\cos^m(b\,z^r+e)\cosh^v(c\,z^r)\,dz == \frac{2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{\alpha} -$$

$$\frac{2^{-m-v}\,z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2iek-iem}\,\Gamma\left(\frac{\alpha}{r},(ibm-2ibk)z^r\right)((ibm-2ibk)z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.e^{iem-2iek}\,((2ibk-ibm)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ibk-ibm)z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{\alpha}{r},(cv-2ck)z^r\right)((cv-2ck)z^r)^{-\frac{\alpha}{r}}+((2ck-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ck-cv)z^r\right)\right)-$$

$$\frac{2^{-m-v}\,z^\alpha}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2iek-iem}\,\Gamma\left(\frac{\alpha}{r},(-2bik+ibm-2cs+cv)z^r\right)((-2bik+ibm-2cs+cv)z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-2eik+iem}\,((2ibk-ibm-2cs+cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ibk-ibm-2cs+cv)z^r\right)+$$

$$e^{2iek-iem}\,((-2bik+ibm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2bik+ibm+2cs-cv)z^r\right)+$$

$$\left.e^{-2eik+iem}\,((2ibk-ibm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ibk-ibm+2cs-cv)z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3682.01

$$\int z^n\cos^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1} -$$

$$2^{-m-v-1}\,z^{n+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2iek-iem}\,\Gamma\left(\frac{n+1}{2},(ibm-2ibk)z^2\right)\left((ibm-2ibk)z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{iem-2iek}\left((2ibk-ibm)z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(2ibk-ibm)z^2\right)\right)-\ 2^{-m-v-1}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},(cv-2ck)z^2\right)\left((cv-2ck)z^2\right)^{\frac{1}{2}(-n-1)}+\left((2ck-cv)z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(2ck-cv)z^2\right)\right)-\ 2^{-m-v-1}$$

$$z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2iek-iem}\,\Gamma\left(\frac{n+1}{2},(-2bik+ibm-2cs+cv)z^2\right)\left((-2bik+ibm-2cs+cv)z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$e^{-2eik+iem}\left((2ibk-ibm-2cs+cv)z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(2ibk-ibm-2cs+cv)z^2\right)+$$

$$e^{2iek-iem}\left((-2bik+ibm+2cs-cv)z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(-2bik+ibm+2cs-cv)z^2\right)+$$

$$e^{-2eik+iem}\left((2ibk-ibm+2cs-cv)z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\left.\Gamma\left(\frac{n+1}{2},(2ibk-ibm+2cs-cv)z^2\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3683.01

$$\int z^n \cos^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}$$

$$\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(i\,b\,m-2\,i\,b\,k)\,\sqrt{z}\right)+e^{i\,e\,m-2\,i\,e\,k}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)-$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(2\,c\,k-c\,v)^{-2\,(n+1)}\left(\Gamma\left(2\,(n+1),\,(c\,v-2\,c\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,(2\,c\,k-c\,v)\,\sqrt{z}\right)\right)-$$

$$2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}+\right.$$

$$e^{-2\,e\,i\,k+i\,e\,m}\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)+e^{2\,i\,e\,k-i\,e\,m}$$

$$(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)+e^{-2\,e\,i\,k+i\,e\,m}\,(2\,i\,b\,k-i$$

$$\left.b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r\right)$

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$$\int z^n \cos^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{i\,d^2\,(m-2\,k)}{4\,b}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\right.\right.$$

$$\left.\left(-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\right)$$

$$(-i\,b\,(m-2\,k))^{-n-1}+e^{-\frac{i\,d^2\,(m-2\,k)}{4\,b}}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{i\,d^2\,(m-2\,s)^2}{4\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^{j+1}\right.\right.$$

$$\left(-\frac{(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2}{c\,(v-2\,k)-i\,b\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},-\frac{(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2}{4\,(c\,(v-2\,k)-i\,b\,(m-2\,s))}\right)\right)(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-n-1}+\right.$$

$$e^{\frac{i\,d^2\,(m-2\,s)^2}{4\,(-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v)}}\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+$$

$$2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2}{b\,i\,(m-2\,s)+c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2}{4\,(b\,i\,(m-2\,s)+c\,(v-2\,k))}\right)+e^{-\frac{i\,d^2\,(m-2\,s)^2}{4\,(-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v)}}$$

$$(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^{j+1}$$

$$\left(-\frac{(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2}{-i\,b\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2}{4\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))}\right)+e^{\frac{i\,d^2\,(m-2\,s)^2}{4\,(2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v)}}$$

$$(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2}{i\,b\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2}{4\,(i\,b\,(m-2\,s)-c\,(v-2\,k))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c\right)dz==$$

$$-2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2\,k)^{-2\,(n+1)}\binom{v}{k}\left(\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right)\right)$$

$$c^{-2(n+1)}+\frac{2^{-m-\nu}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{n+1}+2^{-m-2n-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(i\,d\,(m-2k))^{-2(n+1)}\left(e^{-\frac{i\,(m-2k)\,b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2k))^{-h-j+2n}\left(b\,i\,(m-2k)+2\,d\,i\,\sqrt{z}\,(m-2k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(m-2k)+2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2k)\left(b\,i\,(m-2k)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\,(m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(b\,i\,(m-2k)+2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right)+2\,d\,i\,(m-2k)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(m-2k)+2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(b\,i\,(m-2k)+2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right)\right)+$$

$$e^{\frac{i\,(m-2k)\,b^2}{4d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2k))^{-h-j+2n}\left(-i\,b\,(m-2k)-2\,i\,d\,\sqrt{z}\,(m-2k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2k)-2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-i\,b\,(m-2k)\right.$$

$$\left(-i\,b\,(m-2k)-2\,i\,d\,\sqrt{z}\,(m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-i\,b\,(m-2k)-2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right)-$$

$$2\,i\,d\,(m-2k)\sqrt{-\frac{i\left(-i\,b\,(m-2k)-2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-i\,b\,(m-2k)-2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right)\right)\right)+$$

$$2^{-m-2n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(i\,d\,(m-2s))^{-2(n+1)}\left(e^{-\frac{i\,(c\,(\nu-2k)-i\,b\,(m-2s))^2}{4\,d\,(m-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\right.$$

$$(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,k)-i\,b\,(m-2\,s))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)\right)+e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)$$

$$\left.\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}}\right)+e^{\frac{i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{2}}{4\,d\,(m-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,s)-c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}}\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \cos^m(b z^r + d z + e) \cosh^v(c z^r)$

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$$\int z^n \cos^m\left(b z^2 + d z + e\right) \cosh^v\left(c z^2\right) dz == -2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\, z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\Gamma\left(\frac{n+1}{2}, -c\,(v-2k)\,z^2\right) \left(-c\,(v-2k)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left(c\,(v-2k)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c\,(v-2k)\,z^2\right) \right) +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} - 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{\frac{i\,(m-2k)\,d^2}{4b} - i\,e\,(m-2k)} \right.$$

$$\left(\sum_{j=0}^{n} 2^{j-n} \left(i\,d\,(m-2k)\right)^{n-j} \left(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k)\right)^{j+1} \left(-\frac{i\left(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k)\right)^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)} \right.$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{i\left(-i\,d\,(m-2k) - 2\,i\,b\,z\,(m-2k)\right)^2}{4\,b\,(m-2k)}\right) \right) \left(-i\,b\,(m-2k)\right)^{-n-1} +$$

$$e^{-\frac{i\,(m-2k)\,d^2}{4b} + e\,i\,(m-2k)} \left(i\,b\,(m-2k)\right)^{-n-1} \sum_{j=0}^{n} 2^{j-n} \left(-i\,d\,(m-2k)\right)^{n-j} \left(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k)\right)^{j+1}$$

$$\left(\frac{i\left(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k)\right)^2}{b\,(m-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, \frac{i\left(d\,i\,(m-2k) + 2\,b\,i\,z\,(m-2k)\right)^2}{4\,b\,(m-2k)}\right) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{-\frac{1}{4} i \left(\frac{d^2\,(m-2s)^2}{2\,i\,c\,k - b\,m + 2\,b\,s - i\,c\,v} + 4\,e\,(m-2s) \right)} \left(\sum_{j=0}^{n} 2^{j-n} \left(i\,d\,(m-2s)\right)^{n-j} \left(2\left(c\,(v-2k) - i\,b\,(m-2s)\right) z - \right. \right. \right.$$

$$\left. \left. i\,d\,(m-2s)\right)^{j+1} \left(-\frac{\left(2\left(c\,(v-2k) - i\,b\,(m-2s)\right) z - i\,d\,(m-2s)\right)^2}{c\,(v-2k) - i\,b\,(m-2s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \right.$$

$$\left. \left. \Gamma\left(\frac{j+1}{2}, -\frac{\left(2\left(c\,(v-2k) - i\,b\,(m-2s)\right) z - i\,d\,(m-2s)\right)^2}{4\left(c\,(v-2k) - i\,b\,(m-2s)\right)}\right) \right) \left(c\,(v-2k) - i\,b\,(m-2s)\right)^{-n-1} +$$

$$e^{-\frac{1}{4} i \left(-\frac{d^2\,(m-2s)^2}{-2\,c\,i\,k - b\,m + 2\,b\,s + i\,c\,v} - 4\,e\,(m-2s) \right)} \left(b\,i\,(m-2s) + c\,(v-2k)\right)^{-n-1} \sum_{j=0}^{n} 2^{j-n} \left(-i\,d\,(m-2s)\right)^{n-j} \left(d\,i\,(m-2s) + \right.$$

$$\left. 2\left(b\,i\,(m-2s) + c\,(v-2k)\right) z\right)^{j+1} \left(-\frac{\left(d\,i\,(m-2s) + 2\left(b\,i\,(m-2s) + c\,(v-2k)\right) z\right)^2}{b\,i\,(m-2s) + c\,(v-2k)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\left. \Gamma\left(\frac{j+1}{2}, -\frac{\left(d\,i\,(m-2s) + 2\left(b\,i\,(m-2s) + c\,(v-2k)\right) z\right)^2}{4\left(b\,i\,(m-2s) + c\,(v-2k)\right)}\right) + e^{\frac{1}{4} i \left(-\frac{d^2\,(m-2s)^2}{-2\,c\,i\,k - b\,m + 2\,b\,s + i\,c\,v} - 4\,e\,(m-2s) \right)} \right.$$

$$(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^{j+1}$$

$$\left(-\frac{(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2}{-i\,b\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2}{4\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))}\right)+e^{\frac{1}{4}i\left(\frac{d^2\,(m-2\,s)^2}{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v}+4\,e\,(m-2\,s)\right)}$$

$$(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2}{i\,b\,(m-2\,s)-c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2}{4\,(i\,b\,(m-2\,s)-c\,(v-2\,k))}\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c\right)dz==$$

$$-2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2\,k)^{-2\,(n+1)}\binom{v}{k}\left(\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right)\right)$$

$$c^{-2\,(n+1)}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$(i\,d\,(m-2\,k))^{-2\,(n+1)}\left(e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}+e\,i\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+2\,d\,i\,(m-2\,k)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{i(m-2k)b^2}{4d}-ie(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib(m-2k))^{-h-j+2n}\left(-ib(m-2k)-2id\sqrt{z}(m-2k)\right)^{h+j}$$

$$\left(-\frac{i\left(-ib(m-2k)-2id\sqrt{z}(m-2k)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-ib(m-2k)\right.$$

$$\left(-ib(m-2k)-2id\sqrt{z}(m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-ib(m-2k)-2id\sqrt{z}(m-2k)\right)^2}{4d(m-2k)}\right)-$$

$$2id(m-2k)\sqrt{-\frac{i\left(-ib(m-2k)-2id\sqrt{z}(m-2k)\right)^2}{d(m-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-ib(m-2k)-2id\sqrt{z}(m-2k)\right)^2}{4d(m-2k)}\right)\right)\right)+$$

$$2^{-m-2n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(id(m-2s))^{-2(n+1)}\left(e^{-\frac{i(c(\nu-2k)-ib(m-2s))^2}{4d(m-2s)}-ie(m-2s)}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(\nu-2k)-ib(m-2s))^{-h-j+2n}\left(-ib(m-2s)-2id\sqrt{z}(m-2s)+c(\nu-2k)\right)^{h+j}$$

$$\left(-\frac{i\left(-ib(m-2s)-2id\sqrt{z}(m-2s)+c(\nu-2k)\right)^2}{d(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c(\nu-2k)-ib(m-2s))\left(-ib(m-2s)-2id\sqrt{z}(m-2s)+c(\nu-2k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-ib(m-2s)-2id\sqrt{z}(m-2s)+c(\nu-2k)\right)^2}{4d(m-2s)}\right)-$$

$$2id(m-2s)\sqrt{-\frac{i\left(-ib(m-2s)-2id\sqrt{z}(m-2s)+c(\nu-2k)\right)^2}{d(m-2s)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\Bigg)+e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)-c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\;\Gamma\Bigg(\frac{1}{2}(h+j+2),$$

$$-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,\,(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\Bigg)+e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}+e\,i\,(m-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\,\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\Bigg)+e^{\frac{i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}+e\,i\,(m-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((i\,b\,(m-2\,s)-c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z)\cosh^v\left(c\,z^r+g\right)$

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$$\int z^n \cos^m(d\,z)\cosh^v\left(c\,z^2+g\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\right.$$

$$\left.\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{-\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2\,k)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)$$

$$(-c\,(v-2\,s))^{-n-1}+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}$$

$$(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^{j+1}\left(-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,(v-2\,s)\,z-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}\right)+e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == \frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} + (-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-2^{-m-v+1}$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right)+e^{-g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right)+2^{-m-2\,n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\right.$$

$$\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.\left.-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left.\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right)$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{d\,(m-2\,k)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left.\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\;\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\;\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\left.\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right)\Big/;\;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3690.01

$$\int z^n \cos^m(e+d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == -2^{-m-\nu-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}$$

$$\left(e^{g(\nu-2k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(\nu-2k)\,z^2\right)\left(-c\,(\nu-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g(\nu-2k)}\left(c\,(\nu-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(\nu-2k)\,z^2\right)\right)+$$

$$\frac{2^{-m-\nu}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{n+1}+(-1)^n\,2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2k)}\,\Gamma(n+1,\,i\,d\,(m-2k)\,z)\,(-i\,d\,(m-2k))^{-n-1}+e^{i\,e\,(m-2k)}\,(i\,d\,(m-2k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2k)\,z)\right)-$$

$$2^{-m-\nu-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2\,(m-2k)^2}{4\,c\,(\nu-2s)}-i\,e\,(m-2k)-g\,(\nu-2s)}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2k))^{n-j}\,(-i\,d\,(m-2k)-2\,c\,(\nu-2s)\,z)^{j+1}\right.\right.$$

$$\left.\left(\frac{(-i\,d\,(m-2k)-2\,c\,(\nu-2s)\,z)^2}{c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2k)-2\,c\,(\nu-2s)\,z)^2}{4\,c\,(\nu-2s)}\right)\right)$$

$$(-c\,(\nu-2s))^{-n-1}+e^{-\frac{d^2\,(m-2k)^2}{4\,c\,(\nu-2s)}+e\,i\,(m-2k)-g\,(\nu-2s)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(i\,d\,(m-2k)-2\,c\,(\nu-2s)\,z)^{j+1}\right.$$

$$\left.\left(\frac{(i\,d\,(m-2k)-2\,c\,(\nu-2s)\,z)^2}{c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(i\,d\,(m-2k)-2\,c\,(\nu-2s)\,z)^2}{4\,c\,(\nu-2s)}\right)\right)$$

$$(-c\,(\nu-2s))^{-n-1}+e^{\frac{d^2\,(m-2k)^2}{4\,c\,(\nu-2s)}-i\,e\,(m-2k)+g\,(\nu-2s)}\,(c\,(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2k))^{n-j}\,(2\,c\,(\nu-2s)\,z-i\,d\,(m-2k))^{j+1}\left(-\frac{(2\,c\,(\nu-2s)\,z-i\,d\,(m-2k))^2}{c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(2\,c\,(\nu-2s)\,z-i\,d\,(m-2k))^2}{4\,c\,(\nu-2s)}\right)+e^{\frac{d^2\,(m-2k)^2}{4\,c\,(\nu-2s)}+e\,i\,(m-2k)+g\,(\nu-2s)}\,(c\,(\nu-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(d\,i\,(m-2k)+2\,c\,(\nu-2s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2k)+2\,c\,(\nu-2s)\,z)^2}{c\,(\nu-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(d\,i\,(m-2k)+2\,c\,(\nu-2s)\,z)^2}{4\,c\,(\nu-2s)}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3691.01

$$\int z^n \cos^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{i\,e\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}$$

$$\left(e^{g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,-c\,(v-2\,k)\,\sqrt{z}\right)+e^{-g\,(v-2\,k)}\,\Gamma\left(2\,(n+1),\,c\,(v-2\,k)\,\sqrt{z}\right)\right)+2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^{h+j}\right.\right.$$

$$\left(-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,s)\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-\right.\right.$$

$$\left.\left.c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-2\right.$$

$$i\,d\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(-2\,i\,d\,\sqrt{z}\;(m-2\,k)-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{i\,c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left.\left(-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)-\right.$$

$$2\,i\,d\,(m-2\,k)\sqrt{-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{d\,(m-2\,k)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{i\left(c\,(v-2\,s)-2\,i\,d\,(m-2\,k)\,\sqrt{z}\,\right)^2}{4\,d\,(m-2\,k)}\right)\right)(-i\,d\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}-g\,(v-2\,s)+e\,i\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left(2\,i\,d\,(m-2\,k)\sqrt{\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)-c\,(v-2\,s)$$

$$\left.\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(2\,i\,d\,(m-2\,k)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{c^2\,i\,(v-2\,s)^2}{4\,d\,(m-2\,k)}+g\,(v-2\,s)+e\,i\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^{h+j}\left(\frac{i\left(2\,d\,i\,\sqrt{z}\,\,(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(v-2\,s)\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,k)}\right)$$

$$\left.\sqrt{\frac{i\left(2\,d\,i\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)\right)^2}{d\,(m-2\,k)}}\right)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\cos^m(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.3692.01

$$\int z^{\alpha-1}\cos^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz==$$

$$-\frac{1}{r}\left(2^{-m-v}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,g\,s-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.\right.$$

$$e^{2\,g\,s-g\,v}\,((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$e^{g\,v-2\,g\,s}\,((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.\left.\left.e^{g\,v-2\,g\,s}\,((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right)z^\alpha\right)+$$

$$\frac{2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{\alpha}-\frac{1}{r}\left(2^{-m-v}\,z^\alpha\binom{v}{\frac{v}{2}}(1-v\bmod 2)\right.$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},\,(i\,b\,m-2\,i\,b\,k)\,z^r\right)((i\,b\,m-2\,i\,b\,k)\,z^r)^{-\frac{\alpha}{r}}+((2\,i\,b\,k-i\,b\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,b\,k-i\,b\,m)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(2^{-m-v}\,z^\alpha\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2\,g\,k-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(c\,v-2\,c\,k)\,z^r\right)((c\,v-2\,c\,k)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$\left.\left.e^{g\,v-2\,g\,k}\,((2\,c\,k-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,k-c\,v)\,z^r\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3693.01

$$\int z^n \cos^m\left(b\,z^2\right) \cosh^v\left(c\,z^2+g\right) dz ==$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{n+1} - 2^{-m-v-1}\, z^{n+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}$$

$$\left(\Gamma\left(\frac{n+1}{2}, (i\,b\,m-2\,i\,b\,k)\,z^2\right)\left((i\,b\,m-2\,i\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} + \left((2\,i\,b\,k-i\,b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (2\,i\,b\,k-i\,b\,m)\,z^2\right)\right) -$$

$$2^{-m-v-1}\, z^{n+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{2\,g\,k-g\,v}\, \Gamma\left(\frac{n+1}{2}, (c\,v-2\,c\,k)\,z^2\right)\left((c\,v-2\,c\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} +$$

$$e^{g\,v-2\,g\,k} \left((2\,c\,k-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (2\,c\,k-c\,v)\,z^2\right)\right) - 2^{-m-v-1}\, z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{2\,g\,s-g\,v}\, \Gamma\left(\frac{n+1}{2}, (-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)\left((-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)} +$$

$$e^{2\,g\,s-g\,v} \left((2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z^2\right) +$$

$$e^{g\,v-2\,g\,s} \left((-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z^2\right) +$$

$$e^{g\,v-2\,g\,s} \left((2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\left.\Gamma\left(\frac{n+1}{2}, (2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z^2\right)\right) /;\; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3694.01

$$\int z^n \cos^m\left(\sqrt{z}\;b\right) \cosh^v\left(\sqrt{z}\;c+g\right) dz ==$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)}{n+1} - 2^{-m-v+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} (2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}$$

$$\left(\Gamma\left(2\,(n+1), (i\,b\,m-2\,i\,b\,k)\,\sqrt{z}\right) + \Gamma\left(2\,(n+1), (2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right) - 2^{-m-v+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (2\,c\,k-c\,v)^{-2\,(n+1)} \left(e^{2\,g\,k-g\,v}\, \Gamma\left(2\,(n+1), (c\,v-2\,c\,k)\,\sqrt{z}\right) + e^{g\,v-2\,g\,k}\, \Gamma\left(2\,(n+1), (2\,c\,k-c\,v)\,\sqrt{z}\right)\right) -$$

$$2^{-m-v+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{2\,g\,s-g\,v}\, \Gamma\left(2\,(n+1), (-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)} +$$

$$e^{2\,g\,s-g\,v}\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right) + e^{-2\,g\,s+g\,v}$$

$$(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right) + e^{-2\,g\,s+g\,v}\,(2\,i\,b\,k-i\,b$$

$$\left.m+2\,c\,s-c\,v)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)\right) /;\; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $z^{\alpha-1}\cos^m(b\,z^r+e)\cosh^v(c\,z^r+g)$

01.20.21.3695.01

$$\int z^{\alpha-1}\cos^m(b\,z^r+e)\cosh^v(c\,z^r+g)\,dz == -\frac{1}{r}2^{-m-v}z^\alpha$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2iek-iem+2gs-gv}\,\Gamma\left(\frac{\alpha}{r},(-2bik+ibm-2cs+cv)z^r\right)((-2bik+ibm-2cs+cv)z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{-2eik+iem+2gs-gv}((2ibk-ibm-2cs+cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ibk-ibm-2cs+cv)z^r\right)+$$

$$e^{2iek-iem-2gs+gv}((-2bik+ibm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2bik+ibm+2cs-cv)z^r\right)+$$

$$\left.e^{-2eik+iem-2gs+gv}((2ibk-ibm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ibk-ibm+2cs-cv)z^r\right)\right)+$$

$$\frac{2^{-m-v}z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{\alpha}-\frac{2^{-m-v}z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2iek-iem}\,\Gamma\left(\frac{\alpha}{r},(ibm-2ibk)z^r\right)((ibm-2ibk)z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.e^{iem-2iek}((2ibk-ibm)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ibk-ibm)z^r\right)\right)-\frac{2^{-m-v}z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2gk-gv}\,\Gamma\left(\frac{\alpha}{r},(cv-2ck)z^r\right)((cv-2ck)z^r)^{-\frac{\alpha}{r}}+e^{gv-2gk}((2ck-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2ck-cv)z^r\right)\right)/;\ m\in$$

$\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$

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$$\int z^n \cos^m\left(b z^2+e\right) \cosh^v\left(c z^2+g\right) dz ==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{2 i e k-i e m}\,\Gamma\left(\frac{n+1}{2},(i b m-2 i b k) z^2\right)\left((i b m-2 i b k) z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{i e m-2 i e k}\left((2 i b k-i b m) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(2 i b k-i b m) z^2\right)\right)\right) z^{n+1}-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{2 g k-g v}\,\Gamma\left(\frac{n+1}{2},(c v-2 c k) z^2\right)\left((c v-2 c k) z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{g v-2 g k}\left((2 c k-c v) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(2 c k-c v) z^2\right)\right)\right) z^{n+1}-2^{-m-v-1}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\right.$$

$$\left.\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2 i e k-i e m+2 g s-g v}\,\Gamma\left(\frac{n+1}{2},(-2 b i k+i b m-2 c s+c v) z^2\right)\left((-2 b i k+i b m-2 c s+c v) z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$e^{-2 e i k+i e m+2 g s-g v}\left((2 i b k-i b m-2 c s+c v) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(2 i b k-i b m-2 c s+c v) z^2\right)+$$

$$e^{2 i e k-i e m-2 g s+g v}\left((-2 b i k+i b m+2 c s-c v) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(-2 b i k+i b m+2 c s-c v) z^2\right)+$$

$$\left.\left.e^{-2 e i k+i e m-2 g s+g v}\left((2 i b k-i b m+2 c s-c v) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},(2 i b k-i b m+2 c s-c v) z^2\right)\right)\right) z^{n+1}+$$

$$\frac{2^{-m-v} z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1} /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz ==$$

$$\frac{2^{-m-v}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} - 2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(2\,i\,b\,k-i\,b\,m)^{-2\,(n+1)}$$

$$\left(e^{2\,i\,e\,k-i\,e\,m}\,\Gamma\left(2\,(n+1),\,(i\,b\,m-2\,i\,b\,k)\,\sqrt{z}\right)+e^{i\,e\,m-2\,i\,e\,k}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m)\,\sqrt{z}\right)\right)-$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(2\,c\,k-c\,v)^{-2\,(n+1)}$$

$$\left(e^{2\,g\,k-g\,v}\,\Gamma\left(2\,(n+1),\,(c\,v-2\,c\,k)\,\sqrt{z}\right)+e^{g\,v-2\,g\,k}\,\Gamma\left(2\,(n+1),\,(2\,c\,k-c\,v)\,\sqrt{z}\right)\right)-2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2\,i\,e\,k-i\,e\,m+2\,g\,s-g\,v}\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}+\right.$$

$$e^{-2\,e\,i\,k+i\,e\,m+2\,g\,s-g\,v}\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right)+$$

$$e^{2\,i\,e\,k-i\,e\,m-2\,g\,s+g\,v}\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)+$$

$$\left.e^{-2\,e\,i\,k+i\,e\,m-2\,g\,s+g\,v}\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,\sqrt{z}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+g\right)$

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$$\int z^n \cos^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+g\right)dz == -2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\right.$$

$$\left.\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1} - 2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{i\,(m-2\,k)\,d^2}{4\,b}}\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\right.\right.$$

$$\left(-\left(i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2\right)/\left(b\,(m-2\,k)\right)\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\left.\Gamma\left(\frac{j+1}{2},\,-\left(i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2\right)/\left(4\,b\,(m-2\,k)\right)\right)\right)(-i\,b\,(m-2\,k))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\left(i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2\right)\Big/(b\,(m-2\,k))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\Bigg)-2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{-\frac{1}{4}i\left(\frac{d^2\,(m-2\,s)^2}{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v}+4\,g\,i\,(v-2\,k)\right)}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^{j+1}$$

$$\left(-(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2\Big/(c\,(v-2\,k)-i\,b\,(m-2\,s))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\ -(2\,(c\,(v-2\,k)-i\,b\,(m-2\,s))\,z-i\,d\,(m-2\,s))^2\Big/(4\,(c\,(v-2\,k)-i\,b\,(m-2\,s)))\right)\Bigg)$$

$$(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-n-1}+e^{-\frac{1}{4}i\left(-\frac{d^2\,(m-2\,s)^2}{-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v}+4\,g\,i\,(v-2\,k)\right)}\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2\Big/(b\,i\,(m-2\,s)+c\,(v-2\,k))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\ -(d\,i\,(m-2\,s)+2\,(b\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2\Big/(4\,(b\,i\,(m-2\,s)+c\,(v-2\,k)))\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{d^2\,(m-2\,s)^2}{-2\,c\,i\,k-b\,m+2\,b\,s+i\,c\,v}+4\,g\,i\,(v-2\,k)\right)}\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,s))^{n-j}\,(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^{j+1}$$

$$\left(-(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2\Big/(-i\,b\,(m-2\,s)-c\,(v-2\,k))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},\ -(2\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))\,z-i\,d\,(m-2\,s))^2\Big/(4\,(-i\,b\,(m-2\,s)-c\,(v-2\,k)))\right)+$$

$$e^{\frac{1}{4}i\left(\frac{d^2\,(m-2\,s)^2}{2\,i\,c\,k-b\,m+2\,b\,s-i\,c\,v}+4\,g\,i\,(v-2\,k)\right)}\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,s))^{n-j}\,(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2\Big/(i\,b\,(m-2\,s)-c\,(v-2\,k))\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ -(d\,i\,(m-2\,s)+2\,(i\,b\,(m-2\,s)-c\,(v-2\,k))\,z)^2\Big/\right.$$

$$\left.(4\,(i\,b\,(m-2\,s)-c\,(v-2\,k)))\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(\sqrt{z}\ c + g\right) dz == -2^{-m-v+1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (v-2k)^{-2(n+1)} \binom{v}{k} \left(e^{g(v-2k)}\, \Gamma\left(2(n+1),\, -c(v-2k)\sqrt{z}\right) + e^{-g(v-2k)}\, \Gamma\left(2(n+1),\, c(v-2k)\sqrt{z}\right)\right)\right) c^{-2(n+1)} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} (i\,d\,(m-2k))^{-2(n+1)} \left(e^{-\frac{i(m-2k)b^2}{4d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(m-2k))^{-h-j+2n} \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^{h+j} \right.$$

$$\left(\frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\,i\,(m-2k) \left(b\,i\,(m-2k) + \right.\right.$$

$$\left. 2\,d\,i\,\sqrt{z}\ (m-2k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, \frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)}\right) + 2\,d\,i\,(m-2k)$$

$$\left. \left. \sqrt{\frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\, \frac{i\left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)}\right) \right) +$$

$$e^{\frac{i(m-2k)b^2}{4d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b\,(m-2k))^{-h-j+2n} \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b\,(m-2k) \right.$$

$$\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, -\frac{i\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^2}{4\,d\,(m-2k)}\right) -$$

$$2\,i\,d\,(m-2k) \sqrt{-\frac{i\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\ (m-2k)\right)^2}{d\,(m-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$-\frac{i\left(-i\,b\,(m-2\,k)-2\,i\,d\,\sqrt{z}\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(i\,d\,(m-2\,s))^{-2\,(n+1)}\Bigg(e^{-\frac{i\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^2}{4\,d\,(m-2\,s)}+g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c\,(v-2\,k)-i\,b\,(m-2\,s))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\;\Gamma\Bigg(\frac{1}{2}\,(h+j+2),$$

$$-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\Bigg)\Bigg)+e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\,(m-2\,s)-c\,(v-2\,k)\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}+g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\left.\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\right)+e^{\frac{i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}-g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\ (m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,s)-c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\left.\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+g\right)$

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$$\int z^n\cos^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+g\right)dz==-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}$$

$$\left(e^{g\,(v-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,-c\,(v-2\,k)\,z^2\right)\left(-c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{-g\,(v-2\,k)}\left(c\,(v-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,k)\,z^2\right)\right)+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{\frac{i\,(m-2\,k)\,d^2}{4\,b}-i\,e\,(m-2\,k)}\right.$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k))^{n-j}\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^{j+1}\left(-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{i\,(-i\,d\,(m-2\,k)-2\,i\,b\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)\right)(-i\,b\,(m-2\,k))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{2icbk-bm+2bs-icv}+4e(m-2s)+4gi(v-2k)\right)}\left(\sum_{j=0}^{n}2^{j-n}(id(m-2s))^{n-j}(2(c(v-2k)-ib(m-2s))\right.\right.$$

$$z-id(m-2s))^{j+1}\left(-\frac{(2(c(v-2k)-ib(m-2s))z-id(m-2s))^2}{c(v-2k)-ib(m-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(2(c(v-2k)-ib(m-2s))z-id(m-2s))^2}{4(c(v-2k)-ib(m-2s))}\right)\right)(c(v-2k)-ib(m-2s))^{-n-1}+$$

$$e^{-\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{-2cik-bm+2bs+icv}-4e(m-2s)+4gi(v-2k)\right)}(bi(m-2s)+c(v-2k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}(-id(m-2s))^{n-j}(di(m-2s)+2(bi(m-2s)+c(v-2k))z)^{j+1}$$

$$\left(-\frac{(di(m-2s)+2(bi(m-2s)+c(v-2k))z)^2}{bi(m-2s)+c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(di(m-2s)+2(bi(m-2s)+c(v-2k))z)^2}{4(bi(m-2s)+c(v-2k))}\right)+e^{\frac{1}{4}i\left(-\frac{d^2(m-2s)^2}{-2cik-bm+2bs+icv}-4e(m-2s)+4gi(v-2k)\right)}$$

$$(-ib(m-2s)-c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(id(m-2s))^{n-j}(2(-ib(m-2s)-c(v-2k))z-id(m-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2s)-c(v-2k))z-id(m-2s))^2}{-ib(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2s)-c(v-2k))z-id(m-2s))^2}{4(-ib(m-2s)-c(v-2k))}\right)+e^{\frac{1}{4}i\left(\frac{d^2(m-2s)^2}{2icbk-bm+2bs-icv}+4e(m-2s)+4gi(v-2k)\right)}$$

$$(ib(m-2s)-c(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-id(m-2s))^{n-j}(di(m-2s)+2(ib(m-2s)-c(v-2k))z)^{j+1}$$

$$\left(-\frac{(di(m-2s)+2(ib(m-2s)-c(v-2k))z)^2}{ib(m-2s)-c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(di(m-2s)+2(ib(m-2s)-c(v-2k))z)^2}{4(ib(m-2s)-c(v-2k))}\right)\right)/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ b+e+dz\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz==-2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2k)^{-2(n+1)}\binom{v}{k}\left(e^{g(v-2k)}\Gamma\left(2(n+1),-c(v-2k)\sqrt{z}\right)+e^{-g(v-2k)}\Gamma\left(2(n+1),c(v-2k)\sqrt{z}\right)\right)\right)c^{-2(n+1)}+$$

$$\frac{2^{-m-\nu}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1-m \bmod 2)\,(1-\nu \bmod 2)}{n+1} + 2^{-m-2n-\nu-1} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} (i\,d\,(m-2k))^{-2(n+1)}$$

$$\left(e^{-\frac{i\,(m-2k)\,b^2}{4d} + e\,i\,(m-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b\,(m-2k))^{-h-j+2n} \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k)\right)^{h+j} \right.$$

$$\left(\frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\,i\,(m-2k) \left(b\,i\,(m-2k) + \right.\right.$$

$$\left. 2\,d\,i\,\sqrt{z}\,(m-2k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, \frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right) + 2\,d\,i\,(m-2k)$$

$$\left. \sqrt{\frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)}}\; \Gamma\left(\frac{1}{2}(h+j+2),\, \frac{i \left(b\,i\,(m-2k) + 2\,d\,i\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right) \right) +$$

$$e^{\frac{i\,(m-2k)\,b^2}{4d} - i\,e\,(m-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b\,(m-2k))^{-h-j+2n} \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k)\right)^{h+j}$$

$$\left(-\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-i\,b\,(m-2k) \right.$$

$$\left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k)\right) \Gamma\left(\frac{1}{2}(h+j+1),\, -\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right) -$$

$$2\,i\,d\,(m-2k) \sqrt{-\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{d\,(m-2k)}}\; \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left. \left. -\frac{i \left(-i\,b\,(m-2k) - 2\,i\,d\,\sqrt{z}\,(m-2k)\right)^2}{4\,d\,(m-2k)}\right) \right) \right) +$$

$$2^{-m-2n-\nu-1} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} (i\,d\,(m-2s))^{-2(n+1)} \left(e^{-\frac{i\,(c\,(\nu-2k) - i\,b\,(m-2s))^2}{4\,d\,(m-2s)} - i\,e\,(m-2s) + g\,(\nu-2k)} \right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,k)-i\,b\,(m-2\,s))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)\right)+e^{-\frac{i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{2}}{4\,d\,(m-2\,s)}-i\,e\,(m-2\,s)-g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{4\,d\,(m-2\,s)}\right)-$$

$$2\,i\,d\,(m-2\,s)\sqrt{-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{2}}{d\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.-\frac{i\left(-i\,b\,(m-2\,s)-2\,i\,d\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+e^{\frac{i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}+e\,i\,(m-2\,s)+g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\;\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)+$$

$$2\,d\,i\,(m-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\;\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,d\,(m-2\,s)}\right)$$

$$\left.\sqrt{\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)+c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}}\right)+e^{\frac{i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,d\,(m-2\,s)}+e\,i\,(m-2\,s)-g\,(v-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)^2}{d\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,s)-c\,(v-2\,k))\left(b\,i\,(m-2\,s)+2\,d\,i\,\sqrt{z}\;(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)+$$

$$2\,d\,i\,(m-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{4\,d\,(m-2s)}\right)$$

$$\sqrt{\frac{i\left(b\,i\,(m-2s)+2\,d\,i\,\sqrt{z}\ (m-2s)-c\,(v-2k)\right)^2}{d\,(m-2s)}}\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n\cos^m(d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,i\,d\,(m-2k)\,z)\,(-i\,d\,(m-2k))^{-n-1}+(i\,d\,(m-2k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2k)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{\frac{f^2(v-2k)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2k))^{n-j}\,(-f\,(v-2k)-2\,c\,z\,(v-2k))^{j+1}\right.$$

$$\left.\left(\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)$$

$$(-c\,(v-2k))^{-n-1}+e^{-\frac{f^2(v-2k)}{4c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ -\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{(-i\,d\,(m-2k)-f\,(v-2s))^2}{4\,c\,(v-2s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2k)+f\,(v-2s))^{n-j}\right.$$

$$\left.(-i\,d\,(m-2k)-f\,(v-2s)-2\,c\,(v-2s)\,z)^{j+1}\left(\frac{(-i\,d\,(m-2k)-f\,(v-2s)-2\,c\,(v-2s)\,z)^2}{c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left(\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f\,(v-2\,s)-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m(d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-\right.\right.\right.$$

$$\left.\left.\left.i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}}\right)\Bigg)$$

$$(f\,(v-2\,s)-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)+$$

$$e^{-\frac{c^2(v-2s)^2}{4(i\,d\,(m-2k)-f(v-2s))}}\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)^{-2(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2n}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n \cos^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{i\,e\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2\,k)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)$$

$$(-c\,(v-2\,k))^{-n-1}+e^{-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{n-j}\right.\right.$$

$$(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left(\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f\,(v-2\,s)-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{i\,e\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}}\right)\right)$$

$$(f\,(v-2\,s)-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}+e\,i\,(m-2\,k)}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}-i\,e\,(m-2\,k)}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)-$$

$$c\,(v-2\,s)\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d\,(m-2\,k)-f\,(v-2\,s))}+e\,i\,(m-2\,k)}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m(b\,z^r)\cosh^v(c\,z^r+f\,z)$

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$$\int z^n\cos^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z\right)dz==-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},-i\,b\,(m-2\,k)\,z^2\right)\left(-i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(i\,b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},i\,b\,(m-2\,k)\,z^2\right)\right)\right)$$

$$z^{n+1}+\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2(v-2k)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\left(f\,(v-2\,k)\right)^{n-j}\left(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k)\right)^{j+1}\left(\frac{\left(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k)\right)^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{\left(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k)\right)^2}{4\,c\,(v-2\,k)}\right)\right)(-c\,(v-2\,k))^{-n-1}+\right.$$

$$e^{-\frac{f^2(v-2k)}{4c}}(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\left(-f\,(v-2\,k)\right)^{n-j}\left(f\,(v-2\,k)+2\,c\,z\,(v-2\,k)\right)^{j+1}$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{if^2(v-2s)^2}{4(2bk-bm+2ics-icv)}}\left(\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^{j+1}\right.$$

$$\left(-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{c(v-2s)-ib(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{4(c(v-2s)-ib(m-2k))}\right)\right)(c(v-2s)-ib(m-2k))^{-n-1}+$$

$$e^{\frac{if^2(v-2s)^2}{4(-2bk+bm+2ics-icv)}}(bi(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}\left(-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)+e^{-\frac{if^2(v-2s)^2}{4(-2bk+bm+2ics-icv)}}$$

$$(-ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{-ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-ib(m-2k)-c(v-2s))}\right)+$$

$$e^{-\frac{if^2(v-2s)^2}{4(2bk-bm+2ics-icv)}}(ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(ib(m-2k)-c(v-2s))}\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b\right) \cosh^v\left(\sqrt{z}\ c + f\ z\right) dz == (-1)^n\, 2^{-m-v+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (m-2k)^{-2(n+1)} \binom{m}{k} \left(\Gamma\left(2(n+1), -i\, b\, (m-2k)\sqrt{z}\right) + \Gamma\left(2(n+1), i\, b\, (m-2k)\sqrt{z}\right)\right)\right) b^{-2(n+1)} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)(1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (f\,(v-2k))^{-2(n+1)} \left(e^{\frac{c^2 (v-2k)}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c\,(v-2k))^{-h-j+2n} \left(-c\,(v-2k) - 2\,f\,\sqrt{z}\ (v-2k)\right)^{h+j} \right.$$

$$\left(\frac{\left(-c\,(v-2k) - 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-c\,(v-2k) \left(-c\,(v-2k) - 2\,f\,\sqrt{z}\ (v-2k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}(h+j+1), \frac{\left(-c\,(v-2k) - 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{4\,f\,(v-2k)} \right) - 2\,f\,(v-2k) \right.$$

$$\left. \sqrt{\frac{\left(-c\,(v-2k) - 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2), \frac{\left(-c\,(v-2k) - 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{4\,f\,(v-2k)} \right) \right) +$$

$$e^{-\frac{c^2 (v-2k)}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(v-2k))^{-h-j+2n} \left(c\,(v-2k) + 2\,f\,\sqrt{z}\ (v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2k) + 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(c\,(v-2k) \left(c\,(v-2k) + 2\,f\,\sqrt{z}\ (v-2k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}(h+j+1), -\frac{\left(c\,(v-2k) + 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{4\,f\,(v-2k)} \right) + 2\,f\,(v-2k)\,\Gamma\left(\frac{1}{2}(h+j+2), \right.\right.$$

$$\left.\left. -\frac{\left(c\,(v-2k) + 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{4\,f\,(v-2k)} \right) \sqrt{-\frac{\left(c\,(v-2k) + 2\,f\,\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)}}\ \right) \right) +$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f(v-2s))^{-2(n+1)}\left(e^{\frac{(-ib(m-2k)-c(v-2s))^2}{4f(v-2s)}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-ib(m-2k)-c(v-2s))^{-h-j+2n}\right.$$

$$\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-ib(m-2k)-c(v-2s))\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2f(v-2s)\sqrt{\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)+e^{\frac{(ib(m-2k)-c(v-2s))^2}{4f(v-2s)}}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2k)-c(v-2s))^{-h-j+2n}\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((ib(m-2k)-c(v-2s))\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2f(v-2s)\sqrt{\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)+$$

$$2\,f\,(v-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{f\,(v-2s)}}\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z)$

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$$\int z^n\cos^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz==$$

$$-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{i\,e\,(m-2k)}\,\Gamma\left(\frac{n+1}{2},-i\,b\,(m-2k)\,z^2\right)\left(-i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.\right.$$

$$\left.\left.e^{-i\,e\,(m-2k)}\left(i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},i\,b\,(m-2k)\,z^2\right)\right)\right)z^{n+1}+$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2k)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2k))^{n-j}\,(-f\,(v-2k)-2\,c\,z\,(v-2k))^{j+1}\left(\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\,\Gamma\left(\frac{j+1}{2},\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)(-c\,(v-2k))^{-n-1}+\right.$$

$$e^{-\frac{f^2\,(v-2k)}{4\,c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\,\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{1}{4}i\left(4\,e\,(m-2k)-\frac{f^2\,(v-2s)^2}{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2s))^{n-j}\right.\right.$$

$$(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^{j+1}\left(-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{c(v-2s)-ib(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{4(c(v-2s)-ib(m-2k))}\right)(c(v-2s)-ib(m-2k))^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}+4e(m-2k)\right)}(bi(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}\left(-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}+4e(m-2k)\right)}$$

$$(-ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{-ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-ib(m-2k)-c(v-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(4e(m-2k)-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}\right)}(ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(ib(m-2k)-c(v-2s))}\right)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+f\right)dz==(-1)^n\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(e^{ie(m-2k)}\Gamma\left(2(n+1),-ib(m-2k)\sqrt{z}\right)+e^{-ie(m-2k)}\Gamma\left(2(n+1),ib(m-2k)\sqrt{z}\right)\right)\right)$$

$$b^{-2(n+1)}+\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(v-2k))^{-2(n+1)}\left(e^{\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\right.$$

$$\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^{h+j}\left(\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c(v-2k)\right.$$

$$\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)-2f(v-2k)$$

$$\left.\left.\sqrt{\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-c(v-2k)-2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)\right)+$$

$$e^{-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c(v-2k)\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)+2f(v-2k)\Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}}\right)\Bigg)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f(v-2s))^{-2(n+1)}\left(e^{\frac{(-ib(m-2k)-c(v-2s))^2}{4f(v-2s)}-ie(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j\right.$$

$$(-ib(m-2k)-c(v-2s))^{-h-j+2n}\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left.\left(\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\right.$$

$$\left((-i\,b\,(m-2\,k)-c\,(v-2\,s))\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\,\sqrt{\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{\frac{(i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e\,i\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,k)-c\,(v-2\,s))\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\,\sqrt{\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}-i\,e\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e\,i\,(m-2\,k)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \cos^m(b z^r + d z) \cosh^v(c z^r + f z)$

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$$\int z^n \cos^m\left(b z^2 + d z\right) \cosh^v\left(c z^2 + f z\right) dz ==$$

$$\frac{\left(2^{-m-v} z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1 - m \bmod 2)(1 - v \bmod 2)}{n+1} - 2^{-m-v-1}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-\frac{i(2k-m)d^2}{4b}}\left(\sum_{j=0}^{n} 2^{j-n}(-i d(2k-m))^{n-j}(d i(2k-m) + 2 b i z(2k-m))^{j+1}\left(\frac{i(d i(2k-m) + 2 b i z(2k-m))^2}{b(2k-m)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i(d i(2k-m) + 2 b i z(2k-m))^2}{4 b(2k-m)}\right)\right)(i b(2k-m))^{-n-1} +$$

$$e^{-\frac{i(m-2k)d^2}{4b}}(i b(m-2k))^{-n-1}\sum_{j=0}^{n} 2^{j-n}(-i d(m-2k))^{n-j}(d i(m-2k) + 2 b i z(m-2k))^{j+1}$$

$$\left(\frac{i(d i(m-2k) + 2 b i z(m-2k))^2}{b(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, \frac{i(d i(m-2k) + 2 b i z(m-2k))^2}{4 b(m-2k)}\right) -$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{-\frac{f^2(2k-v)}{4c}}\left(\sum_{j=0}^{n} 2^{j-n}(-f(2k-v))^{n-j}(f(2k-v) + 2 c z(2k-v))^{j+1}\right.\right.$$

$$\left.\left.\left(-\frac{(f(2k-v) + 2 c z(2k-v))^2}{c(2k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f(2k-v) + 2 c z(2k-v))^2}{4 c(2k-v)}\right)\right)(c(2k-v))^{-n-1} +\right.$$

$$e^{-\frac{f^2(v-2k)}{4c}}(c(v-2k))^{-n-1}\sum_{j=0}^{n} 2^{j-n}(-f(v-2k))^{n-j}(f(v-2k) + 2 c z(v-2k))^{j+1}$$

$$\left(-\frac{(f(v-2k) + 2 c z(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(f(v-2k) + 2 c z(v-2k))^2}{4 c(v-2k)}\right)\Bigg) -$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d i(2k-m) + f(2s-v))^2}{4(b i(2k-m) + c(2s-v))}}\left(\sum_{j=0}^{n} 2^{j-n}(-i d(2k-m) - f(2s-v))^{n-j}\right.\right.$$

$$(d i(2k-m) + f(2s-v) + 2(b i(2k-m) + c(2s-v))z)^{j+1}$$

$$\left(-(d i(2k-m) + f(2s-v) + 2(b i(2k-m) + c(2s-v))z)^2 / (b i(2k-m) + c(2s-v))\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2}, -\frac{(d i(2k-m) + f(2s-v) + 2(b i(2k-m) + c(2s-v))z)^2}{4(b i(2k-m) + c(2s-v))}\right)\right)$$

$$(b\,i\,(2\,k-m)+c\,(2\,s-v))^{-n-1}+e^{-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v))^2}{4\,(b\,i\,(m-2\,k)+c\,(2\,s-v))}}\,(b\,i\,(m-2\,k)+c\,(2\,s-v))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(2\,s-v))^{n-j}\,(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^2}{b\,i\,(m-2\,k)+c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(2\,s-v)+2\,(b\,i\,(m-2\,k)+c\,(2\,s-v))\,z)^2}{4\,(b\,i\,(m-2\,k)+c\,(2\,s-v))}\right)+$$

$$e^{-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s))^2}{4\,(b\,i\,(2\,k-m)+c\,(v-2\,s))}}\,(b\,i\,(2\,k-m)+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^2}{b\,i\,(2\,k-m)+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2\,k-m)+f\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^2}{4\,(b\,i\,(2\,k-m)+c\,(v-2\,s))}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,(b\,i\,(m-2\,k)+c\,(v-2\,s))}}\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2}{b\,i\,(m-2\,k)+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,(b\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2}{4\,(b\,i\,(m-2\,k)+c\,(v-2\,s))}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^{n-1}\,2^{-m-2\,n-v-1}\,d^{-2\,n-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(2\,k-m)^{-2\,n-2}\left(e^{-\frac{i\,(2\,k-m)\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(2\,k-m))^{-h-j+2\,n}\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\;(2\,k-m)\right)^2}{d\,(2\,k-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(2\,k-m)\left(b\,i\,(2\,k-m)+\right.\right.$$

$$2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)+2\,d\,i\,(2\,k-m)$$

$$\sqrt{\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{d\,(2\,k-m)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)\Bigg)+$$

$$e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}}\,\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+2),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f\,(2\,k-v))^{-2\,n-2}\Bigg(e^{-\frac{c^2\,(2\,k-v)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^{h+j}\left(-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(c\,(2\,k-v)\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{4\,f\,(2\,k-v)}\right)+2\,f\,(2\,k-$$

$$v)\sqrt{-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{f\,(2\,k-v)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{4\,f\,(2\,k-v)}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\Bigg)+2\,f\,(v-2\,k)$$

$$\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{-\frac{(b\,i\,(2\,s-m)+c\,(2\,k-v))^2}{4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\Bigg(-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\Bigg)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(2\,s-m)+c\,(2\,k-v))\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)$$

$$\Gamma\Bigg(\frac{1}{2}\,(h+j+1),\,-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/$$

$$\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\right)\Bigg)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))$$

$$\Gamma\Bigg(\frac{1}{2}\,(h+j+2),\,-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/$$

$$\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\right)\Bigg)\sqrt{\Bigg(-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\Bigg)}\Bigg)\Bigg)$$

$$(d\,i\,(2\,s-m)+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}}\,(d\,i\,(m-2\,s)+f\,(2\,k-v))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(m-2\,s)+c\,(2\,k-v)\right)\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\right)\right)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\right)\right)\sqrt{\left(-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)\right)}\Bigg)+$$

$$e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}}\,(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(v-2\,k)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(2\,s-m)+c\,(v-2\,k)\right)\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\right)\right)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\right)\right)\sqrt{\left(-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(v-2\,k)\right)\right)}\Bigg)+$$

$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(v-2\,k)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(m-2\,s)+c\,(v-2\,k)\right)\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/}$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n\cos^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{-\frac{i\,(2\,k-m)\,d^2}{4\,b}+e\,i\,(2\,k-m)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m))^{n-j}\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^{j+1}\left(\frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{4\,b\,(2\,k-m)}\right)\right)(i\,b\,(2\,k-m))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{f^2\,(2\,k-v)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,k-v))^{n-j}\,(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^{j+1}\right.$$

$$\left.\left(-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{4\,c\,(2\,k-v)}\right)\right)(c\,(2\,k-v))^{-n-1}+$$

$$e^{-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d\,i\,(2k-m)+f\,(2s-v))^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}+e\,i\,(2k-m)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m)-f\,(2s-v))^{n-j}\right.\right.$$
$$(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^{j+1}$$
$$\left(-(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2\Big/(b\,i\,(2k-m)+c\,(2s-v))\right)^{\frac{1}{2}(-j-1)}$$
$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}\right)\right)\right.$$
$$(b\,i\,(2k-m)+c\,(2s-v))^{-n-1}+e^{-\frac{(d\,i\,(m-2k)+f\,(2s-v))^2}{4\,(b\,i\,(m-2k)+c\,(2s-v))}+e\,i\,(m-2k)}\,(b\,i\,(m-2k)+c\,(2s-v))^{-n-1}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k)-f\,(2s-v))^{n-j}\,(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^2}{b\,i\,(m-2k)+c\,(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^2}{4\,(b\,i\,(m-2k)+c\,(2s-v))}\right)+$$
$$e^{-\frac{(d\,i\,(2k-m)+f\,(v-2s))^2}{4\,(b\,i\,(2k-m)+c\,(v-2s))}+e\,i\,(2k-m)}\,(b\,i\,(2k-m)+c\,(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m)-f\,(v-2s))^{n-j}$$
$$(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^2}{b\,i\,(2k-m)+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^2}{4\,(b\,i\,(2k-m)+c\,(v-2s))}\right)+$$
$$e^{-\frac{(d\,i\,(m-2k)+f\,(v-2s))^2}{4\,(b\,i\,(m-2k)+c\,(v-2s))}+e\,i\,(m-2k)}\,(b\,i\,(m-2k)+c\,(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k)-f\,(v-2s))^{n-j}$$
$$(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{b\,i\,(m-2k)+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{4\,(b\,i\,(m-2k)+c\,(v-2s))}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz==$$
$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^{n-1}\,2^{-m-2\,n-v-1}\,d^{-2\,n-2}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}(2k-m)^{-2n-2}\left(e^{-\frac{i(2k-m)b^2}{4d}+ei(2k-m)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(2k-m))^{-h-j+2n}\left(bi(2k-m)+2di\sqrt{z}\ (2k-m)\right)^{h+j}\right.$$

$$\left(\frac{i\left(bi(2k-m)+2di\sqrt{z}\ (2k-m)\right)^2}{d(2k-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(bi(2k-m)\left(bi(2k-m)+\right.\right.$$

$$\left.2di\sqrt{z}\ (2k-m)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(bi(2k-m)+2di\sqrt{z}\ (2k-m)\right)^2}{4d(2k-m)}\right)+2di(2k-m)$$

$$\left.\left.\sqrt{\frac{i\left(bi(2k-m)+2di\sqrt{z}\ (2k-m)\right)^2}{d(2k-m)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(bi(2k-m)+2di\sqrt{z}\ (2k-m)\right)^2}{4d(2k-m)}\right)\right)+\right.$$

$$e^{-\frac{i(m-2k)b^2}{4d}+ei(m-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2k))^{-h-j+2n}\left(bi(m-2k)+2di\sqrt{z}\ (m-2k)\right)^{h+j}$$

$$\left(\frac{i\left(bi(m-2k)+2di\sqrt{z}\ (m-2k)\right)^2}{d(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(bi(m-2k)\left(bi(m-2k)+2di\sqrt{z}\ (m-2k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(bi(m-2k)+2di\sqrt{z}\ (m-2k)\right)^2}{4d(m-2k)}\right)+\right.$$

$$2di(m-2k)\sqrt{\frac{i\left(bi(m-2k)+2di\sqrt{z}\ (m-2k)\right)^2}{d(m-2k)}}\ \Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+2),\ \frac{i\left(bi(m-2k)+2di\sqrt{z}\ (m-2k)\right)^2}{4d(m-2k)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(2k-v))^{-2n-2}\left(e^{-\frac{c^2(2k-v)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(2k-v))^{-h-j+2n}\right.$$

$$\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^{h+j}\left(-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{f\,(2\,k-\nu)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(2\,k-\nu)\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{4\,f\,(2\,k-\nu)}\right)+2\,f\,(2\,k-\right.$$

$$\left.\nu)\sqrt{-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{f\,(2\,k-\nu)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(2\,k-\nu)+2\,f\,\sqrt{z}\,\,(2\,k-\nu)\right)^2}{4\,f\,(2\,k-\nu)}\right)\right)+$$

$$e^{-\frac{c^2\,(\nu-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(\nu-2\,k))^{-h-j+2\,n}\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{f\,(\nu-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(\nu-2\,k)\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{4\,f\,(\nu-2\,k)}\right)+2\,f\,(\nu-2\,k)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{f\,(\nu-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(\nu-2\,k)+2\,f\,\sqrt{z}\,\,(\nu-2\,k)\right)^2}{4\,f\,(\nu-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-\nu-1}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{(b\,i\,(2\,s-m)+c\,(2\,k-\nu))^2}{4\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))}+e\,i\,(2\,s-m)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(2\,k-\nu))^{-h-j+2\,n}\right.\right.$$

$$\left(b\,i\,(2\,s-m)+c\,(2\,k-\nu)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(2\,s-m)+c\,(2\,k-\nu)+\right.\right.$$

$$\left.\left.2\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-\nu)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(2\,s-m)+c\,(2\,k-\nu)\right)\left(b\,i\,(2\,s-m)+c\,(2\,k-\nu)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(2\,s-m)+c\,(2\,k-\nu)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\right)\right)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(2\,s-m)+c\,(2\,k-\nu)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-\nu))\right)\right)\sqrt{\left(-\left(b\,i\,(2\,s-m)+c\,(2\,k-\nu)+\right.\right.}$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\Big)\Big)\Big]$$

$$(d\,i\,(2\,s-m)+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}+e\,i\,(m-2\,s)}\,(d\,i\,(m-2\,s)+f\,(2\,k-v))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^{h+j}\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(m-2\,s)+c\,(2\,k-v))\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/\,(4\,(d\,i\,(m-2\,s)+$$

$$f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/}$$

$$(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)\Big)+e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}+e\,i\,(2\,s-m)}$$

$$(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^{h+j}\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(2\,s-m)+c\,(v-2\,k))\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/\,(4\,(d\,i\,(2\,s-m)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/}$$

$$(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)\Big)+e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+e\,i\,(m-2\,s)}$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^{h+j}\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+$$

$$2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\Big)^2\Big/\big(d\,i\,(m-2\,s)+f\,(v-2\,k)\big)\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(m-2\,s)+c\,(v-2\,k))\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/}$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\cos^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\big(\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\big)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{\frac{f^2\,(v-2\,k)}{4\,c}-g\,(v-2\,k)}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)$$

$$(-c\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\Bigg(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{n-j}$$

$$(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\right.$$

$$\left(\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f\,(v-2\,s)-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}\right.$$

$$\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}+g\,(v-2\,s)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-\right.\right.\right.$$

$$\left.\left.\left.i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.$$

$$\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}}\right)\Bigg)$$

$$(f\,(v-2\,s)-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}+g\,(v-2\,s)}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\;-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(-i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}-g\,(v-2\,s)}\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)^{-2\,(n+1)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)-$$

$$c\,(v-2\,s)\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\left(i\,d\,(m-2\,k)-f\,(v-2\,s)\right)}\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \cos^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{i\,e\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2\,k)}{4\,c}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)$$

$$(-c\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{n-j}\right.\right.$$

$$(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-i\,d\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{\frac{(i\,d\,(m-2\,k)-f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)-g\,(v-2\,s)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,s)-i\,d\,(m-2\,k))^{n-j}\right.$$

$$(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^{j+1}\left(\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(d\,i\,(m-2\,k)-f\,(v-2\,s)-2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)(-c\,(v-2\,s))^{-n-1}+$$

$$e^{-\frac{(f\,(v-2\,s)-i\,d\,(m-2\,k))^2}{4\,c\,(v-2\,s)}-i\,e\,(m-2\,k)+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(-i\,d\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)+$$

$$e^{-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s))^2}{4\,c\,(v-2\,s)}+e\,i\,(m-2\,k)+g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{n-j}$$

$$(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^{j+1}\left(-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2\,k)+f\,(v-2\,s)+2\,c\,(v-2\,s)\,z)^2}{4\,c\,(v-2\,s)}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}+(-1)^n\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-i\,e\,(m-2\,k)}\,\Gamma(n+1,\,i\,d\,(m-2\,k)\,z)\,(-i\,d\,(m-2\,k))^{-n-1}+e^{i\,e\,(m-2\,k)}\,(i\,d\,(m-2\,k))^{-n-1}\,\Gamma(n+1,\,-i\,d\,(m-2\,k)\,z)\right)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(f\,(v-2\,k))^{-2\,(n+1)}\binom{v}{k}\left(e^{\frac{c^2\,(v-2\,k)}{4\,f}-g\,(v-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,k))^{-h-j+2\,n}\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{f\,(v-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\;(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\;(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)+2\,f\,(v-2\,k)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}+g\,(v-2\,s)-i\,e\,(m-2\,k)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)+$$

$$2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+j+2),-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-i\,d\,(m-2\,k))}\right)$$

$$\left.\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(f\,(v-2\,s)-i\,d\,(m-2\,k))\,\sqrt{z}\right)^2}{f\,(v-2\,s)-i\,d\,(m-2\,k)}}\right)\right)$$

$$(f\,(v-2\,s)-i\,d\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}+g\,(v-2\,s)+e\,i\,(m-2\,k)}\,(d\,i\,(m-2\,k)+f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s))^{-h-j+2\,n}\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}$$

$$\binom{n}{j}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)+$$

$$2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d\,i\,(m-2\,k)+f\,(v-2\,s))}\right)$$

$$\left.\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d\,i\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d\,i\,(m-2\,k)+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)-i\,e\,(m-2\,k)}\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{-i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)-$$

$$c\,(v-2\,s)\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(2\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(-i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(i\,d\,(m-2\,k)-f\,(v-2\,s))}-g\,(v-2\,s)+e\,i\,(m-2\,k)}\,(i\,d\,(m-2\,k)-f\,(v-2\,s))^{-2\,(n+1)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(-c\,(v-2\,s))^{-h-j+2\,n}\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+j}$$

$$\left(-\frac{\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{2}}{i\,d\,(m-2\,k)-f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\sqrt{-\frac{\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{2}}{i\,d\,(m-2\,k)-f\,(v-2\,s)}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{2}}{4\,(i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)-$$

$$c\,(v-2\,s)\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\right.$$

$$\left.\left.-\frac{\left(2\,(i\,d\,(m-2\,k)-f\,(v-2\,s))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{2}}{4\,(i\,d\,(m-2\,k)-f\,(v-2\,s))}\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \cos^m(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^{n}\cos^{m}\left(b\,z^{2}\right)\cosh^{v}\left(c\,z^{2}+f\,z+g\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\,z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},\,-i\,b\,(m-2\,k)\,z^{2}\right)\left(-i\,b\,(m-2\,k)\,z^{2}\right)^{\frac{1}{2}(-n-1)}+\left(i\,b\,(m-2\,k)\,z^{2}\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,i\,b\,(m-2\,k)\,z^{2}\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^{2}\,(v-2\,k)}{4\,c}-g\,(v-2\,k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2\,k))^{n-j}\,(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{2}}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,\frac{(-f\,(v-2\,k)-2\,c\,z\,(v-2\,k))^{2}}{4\,c\,(v-2\,k)}\right)\right)$$

$$(-c\,(v-2\,k))^{-n-1}+e^{g\,(v-2\,k)-\frac{f^{2}\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f(v-2k)+2cz(v-2k))^2}{c(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2k)+2cz(v-2k))^2}{4c(v-2k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}+4gi(v-2s)\right)}\Bigg(\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^{j+1}\left(-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{c(v-2s)-ib(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{4(c(v-2s)-ib(m-2k))}\right)\Bigg)(c(v-2s)-ib(m-2k))^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)\right)}(bi(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}\left(-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)\right)}$$

$$(-ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{-ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-ib(m-2k)-c(v-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}+4gi(v-2s)\right)}(ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(ib(m-2k)-c(v-2s))}\right)\Bigg)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b\right) \cosh^v\left(\sqrt{z}\ c + g + f\ z\right) dz == (-1)^n\, 2^{-m-v+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (m-2k)^{-2(n+1)} \binom{m}{k} \left(\Gamma\left(2(n+1), -i\,b\,(m-2k)\sqrt{z}\right) + \Gamma\left(2(n+1), i\,b\,(m-2k)\sqrt{z}\right)\right)\right) b^{-2(n+1)} +$$

$$\frac{2^{-m-v}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)(1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} (f\,(v-2k))^{-2(n+1)} \left(e^{\frac{c^2 (v-2k)}{4f} - g(v-2k)} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-c\,(v-2k))^{-h-j+2n} \left(-c\,(v-2k) - 2f\sqrt{z}\ (v-2k)\right)^{h+j} \right.$$

$$\left(\frac{\left(-c\,(v-2k) - 2f\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(-c\,(v-2k) \left(-c\,(v-2k) - 2f\sqrt{z}\ (v-2k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}(h+j+1),\ \frac{\left(-c\,(v-2k) - 2f\sqrt{z}\ (v-2k)\right)^2}{4f\,(v-2k)} \right) - 2f\,(v-2k) \right.$$

$$\left. \sqrt{\frac{\left(-c\,(v-2k) - 2f\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(-c\,(v-2k) - 2f\sqrt{z}\ (v-2k)\right)^2}{4f\,(v-2k)} \right) \right) +$$

$$e^{g(v-2k) - \frac{c^2 (v-2k)}{4f}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (c\,(v-2k))^{-h-j+2n} \left(c\,(v-2k) + 2f\sqrt{z}\ (v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2k) + 2f\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(c\,(v-2k) \left(c\,(v-2k) + 2f\sqrt{z}\ (v-2k)\right) \Gamma\left(\right.\right.$$

$$\left.\left. \frac{1}{2}(h+j+1),\ -\frac{\left(c\,(v-2k) + 2f\sqrt{z}\ (v-2k)\right)^2}{4f\,(v-2k)} \right) + 2f\,(v-2k)\,\Gamma\left(\frac{1}{2}(h+j+2), \right.\right.$$

$$\left.\left. -\frac{\left(c\,(v-2k) + 2f\sqrt{z}\ (v-2k)\right)^2}{4f\,(v-2k)} \right) \sqrt{-\frac{\left(c\,(v-2k) + 2f\sqrt{z}\ (v-2k)\right)^2}{f\,(v-2k)}} \right) +$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f(v-2s))^{-2(n+1)}\left(e^{\frac{(-ib(m-2k)-c(v-2s))^2}{4f(v-2s)}-g(v-2s)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j\right.$$

$$(-ib(m-2k)-c(v-2s))^{-h-j+2n}\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-ib(m-2k)-c(v-2s))\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2f(v-2s)\sqrt{\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+j+2),\frac{\left(-ib(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)\right)+e^{\frac{(ib(m-2k)-c(v-2s))^2}{4f(v-2s)}-g(v-2s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(ib(m-2k)-c(v-2s))^{-h-j+2n}\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((ib(m-2k)-c(v-2s))\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{4f(v-2s)}\right)-$$

$$2f(v-2s)\sqrt{\frac{\left(bi(m-2k)-c(v-2s)-2f(v-2s)\sqrt{z}\right)^2}{f(v-2s)}}$$

$$\Gamma\left(\frac{1}{2}(h+j+2),\ \frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\Bigg)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}(h+j+2),\ -\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\Bigg)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)+$$

$$2\,f\,(v-2s)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{4\,f\,(v-2s)}\right)$$

$$\sqrt{-\frac{\left(b\,i\,(m-2k)+c\,(v-2s)+2\,f\,(v-2s)\,\sqrt{z}\right)^2}{f\,(v-2s)}}\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\cos^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==\frac{2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{i\,e\,(m-2k)}\,\Gamma\left(\frac{n+1}{2},-i\,b\,(m-2k)\,z^2\right)\left(-i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.e^{-i\,e\,(m-2k)}\left(i\,b\,(m-2k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},i\,b\,(m-2k)\,z^2\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{\frac{f^2\,(v-2k)}{4\,c}-g\,(v-2k)}\left(\sum_{j=0}^{n}2^{j-n}\,(f\,(v-2k))^{n-j}\,(-f\,(v-2k)-2\,c\,z\,(v-2k))^{j+1}\right.\right.$$

$$\left.\left(\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{(-f\,(v-2k)-2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)$$

$$(-c\,(v-2k))^{-n-1}+e^{g\,(v-2k)-\frac{f^2\,(v-2k)}{4\,c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{1}{4}i\left(-\frac{f^2\,(v-2s)^2}{2\,b\,k-b\,m+2\,i\,c\,s-i\,c\,v}+4\,g\,i\,(v-2s)+4\,e\,(m-2k)\right)}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2s))^{n-j}\right.\right.$$

$$\left.\left.(f\,(v-2s)+2\,(c\,(v-2s)-i\,b\,(m-2k))\,z)^{j+1}\left(-\frac{(f\,(v-2s)+2\,(c\,(v-2s)-i\,b\,(m-2k))\,z)^2}{c\,(v-2s)-i\,b\,(m-2k)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(c(v-2s)-ib(m-2k))z)^2}{4(c(v-2s)-ib(m-2k))}\right)(c(v-2s)-ib(m-2k))^{-n-1}+$$

$$e^{\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)+4e(m-2k)\right)}(bi(m-2k)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-f(v-2s))^{n-j}$$

$$(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^{j+1}\left(-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{bi(m-2k)+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f(v-2s)+2(bi(m-2k)+c(v-2s))z)^2}{4(bi(m-2k)+c(v-2s))}\right)+e^{-\frac{1}{4}i\left(\frac{f^2(v-2s)^2}{-2bk+bm+2ics-icv}-4ig(v-2s)+4e(m-2k)\right)}$$

$$(-ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}$$

$$\left(-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{-ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(2(-ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(-ib(m-2k)-c(v-2s))}\right)+$$

$$e^{\frac{1}{4}i\left(-\frac{f^2(v-2s)^2}{2bk-bm+2ics-icv}+4gi(v-2s)+4e(m-2k)\right)}(ib(m-2k)-c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(f(v-2s))^{n-j}$$

$$(2(ib(m-2k)-c(v-2s))z-f(v-2s))^{j+1}\left(-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{ib(m-2k)-c(v-2s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(2(ib(m-2k)-c(v-2s))z-f(v-2s))^2}{4(ib(m-2k)-c(v-2s))}\right)\right/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\,b+e\right)\cosh^v\left(\sqrt{z}\,c+g+fz\right)dz==(-1)^n\,2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(m-2k)^{-2(n+1)}\binom{m}{k}\left(e^{ie(m-2k)}\Gamma\left(2(n+1),-ib(m-2k)\sqrt{z}\right)+e^{-ie(m-2k)}\Gamma\left(2(n+1),ib(m-2k)\sqrt{z}\right)\right)\right)$$

$$b^{-2(n+1)}+\frac{2^{-m-v}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{n+1}+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(v-2k))^{-2(n+1)}\left(e^{\frac{c^2(v-2k)}{4f}-g(v-2k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(-c(v-2k))^{-h-j+2n}\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}\left(\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(-c\,(v-2\,k)\right.$$

$$\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)-2\,f\,(v-2\,k)$$

$$\left.\sqrt{\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{\left(-c\,(v-2\,k)-2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\right)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\Bigg)+2\,f\,(v-2\,k)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\,\right)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-2\,(n+1)}\left(e^{\frac{(-i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}-i\,e\,(m-2\,k)-g\,(v-2\,s)}\right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)\right)\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+e^{\frac{(i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e\,i\,(m-2\,k)-g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b\,(m-2\,k)-c\,(v-2\,s))\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\right.$$

$$\left.\left.\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)-2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)\right)+e^{-\frac{(c\,(v-2\,s)-i\,b\,(m-2\,k))^2}{4\,f\,(v-2\,s)}-i\,e\,(m-2\,k)+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,s)-i\,b\,(m-2\,k))^{-h-j+2\,n}\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((c\,(v-2\,s)-i\,b\,(m-2\,k))\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}+e\,i\,(m-2\,k)+g\,(v-2\,s)}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)+$$

$$2\,f\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{4\,f\,(v-2\,s)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(v-2\,s)}}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \cos^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-\frac{i\,(2k-m)\,d^2}{4b}}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m))^{n-j}\,(d\,i\,(2k-m)+2\,b\,i\,z\,(2k-m))^{j+1}\left(\frac{i\,(d\,i\,(2k-m)+2\,b\,i\,z\,(2k-m))^2}{b\,(2k-m)}\right)^{\frac{1}{2}(-j-1)}\right.\right.$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(2k-m)+2\,b\,i\,z\,(2k-m))^2}{4\,b\,(2k-m)}\right)\right)(i\,b\,(2k-m))^{-n-1}+\right.$$

$$e^{-\frac{i\,(m-2k)\,d^2}{4b}}\,(i\,b\,(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k))^{n-j}\,(d\,i\,(m-2k)+2\,b\,i\,z\,(m-2k))^{j+1}$$

$$\left.\left(\frac{i\,(d\,i\,(m-2k)+2\,b\,i\,z\,(m-2k))^2}{b\,(m-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\frac{i\,(d\,i\,(m-2k)+2\,b\,i\,z\,(m-2k))^2}{4\,b\,(m-2k)}\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(e^{g\,(2k-v)-\frac{f^2\,(2k-v)}{4c}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2k-v))^{n-j}\,(f\,(2k-v)+2\,c\,z\,(2k-v))^{j+1}\right.\right.$$

$$\left.\left.\left(-\frac{(f\,(2k-v)+2\,c\,z\,(2k-v))^2}{c\,(2k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(2k-v)+2\,c\,z\,(2k-v))^2}{4\,c\,(2k-v)}\right)\right)(c\,(2k-v))^{-n-1}+\right.$$

$$e^{g\,(v-2k)-\frac{f^2\,(v-2k)}{4c}}\,(c\,(v-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2k))^{n-j}\,(f\,(v-2k)+2\,c\,z\,(v-2k))^{j+1}$$

$$\left.\left(-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{c\,(v-2k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(f\,(v-2k)+2\,c\,z\,(v-2k))^2}{4\,c\,(v-2k)}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d\,i\,(2k-m)+f\,(2s-v))^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}+g\,(2s-v)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m)-f\,(2s-v))^{n-j}\right.\right.$$

$$(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^{j+1}$$

$$\left(-(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2\Big/(b\,i\,(2k-m)+c\,(2s-v))\right)^{\frac{1}{2}(-j-1)}$$

$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}\right)\right)\right.$$

$$(b\,i\,(2k-m)+c\,(2s-v))^{-n-1}+e^{-\frac{(d\,i\,(m-2k)+f\,(2s-v))^2}{4\,(b\,i\,(m-2k)+c\,(2s-v))}+g\,(2s-v)}\,(b\,i\,(m-2k)+c\,(2s-v))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} \left(-i\, d\, (m-2\,k) - f\,(2\,s-v)\right)^{n-j} \left(d\, i\, (m-2\,k) + f\,(2\,s-v) + 2\,(b\, i\, (m-2\,k) + c\,(2\,s-v))\, z\right)^{j+1}$$

$$\left(-\frac{(d\, i\, (m-2\,k) + f\,(2\,s-v) + 2\,(b\, i\, (m-2\,k) + c\,(2\,s-v))\, z)^2}{b\, i\, (m-2\,k) + c\,(2\,s-v)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\, i\, (m-2\,k) + f\,(2\,s-v) + 2\,(b\, i\, (m-2\,k) + c\,(2\,s-v))\, z)^2}{4\,(b\, i\, (m-2\,k) + c\,(2\,s-v))}\right) +$$

$$e^{-\frac{(d\, i\, (2\,k-m) + f\,(v-2\,s))^2}{4\,(b\, i\, (2\,k-m) + c\,(v-2\,s))} + g\,(v-2\,s)} (b\, i\, (2\,k-m) + c\,(v-2\,s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} \left(-i\, d\, (2\,k-m) - f\,(v-2\,s)\right)^{n-j}$$

$$\left(d\, i\, (2\,k-m) + f\,(v-2\,s) + 2\,(b\, i\, (2\,k-m) + c\,(v-2\,s))\, z\right)^{j+1}$$

$$\left(-\frac{(d\, i\, (2\,k-m) + f\,(v-2\,s) + 2\,(b\, i\, (2\,k-m) + c\,(v-2\,s))\, z)^2}{b\, i\, (2\,k-m) + c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\, i\, (2\,k-m) + f\,(v-2\,s) + 2\,(b\, i\, (2\,k-m) + c\,(v-2\,s))\, z)^2}{4\,(b\, i\, (2\,k-m) + c\,(v-2\,s))}\right) +$$

$$e^{-\frac{(d\, i\, (m-2\,k) + f\,(v-2\,s))^2}{4\,(b\, i\, (m-2\,k) + c\,(v-2\,s))} + g\,(v-2\,s)} (b\, i\, (m-2\,k) + c\,(v-2\,s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} \left(-i\, d\, (m-2\,k) - f\,(v-2\,s)\right)^{n-j}$$

$$\left(d\, i\, (m-2\,k) + f\,(v-2\,s) + 2\,(b\, i\, (m-2\,k) + c\,(v-2\,s))\, z\right)^{j+1}$$

$$\left(-\frac{(d\, i\, (m-2\,k) + f\,(v-2\,s) + 2\,(b\, i\, (m-2\,k) + c\,(v-2\,s))\, z)^2}{b\, i\, (m-2\,k) + c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d\, i\, (m-2\,k) + f\,(v-2\,s) + 2\,(b\, i\, (m-2\,k) + c\,(v-2\,s))\, z)^2}{4\,(b\, i\, (m-2\,k) + c\,(v-2\,s))}\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b + d\, z\right) \cosh^v\left(\sqrt{z}\ c + g + f\, z\right) dz ==$$

$$\frac{\left(2^{-m-v}\, z^{n+1}\right) \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{n+1} + (-1)^{n-1}\, 2^{-m-2\,n-v-1}\, d^{-2\,n-2} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} (2\,k-m)^{-2\,n-2} \left(e^{-\frac{i\,(2\,k-m)\,b^2}{4\,d}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\, b\, (2\,k-m))^{-h-j+2\,n} \left(b\, i\, (2\,k-m) + 2\,d\, i\, \sqrt{z}\ (2\,k-m)\right)^{h+j} \right.$$

$$\left(\frac{i \left(b\, i\, (2\,k-m) + 2\,d\, i\, \sqrt{z}\ (2\,k-m)\right)^2}{d\, (2\,k-m)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(b\, i\, (2\,k-m) \left(b\, i\, (2\,k-m) + \right. \right.$$

$$2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\Big)\,\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)+2\,d\,i\,(2\,k-m)$$

$$\sqrt{\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{d\,(2\,k-m)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\,\,(2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)\Bigg)+$$

$$e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{d\,(m-2\,k)}}\,\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+2),\,\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\,\,(m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f\,(2\,k-v))^{-2\,n-2}\Bigg(e^{g\,(2\,k-v)-\frac{c^2\,(2\,k-v)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^{h+j}\left(-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{f\,(2\,k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(c\,(2\,k-v)\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{4\,f\,(2\,k-v)}\right)+2\,f\,(2\,k-$$

$$v)\sqrt{-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{f\,(2\,k-v)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(2\,k-v)+2\,f\,\sqrt{z}\,\,(2\,k-v)\right)^2}{4\,f\,(2\,k-v)}\right)\Bigg)+$$

$$e^{g\,(v-2\,k)-\frac{c^2\,(v-2\,k)}{4\,f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}\right)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg(c\,(v-2\,k)\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\Bigg)+2\,f\,(v-2\,k)$$

$$\sqrt{-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{f\,(v-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(c\,(v-2\,k)+2\,f\,\sqrt{z}\,\,(v-2\,k)\right)^2}{4\,f\,(v-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{-\frac{(b\,i\,(2\,s-m)+c\,(2\,k-v))^2}{4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))}+g\,(2\,k-v)}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\Bigg(-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\Bigg)^{\frac{1}{2}\,(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big(\left(b\,i\,(2\,s-m)+c\,(2\,k-v)\right)\left(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/$$

$$\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\right)\Big)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))$$

$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/$$

$$\left(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\right)\Big)\sqrt{\Big(-\Big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$

$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\Big)^2\Big/\left(d\,i\,(2\,s-m)+f\,(2\,k-v)\right)\Big)}\Big)\Bigg)$$

$$(d\,i\,(2\,s-m)+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}+g\,(2\,k-v)}\,(d\,i\,(m-2\,s)+f\,(2\,k-v))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(m-2\,s)+c\,(2\,k-v)\right)\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\right)\right)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\right)\right)\sqrt{\left(-\left(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(2\,k-v)\right)\right)}\Bigg)+$$

$$e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}+g\,(v-2\,k)}\,(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(v-2\,k)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(2\,s-m)+c\,(v-2\,k)\right)\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\right)\right)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))$$

$$\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\right)\right)\sqrt{\left(-\left(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(2\,s-m)+f\,(v-2\,k)\right)\right)}\Bigg)+$$

$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+g\,(v-2\,k)}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}$$

$$\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}\left(-\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\left(d\,i\,(m-2\,s)+f\,(v-2\,k)\right)\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(\left(b\,i\,(m-2\,s)+c\,(v-2\,k)\right)\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}\,(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/}$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\cos^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\cos^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(e^{-\frac{i\,(2\,k-m)\,d^2}{4\,b}+e\,i\,(2\,k-m)}$$

$$\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2\,k-m))^{n-j}\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^{j+1}\left(\frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-j-1)}\right.$$

$$\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(2\,k-m)+2\,b\,i\,z\,(2\,k-m))^2}{4\,b\,(2\,k-m)}\right)\right)(i\,b\,(2\,k-m))^{-n-1}+$$

$$e^{-\frac{i\,(m-2\,k)\,d^2}{4\,b}+e\,i\,(m-2\,k)}\,(i\,b\,(m-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2\,k))^{n-j}\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^{j+1}$$

$$\left(\frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ \frac{i\,(d\,i\,(m-2\,k)+2\,b\,i\,z\,(m-2\,k))^2}{4\,b\,(m-2\,k)}\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{g\,(2\,k-v)-\frac{f^2\,(2\,k-v)}{4\,c}}\left(\sum_{j=0}^{n}2^{j-n}\,(-f\,(2\,k-v))^{n-j}\,(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^{j+1}\right.$$

$$\left.\left(-\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ -\frac{(f\,(2\,k-v)+2\,c\,z\,(2\,k-v))^2}{4\,c\,(2\,k-v)}\right)\right)(c\,(2\,k-v))^{-n-1}+$$

$$e^{g\,(v-2\,k)-\frac{f^2\,(v-2\,k)}{4\,c}}\,(c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-f\,(v-2\,k))^{n-j}\,(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^{j+1}$$

$$\left(-\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\ -\frac{(f\,(v-2\,k)+2\,c\,z\,(v-2\,k))^2}{4\,c\,(v-2\,k)}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d\,i\,(2k-m)+f\,(2s-v))^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}+e\,i\,(2k-m)+g\,(2s-v)}\left(\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m)-f\,(2s-v))^{n-j}\right.\right.$$
$$(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^{j+1}$$
$$\left(-(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2\Big/(b\,i\,(2k-m)+c\,(2s-v))\right)^{\frac{1}{2}(-j-1)}$$
$$\left.\left.\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2k-m)+f\,(2s-v)+2\,(b\,i\,(2k-m)+c\,(2s-v))\,z)^2}{4\,(b\,i\,(2k-m)+c\,(2s-v))}\right)\right)\right.$$
$$(b\,i\,(2k-m)+c\,(2s-v))^{-n-1}+e^{-\frac{(d\,i\,(m-2k)+f\,(2s-v))^2}{4\,(b\,i\,(m-2k)+c\,(2s-v))}+e\,i\,(m-2k)+g\,(2s-v)}\,(b\,i\,(m-2k)+c\,(2s-v))^{-n-1}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k)-f\,(2s-v))^{n-j}\,(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^2}{b\,i\,(m-2k)+c\,(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+f\,(2s-v)+2\,(b\,i\,(m-2k)+c\,(2s-v))\,z)^2}{4\,(b\,i\,(m-2k)+c\,(2s-v))}\right)+$$
$$e^{-\frac{(d\,i\,(2k-m)+f\,(v-2s))^2}{4\,(b\,i\,(2k-m)+c\,(v-2s))}+e\,i\,(2k-m)+g\,(v-2s)}\,(b\,i\,(2k-m)+c\,(v-2s))^{-n-1}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(2k-m)-f\,(v-2s))^{n-j}\,(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^2}{b\,i\,(2k-m)+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(2k-m)+f\,(v-2s)+2\,(b\,i\,(2k-m)+c\,(v-2s))\,z)^2}{4\,(b\,i\,(2k-m)+c\,(v-2s))}\right)+$$
$$e^{-\frac{(d\,i\,(m-2k)+f\,(v-2s))^2}{4\,(b\,i\,(m-2k)+c\,(v-2s))}+e\,i\,(m-2k)+g\,(v-2s)}\,(b\,i\,(m-2k)+c\,(v-2s))^{-n-1}$$
$$\sum_{j=0}^{n}2^{j-n}\,(-i\,d\,(m-2k)-f\,(v-2s))^{n-j}\,(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^{j+1}$$
$$\left(-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{b\,i\,(m-2k)+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d\,i\,(m-2k)+f\,(v-2s)+2\,(b\,i\,(m-2k)+c\,(v-2s))\,z)^2}{4\,(b\,i\,(m-2k)+c\,(v-2s))}\right)\right);\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \cos^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{\left(2^{-m-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+(-1)^{n-1}\,2^{-m-2\,n-v-1}\,d^{-2\,n-2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$(2\,k-m)^{-2\,n-2}\left(e^{-\frac{i\,(2\,k-m)\,b^2}{4\,d}+e\,i\,(2\,k-m)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(2\,k-m))^{-h-j+2\,n}\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^{h+j}\right.$$

$$\left(\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{d\,(2\,k-m)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(b\,i\,(2\,k-m)\left(b\,i\,(2\,k-m)+\right.\right.$$

$$\left.2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)+2\,d\,i\,(2\,k-m)$$

$$\left.\left.\sqrt{\frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{d\,(2\,k-m)}}\ \Gamma\left(\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(2\,k-m)+2\,d\,i\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,d\,(2\,k-m)}\right)\right)+\right.$$

$$e^{-\frac{i\,(m-2\,k)\,b^2}{4\,d}+e\,i\,(m-2\,k)}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b\,(m-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^{h+j}$$

$$\left(\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(b\,i\,(m-2\,k)\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2}(h+j+1),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)+\right.$$

$$2\,d\,i\,(m-2\,k)\sqrt{\frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{d\,(m-2\,k)}}\ \Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+j+2),\ \frac{i\left(b\,i\,(m-2\,k)+2\,d\,i\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,d\,(m-2\,k)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}(f(2k-v))^{-2n-2}\left(e^{g(2k-v)-\frac{c^2(2k-v)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(2k-v))^{-h-j+2n}\right.$$

$$\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^{h+j}\left(-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{f(2k-v)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c(2k-v)\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{4f(2k-v)}\right)+2f(2k-\right.$$

$$\left.v)\sqrt{-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{f(2k-v)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(2k-v)+2f\sqrt{z}(2k-v)\right)^2}{4f(2k-v)}\right)\right)+$$

$$e^{g(v-2k)-\frac{c^2(v-2k)}{4f}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(v-2k))^{-h-j+2n}\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^{h+j}$$

$$\left(-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c(v-2k)\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)+2f(v-2k)$$

$$\left.\left.\sqrt{-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{f(v-2k)}}\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(c(v-2k)+2f\sqrt{z}(v-2k)\right)^2}{4f(v-2k)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{(bi(2s-m)+c(2k-v))^2}{4(di(2s-m)+f(2k-v))}+ei(2s-m)+g(2k-v)}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(bi(2s-m)+c(2k-v))^{-h-j+2n}\right.\right.$$

$$\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)^{h+j}\left(-\left(bi(2s-m)+c(2k-v)+\right.\right.$$

$$\left.\left.2(di(2s-m)+f(2k-v))\sqrt{z}\right)^2\Big/(di(2s-m)+f(2k-v))\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((bi(2s-m)+c(2k-v))\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\left(bi(2s-m)+c(2k-v)+2(di(2s-m)+f(2k-v))\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(2\,s-m)+c\,(2\,k-v)+2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(2\,s-m)+f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(2\,k-v)+$$
$$2\,(d\,i\,(2\,s-m)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(2\,s-m)+f\,(2\,k-v))\Big)\Big)\Big)$$

$$(d\,i\,(2\,s-m)+f\,(2\,k-v))^{-2\,n-2}+e^{-\frac{(b\,i\,(m-2\,s)+c\,(2\,k-v))^2}{4\,(d\,i\,(m-2\,s)+f\,(2\,k-v))}+e\,i\,(m-2\,s)+g\,(2\,k-v)}\,(d\,i\,(m-2\,s)+f\,(2\,k-v))^{-2\,n-2}$$
$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b\,i\,(m-2\,s)+c\,(2\,k-v))^{-h-j+2\,n}$$
$$\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^{h+j}\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$
$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$
$$\Big((b\,i\,(m-2\,s)+c\,(2\,k-v))\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(m-2\,s)+f\,(2\,k-v)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(2\,k-v)+$$
$$2\,(d\,i\,(m-2\,s)+f\,(2\,k-v))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(2\,k-v))\Big)\Big)+$$

$$e^{-\frac{(b\,i\,(2\,s-m)+c\,(v-2\,k))^2}{4\,(d\,i\,(2\,s-m)+f\,(v-2\,k))}+e\,i\,(2\,s-m)+g\,(v-2\,k)}\,(d\,i\,(2\,s-m)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$
$$(b\,i\,(2\,s-m)+c\,(v-2\,k))^{-h-j+2\,n}\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^{h+j}$$
$$\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$
$$\Big((b\,i\,(2\,s-m)+c\,(v-2\,k))\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+1),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))$$
$$\Gamma\Big(\frac{1}{2}\,(h+j+2),\,-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(2\,s-m)+f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(2\,s-m)+c\,(v-2\,k)+2\,(d\,i\,(2\,s-m)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(d\,i\,(2\,s-m)+f\,(v-2\,k))\Big)}+$$

$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d\,i\,(m-2\,s)+f\,(v-2\,k))}+e\,i\,(m-2\,s)+g\,(v-2\,k)}\,(d\,i\,(m-2\,s)+f\,(v-2\,k))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j$$

$$(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-j+2\,n}\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(d\,i\,(m-2\,s)+f\,(v-2\,k))\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Big((b\,i\,(m-2\,s)+c\,(v-2\,k))\left(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}(h+j+1),\,-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,i\,(m-2\,s)+f\,(v-2\,k)))\Big)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\Gamma\Big(\frac{1}{2}(h+j+2),$$

$$-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/(4\,(d\,i\,(m-2\,s)+$$

$$f\,(v-2\,k)))\Big)\sqrt{\Big(-\big(b\,i\,(m-2\,s)+c\,(v-2\,k)+2\,(d\,i\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\big)^2\Big/$$

$$(d\,i\,(m-2\,s)+f\,(v-2\,k))\Big)\Big)\Big);\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving functions of the direct function, trigonometric and exponential functions

Involving powers of the direct function, trigonometric and exponential functions

Involving sin and exp

Involving $e^{p\,z}\sin(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3726.01

$$\int e^{p\,z}\sin(c\,z)\cosh^{\nu}(a\,z)\,dz==\frac{1}{2}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\left(-\frac{e^{\frac{i\,\pi}{2}+(p+i\,c)\,z}}{p+i\,c-a\,\nu}\,{}_2F_1\Big(\frac{p+i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{p+i\,c-a\,\nu}{2\,a}+1;\,-e^{2\,a\,z}\Big)-\right.$$

$$\left.\frac{e^{-\frac{1}{2}(i\,\pi)+(p-i\,c)\,z}}{p-i\,c-a\,\nu}\,{}_2F_1\Big(\frac{p-i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{p-i\,c-a\,\nu}{2\,a}+1;\,-e^{2\,a\,z}\Big)\right)$$

01.20.21.3727.01

$$\int e^{p z} \sin(c z) \cosh^{\nu}(a z)\, dz == i\, 2^{-\nu-1} \left(\left(\frac{e^{(p+i c) z}}{p+i c} + \frac{e^{-(i c-p) z}}{i c-p} \right) \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) + \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{e^{-(-p-i c-2 a s+a \nu) z}}{-p-i c-2 a s+a \nu} - \frac{e^{-(-p+i c+2 a s-a \nu) z}}{-p+i c+2 a s-a \nu} + \frac{e^{-(-p-i c+2 a s-a \nu) z}}{-p-i c+2 a s-a \nu} - \frac{e^{-(-p+i c-2 a s+a \nu) z}}{-p+i c-2 a s+a \nu} \right) \right) /; \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} \sin(c z + d) \cosh^{\nu}(a z)$

01.20.21.3728.01

$$\int e^{p z} \sin(d + c z) \cosh^{\nu}(a z)\, dz == -\frac{1}{2} i\, e^{i d} \left(1 + e^{-2 a z}\right)^{-\nu} \cosh^{\nu}(a z) \left(\frac{e^{i (-2 d - c z - i p z + \pi)}}{-i c + p + a \nu} {}_2F_1\left(-\frac{-i c + p + a \nu}{2 a}, -\nu; -\frac{-i c + p + a (\nu - 2)}{2 a}; -e^{-2 a z} \right) + \frac{e^{(i c + p) z}}{i c + p + a \nu} {}_2F_1\left(-\frac{i c + p + a \nu}{2 a}, -\nu; -\frac{i c + p + a (\nu - 2)}{2 a}; -e^{-2 a z} \right) \right)$$

01.20.21.3729.01

$$\int e^{p z} \sin(d + c z) \cosh^{\nu}(a z)\, dz == i\, 2^{-\nu-1} \left(e^{-i d} \left(\frac{e^{2 i d + (i c + p) z}}{i c + p} + \frac{e^{(-i c + p) z}}{i c - p} \right) \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) + e^{-i d} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(-\frac{e^{-(i c - p - 2 a s + a \nu) z}}{i c - p - 2 a s + a \nu} + \frac{e^{2 i d - (-i c - p + 2 a s - a \nu) z}}{-i c - p + 2 a s - a \nu} - \frac{e^{-(i c - p + 2 a s - a \nu) z}}{i c - p + 2 a s - a \nu} + \frac{e^{2 i d - (-i c - p - 2 a s + a \nu) z}}{-i c - p - 2 a s + a \nu} \right) \binom{\nu}{s} \right) /; \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} \sin(c z) \cosh^{\nu}(a z + b)$

01.20.21.3730.01

$$\int e^{p z} \sin(c z) \cosh^{\nu}(b + a z)\, dz == -\frac{1}{2} i \left(1 + e^{-2 (b + a z)}\right)^{-\nu} \cosh^{\nu}(b + a z) \left(-\frac{e^{p z - i c z}}{-i c + p + a \nu} {}_2F_1\left(-\frac{-i c + p + a \nu}{2 a}, -\nu; -\frac{-i c + p + a (\nu - 2)}{2 a}; -e^{-2 (b + a z)} \right) + \frac{e^{(i c + p) z}}{i c + p + a \nu} {}_2F_1\left(-\frac{i c + p + a \nu}{2 a}, -\nu; -\frac{i c + p + a (\nu - 2)}{2 a}; -e^{-2 (b + a z)} \right) \right)$$

01.20.21.3731.01

$$\int e^{p z} \sin(c z) \cosh^{\nu}(b + a z)\, dz == i\, 2^{-\nu-1} \left(\left(\frac{e^{(i c + p) z}}{i c + p} + \frac{e^{-(i c - p) z}}{i c - p} \right) \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) + \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2 b s - b \nu} \left(-\frac{e^{4 b s - (i c - p - 2 a s + a \nu) z}}{i c - p - 2 a s + a \nu} + \frac{e^{2 b \nu - (-i c - p + 2 a s - a \nu) z}}{-i c - p + 2 a s - a \nu} - \frac{e^{2 b \nu - (i c - p + 2 a s - a \nu) z}}{i c - p + 2 a s - a \nu} + \frac{e^{4 b s - (-i c - p - 2 a s + a \nu) z}}{-i c - p - 2 a s + a \nu} \right) \binom{\nu}{s} \right) /; \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} \sin(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.3732.01

$$\int e^{p z} \sin(d + c z) \cosh^{\nu}(b + a z)\, dz ==$$

$$-\frac{1}{2} i e^{i d} \left(1 + e^{-2 (b+a z)}\right)^{-\nu} \cosh^{\nu}(b + a z) \left(\frac{e^{i (-2 d - c z - i p z + \pi)}}{-i c + p + a \nu} {}_2F_1\left(-\frac{-i c + p + a \nu}{2 a}, -\nu; -\frac{-i c + p + a (\nu - 2)}{2 a}; -e^{-2 (b+a z)}\right) + \right.$$

$$\left. \frac{e^{(i c + p) z}}{i c + p + a \nu} {}_2F_1\left(-\frac{i c + p + a \nu}{2 a}, -\nu; -\frac{i c + p + a (\nu - 2)}{2 a}; -e^{-2 (b+a z)}\right)\right)$$

01.20.21.3733.01

$$\int e^{p z} \sin(c z + d) \cosh^{\nu}(a z + b)\, dz ==$$

$$i 2^{-\nu-1} \left(e^{-i d} \left(\frac{e^{2 i d + (i c + p) z}}{i c + p} + \frac{e^{-(i c - p) z}}{i c - p}\right) \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) + \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-i d - 2 b s - b \nu} \left(-\frac{e^{4 b s - (i c - p - 2 a s + a \nu) z}}{i c - p - 2 a s + a \nu} + \right.\right.$$

$$\left.\left. \frac{e^{2 (i d + b \nu) - (-i c - p + 2 a s - a \nu) z}}{-i c - p + 2 a s - a \nu} - \frac{e^{2 b \nu - (i c - p + 2 a s - a \nu) z}}{i c - p + 2 a s - a \nu} + \frac{e^{2 i d + 4 b s - (-i c - p - 2 a s + a \nu) z}}{-i c - p - 2 a s + a \nu}\right) \binom{\nu}{s}\right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \sin\left(b z^r\right) \cosh^{\nu}(c z)$

01.20.21.3734.01

$$\int e^{p z^2} \sin\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{(-i b + p)(i b + p)} \left(e^{-\frac{c^2 (\nu-2 s)^2 - 2 i (-i b + p) \pi}{4 (-i b + p)}} \sqrt{-i b + p}\ (i b + p) \operatorname{erfi}\left(\frac{c (\nu - 2 s) + 2 (-i b + p) z}{2 \sqrt{-i b + p}}\right) + \right.\right.$$

$$\left. e^{-\frac{c^2 (\nu-2 s)^2 + 2 i (i b + p) \pi}{4 (i b + p)}} (-i b + p) \sqrt{i b + p}\ \operatorname{erfi}\left(\frac{-c (\nu - 2 s) + 2 i b z + 2 p z}{2 \sqrt{i b + p}}\right)\right) +$$

$$\frac{1}{(-i b + p)(i b + p)} \left(e^{-\frac{c^2 (\nu-2 s)^2 - 2 i (-i b + p) \pi}{4 (-i b + p)}} \sqrt{-i b + p}\ (i b + p) \operatorname{erfi}\left(\frac{-c (\nu - 2 s) - 2 i b z + 2 p z}{2 \sqrt{-i b + p}}\right) + \right.$$

$$\left.\left. e^{-\frac{c^2 (\nu-2 s)^2 + 2 i (i b + p) \pi}{4 (i b + p)}} (-i b + p) \sqrt{i b + p}\ \operatorname{erfi}\left(\frac{c (\nu - 2 s) + 2 (i b + p) z}{2 \sqrt{i b + p}}\right)\right)\right) - \frac{i 2^{-\nu-2} \sqrt{\pi}\ (1 - \nu \bmod 2)}{b^2 + p^2}$$

$$\binom{\nu}{\frac{\nu}{2}} \left((-i b + p) \sqrt{i b + p}\ \operatorname{erfi}\left(\sqrt{i b + p}\ z\right) - \sqrt{-i b + p}\ (i b + p) \operatorname{erfi}\left(\frac{2 p z - 2 i b z}{2 \sqrt{-i b + p}}\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3735.01

$$\int e^{p\sqrt{z}}\sin\left(b\sqrt{z}\right)\cosh^{\nu}(c\,z)\,dz == \frac{1}{\left(b^2+p^2\right)^2}$$

$$\left(2^{1-\nu}\,e^{p\sqrt{z}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\left(-\sqrt{z}\;b^2+2\,p-p^2\sqrt{z}\right)\cos\left(b\sqrt{z}\right)+\left(\sqrt{z}\;p^3-p^2+b^2\left(\sqrt{z}\;p+1\right)\right)\sin\left(b\sqrt{z}\right)\right)\right)-$$

$$i\,2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{(i\,p-b)^2}{c\,(8\,s-4\,\nu)}}(i\,b+p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-i\,b-p+2\,c\,(\nu-2\,s)\sqrt{z}}{2\sqrt{c\,(2\,s-\nu)}}\right)}{(c\,(2\,s-\nu))^{3/2}}+\frac{e^{i\,\pi-\frac{(b+i\,p)^2}{c\,(8\,s-4\,\nu)}}(-i\,b+p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-i\,b+p+2\,c\,(\nu-2\,s)\sqrt{z}}{2\sqrt{c\,(\nu-2\,s)}}\right)}{c\,(2\,s-\nu)\sqrt{c\,(\nu-2\,s)}}+\right.$$

$$\frac{8\,e^{p\sqrt{z}}\,i\sin\left(b\sqrt{z}\right)\sinh(c\,(2\,s-\nu)\,z)}{c\,(2\,s-\nu)}-\frac{e^{\frac{(b+i\,p)^2}{c\,(8\,s-4\,\nu)}}(-i\,b+p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{i\,b-p+2\,c\,(\nu-2\,s)\sqrt{z}}{2\sqrt{c\,(2\,s-\nu)}}\right)}{(c\,(2\,s-\nu))^{3/2}}-$$

$$\left.\frac{e^{-\frac{(i\,b+p)^2}{4\,c\,(\nu-2\,s)}-i\,\pi}(i\,b+p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{i\,b+p+2\,c\,(\nu-2\,s)\sqrt{z}}{2\sqrt{c\,(\nu-2\,s)}}\right)}{c\,(2\,s-\nu)\sqrt{c\,(\nu-2\,s)}}\right)/;\;\nu\in\mathbb{N}^+$$

Involving $e^{p\,z^r}\sin(b\,z)\cosh^{\nu}(c\,z)$

01.20.21.3736.01

$$\int e^{p\,z^2}\sin(b\,z)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(e^{-\frac{-b^2-2\pi i\,p}{4\,p}}\operatorname{erfi}\left(\frac{-i\,b+2\,p\,z}{2\sqrt{p}}\right)+e^{-\frac{2\pi i\,p-b^2}{4\,p}}\operatorname{erfi}\left(\frac{i\,b+2\,p\,z}{2\sqrt{p}}\right)\right)(1-\nu \bmod 2)}{\sqrt{p}}+$$

$$\frac{1}{\sqrt{p}}\left(2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(-i\,b+c\,(\nu-2\,s))^2-2\pi i\,p}{4\,p}}\operatorname{erfi}\left(\frac{-i\,b+c\,(\nu-2\,s)+2\,p\,z}{2\sqrt{p}}\right)+\right.\right.$$

$$e^{-\frac{(i\,b+c\,(\nu-2\,s))^2+2\pi i\,p}{4\,p}}\operatorname{erfi}\left(\frac{i\,b+c\,(\nu-2\,s)+2\,p\,z}{2\sqrt{p}}\right)+e^{-\frac{(-i\,b-c\,(\nu-2\,s))^2-2\pi i\,p}{4\,p}}\operatorname{erfi}\left(\frac{-i\,b-c\,(\nu-2\,s)+2\,p\,z}{2\sqrt{p}}\right)+$$

$$\left.\left.e^{-\frac{(i\,b-c\,(\nu-2\,s))^2+2\pi i\,p}{4\,p}}\operatorname{erfi}\left(\frac{i\,b-c\,(\nu-2\,s)+2\,p\,z}{2\sqrt{p}}\right)\right)\right)/;\;\nu\in\mathbb{Z}\wedge\nu>0$$

01.20.21.3737.01

$$\int e^{p\sqrt{z}} \sin(b\,z) \cosh^{\nu}(c\,z)\,dz ==$$

$$i\,2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\frac{4\,e^{p\sqrt{z}}\,i\cos(b\,z)}{b} - \frac{e^{-\frac{i\,p^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{(-i\,b)^{3/2}} - \frac{e^{\frac{i\,p^2}{4\,b}-i\,\pi}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{(i\,b)^{3/2}}\right)(1-\nu \bmod 2) -$$

$$i\,2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(2\,e^{p\sqrt{z}}\left(\frac{2\cosh((-i\,b+2\,c\,s-c\,\nu)\,z)}{i\,b+c\,(\nu-2\,s)} + \frac{2\cosh((i\,b+2\,c\,s-c\,\nu)\,z)}{i\,b+2\,c\,s-c\,\nu}\right)+\right.$$

$$\frac{e^{-\frac{p^2}{4\,(i\,b+c\,(\nu-2\,s))}-i\,\pi}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(i\,b+c\,(\nu-2\,s))\sqrt{z}}{2\sqrt{i\,b+c\,(\nu-2\,s)}}\right)}{(i\,b+c\,(\nu-2\,s))^{3/2}} + \frac{e^{-\frac{p^2}{4\,(-i\,b-c\,(\nu-2\,s))}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(-i\,b-c\,(\nu-2\,s))\sqrt{z}}{2\sqrt{-i\,b-c\,(\nu-2\,s)}}\right)}{(-i\,b-c\,(\nu-2\,s))^{3/2}} -$$

$$\left.\frac{e^{i\,\pi-\frac{p^2}{4\,(-i\,b+c\,(\nu-2\,s))}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(-i\,b+c\,(\nu-2\,s))\sqrt{z}}{2\sqrt{-i\,b+c\,(\nu-2\,s)}}\right)}{(-i\,b+c\,(\nu-2\,s))^{3/2}} - \frac{e^{-\frac{p^2}{4\,(i\,b-c\,(\nu-2\,s))}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(i\,b-c\,(\nu-2\,s))\sqrt{z}}{2\sqrt{i\,b-c\,(\nu-2\,s)}}\right)}{(i\,b-c\,(\nu-2\,s))^{3/2}}\right) /;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\sin\left(b\,z^{r}\right)\cosh^{\nu}(c\,z)$

01.20.21.3738.01

$$\int e^{p\,z}\sin\left(b\,z^{2}\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$\frac{i\,2^{-\nu-2}\sqrt{\pi}}{b}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-i\,b}\;e^{-\frac{i\left(p^2-2\,b\,\pi\right)}{4\,b}}\operatorname{erfi}\left(\frac{p-2\,i\,b\,z}{2\sqrt{-i\,b}}\right) - \sqrt{i\,b}\;e^{\frac{i\left(p^2-2\,b\,\pi\right)}{4\,b}}\operatorname{erfi}\left(\frac{p+2\,i\,b\,z}{2\sqrt{i\,b}}\right)\right)(1-\nu \bmod 2) -$$

$$\frac{i\,2^{-\nu-2}\sqrt{\pi}}{b}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-\sqrt{-i\,b}\;e^{-\frac{i\left((p+c\,(\nu-2\,s))^2-2\,b\,\pi\right)}{4\,b}}\operatorname{erfi}\left(\frac{p+c\,(\nu-2\,s)-2\,i\,b\,z}{2\sqrt{-i\,b}}\right)-\right.$$

$$\sqrt{-i\,b}\;e^{-\frac{i\left((p-c\,(\nu-2\,s))^2-2\,b\,\pi\right)}{4\,b}}\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)-2\,i\,b\,z}{2\sqrt{-i\,b}}\right) + \sqrt{i\,b}\;e^{\frac{i\left((p+c\,(\nu-2\,s))^2-2\,b\,\pi\right)}{4\,b}}\operatorname{erfi}\left(\frac{p+c\,(\nu-2\,s)+2\,i\,b\,z}{2\sqrt{i\,b}}\right)+$$

$$\left.\sqrt{i\,b}\;e^{\frac{i\left((p-c\,(\nu-2\,s))^2-2\,b\,\pi\right)}{4\,b}}\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)+2\,i\,b\,z}{2\sqrt{i\,b}}\right)\right) /;\ \nu\in\mathbb{N}^{+}$$

01.20.21.3739.01

$$\int e^{p z} \sin\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(\frac{b\, e^{\frac{b^2}{4p}-i\pi}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{i b+2 p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}+\frac{b\, e^{\frac{b^2}{4p}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{i b-2 p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}+\frac{4\, e^{p z}\sin\left(b\sqrt{z}\right)}{p}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{b\, e^{\frac{b^2}{4(p+c(\nu-2s))}+i\pi}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-i b+2(p+c(\nu-2s))\sqrt{z}}{2\sqrt{p+c(\nu-2s)}}\right)}{(p+c(\nu-2s))^{3/2}}+\frac{b\, e^{\frac{b^2}{4(p+c(\nu-2s))}-i\pi}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{i b+2(p+c(\nu-2s))\sqrt{z}}{2\sqrt{p+c(\nu-2s)}}\right)}{(p+c(\nu-2s))^{3/2}}+\right.$$

$$\frac{b\, e^{\frac{b^2}{4(p-c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{-i b+2(c(\nu-2s)-p)\sqrt{z}}{2\sqrt{p-c(\nu-2s)}}\right)}{(p-c(\nu-2s))^{3/2}}+\frac{b\, e^{\frac{b^2}{4(p-c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{i b+2(c(\nu-2s)-p)\sqrt{z}}{2\sqrt{p-c(\nu-2s)}}\right)}{(p-c(\nu-2s))^{3/2}}+$$

$$\left.\frac{8\, e^{p z}\sin\left(b\sqrt{z}\right)(p\cosh(c(2s-\nu)z)+c(\nu-2s)\sinh(c(2s-\nu)z))}{(p+2cs-c\nu)(p+c(\nu-2s))}\right) /;\ \nu\in\mathbb{Z}\wedge\nu>0$$

Involving $e^{p z}\sin(b z)\cosh^{\nu}(c z^{r})$

01.20.21.3740.01

$$\int e^{p z}\sin(b z)\cosh^{\nu}\left(c z^2\right) dz == \frac{2^{-\nu}\, e^{p z}(1-\nu \bmod 2)(p\sin(b z)-b\cos(b z))}{b^2+p^2}\binom{\nu}{\frac{\nu}{2}}-$$

$$\frac{2^{-\nu-2}\sqrt{\pi}}{c}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\nu-2s}\left(\binom{\nu}{s}\left(e^{\frac{(-i b+p)^2+2 c i \pi(\nu-2s)}{4c(\nu-2s)}}\sqrt{-c(\nu-2s)}\ \operatorname{erfi}\left(\frac{-i b+p-2c(\nu-2s)z}{2\sqrt{-c(\nu-2s)}}\right)+\right.\right.$$

$$e^{\frac{(i b+p)^2-2 i c \pi(\nu-2s)}{4c(\nu-2s)}}\sqrt{-c(\nu-2s)}\ \operatorname{erfi}\left(\frac{i b+p-2c(\nu-2s)z}{2\sqrt{-c(\nu-2s)}}\right)-e^{-\frac{(-i b+p)^2-2 i c \pi(\nu-2s)}{4c(\nu-2s)}}\sqrt{c(\nu-2s)}$$

$$\left.\left.\operatorname{erfi}\left(\frac{-i b+p+2c(\nu-2s)z}{2\sqrt{c(\nu-2s)}}\right)-e^{-\frac{(i b+p)^2+2 c i \pi(\nu-2s)}{4c(\nu-2s)}}\sqrt{c(\nu-2s)}\ \operatorname{erfi}\left(\frac{i b+p+2c(\nu-2s)z}{2\sqrt{c(\nu-2s)}}\right)\right)\right) /;\ \nu\in\mathbb{N}^{+}$$

01.20.21.3741.01

$$\int e^{p z} \sin(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-1} i \left(\frac{e^{(-i b+p) z}}{-i b+p} - \frac{e^{(i b+p) z}}{i b+p}\right)\binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) + 2^{-\nu-2} i \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{4 e^{(-i b+p) z} \cosh\left(c (2 s-\nu) \sqrt{z}\right)}{-i b+p} - \right.$$

$$\frac{4 e^{(i b+p) z} \cosh\left(c (2 s-\nu) \sqrt{z}\right)}{i b+p} + \frac{c e^{-\frac{(c \nu-2 c s)^2}{4(-i b+p)}} \sqrt{\pi}\ (2 s-\nu) \operatorname{erfi}\left(\frac{2(-i b+p)\sqrt{z}-c(2 s-\nu)}{2\sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}} -$$

$$\frac{c e^{i\pi-\frac{(2 c s-c \nu)^2}{4(-i b+p)}} \sqrt{\pi}\ (\nu-2 s) \operatorname{erfi}\left(\frac{2(-i b+p)\sqrt{z}-c(\nu-2 s)}{2\sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}} + \frac{c e^{-\frac{c^2 (\nu-2 s)^2}{4(i b+p)}-i\pi} \sqrt{\pi}\ (\nu-2 s) \operatorname{erfi}\left(\frac{2(i b+p)\sqrt{z}-c(\nu-2 s)}{2\sqrt{i b+p}}\right)}{(i b+p)^{3/2}} -$$

$$\left. \frac{c e^{-\frac{(c \nu-2 c s)^2}{4(i b+p)}} \sqrt{\pi}\ (2 s-\nu) \operatorname{erfi}\left(\frac{2(i b+p)\sqrt{z}-c(2 s-\nu)}{2\sqrt{i b+p}}\right)}{(i b+p)^{3/2}} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \sin(b z) \cosh^{\nu}\left(c z^r\right)$

01.20.21.3742.01

$$\int e^{p z^2} \sin(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$\frac{2^{-\nu-2} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \left(e^{-\frac{-b^2-2\pi i p}{4p}} \operatorname{erfi}\left(\frac{-i b+2 p z}{2\sqrt{p}}\right) + e^{-\frac{2\pi i p-b^2}{4p}} \operatorname{erfi}\left(\frac{i b+2 p z}{2\sqrt{p}}\right)\right)(1-\nu \bmod 2)}{\sqrt{p}} + 2^{-\nu-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s}$$

$$\left(\left(e^{-\frac{-b^2-2 i \pi (p+c(\nu-2 s))}{4(p+c(\nu-2 s))}} \sqrt{p+c(\nu-2 s)}\ (p-c(\nu-2 s)) \operatorname{erfi}\left(\frac{-i b+2(p+c(\nu-2 s)) z}{2\sqrt{p+c(\nu-2 s)}}\right) + e^{-\frac{2 i \pi (p-c(\nu-2 s))-b^2}{4(p-c(\nu-2 s))}} (p+c(\nu-2 s)) \right.\right.$$

$$\left. \sqrt{p-c(\nu-2 s)}\ \operatorname{erfi}\left(\frac{i b+2 p z-2 c(\nu-2 s) z}{2\sqrt{p-c(\nu-2 s)}}\right)\right) \Big/ ((p-c(\nu-2 s))(p+c(\nu-2 s))) + \left(e^{-\frac{2 i \pi (p+c(\nu-2 s))-b^2}{4(p+c(\nu-2 s))}} \right.$$

$$\sqrt{p+c(\nu-2 s)}\ (p-c(\nu-2 s)) \operatorname{erfi}\left(\frac{i b+2(p+c(\nu-2 s)) z}{2\sqrt{p+c(\nu-2 s)}}\right) + e^{-\frac{-b^2-2 i \pi (p-c(\nu-2 s))}{4(p-c(\nu-2 s))}} (p+c(\nu-2 s))$$

$$\left. \left. \sqrt{p-c(\nu-2 s)}\ \operatorname{erfi}\left(\frac{-i b+2 p z-2 c(\nu-2 s) z}{2\sqrt{p-c(\nu-2 s)}}\right)\right) \Big/ ((p-c(\nu-2 s))(p+c(\nu-2 s)))\right) /; \nu \in \mathbb{Z} \wedge \nu > 0$$

01.20.21.3743.01

$$\int e^{p\sqrt{z}}\sin(b\,z)\cosh^{\nu}\left(c\sqrt{z}\right)dz ==$$

$$2^{-\nu-1}\left(-\frac{2\,e^{p\sqrt{z}}\cos(b\,z)}{b}+\frac{e^{\frac{i\,p^2}{4\,b}}\,i\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{2\,(i\,b)^{3/2}}-\frac{i\,e^{-\frac{i\,p^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{2\,(-i\,b)^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+2^{-\nu-1}\,i$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{2\,e^{(p-c\,(2\,s+\nu))\sqrt{z}}\left(e^{4\,c\,s\sqrt{z}}+e^{2\,c\,\nu\sqrt{z}}\right)i\cos(b\,z)}{b}-\frac{e^{-\frac{i\,(p+c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(p+c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{p+c\,(\nu-2\,s)-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{2\,(-i\,b)^{3/2}}-\right.$$

$$\frac{e^{-\frac{i\,(p-c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(p-c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{2\,(-i\,b)^{3/2}}+$$

$$\frac{e^{\frac{i\,(p+c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(p+c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{p+c\,(\nu-2\,s)+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{2\,(i\,b)^{3/2}}+$$

$$\left.\frac{e^{\frac{i\,(p-c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(p-c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{2\,(i\,b)^{3/2}}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\sin\left(b\,z^{r}\right)\cosh^{\nu}\left(c\,z^{r}\right)$

01.20.21.3744.01

$$\int e^{p z} \sin\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$\frac{i\, 2^{-\nu-2} \sqrt{\pi}}{b} \binom{\nu}{\frac{\nu}{2}} \left(\sqrt{-i b}\; e^{-\frac{i\left(p^2-2 b \pi\right)}{4 b}} \operatorname{erfi}\left(\frac{p-2 i b z}{2 \sqrt{-i b}}\right) - \sqrt{i b}\; e^{\frac{i\left(p^2-2 b \pi\right)}{4 b}} \operatorname{erfi}\left(\frac{p+2 i b z}{2 \sqrt{i b}}\right)\right) (1-\nu \bmod 2) +$$

$$2^{-\nu-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\left(e^{-\frac{p^2-2 i \pi (-i b+c (\nu-2 s))}{4 (-i b+c (\nu-2 s))}} \sqrt{-i b+c (\nu-2 s)}\; (i b-c (\nu-2 s)) \operatorname{erfi}\left(\frac{p+2 (-i b+c (\nu-2 s)) z}{2 \sqrt{-i b+c (\nu-2 s)}}\right) + \right.\right.$$

$$\left.\left. e^{-\frac{p^2+2 i \pi (i b-c (\nu-2 s))}{4 (i b-c (\nu-2 s))}} (-i b+c (\nu-2 s)) \sqrt{i b-c (\nu-2 s)}\; \operatorname{erfi}\left(\frac{p-2 (-i b+c (\nu-2 s)) z}{2 \sqrt{i b-c (\nu-2 s)}}\right)\right) \Big/ \right.$$

$$\left. ((i b-c (\nu-2 s)) (-i b+c (\nu-2 s))) + \left(e^{-\frac{p^2+2 i \pi (i b+c (\nu-2 s))}{4 (i b+c (\nu-2 s))}} \sqrt{i b+c (\nu-2 s)}\; (-i b-c (\nu-2 s)) \right.\right.$$

$$\operatorname{erfi}\left(\frac{p+2 (i b+c (\nu-2 s)) z}{2 \sqrt{i b+c (\nu-2 s)}}\right) + e^{-\frac{p^2-2 i \pi (-i b-c (\nu-2 s))}{4 (-i b-c (\nu-2 s))}} (i b+c (\nu-2 s)) \sqrt{-i b-c (\nu-2 s)}$$

$$\left.\left. \operatorname{erfi}\left(\frac{p-2 (i b+c (\nu-2 s)) z}{2 \sqrt{-i b-c (\nu-2 s)}}\right)\right) \Big/ ((-i b-c (\nu-2 s)) (i b+c (\nu-2 s)))\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3745.01

$$\int e^{p z} \sin\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\frac{4 e^{p z} \sin\left(b \sqrt{z}\right)}{p} - \frac{b\, e^{\frac{b^2}{4 p}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{-i b+2 p \sqrt{z}}{2 \sqrt{p}}\right) + \operatorname{erfi}\left(\frac{i b+2 p \sqrt{z}}{2 \sqrt{p}}\right)\right)}{p^{3/2}} \right) -$$

$$i\, 2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{p^{3/2}} \left(e^{\frac{(b+c i (\nu-2 s))^2}{4 p}} \sqrt{\pi}\; (b+c i (\nu-2 s)) \right.\right.$$

$$\left.\left. \left(\operatorname{erf}\left(\frac{b-2 i c s+i c \nu-2 i p \sqrt{z}}{2 \sqrt{p}}\right) - \operatorname{erf}\left(\frac{b-2 i c s+i c \nu+2 i p \sqrt{z}}{2 \sqrt{p}}\right)\right)\right) + \frac{1}{p^{3/2}} \right.$$

$$\left(e^{\frac{(b+2 i c s-i c \nu)^2}{4 p}} \sqrt{\pi}\; (b+2 i c s-i c \nu) \left(\operatorname{erf}\left(\frac{b+2 i c s-i c \nu-2 i p \sqrt{z}}{2 \sqrt{p}}\right) - \operatorname{erf}\left(\frac{b+2 i c s-i c \nu+2 i p \sqrt{z}}{2 \sqrt{p}}\right)\right)\right) +$$

$$\left. \frac{4 i\, e^{p z} \left(\sin\left((b+2 i c s-i c \nu) \sqrt{z}\right) + \sin\left((b+c i (\nu-2 s)) \sqrt{z}\right)\right)}{p} \right) /;\ \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \sin\left(b z^r\right) \cosh^{\nu}\left(c z^r\right)$

01.20.21.3746.01

$$\int e^{p z^r} \sin(b z^r) \cosh^v(c z^r)\, dz ==$$

$$-\frac{i\, 2^{-v-1} z}{r}\left(\binom{v}{\frac{v}{2}}\left((-i b-p) z^r\right)^{-1/r}\Gamma\left(\frac{1}{r}, (-i b-p) z^r\right)-\left((i b-p) z^r\right)^{-1/r}\Gamma\left(\frac{1}{r}, (i b-p) z^r\right)\right)(v \bmod 2-1)+$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\Gamma\left(\frac{1}{r}, (-i b-p-2 c s+c v) z^r\right)\left((-i b-p-2 c s+c v) z^r\right)^{-1/r}+\right.$$

$$\left((i b-p-2 c s+c v) z^r\right)^{-1/r}\Gamma\left(\frac{1}{r}, (i b-p-2 c s+c v) z^r\right)-\left((-i b-p+2 c s-c v) z^r\right)^{-1/r}$$

$$\left.\left.\Gamma\left(\frac{1}{r}, (-i b-p+2 c s-c v) z^r\right)+\left((i b-p+2 c s-c v) z^r\right)^{-1/r}\Gamma\left(\frac{1}{r}, (i b-p+2 c s-c v) z^r\right)\right)\right) /; v \in \mathbb{N}^+$$

01.20.21.3747.01

$$\int e^{p z^2} \sin\left(b z^2\right) \cosh^v\left(c z^2\right) dz == 2^{-v-2} i\left(\frac{\operatorname{erfi}\left(\sqrt{-i b+p}\ z\right)}{\sqrt{-i b+p}}-\frac{\operatorname{erfi}\left(\sqrt{i b+p}\ z\right)}{\sqrt{i b+p}}\right)\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)+$$

$$2^{-v-2} i \sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{\operatorname{erfi}\left(\sqrt{-i b+p-2 c s+c v}\ z\right)}{\sqrt{-i b+p-2 c s+c v}}+\frac{\operatorname{erfi}\left(\sqrt{-i b+p+2 c s-c v}\ z\right)}{\sqrt{-i b+p+2 c s-c v}}-\right.$$

$$\left.\frac{\operatorname{erfi}\left(\sqrt{i b+p-2 c s+c v}\ z\right)}{\sqrt{i b+p-2 c s+c v}}-\frac{\operatorname{erfi}\left(\sqrt{i b+p+2 c s-c v}\ z\right)}{\sqrt{i b+p+2 c s-c v}}\right) /; v \in \mathbb{N}^+$$

01.20.21.3748.01

$$\int e^{p \sqrt{z}} \sin\left(b \sqrt{z}\right) \cosh^v\left(c \sqrt{z}\right) dz == \frac{1}{\left(b^2+p^2\right)^2}$$

$$\left(2^{1-v} e^{p \sqrt{z}}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(\left(\left(\sqrt{z}\ p+1\right) b^2+p^2\left(p \sqrt{z}-1\right)\right)\sin\left(b \sqrt{z}\right)-b\left(\sqrt{z}\ b^2-2 p+p^2 \sqrt{z}\right)\cos\left(b \sqrt{z}\right)\right)\right)+$$

$$2^{1-v} e^{p \sqrt{z}} i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(p^2\left(p \sqrt{z}-1\right)-(-i b-2 c s+c v)^2\left(\sqrt{z}\ p+1\right)\right)\sinh\left((-i b-2 c s+c v) \sqrt{z}\right)-(-i b-2 c s+c v)\right.\right.$$

$$\left.\left(\sqrt{z}\ p^2-2 p-(-i b-2 c s+c v)^2 \sqrt{z}\right)\cosh\left((-i b-2 c s+c v) \sqrt{z}\right)\right)\Big/\left(p^2-(-i b-2 c s+c v)^2\right)^2+$$

$$\left(\left(p^2\left(p \sqrt{z}-1\right)-(-i b+2 c s-c v)^2\left(\sqrt{z}\ p+1\right)\right)\sinh\left((-i b+2 c s-c v) \sqrt{z}\right)-(-i b+2 c s-c v)\left(\sqrt{z}\ p^2-\right.\right.$$

$$\left.\left.2 p-(-i b+2 c s-c v)^2 \sqrt{z}\right)\cosh\left((-i b+2 c s-c v) \sqrt{z}\right)\right)\Big/\left(p^2-(-i b+2 c s-c v)^2\right)^2\Bigg) /; v \in \mathbb{N}^+$$

Involving $e^{b z^r+e} \sin(a z^r+q) \sinh^v(c z^r+g)$

01.20.21.3749.01

$$\int e^{b z^r+e} \sin(a z^r+q) \cosh^{\nu}(c z^r+g)\, dz ==$$

$$-\frac{2^{-\nu-1} z}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e+i q-\frac{i \pi}{2}} \Gamma\left(\frac{1}{r},(-b-i a) z^r\right)((-b-i a) z^r)^{-1/r}+e^{e-i q+\frac{i \pi}{2}}((i a-b) z^r)^{-1/r} \Gamma\left(\frac{1}{r},(i a-b) z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+i q+2 g s-g \nu-\frac{i \pi}{2}} \Gamma\left(\frac{1}{r},(-b-i a-2 c s+c \nu) z^r\right)((-b-i a-2 c s+c \nu) z^r)^{-1/r}+\right.$$

$$e^{e-i q+2 g s-g \nu+\frac{i \pi}{2}}((-b+i a-2 c s+c \nu) z^r)^{-1/r} \Gamma\left(\frac{1}{r},(-b+i a-2 c s+c \nu) z^r\right)+$$

$$e^{e+i q-2 g s+g \nu-\frac{i \pi}{2}}((-b-i a+2 c s-c \nu) z^r)^{-1/r} \Gamma\left(\frac{1}{r},(-b-i a+2 c s-c \nu) z^r\right)+$$

$$\left.\left.e^{e-i q-2 g s+g \nu+\frac{i \pi}{2}}((-b+i a+2 c s-c \nu) z^r)^{-1/r} \Gamma\left(\frac{1}{r},(-b+i a+2 c s-c \nu) z^r\right)\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3750.01

$$\int e^{b z^2+e} \sin\left(a z^2+q\right) \cosh^{\nu}\left(c z^2+g\right) dz == 2^{-\nu-2}\left(\frac{e^{-2 i q} \operatorname{erfi}\left(\sqrt{b-i a}\, z\right)}{\sqrt{b-i a}}-\frac{\operatorname{erfi}\left(\sqrt{b+i a}\, z\right)}{\sqrt{b+i a}}\right) e^{e+i q} i \sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2} i \sqrt{\pi} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{e-i q+g(\nu-2 s)} \operatorname{erfi}\left(\sqrt{b-i a+c(\nu-2 s)}\, z\right)}{\sqrt{b-i a+c(\nu-2 s)}}+\frac{e^{e-i q-g(\nu-2 s)} \operatorname{erfi}\left(\sqrt{b-i a-c(\nu-2 s)}\, z\right)}{\sqrt{b-i a-c(\nu-2 s)}}-\right.$$

$$\left.\frac{e^{e+i q+g(\nu-2 s)} \operatorname{erfi}\left(\sqrt{b+i a+c(\nu-2 s)}\, z\right)}{\sqrt{b+i a+c(\nu-2 s)}}-\frac{e^{e+i q-g(\nu-2 s)} \operatorname{erfi}\left(\sqrt{b+i a-c(\nu-2 s)}\, z\right)}{\sqrt{b+i a-c(\nu-2 s)}}\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3751.01

$$\int e^{\sqrt{z}\ b+e}\sin\left(\sqrt{z}\ a+q\right)\cosh^{v}\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-v}\left(\frac{e^{\sqrt{z}\ (b-i\,a)+e-i\,q}\left((b-i\,a)\sqrt{z}\ -1\right)}{(b-i\,a)^2}-\frac{e^{\sqrt{z}\ (b+i\,a)+e+i\,q}\left((b+i\,a)\sqrt{z}\ -1\right)}{(b+i\,a)^2}\right)i\binom{v}{\frac{v}{2}}(1-v \bmod 2)+$$

$$2^{-v}\,i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\frac{e^{e-i\,q+g\,(v-2\,s)+(b-i\,a+c\,(v-2\,s))\sqrt{z}}\left((b-i\,a+c\,(v-2\,s))\sqrt{z}\ -1\right)}{(b-i\,a+c\,(v-2\,s))^2}+\right.$$

$$\frac{e^{e-i\,q-g\,(v-2\,s)+(b-i\,a-c\,(v-2\,s))\sqrt{z}}\left((b-i\,a-c\,(v-2\,s))\sqrt{z}\ -1\right)}{(b-i\,a-c\,(v-2\,s))^2}-$$

$$\frac{e^{e+i\,q+g\,(v-2\,s)+(b+i\,a+c\,(v-2\,s))\sqrt{z}}\left((b+i\,a+c\,(v-2\,s))\sqrt{z}\ -1\right)}{(b+i\,a+c\,(v-2\,s))^2}-$$

$$\left.\frac{e^{e+i\,q-g\,(v-2\,s)+(b+i\,a-c\,(v-2\,s))\sqrt{z}}\left((b+i\,a-c\,(v-2\,s))\sqrt{z}\ -1\right)}{(b+i\,a-c\,(v-2\,s))^2}\right)\binom{v}{s}/;\ v\in\mathbb{N}^{+}$$

Involving $e^{b\,z^r+d\,z+e}\sin\left(a\,z^r+p\,z+q\right)\cosh^{v}\left(c\,z^r+f\,z+g\right)$

01.20.21.3752.01

$$\int e^{b z^2+d z+e} \sin\left(a z^2+p z+q\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{a^2+b^2}\left(2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b-i a}\,(b+i a)\,e^{-\frac{(d-i p)^2-4(b-i a)\left(e-i q+\frac{i\pi}{2}\right)}{4(b-i a)}}\operatorname{erfi}\left(\frac{d-i p-2 i a z+2 b z}{2\sqrt{b-i a}}\right)+\right.\right.$$

$$\left.\left.(b-i a)\sqrt{b+i a}\;e^{-\frac{(d+i p)^2-4(b+i a)\left(e+i q-\frac{i\pi}{2}\right)}{4(b+i a)}}\operatorname{erfi}\left(\frac{d+i p+2(b+i a)z}{2\sqrt{b+i a}}\right)\right)(1-\nu \bmod 2)\right)+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(e^{-\frac{(d-i p+f(\nu-2s))^2-4(b-i a+c(\nu-2s))\left(e-i q+g(\nu-2s)+\frac{i\pi}{2}\right)}{4(b-i a+c(\nu-2s))}}\sqrt{b-i a+c(\nu-2s)}\;(b+i a-c(\nu-2s))\right.\right.$$

$$\operatorname{erfi}\left(\frac{d-i p+f(\nu-2s)+2(b-i a+c(\nu-2s))z}{2\sqrt{b-i a+c(\nu-2s)}}\right)+$$

$$e^{-\frac{(d+i p-f(\nu-2s))^2-4(b+i a-c(\nu-2s))\left(e+i q-g(\nu-2s)-\frac{i\pi}{2}\right)}{4(b+i a-c(\nu-2s))}}(b-i a+c(\nu-2s))\sqrt{b+i a-c(\nu-2s)}$$

$$\left.\left.\operatorname{erfi}\left(\frac{d+i p-f(\nu-2s)+2 b z-2(-i a+c(\nu-2s))z}{2\sqrt{b+i a-c(\nu-2s)}}\right)\right)\Big/((b+i a-c(\nu-2s))(b-i a+c(\nu-2s)))+\right.$$

$$\left(e^{-\frac{(d+i p+f(\nu-2s))^2-4(b+i a+c(\nu-2s))\left(e+i q+g(\nu-2s)-\frac{i\pi}{2}\right)}{4(b+i a+c(\nu-2s))}}\sqrt{b+i a+c(\nu-2s)}\;(b-i a-c(\nu-2s))\right.$$

$$\operatorname{erfi}\left(\frac{d+i p+f(\nu-2s)+2(b+i a+c(\nu-2s))z}{2\sqrt{b+i a+c(\nu-2s)}}\right)+e^{-\frac{(d-i p-f(\nu-2s))^2-4(b-i a-c(\nu-2s))\left(e-i q-g(\nu-2s)+\frac{i\pi}{2}\right)}{4(b-i a-c(\nu-2s))}}$$

$$\left.\left.(b+i a+c(\nu-2s))\sqrt{b-i a-c(\nu-2s)}\;\operatorname{erfi}\left(\frac{d-i p-f(\nu-2s)+2 b z-2(i a+c(\nu-2s))z}{2\sqrt{b-i a-c(\nu-2s)}}\right)\right)\Big/\right.$$

$$\left.((b-i a-c(\nu-2s))(b+i a+c(\nu-2s)))\right);\ \nu\in\mathbb{N}^+$$

01.20.21.3753.01

$$\int e^{\sqrt{z}\ b+d z+e} \sin\left(\sqrt{z}\ a+p z+q\right) \cosh^{\nu}\left(\sqrt{z}\ c+f z+g\right) dz ==$$

$$2^{-\nu-2}\, e^{e-i q+\frac{i \pi}{2}} \left(\sqrt{\pi} \left(\frac{(b+i a)\, e^{2 i q-\frac{(b+i a)^2}{4 (d+i p)}} \operatorname{erfi}\left(\frac{b+i a+2 (d+i p) \sqrt{z}}{2 \sqrt{d+i p}} \right)}{(d+i p)^{3/2}} - \frac{(b-i a)\, e^{-\frac{(b-i a)^2}{4 (d-i p)}} \operatorname{erfi}\left(\frac{b-i a+2 (d-i p) \sqrt{z}}{2 \sqrt{d-i p}} \right)}{(d-i p)^{3/2}} \right) - \right.$$

$$\left. \frac{2\, e^{\sqrt{z}\ (b+i a)+2 i q+(d+i p) z}}{d+i p} + \frac{2\, e^{\sqrt{z}\ (b-i a)+(d-i p) z}}{d-i p} \right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{e-i q-g (\nu-2 s)+\frac{i \pi}{2}} \left(\frac{1}{(d+i p-2 f s+f \nu)^{3/2}} \left(e^{-\frac{(b+i a+c (\nu-2 s))^2}{4 (d+i p-2 f s+f \nu)}+2 i q+2 g (\nu-2 s)} \sqrt{\pi} \right. \right. \right.$$

$$\left. \left. (b+i a+c (\nu-2 s)) \operatorname{erfi}\left(\frac{b+i a+c (\nu-2 s)+2 (d+i p-2 f s+f \nu) \sqrt{z}}{2 \sqrt{d+i p-2 f s+f \nu}} \right) \right) - \right.$$

$$\frac{2\, e^{2 i q+2 g (\nu-2 s)+(d+i p-2 f s+f \nu) z+(b+i a-2 c s+c \nu) \sqrt{z}}}{d+i p-2 f s+f \nu} + \frac{2\, e^{\sqrt{z}\ (b-i a+2 c s-c \nu)+(d-i p+2 f s-f \nu) z}}{d-i p+2 f s-f \nu} -$$

$$\left. \left(e^{-\frac{(b-i a+2 c s-c \nu)^2}{4 (d-i p+2 f s-f \nu)}} \sqrt{\pi}\ (b-i a+2 c s-c \nu) \operatorname{erfi}\left(\frac{b-i a+c (2 s-\nu)+2 (d-i p+2 f s-f \nu) \sqrt{z}}{2 \sqrt{d-i p+2 f s-f \nu}} \right) \right) \right/$$

$$(d-i p+2 f s-f \nu)^{3/2} \Bigg) + e^{e+i q-g (\nu-2 s)-\frac{i \pi}{2}} \left(\frac{1}{(d-i p-2 f s+f \nu)^{3/2}} \left(e^{-\frac{(b-i a-2 c s+c \nu)^2}{4 (d-i p-2 f s+f \nu)}-2 i q+2 g (\nu-2 s)} \right. \right.$$

$$\left. \left. \sqrt{\pi}\ (b-i a-2 c s+c \nu) \operatorname{erfi}\left(\frac{b-i a+c (\nu-2 s)+2 (d-i p-2 f s+f \nu) \sqrt{z}}{2 \sqrt{d-i p-2 f s+f \nu}} \right) \right) - \right.$$

$$\frac{2\, e^{-2 i q+2 g (\nu-2 s)+(d-i p-2 f s+f \nu) z+(b-i a-2 c s+c \nu) \sqrt{z}}}{d-i p-2 f s+f \nu} + \frac{2\, e^{\sqrt{z}\ (b+i a+2 c s-c \nu)+(d+i p+2 f s-f \nu) z}}{d+i p+2 f s-f \nu} -$$

$$\left. \left(e^{-\frac{(b+i a+2 c s-c \nu)^2}{4 (d+i p+2 f s-f \nu)}} \sqrt{\pi}\ (b+i a+2 c s-c \nu) \operatorname{erfi}\left(\frac{b+i a+c (2 s-\nu)+2 (d+i p+2 f s-f \nu) \sqrt{z}}{2 \sqrt{d+i p+2 f s-f \nu}} \right) \right) \right/$$

$$\left. (d+i p+2 f s-f \nu)^{3/2} \right) \Bigg) /; \nu \in \mathbb{N}^+$$

Involving sin and rational functions of exp

Involving $\sin(e\,z)\cosh^{v}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.3754.01

$$\int \frac{\sin(e\,z)\cosh^{v}(c\,z)}{\left(a+b\,e^{d\,z}\right)^{n}}\,dz ==$$

$$2^{-v-1}\,a^{-n}\,i\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-i\,e-2\,c\,s+c\,v}\left(e^{(-i\,e-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{-i\,e-2\,c\,s+c\,v}{d},\,n;\,\frac{d-i\,e-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.e^{(i\,e+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{i\,e+2\,c\,s-c\,v}{d},\,n;\,\frac{d+i\,e+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-i\,e+2\,c\,s-c\,v}\left(e^{(i\,e-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{i\,e-2\,c\,s+c\,v}{d},\,n;\,\frac{d+i\,e-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.$$

$$\left.\left.e^{(-i\,e+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{-i\,e+2\,c\,s-c\,v}{d},\,n;\,\frac{d-i\,e+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)-$$

$$\frac{2^{-v-1}\,a^{-n}\,(1-v \bmod 2)}{e}\binom{v}{\frac{v}{2}}\left(e^{i\,e\,z}\,{}_2F_1\left(\frac{i\,e}{d},\,n;\,\frac{d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+e^{-i\,e\,z}\,{}_2F_1\left(-\frac{i\,e}{d},\,n;\,\frac{d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/;\,n\in$$

$\mathbb{N}^{+}\bigwedge v\in$

$\mathbb{N}^{+}$

Involving $e^{p\,z}\sin(e\,z)\cosh^{v}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.3755.01

$$\int \frac{e^{p z} \sin(e z) \cosh^{v}(c z)}{\left(a + b\, e^{d z}\right)^{n}} dz ==$$

$$2^{-v-1}\, a^{-n}\, i \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{(-i e+p-2 c s+c v) z} (-i e - p - 2 c s + c v)\, {}_2F_1\left(\frac{-i e + p - 2 c s + c v}{d}, n; \frac{d - i e + p - 2 c s + c v}{d}; -\frac{b\, e^{d z}}{a} \right) + \right. \right.$$

$$\left. e^{(i e+p+2 c s-c v) z} (-i e + p - 2 c s + c v)\, {}_2F_1\left(\frac{i e + p + 2 c s - c v}{d}, n; \frac{d + i e + p + 2 c s - c v}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \Big/$$

$$((-i e - p - 2 c s + c v)(-i e + p - 2 c s + c v)) +$$

$$\left(e^{(i e+p-2 c s+c v) z} (-i e + p + 2 c s - c v)\, {}_2F_1\left(\frac{i e + p - 2 c s + c v}{d}, n; \frac{d + i e + p - 2 c s + c v}{d}; -\frac{b\, e^{d z}}{a} \right) + \right.$$

$$\left. e^{(-i e+p+2 c s-c v) z} (-i e - p + 2 c s - c v)\, {}_2F_1\left(\frac{-i e + p + 2 c s - c v}{d}, n; \frac{d - i e + p + 2 c s - c v}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \Big/$$

$$\left. ((-i e - p + 2 c s - c v)(-i e + p + 2 c s - c v)) \right) -$$

$$\frac{1}{(i e - p)(i e + p)} \left(2^{-v-1}\, i\, a^{-n} \binom{v}{\frac{v}{2}} \left(e^{(-i e+p) z} (i e + p)\, {}_2F_1\left(\frac{-i e + p}{d}, n; \frac{d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) + \right. \right.$$

$$\left. \left. e^{(i e+p) z} (i e - p)\, {}_2F_1\left(\frac{i e + p}{d}, n; \frac{d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) (1 - v \bmod 2) \right) /; n \in \mathbb{N}^{+} \bigwedge v \in \mathbb{N}^{+}$$

Involving sin and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^{\beta} \sin(e z) \cosh^{v}(c z)$

01.20.21.3756.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta} \sin(e\,z)\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-1}\,i\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{-i\,e-2\,c\,s+c\,\nu}\left(e^{(-i\,e-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{-i\,e-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d-i\,e-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.e^{(i\,e+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{i\,e+2\,c\,s-c\,\nu}{d},\,-\beta;\,\frac{d+i\,e+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-i\,e+2\,c\,s-c\,\nu}\left(e^{(i\,e-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{i\,e-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d+i\,e-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.$$

$$\left.\left.e^{(-i\,e+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{-i\,e+2\,c\,s-c\,\nu}{d},\,-\beta;\,\frac{d-i\,e+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)-$$

$$\frac{1}{e}\left(2^{-\nu-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e\,z}\,{}_2F_1\left(\frac{i\,e}{d},\,-\beta;\,\frac{d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+e^{-i\,e\,z}\,{}_2F_1\left(-\frac{i\,e}{d},\,-\beta;\,\frac{d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right.$$

$$\left.(1-\nu \bmod 2)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\sin(e\,z)\cosh^{\nu}(c\,z)$

01.20.21.3757.01

$$\int e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\sin(e\,z)\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-1}\,i\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(e^{(-i\,e+p-2\,c\,s+c\,\nu)\,z}\,(-i\,e-p-2\,c\,s+c\,\nu)\,{}_2F_1\left(\frac{-i\,e+p-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d-i\,e+p-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.e^{(i\,e+p+2\,c\,s-c\,\nu)\,z}\,(-i\,e+p-2\,c\,s+c\,\nu)\,{}_2F_1\left(\frac{i\,e+p+2\,c\,s-c\,\nu}{d},\,-\beta;\,\frac{d+i\,e+p+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$

$$((-i\,e-p-2\,c\,s+c\,\nu)\,(-i\,e+p-2\,c\,s+c\,\nu))+$$

$$\left(e^{(i\,e+p-2\,c\,s+c\,\nu)\,z}\,(-i\,e+p+2\,c\,s-c\,\nu)\,{}_2F_1\left(\frac{i\,e+p-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d+i\,e+p-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.$$

$$\left.\left.e^{(-i\,e+p+2\,c\,s-c\,\nu)\,z}\,(-i\,e-p+2\,c\,s-c\,\nu)\,{}_2F_1\left(\frac{-i\,e+p+2\,c\,s-c\,\nu}{d},\,-\beta;\,\frac{d-i\,e+p+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/\right.$$

$$\left.((-i\,e-p+2\,c\,s-c\,\nu)\,(-i\,e+p+2\,c\,s-c\,\nu))\right)-\frac{1}{(i\,e-p)\,(i\,e+p)}$$

$$\left(2^{-\nu-1}\,i\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\left(e^{(-i\,e+p)\,z}\,(i\,e+p)\,{}_2F_1\left(\frac{-i\,e+p}{d},\,-\beta;\,\frac{d-i\,e+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.\left.e^{(i\,e+p)\,z}\,(i\,e-p)\,{}_2F_1\left(\frac{i\,e+p}{d},\,-\beta;\,\frac{d+i\,e+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)(1-\nu \bmod 2)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving powers of sin and exp

Involving $e^{p z} \sin^{\mu}(c z) \cosh^{\nu}(a z)$

01.20.21.3758.01

$$\int e^{p z} \sin^{\mu}(c z) \cosh^{\nu}(a z)\, dz == 2^{-\nu} \sin^{\mu}(c z) \left(1 - e^{2 i c z}\right)^{-\mu}$$
$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{e^{(p+a(\nu-2s))z}}{p + a(\nu-2s) - i c \mu} {}_2F_1\left(-\frac{i(p+a(\nu-2s)-i c \mu)}{2c}, -\mu; 1 - \frac{i(p+a(\nu-2s)-i c \mu)}{2c}; e^{2 i c z}\right) + \right.$$
$$\left. \frac{e^{(p-a(\nu-2s))z}}{p - a(\nu-2s) - i c \mu} {}_2F_1\left(-\frac{i(p-a(\nu-2s)-i c \mu)}{2c}, -\mu; 1 - \frac{i(p-a(\nu-2s)-i c \mu)}{2c}; e^{2 i c z}\right) \right) +$$
$$\frac{2^{-\nu} e^{p z} \left(1 - e^{2 i c z}\right)^{-\mu} \sin^{\mu}(c z) (1 - \nu \bmod 2)}{p - i c \mu} \binom{\nu}{\frac{\nu}{2}} {}_2F_1\left(-\frac{i(p - i c \mu)}{2c}, -\mu; 1 - \frac{i(p - i c \mu)}{2c}; e^{2 i c z}\right) /; \nu \in \mathbb{N}$$

01.20.21.3759.01

$$\int e^{p z} \sin^{m}(c z) \cosh^{\nu}(a z)\, dz ==$$
$$\frac{2^{-m} e^{p z} \cosh^{\nu}(a z) (1 - m \bmod 2) \left(1 + e^{2 a z}\right)^{-\nu}}{p - a \nu} \binom{m}{\frac{m}{2}} {}_2F_1\left(\frac{p - a \nu}{2 a}, -\nu; \frac{p - a \nu}{2 a} + 1; -e^{2 a z}\right) + 2^{-m} \cosh^{\nu}(a z) \left(1 + e^{2 a z}\right)^{-\nu}$$
$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{m+s} \binom{m}{s} \left(\frac{e^{\frac{1}{2} i (m\pi) + (p + c i (m-2s)) z}}{p + c i (m-2s) - a \nu} {}_2F_1\left(\frac{p + c i (m-2s) - a \nu}{2 a}, -\nu; \frac{p + c i (m-2s) - a \nu}{2 a} + 1; -e^{2 a z}\right) + \right.$$
$$\left. \frac{e^{-i \frac{1}{2} (m\pi) + (p - i c (m-2s)) z}}{p - i c (m-2s) - a \nu} {}_2F_1\left(\frac{p - i c (m-2s) - a \nu}{2 a}, -\nu; \frac{p - i c (m-2s) - a \nu}{2 a} + 1; -e^{2 a z}\right) \right) /; m \in \mathbb{N}$$

01.20.21.3760.01

$$\int e^{p z} \sin^{m}(c z) \cosh^{\nu}(a z)\, dz == \frac{2^{-m-\nu} e^{p z} (1 - m \bmod 2) (1 - \nu \bmod 2)}{p} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} -$$
$$i^{-m} 2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{k} \left(\frac{e^{-(-p + 2 i c k - i c m) z}}{-p + 2 i c k - i c m} + \frac{e^{i m \pi - (-p - 2 i c k + i c m) z}}{-p - 2 i c k + i c m} \right) \binom{m}{k} -$$
$$2^{-m-\nu} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\frac{e^{-(-p - a(\nu-2s)) z}}{-p - a(\nu-2s)} + \frac{e^{-(-p - 2as + a\nu) z}}{-p - 2as + a\nu} \right) \binom{\nu}{s} -$$
$$i^{-m} 2^{-m-\nu} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{k} \binom{m}{k} \left(e^{i m \pi} \left(\frac{e^{-(-p - 2 i c k + i c m + 2as - a\nu) z}}{-p - 2 i c k + i c m + 2as - a\nu} + \frac{e^{-(-p + c i (m-2k) - 2as + a\nu) z}}{-p + c i (m-2k) - 2as + a\nu} \right) + \right.$$
$$\left. \frac{e^{-(-p + 2 i c k - i c m - 2as + a\nu) z}}{-p + 2 i c k - i c m - 2as + a\nu} + \frac{e^{-(-p + 2 i c k - i c m + 2as - a\nu) z}}{-p + 2 i c k - i c m + 2as - a\nu} \right) /; m \in \mathbb{N}^{+} \bigwedge \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} \sin^{\mu}(c z + d) \cosh^{\nu}(a z)$

01.20.21.3761.01

$$\int e^{p z} \sin^{\mu}(d+c z) \cosh^{\nu}(a z)\, dz == 2^{-\nu} \frac{e^{p z}\left(1-e^{2(i d+i c z)}\right)^{-\mu}\ (1-\nu \bmod 2) \sin^{\mu}(d+c z)}{p-i c \mu}$$
$$\binom{\nu}{\frac{\nu}{2}}\, {}_2F_1\left(-\frac{i(p-i c \mu)}{2c}, -\mu; \frac{1}{2}\left(-\frac{i p}{c}-\mu+2\right); e^{2(i d+i c z)}\right) + 2^{-\nu}\left(1-e^{2(i d+i c z)}\right)^{-\mu} \sin^{\mu}(d+c z)$$
$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k}\left(\frac{e^{(p+a(\nu-2k))z}}{p+a(\nu-2k)-i c \mu}\, {}_2F_1\left(-\frac{i(p+a(\nu-2k)-i c \mu)}{2c}, -\mu; \frac{1}{2}\left(-\frac{i(p+a(\nu-2k))}{c}-\mu+2\right); e^{2(i d+i c z)}\right) + \right.$$
$$\left.\frac{e^{(p-a(\nu-2k))z}}{p-a(\nu-2k)-i c \mu}\, {}_2F_1\left(-\frac{i(p-a(\nu-2k)-i c \mu)}{2c}, -\mu; \frac{1}{2}\left(-\frac{i(p-a(\nu-2k))}{c}-\mu+2\right); e^{2(i d+i c z)}\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3762.01

$$\int e^{p z} \sin^{m}(d+c z) \cosh^{\nu}(a z)\, dz ==$$
$$\frac{2^{-m} e^{p z}\left(1+e^{2 a z}\right)^{-\nu}(1-m \bmod 2) \cosh^{\nu}(a z)}{p-a \nu} \binom{m}{\frac{m}{2}}\, {}_2F_1\left(\frac{p-a \nu}{2a}, -\nu; \frac{1}{2}\left(\frac{p}{a}-\nu+2\right); -e^{2 a z}\right) +$$
$$2^{-m} i^{-m}\left(1+e^{2 a z}\right)^{-\nu} \cosh^{\nu}(a z) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k e^{i d(m-2k)} \binom{m}{k}$$
$$\left(\frac{e^{i \pi m-2 d i(m-2k)+(p-i c(m-2k))z}}{-i c(m-2k)+p-a \nu}\, {}_2F_1\left(\frac{-i c(m-2k)+p-a \nu}{2a}, -\nu; \frac{1}{2}\left(\frac{p-i c(m-2k)}{a}-\nu+2\right); -e^{2 a z}\right) + \right.$$
$$\left.\frac{e^{(c i(m-2k)+p)z}}{c i(m-2k)+p-a \nu}\, {}_2F_1\left(\frac{c i(m-2k)+p-a \nu}{2a}, -\nu; \frac{1}{2}\left(\frac{c i(m-2k)+p}{a}-\nu+2\right); -e^{2 a z}\right)\right) /;\ m \in \mathbb{N}^+$$

01.20.21.3763.01

$$\int e^{p z} \sin^{m}(d+c z) \cosh^{\nu}(a z)\, dz == \frac{e^{p z} 2^{-m-\nu} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1-m \bmod 2)(1-\nu \bmod 2)}{p} -$$
$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} \left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k e^{-2 d i k-i d m-\frac{i \pi m}{2}} \left(\frac{e^{2 i d m-(-i c(m-2k)-p)z}}{-i c(m-2k)-p} + \frac{e^{4 i d k-(-2 c i k+i c m-p)z+i m \pi}}{-2 c i k+i c m-p}\right) \binom{m}{k}\right)(1-\nu \bmod 2) -$$
$$2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \left(\frac{e^{(p+a(\nu-2s))z}}{-p-a(\nu-2s)} + \frac{e^{(p+2as-a\nu)z}}{-p-2as+a\nu}\right) \binom{\nu}{s} -$$
$$2^{-m-\nu} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-2 d i k-i d m-\frac{i m \pi}{2}} \left(\frac{e^{2 i d m-(2 i c k-i c m-p+2 a s-a \nu)z}}{2 i c k-i c m-p+2 a s-a \nu} + \frac{e^{4 i d k-(-2 c i k+i c m-p+2 a s-a \nu)z+i m \pi}}{-2 c i k+i c m-p+2 a s-a \nu} + \right.$$
$$\left.\frac{e^{4 i d k-(-2 c i k+i c m-p-2 a s+a \nu)z+i m \pi}}{-2 c i k+i c m-p-2 a s+a \nu} + \frac{e^{2 i d m-(2 i c k-i c m-p-2 a s+a \nu)z}}{2 i c k-i c m-p-2 a s+a \nu}\right) \binom{\nu}{s} /;\ m \in \mathbb{N}^+ \wedge \nu \in \mathbb{N}^+$$

Involving $e^{p z} \sin^{\mu}(c z) \cosh^{\nu}(a z+b)$

01.20.21.3764.01

$$\int e^{p z} \sin^{\mu}(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-\nu} \sin^{\mu}(c z)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{b (\nu-2 k)} \binom{\nu}{k} \left(\frac{e^{(p+a (\nu-2 k)) z}}{p + a (\nu-2 k) - i c \mu} {}_2F_1\left(-\frac{i (p + a (\nu-2 k) - i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i (p + a (\nu-2 k))}{c} - \mu + 2\right); e^{2 i c z}\right) + \right.\right.$$

$$\left.\left. \frac{e^{(p-a (\nu-2 k)) z - 2 b (\nu-2 k)}}{p - a (\nu-2 k) - i c \mu} {}_2F_1\left(-\frac{i (p - a (\nu-2 k) - i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i (p - a (\nu-2 k))}{c} - \mu + 2\right); e^{2 i c z}\right)\right)\right)$$

$$\left(1 - e^{2 i c z}\right)^{-\mu} + \frac{2^{-\nu} e^{p z} \left(1 - e^{2 i c z}\right)^{-\mu} (1 - \nu \bmod 2) \sin^{\mu}(c z)}{p - i c \mu} \binom{\nu}{\frac{\nu}{2}}$$

$${}_2F_1\left(-\frac{i (p - i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i p}{c} - \mu + 2\right); e^{2 i c z}\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3765.01

$$\int e^{p z} \sin^{m}(c z) \cosh^{\nu}(b + a z)\, dz == \frac{2^{-m} e^{p z} \left(1 + e^{2 (b+a z)}\right)^{-\nu} (1 - m \bmod 2) \cosh^{\nu}(b + a z)}{p - a \nu}$$

$$\binom{m}{\frac{m}{2}} {}_2F_1\left(\frac{p - a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{p}{a} - \nu + 2\right); -e^{2 (b+a z)}\right) + 2^{-m} i^{-m} \left(1 + e^{2 (b+a z)}\right)^{-\nu} \cosh^{\nu}(b + a z)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\frac{e^{i \pi m + (p - i c (m-2 k)) z}}{-i c (m-2 k) + p - a \nu} {}_2F_1\left(\frac{-i c (m-2 k) + p - a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{p - i c (m-2 k)}{a} - \nu + 2\right); -e^{2 (b+a z)}\right) + \right.\right.$$

$$\left.\left. \frac{e^{(c i (m-2 k) + p) z}}{c i (m-2 k) + p - a \nu} {}_2F_1\left(\frac{c i (m-2 k) + p - a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{c i (m-2 k) + p}{a} - \nu + 2\right); -e^{2 (b+a z)}\right)\right)\right) /; m \in \mathbb{N}^+$$

01.20.21.3766.01

$$\int e^{p z} \sin^{m}(c z) \cosh^{\nu}(b + a z)\, dz == \frac{2^{-m-\nu} e^{p z} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1 - m \bmod 2) (1 - \nu \bmod 2)}{p} -$$

$$2^{-m-\nu} i^{-m} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \left(\frac{e^{-(-i c (m-2 k) - p) z}}{-i c (m-2 k) - p} + \frac{e^{i m \pi - (-2 c i k + i c m - p) z}}{-2 c i k + i c m - p}\right) \binom{m}{k} -$$

$$2^{-m-\nu} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2 b s - b \nu} \left(\frac{e^{2 b \nu - (-p - a (\nu-2 s)) z}}{-p - a (\nu-2 s)} + \frac{e^{4 b s - (-p - 2 a s + a \nu) z}}{-p - 2 a s + a \nu}\right) \binom{\nu}{s} -$$

$$2^{-m-\nu} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{1}{2} i \pi m - 2 b s - b \nu} \left(e^{2 b \nu} \left(\frac{e^{-(2 i c k - i c m - p + 2 a s - a \nu) z}}{2 i c k - i c m - p + 2 a s - a \nu} + \frac{e^{i m \pi - (-2 c i k + i c m - p + 2 a s - a \nu) z}}{-2 c i k + i c m - p + 2 a s - a \nu}\right) + \right.$$

$$\left. \frac{e^{i \pi m + 4 b s - (-2 c i k + i c m - p - 2 a s + a \nu) z}}{-2 c i k + i c m - p - 2 a s + a \nu} + \frac{e^{4 b s - (2 i c k - i c m - p - 2 a s + a \nu) z}}{2 i c k - i c m - p - 2 a s + a \nu}\right) \binom{\nu}{s} /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

Involving $e^{p z} \sin^{\mu}(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.3767.01

$$\int e^{p z} \sin^{\mu}(d+c z) \cosh^{\nu}(b+a z)\, dz == 2^{-\nu}\left(\left(1-e^{2(i d+i c z)}\right)^{-\mu}\sin^{\mu}(d+c z)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{2 b s-b \nu}\binom{\nu}{s}\right.$$
$$\left(\frac{e^{2 b(\nu-2 s)+(p+a(\nu-2 s)) z}}{p-2 a s+a \nu-i c \mu}\,{}_2F_1\left(-\frac{i(p-2 a s+a \nu-i c \mu)}{2 c},\,-\mu;\,\frac{1}{2}\left(-\frac{i(p-2 a s+a \nu)}{c}-\mu+2\right);\,e^{2 i(d+c z)}\right)+\right.$$
$$\left.\left.\frac{e^{(p+2 a s-a \nu) z}}{p+2 a s-a \nu-i c \mu}\,{}_2F_1\left(-\frac{i(p+2 a s-a \nu-i c \mu)}{2 c},\,-\mu;\,-\frac{i(p+2 a s-a \nu-i c(\mu-2))}{2 c};\,e^{2 i(d+c z)}\right)\right)-\right.$$
$$\left.\frac{e^{p z}\sin^{\mu}(d+c z)\left(1-e^{2(i d+i c z)}\right)^{-\mu}(\nu \bmod 2-1)}{p-i c \mu}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{i p+c \mu}{2 c},\,-\mu;\,\frac{1}{2}\left(-\frac{i p}{c}-\mu+2\right);\,e^{2 i(d+c z)}\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.3768.01

$$\int e^{p z}\sin^{m}(d+c z)\cosh^{\nu}(b+a z)\,dz ==$$
$$2^{-m}\left(-\frac{e^{p z}\left(1+e^{2(b+a z)}\right)^{-\nu}\cosh^{\nu}(b+a z)(m \bmod 2-1)}{p-a \nu}\binom{m}{\frac{m}{2}}\,{}_2F_1\left(\frac{p-a \nu}{2 a},\,-\nu;\,\frac{1}{2}\left(\frac{p}{a}-\nu+2\right);\,-e^{2(b+a z)}\right)+\right.$$
$$i^{-m}\left(1+e^{-2(b+a z)}\right)^{-\nu}\cosh^{\nu}(b+a z)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{i d(m-2 k)}\binom{m}{k}\left(\frac{e^{i(4 d k+2 c z k-2 d m-c m z-i p z+m \pi)}}{c i(2 k-m)+p+a \nu}\right.$$
$$\,{}_2F_1\left(-\frac{2 i c k-i c m+p+a \nu}{2 a},\,-\nu;\,-\frac{2 i c k-i c m+p+a(\nu-2)}{2 a};\,-e^{-2(b+a z)}\right)+\frac{e^{(c i(m-2 k)+p) z}}{c i(m-2 k)+p+a \nu}$$
$$\left.\left.\,{}_2F_1\left(-\frac{c i(m-2 k)+p+a \nu}{2 a},\,-\nu;\,-\frac{-2 c i k+i c m+p+a(\nu-2)}{2 a};\,-e^{-2(b+a z)}\right)\right)\right)/;\ m\in\mathbb{N}^+$$

01.20.21.3769.01

$$\int e^{p z}\sin^{m}(d+c z)\cosh^{\nu}(b+a z)\,dz == \frac{2^{-m-\nu}e^{p z}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)(1-\nu \bmod 2)}{p}-$$
$$i^{-m}\,2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-i d(2 k+m)}\left(\frac{e^{2 i d m-(2 i c k-i c m-p) z}}{2 i c k-i c m-p}+\frac{e^{4 i d k-(-2 c i k+i c m-p) z+i m \pi}}{-2 c i k+i c m-p}\right)\binom{m}{k}-$$
$$2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-b(2 s+\nu)}\left(\frac{e^{2 b \nu-(-p-a(\nu-2 s)) z}}{-p-a(\nu-2 s)}+\frac{e^{4 b s-(-p-2 a s+a \nu) z}}{-p-2 a s+a \nu}\right)\binom{\nu}{s}-i^{-m}\,2^{-m-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-2 d i k-i d m-2 b s-b \nu}\left(e^{2 i d m}\left(\frac{e^{2 b \nu-(2 i c k-i c m-p+2 a s-a \nu) z}}{2 i c k-i c m-p+2 a s-a \nu}+\frac{e^{4 b s-(2 i c k-i c m-p-2 a s+a \nu) z}}{2 i c k-i c m-p-2 a s+a \nu}\right)+e^{4 i d k+i m \pi}\right.$$
$$\left.\left.\left(\frac{e^{2 b \nu-(-2 c i k+i c m-p+2 a s-a \nu) z}}{-2 c i k+i c m-p+2 a s-a \nu}+\frac{e^{4 b s-(c i(m-2 k)-p-2 a s+a \nu) z}}{c i(m-2 k)-p-2 a s+a \nu}\right)\right)\binom{m}{k}/;\ m\in\mathbb{Z}\wedge m>0\wedge \nu\in\mathbb{Z}\wedge \nu>0$$

Involving $e^{p z^r} \sin^m(b z^r) \cosh^v(c z)$

01.20.21.3770.01

$$\int e^{p z^2} \sin^m\left(b z^2\right) \cosh^v(c z)\, dz == \frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{2 p z - c (v - 2 s)}{2 \sqrt{p}} \right) + e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{c (v - 2 s) + 2 p z}{2 \sqrt{p}} \right) \right) \right) +$$

$$2^{-m-v-1} i^{-m} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left((-1)^k \binom{m}{k} \left((-1)^m \sqrt{p - i b (m - 2 k)}\ (b i (m - 2 k) + p) \operatorname{erfi}\left(\frac{2 p z - 2 i b (m - 2 k) z}{2 \sqrt{p - i b (m - 2 k)}} \right) + \right. \right.$$

$$\left. \left. (p - i b (m - 2 k)) \sqrt{b i (m - 2 k) + p}\ \operatorname{erfi}\left(\sqrt{b i (m - 2 k) + p}\ z \right) \right) \right) \Big/ ((p - i b (m - 2 k)) (b i (m - 2 k) + p)) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{c^2 (v-2s)^2 + 2 i m (p - i b (2k - m)) \pi}{4 (p - i b (2k - m))}} \sqrt{p - i b (2 k - m)}\ (b i (2 k - m) + p) \right. \right.$$

$$\operatorname{erfi}\left(\frac{-c (v - 2 s) - 2 i b (2 k - m) z + 2 p z}{2 \sqrt{p - i b (2 k - m)}} \right) + e^{-\frac{c^2 (v-2s)^2 - 2 i m (b i (2k - m) + p) \pi}{4 (b i (2k - m) + p)}} (p - i b (2 k - m))$$

$$\left. \left. \sqrt{b i (2 k - m) + p}\ \operatorname{erfi}\left(\frac{c (v - 2 s) + 2 (b i (2 k - m) + p) z}{2 \sqrt{b i (2 k - m) + p}} \right) \right) \right) \Big/ ((p - i b (2 k - m)) (b i (2 k - m) + p)) +$$

$$\left(e^{-\frac{c^2 (v-2s)^2 - 2 i m (p - i b (m - 2k)) \pi}{4 (p - i b (m - 2k))}} \sqrt{p - i b (m - 2 k)}\ (b i (m - 2 k) + p) \operatorname{erfi}\left(\frac{-c (v - 2 s) - 2 i b (m - 2 k) z + 2 p z}{2 \sqrt{p - i b (m - 2 k)}} \right) + \right.$$

$$\left. e^{-\frac{c^2 (v-2s)^2 + 2 i m (b i (m - 2k) + p) \pi}{4 (b i (m - 2k) + p)}} (p - i b (m - 2 k)) \sqrt{b i (m - 2 k) + p}\ \operatorname{erfi}\left(\frac{c (v - 2 s) + 2 (b i (m - 2 k) + p) z}{2 \sqrt{b i (m - 2 k) + p}} \right) \right) \Big/$$

$$\left. ((p - i b (m - 2 k)) (b i (m - 2 k) + p)) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3771.01

$$\int e^{p\sqrt{z}}\sin^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz == \frac{2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{p^2} +$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{e^{\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\,p+c(v-2s)z}}{c(v-2s)}-\right.$$

$$\left.\frac{2e^{p\sqrt{z}-c(v-2s)z}}{c(v-2s)}-\frac{e^{-\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)+2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k e^{p\sqrt{z}}\binom{m}{k}\left(\left(\sqrt{z}\,p^3-p^2+b^2(m-2k)^2\left(\sqrt{z}\,p+1\right)\right)\cos\left(\frac{m\pi}{2}-b(m-2k)\sqrt{z}\right)+b(m-2k)\left(-b^2\sqrt{z}\right.\right.\right.$$

$$\left.\left.\left.(m-2k)^2+2p-p^2\sqrt{z}\right)\sin\left(\frac{m\pi}{2}-b(m-2k)\sqrt{z}\right)\right)\right)\Big/\left((i\,b(m-2k)-p)^2\,(b\,i(m-2k)+p)^2\right)+$$

$$2^{-m-v-1}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{e^{\frac{(b(m-2k)+ip)^2}{c(8s-4v)}}\,(b\,i(2k-m)+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,i(m-2k)-p+2c(v-2s)\sqrt{z}}{2\sqrt{c(2s-v)}}\right)}{(c(2s-v))^{3/2}}+\right.\right.$$

$$\left.\left(e^{-\frac{(b\,i(m-2k)+p)^2}{4c(v-2s)}-i\,m\pi}\,(-2\,b\,i\,k+i\,b\,m+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,i(m-2k)+p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)\right)\Big/\right.$$

$$\left.\left(c(2s-v)\sqrt{c(v-2s)}\right)+\frac{2e^{-i\pi m+c(v-2s)z+(b\,i(m-2k)+p)\sqrt{z}}}{c(v-2s)}-\frac{2e^{(p-i\,b(m-2k))\sqrt{z}-c(v-2s)z}}{c(v-2s)}\right)+$$

$$\frac{e^{\frac{(2bk-bm+ip)^2}{c(8s-4v)}}\,(-2\,b\,i\,k+i\,b\,m+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,i(2k-m)-p+2c(v-2s)\sqrt{z}}{2\sqrt{c(2s-v)}}\right)}{(c(2s-v))^{3/2}}+$$

$$\frac{e^{i\,m\pi-\frac{(b(m-2k)+ip)^2}{c(8s-4v)}}\,(b\,i(2k-m)+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,i(2k-m)+p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{c(2s-v)\sqrt{c(v-2s)}}+$$

$$\left.\frac{2e^{i\pi m+c(v-2s)z+(b\,i(2k-m)+p)\sqrt{z}}}{c(v-2s)}-\frac{2e^{(p-i\,b(2k-m))\sqrt{z}-c(v-2s)z}}{c(v-2s)}\right)/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p z^r} \sin^m(b z) \cosh^v(c z)$

01.20.21.3772.01

$$\int e^{p z^2} \sin^m(b z) \cosh^v(c z)\, dz ==$$

$$\frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} + \frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \right.$$

$$\left. \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{-b^2 (m-2k)^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{2 p z - i b (m-2k)}{2\sqrt{p}} \right) + e^{-\frac{2\pi i m p - b^2 (m-2k)^2}{4p}} \operatorname{erfi}\left(\frac{b i (m-2k) + 2 p z}{2\sqrt{p}} \right) \right) \right) +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{2 p z - c (v-2s)}{2\sqrt{p}} \right) + e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{c (v-2s) + 2 p z}{2\sqrt{p}} \right) \right) \right) +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{(b i (2k-m) + c (v-2s))^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{b i (2k-m) + c (v-2s) + 2 p z}{2\sqrt{p}} \right) + e^{-\frac{(b i (m-2k) + c (v-2s))^2 + 2\pi i m p}{4p}} \operatorname{erfi}\left(\right. \right.$$

$$\left. \frac{b i (m-2k) + c (v-2s) + 2 p z}{2\sqrt{p}} \right) + e^{-\frac{(-i b (2k-m) - c (v-2s))^2 + 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{-i b (2k-m) - c (v-2s) + 2 p z}{2\sqrt{p}} \right) +$$

$$\left. \left. e^{-\frac{(-i b (m-2k) - c (v-2s))^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{-i b (m-2k) - c (v-2s) + 2 p z}{2\sqrt{p}} \right) \right) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3773.01

$$\int e^{p \sqrt{z}} \sin^m(b z) \cosh^v(c z)\, dz == \frac{2^{-m-v+1} e^{p \sqrt{z}} \left(p \sqrt{z} - 1 \right) \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p^2} +$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{\frac{i m \pi}{2}} \binom{m}{k} \left(\frac{2 i e^{p \sqrt{z} - i b (m-2k) z}}{b (m-2k)} - \frac{2 i e^{-i \pi m + b i (m-2k) z + p \sqrt{z}}}{b (m-2k)} - \right.$$

$$\left. \frac{e^{-\frac{i p^2}{4 b (m-2k)}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p - 2 i b (m-2k) \sqrt{z}}{2 \sqrt{-i b (m-2k)}} \right)}{(-i b (m-2k))^{3/2}} - \frac{e^{\frac{i p^2}{4 b (m-2k)} - i m \pi} p \sqrt{\pi} \operatorname{erfi}\left(\frac{2 b i \sqrt{z} (m-2k) + p}{2 \sqrt{i b (m-2k)}} \right)}{(i b (m-2k))^{3/2}} \right) +$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{e^{\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\,p+c(v-2s)z}}{c(v-2s)}-\right.$$

$$\left.\frac{2e^{p\sqrt{z}-c(v-2s)z}}{c(v-2s)}-\frac{e^{-\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)+$$

$$2^{-m-v-1}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{2e^{-i\pi m+(bi(m-2k)+c(v-2s))z+p\sqrt{z}}}{bi(m-2k)+c(v-2s)}-\right.\right.$$

$$\frac{e^{-\frac{p^2}{4(bi(m-2k)+c(v-2s))}-im\pi}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(bi(m-2k)+c(v-2s))\sqrt{z}}{2\sqrt{bi(m-2k)+c(v-2s)}}\right)}{(bi(m-2k)+c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\,p+(-ib(m-2k)-c(v-2s))z}}{-ib(m-2k)-c(v-2s)}-$$

$$\left.\frac{e^{-\frac{p^2}{4(-ib(m-2k)-c(v-2s))}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(-ib(m-2k)-c(v-2s))\sqrt{z}}{2\sqrt{-ib(m-2k)-c(v-2s)}}\right)}{(-ib(m-2k)-c(v-2s))^{3/2}}\right)+\frac{2e^{i\pi m+(bi(2k-m)+c(v-2s))z+p\sqrt{z}}}{bi(2k-m)+c(v-2s)}-$$

$$\frac{e^{im\pi-\frac{p^2}{4(bi(2k-m)+c(v-2s))}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(bi(2k-m)+c(v-2s))\sqrt{z}}{2\sqrt{bi(2k-m)+c(v-2s)}}\right)}{(bi(2k-m)+c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\,p+(-ib(2k-m)-c(v-2s))z}}{-ib(2k-m)-c(v-2s)}-$$

$$\left.\frac{e^{-\frac{p^2}{4(-ib(2k-m)-c(v-2s))}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(-ib(2k-m)-c(v-2s))\sqrt{z}}{2\sqrt{-ib(2k-m)-c(v-2s)}}\right)}{(-ib(2k-m)-c(v-2s))^{3/2}}\right)\Big/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{pz}\sin^m(bz^r)\cosh^v(cz)$

01.20.21.3774.01

$$\int e^{p z} \sin^m\left(b z^2\right) \cosh^v(c z)\, dz == \frac{2^{-m-v}\, e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{p} +$$

$$2^{-m-v+1}\, e^{p z} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{\binom{v}{s} (c\,(v-2\,s) \sinh(c\,(v-2\,s)\,z) - p \cosh(c\,(v-2\,s)\,z))}{(c\,(v-2\,s) - p)\,(p + c\,(v-2\,s))} + \frac{1}{b}\left(i\, 2^{-m-v-1} \sqrt{\pi} \right.$$

$$\binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m-2\,k}\left((-1)^k \binom{m}{k} \left(e^{-\frac{i\left(p^2 - 2\,b\,m\,(m-2\,k)\,\pi\right)}{4\,b\,(m-2\,k)}} \sqrt{-i\,b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{p - 2\,i\,b\,(m-2\,k)\,z}{2\sqrt{-i\,b\,(m-2\,k)}} \right) - \right.\right.$$

$$\left.\left. e^{\frac{i\left(p^2 - 2\,b\,m\,(m-2\,k)\,\pi\right)}{4\,b\,(m-2\,k)}} \sqrt{i\,b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{p + 2\,b\,i\,(m-2\,k)\,z}{2\sqrt{i\,b\,(m-2\,k)}} \right) \right) \right) + \frac{1}{b}\left(i\, 2^{-m-v-1} \sqrt{\pi} \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{2\,k-m}\left(\binom{v}{s} \left(e^{-\frac{i\left((p - c\,(v-2\,s))^2 + 2\,b\,(2\,k-m)\,m\,\pi\right)}{4\,b\,(2\,k-m)}} \sqrt{-i\,b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{p - c\,(v-2\,s) - 2\,i\,b\,(2\,k-m)\,z}{2\sqrt{-i\,b\,(2\,k-m)}} \right) - \right.\right.$$

$$e^{\frac{i\left((p + c\,(v-2\,s))^2 + 2\,b\,(2\,k-m)\,m\,\pi\right)}{4\,b\,(2\,k-m)}} \sqrt{i\,b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{p + c\,(v-2\,s) + 2\,b\,i\,(2\,k-m)\,z}{2\sqrt{i\,b\,(2\,k-m)}} \right) -$$

$$e^{-\frac{i\left((p - c\,(v-2\,s))^2 - 2\,b\,m\,(m-2\,k)\,\pi\right)}{4\,b\,(m-2\,k)}} \sqrt{-i\,b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{p - c\,(v-2\,s) - 2\,i\,b\,(m-2\,k)\,z}{2\sqrt{-i\,b\,(m-2\,k)}} \right) + e^{\frac{i\left((p + c\,(v-2\,s))^2 - 2\,b\,m\,(m-2\,k)\,\pi\right)}{4\,b\,(m-2\,k)}}$$

$$\left.\left.\left. \sqrt{i\,b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{p + c\,(v-2\,s) + 2\,b\,i\,(m-2\,k)\,z}{2\sqrt{i\,b\,(m-2\,k)}} \right) \right) \right) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3775.01

$$\int e^{p z} \sin^m\left(b \sqrt{z}\right) \cosh^v(c z)\, dz ==$$

$$\frac{2^{-m-v}\, e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{p} + 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\frac{e^{(p-c\,(v-2\,s))\,z}}{p - c\,(v-2\,s)} + \frac{e^{(p+c\,(v-2\,s))\,z}}{p + c\,(v-2\,s)} \right) \binom{v}{s} +$$

$$2^{-m-v-1}\, e^{\frac{i\,m\,\pi}{2}} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(- \frac{i\,b\, e^{\frac{b^2\,(m-2\,k)^2}{4\,p} - i\,m\,\pi}\, (m - 2\,k)\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\,i\,(m-2\,k) + 2\,p\,\sqrt{z}}{2\,\sqrt{p}} \right)}{p^{3/2}} + \right.$$

$$\left. \frac{2\, e^{p\,z - i\,b\,(m-2\,k)\,\sqrt{z}}}{p} + \frac{2\, e^{-i\,\pi\,m + p\,z + b\,i\,(m-2\,k)\,\sqrt{z}}}{p} - \frac{i\,b\, e^{\frac{b^2\,(m-2\,k)^2}{4\,p}}\, (m - 2\,k)\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{i\,b\,(m-2\,k) - 2\,p\,\sqrt{z}}{2\,\sqrt{p}} \right)}{p^{3/2}} \right) +$$

$$2^{-m-v-1}\, i^{-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left((-1)^m \left(\frac{2\, e^{-i\,\pi\,m + (p + c\,(v-2\,s))\,z + b\,i\,(m-2\,k)\,\sqrt{z}}}{p + c\,(v-2\,s)} - \right. \right.$$

$$\frac{i\,b\, e^{\frac{b^2\,(m-2\,k)^2}{4\,(p+c\,(v-2\,s))} - i\,m\,\pi}\, (m - 2\,k)\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\,i\,(m-2\,k) + 2\,(p + c\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{p + c\,(v-2\,s)}} \right)}{(p + c\,(v-2\,s))^{3/2}} + \frac{2\, e^{(p - c\,(v-2\,s))\,z - i\,b\,(m-2\,k)\,\sqrt{z}}}{p - c\,(v-2\,s)} -$$

$$\left. \frac{i\,b\, e^{\frac{b^2\,(m-2\,k)^2}{4\,(p-c\,(v-2\,s))}}\, (m - 2\,k)\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\,i\,(m-2\,k) + 2\,(c\,(v-2\,s) - p)\,\sqrt{z}}{2\,\sqrt{p - c\,(v-2\,s)}} \right)}{(p - c\,(v-2\,s))^{3/2}} \right) + \frac{2\, e^{b\,i\,\sqrt{z}\ (2\,k-m) + (p + c\,(v-2\,s))\,z + i\,m\,\pi}}{p + c\,(v-2\,s)} -$$

$$\frac{i\,b\, e^{\frac{b^2\,(2\,k-m)^2}{4\,(p+c\,(v-2\,s))} + i\,m\,\pi}\, (2\,k - m)\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\,i\,(2\,k-m) + 2\,(p + c\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{p + c\,(v-2\,s)}} \right)}{(p + c\,(v-2\,s))^{3/2}} + \frac{2\, e^{(p - c\,(v-2\,s))\,z - i\,b\,(2\,k-m)\,\sqrt{z}}}{p - c\,(v-2\,s)} -$$

$$\left. \frac{i\,b\, e^{\frac{b^2\,(2\,k-m)^2}{4\,(p-c\,(v-2\,s))}}\, (2\,k - m)\, \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b\,i\,(2\,k-m) + 2\,(c\,(v-2\,s) - p)\,\sqrt{z}}{2\,\sqrt{p - c\,(v-2\,s)}} \right)}{(p - c\,(v-2\,s))^{3/2}} \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

Involving $e^{p\,z} \sin^m(b\,z) \cosh^v\left(c\,z^r\right)$

01.20.21.3776.01

$$\int e^{p z} \sin^m(b z) \cosh^v\left(c z^2\right) dz ==$$

$$2^{-m-v+1} e^{p z} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{(-1)^k \binom{m}{k} \left(p \cos\left(\frac{m \pi}{2} - b (m-2k) z\right) - b (m-2k) \sin\left(\frac{m \pi}{2} - b (m-2k) z\right)\right)}{(p - i b (m-2k)) (b i (m-2k) + p)} \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} -$$

$$\frac{1}{c} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v-2s} \left(\binom{v}{s} \left(e^{\frac{p^2}{4c(v-2s)}} \sqrt{-c(v-2s)} \operatorname{erfi}\left(\frac{p - 2c(v-2s) z}{2\sqrt{-c(v-2s)}} \right) - \right. \right. \right.$$

$$\left. \left. \left. e^{-\frac{p^2}{4c(v-2s)}} \sqrt{c(v-2s)} \operatorname{erfi}\left(\frac{p + 2c(v-2s) z}{2\sqrt{c(v-2s)}} \right) \right) \right) \right) - \frac{1}{c} \left(2^{-m-v-1} \sqrt{\pi} \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v-2s} \left(\binom{v}{s} \left(e^{\frac{(p - i b (2k-m))^2 - 2 i c m \pi (v-2s)}{4c(v-2s)}} \sqrt{-c(v-2s)} \operatorname{erfi}\left(\frac{-i b (2k-m) + p - 2c(v-2s) z}{2\sqrt{-c(v-2s)}} \right) + \right. \right.$$

$$e^{\frac{(p - i b (m-2k))^2 + 2 i c m \pi (v-2s)}{4c(v-2s)}} \sqrt{-c(v-2s)} \operatorname{erfi}\left(\frac{-i b (m-2k) + p - 2c(v-2s) z}{2\sqrt{-c(v-2s)}} \right) -$$

$$e^{-\frac{(b i (2k-m) + p)^2 - 2 i c m \pi (v-2s)}{4c(v-2s)}} \sqrt{c(v-2s)} \operatorname{erfi}\left(\frac{b i (2k-m) + p + 2c(v-2s) z}{2\sqrt{c(v-2s)}} \right) - e^{-\frac{(b i (m-2k) + p)^2 + 2 i c m \pi (v-2s)}{4c(v-2s)}}$$

$$\left. \left. \left. \sqrt{c(v-2s)} \operatorname{erfi}\left(\frac{b i (m-2k) + p + 2c(v-2s) z}{2\sqrt{c(v-2s)}} \right) \right) \right) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3777.01

$$\int e^{p z} \sin^m(b z) \cosh^v\left(c \sqrt{z}\right) dz == 2^{-m-v} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{\frac{i m \pi}{2}} \left(\frac{e^{(b i (m-2k)+p) z - i m \pi}}{b i (m-2k) + p} + \frac{e^{(p - i b (m-2k)) z}}{p - i b (m-2k)} \right) \binom{m}{k} \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} + 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{4 e^{p z} \cosh\left(c (v-2s) \sqrt{z}\right)}{p} + \frac{c e^{-\frac{c^2 (v-2s)^2}{4p}} \sqrt{\pi} (2s - v) \left(\operatorname{erfi}\left(\frac{2p \sqrt{z} - c (2s - v)}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{2p \sqrt{z} - c (v-2s)}{2 \sqrt{p}} \right) \right)}{p^{3/2}} \right) +$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{1}{2} i m \pi} \left(\frac{c e^{-\frac{(c v - 2 c s)^2}{4 (-2 b i k + i b m + p)}} \sqrt{\pi} (2s - v) \operatorname{erfi}\left(\frac{2 (-2 b i k + i b m + p) \sqrt{z} - c (2s - v)}{2 \sqrt{-2 b i k + i b m + p}} \right)}{(-2 b i k + i b m + p)^{3/2}} + \right. \right.$$

$$\left. \left(c e^{i m \pi - \frac{(2 c s - c v)^2}{4 (2 i b k - i b m + p)}} \sqrt{\pi} (v - 2s) \operatorname{erfi}\left(\frac{2 (2 i b k - i b m + p) \sqrt{z} - c (v - 2s)}{2 \sqrt{2 i b k - i b m + p}} \right) \right) \Big/ (2 i b k - i b m + p)^{3/2} + \right.$$

$$\left. \frac{2 e^{\sqrt{z} (c v - 2 c s) + (-2 b i k + i b m + p) z}}{-2 b i k + i b m + p} + \frac{2 e^{i \pi m + (2 i b k - i b m + p) z + (2 c s - c v) \sqrt{z}}}{2 i b k - i b m + p} \right) +$$

$$e^{\frac{i m \pi}{2}} \left(\left(c e^{-\frac{c^2 (v-2s)^2}{4 (-2 b i k + i b m + p)} - i m \pi} \sqrt{\pi} (v - 2s) \operatorname{erfi}\left(\frac{2 (-2 b i k + i b m + p) \sqrt{z} - c (v - 2s)}{2 \sqrt{-2 b i k + i b m + p}} \right) \right) \Big/ \right.$$

$$(-2 b i k + i b m + p)^{3/2} + \frac{c e^{-\frac{(c v - 2 c s)^2}{4 (2 i b k - i b m + p)}} \sqrt{\pi} (2s - v) \operatorname{erfi}\left(\frac{2 (2 i b k - i b m + p) \sqrt{z} - c (2s - v)}{2 \sqrt{2 i b k - i b m + p}} \right)}{(2 i b k - i b m + p)^{3/2}} +$$

$$\left. \left. \frac{2 e^{-i \pi m + (-2 b i k + i b m + p) z + (2 c s - c v) \sqrt{z}}}{-2 b i k + i b m + p} + \frac{2 e^{\sqrt{z} (c v - 2 c s) + (2 i b k - i b m + p) z}}{2 i b k - i b m + p} \right) \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $e^{p z^r} \sin^m(b z) \cosh^v\left(c z^r\right)$

01.20.21.3778.01

$$\int e^{p z^2} \sin^m(b z) \cosh^v\left(c z^2\right) dz ==$$

$$\frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} + 2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\binom{v}{s} \left((p + c\,(v - 2\,s)) \sqrt{p - c\,(v - 2\,s)}\ \operatorname{erfi}\left(\frac{2\,p\,z - 2\,c\,(v - 2\,s)\,z}{2\sqrt{p - c\,(v - 2\,s)}} \right) + \sqrt{p + c\,(v - 2\,s)}\ (p - c\,(v - 2\,s)) \operatorname{erfi}\left(\sqrt{p + c\,(v - 2\,s)}\ z \right) \right) \right) \Big/ ((p - c\,(v - 2\,s))\,(p + c\,(v - 2\,s))) + \frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \right.$$

$$\left. \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{-b^2 (m-2k)^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{2\,p\,z - i\,b\,(m - 2\,k)}{2\sqrt{p}} \right) + e^{-\frac{2\pi i m p - b^2 (m-2k)^2}{4p}} \operatorname{erfi}\left(\frac{b\,i\,(m - 2\,k) + 2\,p\,z}{2\sqrt{p}} \right) \right) \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{-b^2 (2k-m)^2 - 2 i m \pi (p + c (v-2s))}{4 (p + c (v-2s))}} \sqrt{p + c\,(v - 2\,s)}\ (p - c\,(v - 2\,s)) \right.\right.$$

$$\operatorname{erfi}\left(\frac{b\,i\,(2\,k - m) + 2\,(p + c\,(v - 2\,s))\,z}{2\sqrt{p + c\,(v - 2\,s)}} \right) + e^{-\frac{2 i m \pi (p - c (v-2s)) - b^2 (2k-m)^2}{4 (p - c (v-2s))}} (p + c\,(v - 2\,s)) \sqrt{p - c\,(v - 2\,s)}$$

$$\left. \operatorname{erfi}\left(\frac{-i\,b\,(2\,k - m) + 2\,p\,z - 2\,c\,(v - 2\,s)\,z}{2\sqrt{p - c\,(v - 2\,s)}} \right) \right) \Big/ ((p - c\,(v - 2\,s))\,(p + c\,(v - 2\,s))) +$$

$$\left(e^{-\frac{2 i m \pi (p + c (v-2s)) - b^2 (m-2k)^2}{4 (p + c (v-2s))}} \sqrt{p + c\,(v - 2\,s)}\ (p - c\,(v - 2\,s)) \operatorname{erfi}\left(\frac{b\,i\,(m - 2\,k) + 2\,(p + c\,(v - 2\,s))\,z}{2\sqrt{p + c\,(v - 2\,s)}} \right) + \right.$$

$$\left. e^{-\frac{-b^2 (m-2k)^2 - 2 i m \pi (p - c (v-2s))}{4 (p - c (v-2s))}} (p + c\,(v - 2\,s)) \sqrt{p - c\,(v - 2\,s)}\ \operatorname{erfi}\left(\frac{-i\,b\,(m - 2\,k) + 2\,p\,z - 2\,c\,(v - 2\,s)\,z}{2\sqrt{p - c\,(v - 2\,s)}} \right) \right) \Big/$$

$$\left. ((p - c\,(v - 2\,s))\,(p + c\,(v - 2\,s))) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3779.01

$$\int e^{p \sqrt{z}} \sin^m(b z) \cosh^v\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-v} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i m \pi}{2}} \left(\frac{i\,e^{p \sqrt{z}}\, - i\,b\,(m-2\,k)\,z}{b\,(m - 2\,k)} - \frac{e^{-\frac{i\,p^2}{4\,b\,(m-2\,k)}}\, p \sqrt{\pi}\ \operatorname{erfi}\left(\frac{p - 2\,i\,b\,(m-2\,k)\sqrt{z}}{2\sqrt{-i\,b\,(m-2\,k)}} \right)}{2\,(-i\,b\,(m - 2\,k))^{3/2}} \right) + \right.\right.$$

$$\left.\left. e^{-\frac{1}{2} i m \pi} \left(-\frac{i\,e^{\sqrt{z}}\, p + b\,i\,(m-2\,k)\,z}{b\,(m - 2\,k)} - \frac{e^{\frac{i\,p^2}{4\,b\,(m-2\,k)}}\, p \sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\,b\,i\sqrt{z}\ (m-2\,k) + p}{2\sqrt{i\,b\,(m-2\,k)}} \right)}{2\,(i\,b\,(m - 2\,k))^{3/2}} \right) \right) \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v+1}\, e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{p^2}+2^{-m-v+2}\, e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\left(p^2-c^2(v-2s)^2\right)^2}\left(\binom{v}{s}\left(\left(\sqrt{z}\,p^3-p^2-c^2(v-2s)^2\sqrt{z}\,p-c^2(v-2s)^2\right)\cosh\left(c(2s-v)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.c(2s-v)\left(\sqrt{z}\,p^2-2p-c^2(v-2s)^2\sqrt{z}\right)\sinh\left(c(2s-v)\sqrt{z}\right)\right)\right)+2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{i m\pi}{2}}\left(\frac{i\, e^{(p+c(v-2s))\sqrt{z}-i b(m-2k)z}}{b(m-2k)}-\frac{e^{-\frac{i(p+c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p+c(v-2s))\operatorname{erfi}\left(\frac{-2ib\sqrt{z}\,(m-2k)+p+c(v-2s)}{2\sqrt{-ib(m-2k)}}\right)}{2(-ib(m-2k))^{3/2}}\right)+\right.$$

$$e^{\frac{i m\pi}{2}}\left(\frac{i\, e^{(p-c(v-2s))\sqrt{z}-ib(m-2k)z}}{b(m-2k)}-\frac{e^{-\frac{i(p-c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p-c(v-2s))\operatorname{erfi}\left(\frac{-2ib\sqrt{z}\,(m-2k)+p-c(v-2s)}{2\sqrt{-ib(m-2k)}}\right)}{2(-ib(m-2k))^{3/2}}\right)+$$

$$e^{-\frac{1}{2}im\pi}\left(-\frac{i\, e^{\sqrt{z}\,(p+c(v-2s))+bi(m-2k)z}}{b(m-2k)}-\frac{e^{\frac{i(p+c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p+c(v-2s))\operatorname{erfi}\left(\frac{2bi\sqrt{z}\,(m-2k)+p+c(v-2s)}{2\sqrt{ib(m-2k)}}\right)}{2(ib(m-2k))^{3/2}}\right)+$$

$$e^{-\frac{1}{2}im\pi}\left(-\frac{i\, e^{\sqrt{z}\,(p-c(v-2s))+bi(m-2k)z}}{b(m-2k)}-\right.$$

$$\left.\left.\frac{e^{\frac{i(p-c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p-c(v-2s))\operatorname{erfi}\left(\frac{2bi\sqrt{z}\,(m-2k)+p-c(v-2s)}{2\sqrt{ib(m-2k)}}\right)}{2(ib(m-2k))^{3/2}}\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p\,z}\sin^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3780.01

$$\int e^{p z} \sin^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz ==$$

$$\frac{2^{-m-v}\, e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{p} + \frac{1}{b}\left(i\, 2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m - 2k} \right.$$

$$\left((-1)^k \binom{m}{k} \left(e^{-\frac{i\left(p^2 - 2 b m (m-2k) \pi\right)}{4 b (m-2k)}} \sqrt{-i b (m-2k)}\ \operatorname{erfi}\left(\frac{p - 2 i b (m-2k) z}{2 \sqrt{-i b (m-2k)}} \right) - e^{\frac{i\left(p^2 - 2 b m (m-2k) \pi\right)}{4 b (m-2k)}} \sqrt{i b (m-2k)} \right. \right.$$

$$\left. \left. \operatorname{erfi}\left(\frac{p + 2 b i (m-2k) z}{2 \sqrt{i b (m-2k)}} \right) \right) \right) - \frac{1}{c} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \right.$$

$$\left. \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v - 2s} \left(\binom{v}{s} \left(e^{\frac{p^2}{4 c (v-2s)}} \sqrt{-c (v-2s)}\ \operatorname{erfi}\left(\frac{p - 2 c (v-2s) z}{2 \sqrt{-c (v-2s)}} \right) - e^{-\frac{p^2}{4 c (v-2s)}} \sqrt{c (v-2s)}\ \operatorname{erfi}\left(\frac{p + 2 c (v-2s) z}{2 \sqrt{c (v-2s)}} \right) \right) \right) \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{p^2 - 2 i m \pi (b i (2k-m) + c (v-2s))}{4 (b i (2k-m) + c (v-2s))}} \sqrt{b i (2k-m) + c (v-2s)}\ (-i b (2k-m) - c (v-2s)) \right. \right.$$

$$\operatorname{erfi}\left(\frac{p + 2 (b i (2k-m) + c (v-2s)) z}{2 \sqrt{b i (2k-m) + c (v-2s)}} \right) + e^{-\frac{p^2 + 2 i m \pi (-i b (2k-m) - c (v-2s))}{4 (-i b (2k-m) - c (v-2s))}} (b i (2k-m) + c (v-2s))$$

$$\left. \sqrt{-i b (2k-m) - c (v-2s)}\ \operatorname{erfi}\left(\frac{p - 2 (b i (2k-m) + c (v-2s)) z}{2 \sqrt{-i b (2k-m) - c (v-2s)}} \right) \right) \Big/ ((-i b (2k-m) - c (v-2s))$$

$$(b i (2k-m) + c (v-2s))) + \left(e^{-\frac{p^2 + 2 i m \pi (b i (m-2k) + c (v-2s))}{4 (b i (m-2k) + c (v-2s))}} \sqrt{b i (m-2k) + c (v-2s)} \right.$$

$$(-i b (m-2k) - c (v-2s)) \operatorname{erfi}\left(\frac{p + 2 (b i (m-2k) + c (v-2s)) z}{2 \sqrt{b i (m-2k) + c (v-2s)}} \right) + e^{-\frac{p^2 - 2 i m \pi (-i b (m-2k) - c (v-2s))}{4 (-i b (m-2k) - c (v-2s))}}$$

$$\left. (b i (m-2k) + c (v-2s)) \sqrt{-i b (m-2k) - c (v-2s)}\ \operatorname{erfi}\left(\frac{p - 2 (b i (m-2k) + c (v-2s)) z}{2 \sqrt{-i b (m-2k) - c (v-2s)}} \right) \right) \Big/$$

$$\left. ((-i b (m-2k) - c (v-2s)) (b i (m-2k) + c (v-2s))) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3781.01

$$\int e^{p z} \sin^m\left(b \sqrt{z}\right) \cosh^v\left(c \sqrt{z}\right) dz ==$$

$$\frac{2^{-m-v}\, e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{p} + 2^{-m-v-1}\, i^m \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$\left(\sqrt{\pi}\left(-\frac{e^{-\frac{(2ibk-ibm)^2}{4p}}(2ibk-ibm)\operatorname{erfi}\left(\frac{bi(2k-m)+2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}-\frac{ibe^{\frac{b^2(m-2k)^2}{4p}-im\pi}(m-2k)\operatorname{erfi}\left(\frac{bi(m-2k)+2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right)+\right.$$

$$\left.\frac{4e^{pz-\frac{im\pi}{2}}\cos\left(b\sqrt{z}\ (2k-m)+\frac{m\pi}{2}\right)}{p}\right)+2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\sqrt{\pi}\left(\frac{ce^{-\frac{c^2(v-2s)^2}{4p}}(v-2s)\operatorname{erfi}\left(\frac{2p\sqrt{z}-c(v-2s)}{2\sqrt{p}}\right)}{p^{3/2}}-\frac{e^{-\frac{(cv-2cs)^2}{4p}}(cv-2cs)\operatorname{erfi}\left(\frac{2p\sqrt{z}-c(2s-v)}{2\sqrt{p}}\right)}{p^{3/2}}\right)+\right.$$

$$\left.\frac{4e^{pz}\cosh\left(c(v-2s)\sqrt{z}\right)}{p}\right)+2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{1}{2}im\pi}\left(\frac{4e^{\frac{i\pi m}{2}+pz}\cos\left(\frac{\pi m}{2}+(2bk-bm-2ics+icv)\sqrt{z}\right)}{p}-\frac{1}{p^{3/2}}\left(e^{-\frac{(-2bik+ibm-2cs+cv)^2}{4p}}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{\pi}\ (-2bik+ibm-2cs+cv)\operatorname{erfi}\left(\frac{bi(m-2k)-c(2s-v)+2p\sqrt{z}}{2\sqrt{p}}\right)\right)-\frac{1}{p^{3/2}}\right.\right.\right.$$

$$\left.\left.\left.\left(e^{im\pi-\frac{(2ibk-ibm+2cs-cv)^2}{4p}}\sqrt{\pi}\ (2ibk-ibm+2cs-cv)\operatorname{erfi}\left(\frac{bi(2k-m)-c(v-2s)+2p\sqrt{z}}{2\sqrt{p}}\right)\right)\right)+\right.$$

$$\left.e^{\frac{im\pi}{2}}\left(\frac{4e^{pz-\frac{im\pi}{2}}\cos\left(\frac{\pi m}{2}+(2bk-bm+2ics-icv)\sqrt{z}\right)}{p}-\frac{1}{p^{3/2}}\left(e^{-\frac{(2ibk-ibm-2cs+cv)^2}{4p}}\sqrt{\pi}\ (2ibk-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.ibm-2cs+cv)\operatorname{erfi}\left(\frac{bi(2k-m)-c(2s-v)+2p\sqrt{z}}{2\sqrt{p}}\right)\right)-\frac{1}{p^{3/2}}\left(e^{-\frac{(ib(m-2k)-c(v-2s))^2}{4p}-im\pi}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{\pi}\ (ib(m-2k)-c(v-2s))\operatorname{erfi}\left(\frac{bi(m-2k)-c(v-2s)+2p\sqrt{z}}{2\sqrt{p}}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p z^r}\sin^m\left(b z^r\right)\cosh^v\left(c z^r\right)$

01.20.21.3782.01

$$\int e^{p\,z^r}\sin^m(b\,z^r)\cosh^v(c\,z^r)\,dz ==$$

$$\frac{2^{-m-v}\,z}{r}\left(-(-p\,z^r)^{-1/r}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{r},\,-p\,z^r\right)(m \bmod 2-1)\,(v \bmod 2-1)+i^{-m}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-p)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-p)\,z^r)^{-1/r}+((2\,i\,b\,k-i\,b\,m-p)\,z^r)^{-1/r}\right.$$

$$\left.\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-p)\,z^r\right)\right)+\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,(-p-2\,c\,s+c\,v)\,z^r\right)((-p-2\,c\,s+c\,v)\,z^r)^{-1/r}+((-p-c\,(v-2\,s))\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-p-c\,(v-2\,s))\,z^r\right)\right)-$$

$$i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-p-2\,c\,s+c\,v)\,z^r\right)((2\,i\,b\,k-i\,b\,m-p-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$(-1)^m\left(\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-p-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-p-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$\left.((-2\,b\,i\,k+i\,b\,m-p+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-p+2\,c\,s-c\,v)\,z^r\right)\right)+$$

$$\left.\left.((2\,i\,b\,k-i\,b\,m-p+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-p+2\,c\,s-c\,v)\,z^r\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3783.01

$$\int e^{p z^2} \sin^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz ==$$

$$2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\frac{e^{\frac{i m \pi}{2}} \operatorname{erfi}\left(\sqrt{p - i b (m-2k)}\, z\right)}{\sqrt{p - i b (m-2k)}} + \frac{e^{-\frac{1}{2} i m \pi} \operatorname{erfi}\left(\sqrt{b i (m-2k) + p}\, z\right)}{\sqrt{b i (m-2k) + p}} \right) \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} +$$

$$2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{\operatorname{erfi}\left(\sqrt{p + c (v-2s)}\, z\right)}{\sqrt{p + c (v-2s)}} + \frac{\operatorname{erfi}\left(\sqrt{p - c (v-2s)}\, z\right)}{\sqrt{p - c (v-2s)}} \right) + 2^{-m-v-1} \sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(\frac{\operatorname{erfi}\left(\sqrt{-2 b i k + i b m + p - 2 c s + c v}\, z\right)}{\sqrt{-2 b i k + i b m + p - 2 c s + c v}} + \frac{\operatorname{erfi}\left(\sqrt{2 i b k - i b m + p - 2 c s + c v}\, z\right)}{\sqrt{2 i b k - i b m + p - 2 c s + c v}} + \right.\right.$$

$$\left. \frac{\operatorname{erfi}\left(\sqrt{-2 b i k + i b m + p + 2 c s - c v}\, z\right)}{\sqrt{-2 b i k + i b m + p + 2 c s - c v}} + \frac{\operatorname{erfi}\left(\sqrt{2 i b k - i b m + p + 2 c s - c v}\, z\right)}{\sqrt{2 i b k - i b m + p + 2 c s - c v}} \right) \cos\left(\frac{m \pi}{2}\right) +$$

$$i \left(- \frac{\operatorname{erfi}\left(\sqrt{-2 b i k + i b m + p - 2 c s + c v}\, z\right)}{\sqrt{-2 b i k + i b m + p - 2 c s + c v}} + \frac{\operatorname{erfi}\left(\sqrt{2 i b k - i b m + p - 2 c s + c v}\, z\right)}{\sqrt{2 i b k - i b m + p - 2 c s + c v}} + \right.$$

$$\frac{\operatorname{erfi}\left(\sqrt{2 i b k - i b m + p + 2 c s - c v}\, z\right)}{\sqrt{2 i b k - i b m + p + 2 c s - c v}} -$$

$$\left. \left. \frac{\operatorname{erfi}\left(\sqrt{-2 b i k + i b m + p + 2 c s - c v}\, z\right)}{\sqrt{-2 b i k + i b m + p + 2 c s - c v}} \right) \sin\left(\frac{m \pi}{2}\right) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3784.01

$$\int e^{p\sqrt{z}}\sin^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz = 2^{-m-v+2}\,e^{p\sqrt{z}}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\left(b^2(m-2k)^2+p^2\right)^2}\left((-1)^k\binom{m}{k}\left(\left(b^2\left(\sqrt{z}\;p+1\right)(m-2k)^2+p^2\left(p\sqrt{z}-1\right)\right)\cos\left(\frac{m\pi}{2}-b(m-2k)\sqrt{z}\right)-\right.\right.\right.$$

$$\left.\left.\left.b(m-2k)\left(b^2\sqrt{z}\,(m-2k)^2-2p+p^2\sqrt{z}\right)\sin\left(\frac{m\pi}{2}-b(m-2k)\sqrt{z}\right)\right)\right)\right)(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{p^2}+2^{-m-v+2}\,e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\left(p^2-c^2(v-2s)^2\right)^2}\left(\binom{v}{s}\left(\left(p^2\left(p\sqrt{z}-1\right)-c^2(v-2s)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left(c(v-2s)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.c(v-2s)\left(\sqrt{z}\;p^2-2p-c^2(v-2s)^2\sqrt{z}\right)\sinh\left(c(v-2s)\sqrt{z}\right)\right)\right)+2^{-m-v+2}\,e^{p\sqrt{z}}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(\left(p^2\left(p\sqrt{z}-1\right)-(2ibk-ibm-2cs+cv)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left((2ibk-ibm-2cs+cv)\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{z}\right)-(2ibk-ibm-2cs+cv)\left(\sqrt{z}\;p^2-2p-(2ibk-ibm-2cs+cv)^2\sqrt{z}\right)\right.\right.\right.$$

$$\left.\left.\sinh\left((2ibk-ibm-2cs+cv)\sqrt{z}\right)\right)\Big/\left(p^2-(2ibk-ibm-2cs+cv)^2\right)^2+$$

$$\left(\left(p^2\left(p\sqrt{z}-1\right)-(2ibk-ibm+2cs-cv)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left((2ibk-ibm+2cs-cv)\sqrt{z}\right)-\right.$$

$$(2ibk-ibm+2cs-cv)\left(\sqrt{z}\;p^2-2p-(2ibk-ibm+2cs-cv)^2\sqrt{z}\right)$$

$$\left.\sinh\left((2ibk-ibm+2cs-cv)\sqrt{z}\right)\right)\Big/\left(p^2-(2ibk-ibm+2cs-cv)^2\right)^2\Big)\cos\left(\frac{m\pi}{2}\right)+$$

$$\left(\left(i\left(p^2\left(p\sqrt{z}-1\right)-(2ibk-ibm-2cs+cv)^2\left(\sqrt{z}\;p+1\right)\right)\sinh\left((2ibk-ibm-2cs+cv)\sqrt{z}\right)-\right.\right.$$

$$i(2ibk-ibm-2cs+cv)\left(\sqrt{z}\;p^2-2p-(2ibk-ibm-2cs+cv)^2\sqrt{z}\right)$$

$$\left.\cosh\left((2ibk-ibm-2cs+cv)\sqrt{z}\right)\right)\Big/\left(p^2-(2ibk-ibm-2cs+cv)^2\right)^2+$$

$$\left(i\left(p^2\left(p\sqrt{z}-1\right)-(2ibk-ibm+2cs-cv)^2\left(\sqrt{z}\;p+1\right)\right)\sinh\left((2ibk-ibm+2cs-cv)\sqrt{z}\right)-\right.$$

$$i(2ibk-ibm+2cs-cv)\left(\sqrt{z}\;p^2-2p-(2ibk-ibm+2cs-cv)^2\sqrt{z}\right)$$

$$\left.\cosh\left((2ibk-ibm+2cs-cv)\sqrt{z}\right)\right)\Big/$$

$$\left.\left.\left(p^2-(2ibk-ibm+2cs-cv)^2\right)^2\right)\sin\left(\frac{m\pi}{2}\right)\right)\Big/;\; m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{b z^r+e}\sin^m\left(a z^r+q\right)\cosh^v\left(c z^r+g\right)$

01.20.21.3785.01

$$\int e^{b z^r+e} \sin^m(a z^r+q) \cosh^v(c z^r+g)\, dz ==$$

$$-\frac{2^{-m-v} z}{r}\left(e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{1}{r}, -b z^r\right)(1-m \bmod 2)(1-v \bmod 2)(-b z^r)^{-1/r} + \binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}\left(e^{e+2 i k q-i m q+\frac{i m \pi}{2}} \Gamma\left(\frac{1}{r}, (-b-2 i a k+i a m) z^r\right)((-b-2 i a k+i a m) z^r)^{-1/r} + e^{e-2 i k q+i m q-\frac{i m \pi}{2}}\right.$$

$$\left.((-b+2 i a k-i a m) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2 i a k-i a m) z^r\right)\right) +$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2 g s-g v} \Gamma\left(\frac{1}{r}, (-b-2 c s+c v) z^r\right)((-b-2 c s+c v) z^r)^{-1/r} +\right.$$

$$\left. e^{e-2 g s+g v}((-b+2 c s-c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2 c s-c v) z^r\right)\right) +$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2 i k q-i m q+2 g s-g v+\frac{i m \pi}{2}} \Gamma\left(\frac{1}{r}, (-b-2 i a k+i a m-2 c s+c v) z^r\right)\right.$$

$$((-b-2 i a k+i a m-2 c s+c v) z^r)^{-1/r} + e^{e-2 i k q+i m q+2 g s-g v-\frac{i m \pi}{2}}$$

$$((-b+2 i a k-i a m-2 c s+c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2 i a k-i a m-2 c s+c v) z^r\right) +$$

$$e^{e+2 i k q-i m q-2 g s+g v+\frac{i m \pi}{2}}((-b-2 i a k+i a m+2 c s-c v) z^r)^{-1/r}$$

$$\Gamma\left(\frac{1}{r}, (-b-2 i a k+i a m+2 c s-c v) z^r\right) + e^{e-2 i k q+i m q-2 g s+g v-\frac{i m \pi}{2}}$$

$$\left.\left.((-b+2 i a k-i a m+2 c s-c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2 i a k-i a m+2 c s-c v) z^r\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int e^{b z^2+e} \sin^m\left(a z^2+q\right) \cosh^\nu\left(c z^2+g\right) dz == 2^{-m-\nu-1} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{e+i (m-2 k) q-\frac{i m \pi}{2}} \binom{m}{k} \left(\frac{\operatorname{erfi}\left(\sqrt{b+a i (m-2 k)}\ z\right)}{\sqrt{b+a i (m-2 k)}} + \frac{e^{2\left(\frac{i m \pi}{2}-i (m-2 k) q\right)} \operatorname{erfi}\left(\sqrt{b-i a (m-2 k)}\ z\right)}{\sqrt{b-i a (m-2 k)}}\right)\right)$$

$$(1-\nu \bmod 2)+\frac{2^{-m-\nu-1} e^e \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} \operatorname{erfi}\left(\sqrt{b}\ z\right) (1-m \bmod 2) (1-\nu \bmod 2)}{\sqrt{b}} + 2^{-m-\nu-1} \sqrt{\pi} \binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{e-g (\nu-2 k)} \binom{\nu}{k} \left(\frac{e^{2 g (\nu-2 k)} \operatorname{erfi}\left(\sqrt{b+c (\nu-2 k)}\ z\right)}{\sqrt{b+c (\nu-2 k)}} + \frac{\operatorname{erfi}\left(\sqrt{b-c (\nu-2 k)}\ z\right)}{\sqrt{b-c (\nu-2 k)}}\right) + 2^{-m-\nu-1} \sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{e-i (m-2 k) q-g (\nu-2 s)+\frac{i m \pi}{2}} \left(\frac{e^{2\left(-\frac{1}{2} i \pi m+i (m-2 k) q+g (\nu-2 s)\right)} \operatorname{erfi}\left(\sqrt{b+a i (m-2 k)+c (\nu-2 s)}\ z\right)}{\sqrt{b+a i (m-2 k)+c (\nu-2 s)}} + \frac{\operatorname{erfi}\left(\sqrt{b-i a (m-2 k)-c (\nu-2 s)}\ z\right)}{\sqrt{b-i a (m-2 k)-c (\nu-2 s)}}\right) + e^{e-\frac{i \pi m}{2}+i (m-2 k) q-g (\nu-2 s)} \left(\frac{e^{2\left(\frac{i \pi m}{2}-i (m-2 k) q+g (\nu-2 s)\right)} \operatorname{erfi}\left(\sqrt{b-i a (m-2 k)+c (\nu-2 s)}\ z\right)}{\sqrt{b-i a (m-2 k)+c (\nu-2 s)}} + \frac{\operatorname{erfi}\left(\sqrt{b+a i (m-2 k)-c (\nu-2 s)}\ z\right)}{\sqrt{b+a i (m-2 k)-c (\nu-2 s)}}\right)\right) /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

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$$\int e^{\sqrt{z}\,b+e}\sin^m\left(\sqrt{z}\,a+q\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left(\frac{e^{e+i\,(m-2\,k)\,q+(b+a\,i\,(m-2\,k))\,\sqrt{z}-\frac{i\,m\,\pi}{2}}\left(\sqrt{z}\,b+a\,i\,(m-2\,k)\,\sqrt{z}-1\right)}{(-b-i\,a\,(m-2\,k))^2}+\right.\right.$$

$$\left.\left.\frac{e^{e-i\,(m-2\,k)\,q+(b-i\,a\,(m-2\,k))\,\sqrt{z}+\frac{i\,m\,\pi}{2}}\left(\sqrt{z}\,b-i\,a\,(m-2\,k)\,\sqrt{z}-1\right)}{(b-i\,a\,(m-2\,k))^2}\right)\binom{m}{k}\right)(1-v\bmod 2)+$$

$$\frac{2^{-m-v+1}\,e^{\sqrt{z}\,b+e}\left(b\,\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{b^2}+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\frac{e^{e+g\,(v-2\,k)+(b+c\,(v-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b+c\,(v-2\,k)\,\sqrt{z}-1\right)}{(b+c\,(v-2\,k))^2}+\frac{e^{e-g\,(v-2\,k)+(b-c\,(v-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b-c\,(v-2\,k)\,\sqrt{z}-1\right)}{(c\,(v-2\,k)-b)^2}\right)$$

$$\binom{v}{k}+2^{-m-v+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\left(e^{e-i\,(m-2\,k)\,q+g\,(v-2\,s)+(b-i\,a\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}+\frac{i\,m\,\pi}{2}}\left(\sqrt{z}\,b+(c\,(v-2\,s)-i\,a\,(m-2\,k))\,\sqrt{z}-1\right)\right)\Big/\right.$$

$$(b-i\,a\,(m-2\,k)+c\,(v-2\,s))^2+\left(e^{e-\frac{i\,\pi\,m}{2}+i\,(m-2\,k)\,q+g\,(v-2\,s)+(b+a\,i\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}\right.$$

$$\left.\left.\left(\sqrt{z}\,b+(a\,i\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}-1\right)\right)\Big/(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^2+\right.$$

$$\left(e^{e-\frac{i\,\pi\,m}{2}+i\,(m-2\,k)\,q-g\,(v-2\,s)+(b+a\,i\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}}\left(\sqrt{z}\,b-(c\,(v-2\,s)-i\,a\,(m-2\,k))\,\sqrt{z}-1\right)\right)\Big/$$

$$(-b-i\,a\,(m-2\,k)+c\,(v-2\,s))^2+\left(e^{e-i\,(m-2\,k)\,q-g\,(v-2\,s)+(b-i\,a\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}+\frac{i\,m\,\pi}{2}}\left(\sqrt{z}\,b-\right.\right.$$

$$\left.\left.(a\,i\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}-1\right)\right)\Big/(-b+a\,i\,(m-2\,k)+c\,(v-2\,s))^2\Bigg)\binom{v}{s}/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\sin^m\left(a\,z^r+p\,z+q\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int e^{b\,z^2+d\,z+e}\sin^m\left(a\,z^2+p\,z+q\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\binom{m}{k}\left(e^{-\frac{(d+i\,(m-2\,k)\,p)^2-4\,(b+a\,i\,(m-2\,k))\left(e+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}\right)}{4\,(b+a\,i\,(m-2\,k))}}\sqrt{b+a\,i\,(m-2\,k)}\;(b-i\,a\,(m-2\,k))\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+i\,(m-2\,k)\,p+2\,(b+a\,i\,(m-2\,k))\,z}{2\,\sqrt{b+a\,i\,(m-2\,k)}}\right)+e^{-\frac{(d-i\,(m-2\,k)\,p)^2-4\,(b-i\,a\,(m-2\,k))\left(e-i\,(m-2\,k)\,q+\frac{i\,m\,\pi}{2}\right)}{4\,(b-i\,a\,(m-2\,k))}}\right.\right.\right.$$

$$(b+a\,i\,(m-2\,k))\,\sqrt{b-i\,a\,(m-2\,k)}\;\operatorname{erfi}\left(\frac{d-i\,(m-2\,k)\,p+2\,b\,z-2\,i\,a\,(m-2\,k)\,z}{2\,\sqrt{b-i\,a\,(m-2\,k)}}\right)\Bigg)\Bigg)\Big/$$

$$\left((b-i\,a\,(m-2\,k))\,(b+a\,i\,(m-2\,k))\right)\Bigg)\,(1-v \bmod 2)+\frac{2^{-m-v-1}\,e^{-\frac{d^2-4\,b\,e}{4\,b}}\,\sqrt{\pi}\;(1-m \bmod 2)\,(1-v \bmod 2)}{\sqrt{b}}$$

$$\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\,\sqrt{b}}\right)+2^{-m-v-1}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}\,(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\Bigg(\binom{v}{s}\Bigg(e^{-\frac{(d+f\,(v-2\,s))^2-4\,(b+c\,(v-2\,s))\,(e+g\,(v-2\,s))}{4\,(b+c\,(v-2\,s))}}\,\sqrt{b+c\,(v-2\,s)}\;(b-c\,(v-2\,s))\,\operatorname{erfi}\left(\frac{d+f\,(v-2\,s)+2\,(b+c\,(v-2\,s))\,z}{2\,\sqrt{b+c\,(v-2\,s)}}\right)+$$

$$e^{-\frac{(d-f\,(v-2\,s))^2-4\,(b-c\,(v-2\,s))\,(e-g\,(v-2\,s))}{4\,(b-c\,(v-2\,s))}}\,(b+c\,(v-2\,s))\,\sqrt{b-c\,(v-2\,s)}\;\operatorname{erfi}\left(\frac{d-f\,(v-2\,s)+2\,b\,z-2\,c\,(v-2\,s)\,z}{2\,\sqrt{b-c\,(v-2\,s)}}\right)\Bigg)\Bigg)\Big/$$

$$\left((b-c\,(v-2\,s))\,(b+c\,(v-2\,s))\right)+2^{-m-v-1}\,\sqrt{\pi}\,\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\Bigg(e^{-\frac{(d+i\,(2\,k-m)\,p+f\,(v-2\,s))^2-4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,s))\left(e+i\,(2\,k-m)\,q+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}\right)}{4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,s))}}\,\sqrt{b+a\,i\,(2\,k-m)+c\,(v-2\,s)}$$

$$(b-i\,a\,(2\,k-m)-c\,(v-2\,s))\,\operatorname{erfi}\left(\frac{d+i\,(2\,k-m)\,p+f\,(v-2\,s)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,s))\,z}{2\,\sqrt{b+a\,i\,(2\,k-m)+c\,(v-2\,s)}}\right)+$$

$$e^{-\frac{(d-i\,(2\,k-m)\,p-f\,(v-2\,s))^2-4\,(b-i\,a\,(2\,k-m)-c\,(v-2\,s))\left(e-i\,(2\,k-m)\,q-g\,(v-2\,s)-\frac{i\,m\,\pi}{2}\right)}{4\,(b-i\,a\,(2\,k-m)-c\,(v-2\,s))}}\,(b+a\,i\,(2\,k-m)+c\,(v-2\,s))$$

$$\sqrt{b-i\,a\,(2\,k-m)-c\,(v-2\,s)}\;\operatorname{erfi}\Bigg((d-i\,(2\,k-m)\,p-f\,(v-2\,s)+2\,b\,z-$$

$$2\,(a\,i\,(2\,k-m)+c\,(v-2\,s))\,z\Big)\Big/\left(2\,\sqrt{b-i\,a\,(2\,k-m)-c\,(v-2\,s)}\right)\Bigg)\Bigg)\Big/$$

$$\left((b-i\,a\,(2\,k-m)-c\,(v-2\,s))\,(b+a\,i\,(2\,k-m)+c\,(v-2\,s))\right)+$$

$$\Bigg(e^{-\frac{(d+i\,(m-2\,k)\,p+f\,(v-2\,s))^2-4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))\left(e+i\,(m-2\,k)\,q+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}\right)}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))}}\,\sqrt{b+a\,i\,(m-2\,k)+c\,(v-2\,s)}$$

$$(b-i\,a\,(m-2\,k)-c\,(v-2\,s))\,\operatorname{erfi}\left(\frac{d+i\,(m-2\,k)\,p+f\,(v-2\,s)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))\,z}{2\,\sqrt{b+a\,i\,(m-2\,k)+c\,(v-2\,s)}}\right)+$$

$$e^{-\frac{(d-i\,(m-2\,k)\,p-f\,(v-2\,s))^2-4\,(b-i\,a\,(m-2\,k)-c\,(v-2\,s))\left(e-i\,(m-2\,k)\,q-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}\right)}{4\,(b-i\,a\,(m-2\,k)-c\,(v-2\,s))}}\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))$$

$$\sqrt{b-i\,a\,(m-2\,k)-c\,(v-2\,s)}\;\operatorname{erfi}\Bigg((d-i\,(m-2\,k)\,p-f\,(v-2\,s)+2\,b\,z-$$

$$2\,(a\,i\,(m-2\,k)+c\,(v-2\,s))\,z\Big)\Big/\left(2\,\sqrt{b-i\,a\,(m-2\,k)-c\,(v-2\,s)}\right)\Bigg)\Bigg)\Big/$$

$$\Bigg)$$

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$$\int e^{\sqrt{z}\ b+d\,z+e}\sin^m\left(\sqrt{z}\ a+p\,z+q\right)\cosh^v\left(\sqrt{z}\ c+f\,z+g\right)dz ==$$

$$2^{-m-v-2}\left(\frac{4\,e^{\sqrt{z}\ b+d\,z}}{d}-\frac{2\,b\,e^{-\frac{b^2}{4\,d}}\sqrt{\pi}}{d^{3/2}}\operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\,\sqrt{d}}\right)\right)e^e\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{e-i\,(m-2\,k)\,q+\frac{i\,m\,\pi}{2}}\binom{m}{k}\left(\sqrt{\pi}\left(-\frac{1}{(d+i\,(m-2\,k)\,p)^{3/2}}\left(e^{-\frac{(b+a\,i\,(m-2\,k))^2}{4\,(d+i\,(m-2\,k)\,p)}+2\,i\,(m-2\,k)\,q-i\,m\,\pi}\,(b+a\,i\,(m-2\,k))\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\operatorname{erfi}\left(\frac{b+a\,i\,(m-2\,k)+2\,(d-2\,i\,k\,p+i\,m\,p)\,\sqrt{z}}{2\,\sqrt{d+i\,(m-2\,k)\,p}}\right)\right)-\left(e^{-\frac{(b+2\,i\,a\,k-i\,a\,m)^2}{4\,(d+2\,i\,k\,p-i\,m\,p)}}\,(b+2\,i\,a\,k-i\,a\,m)\operatorname{erfi}\left(\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\frac{b+a\,i\,(2\,k-m)+2\,(d+2\,i\,k\,p-i\,m\,p)\,\sqrt{z}}{2\,\sqrt{d+2\,i\,k\,p-i\,m\,p}}\right)\right)\Big/(d+2\,i\,k\,p-i\,m\,p)^{3/2}\right)+$$
$$\left.\left.\frac{2\,e^{\sqrt{z}\ (b+a\,i\,(m-2\,k))+2\left(i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}\right)+(d+i\,(m-2\,k)\,p)\,z}}{d+i\,(m-2\,k)\,p}+\frac{2\,e^{\sqrt{z}\ (b-i\,a\,(m-2\,k))+(d-i\,(m-2\,k)\,p)\,z}}{d-i\,(m-2\,k)\,p}\right)\right)(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e-g\,(v-2\,s)}\binom{v}{s}\left(\sqrt{\pi}\left(-\frac{e^{-\frac{(b+2\,c\,s-c\,v)^2}{4\,(d+2\,f\,s-f\,v)}}\,(b+2\,c\,s-c\,v)\operatorname{erfi}\left(\frac{b+c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}}{2\,\sqrt{d+2\,f\,s-f\,v}}\right)}{(d+2\,f\,s-f\,v)^{3/2}}-\right.\right.$$
$$\left.\left.\frac{e^{2\,g\,(v-2\,s)-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}}\,(b+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b+c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}}{2\,\sqrt{d+f\,(v-2\,s)}}\right)}{(d+f\,(v-2\,s))^{3/2}}+\right.$$
$$\left.\left.\frac{2\,e^{2\,g\,(v-2\,s)+(d+f\,(v-2\,s))\,z+(b+c\,(v-2\,s))\,\sqrt{z}}}{d+f\,(v-2\,s)}+\frac{2\,e^{\sqrt{z}\ (b-c\,(v-2\,s))+(d-f\,(v-2\,s))\,z}}{d-f\,(v-2\,s)}\right)+2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e-i\,(m-2\,k)\,q-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\left(\left(2\,e^{-i\,\pi\,m+2\,i\,(m-2\,k)\,q+2\,g\,(v-2\,s)+(d-2\,i\,k\,p+i\,m\,p-2\,f\,s+f\,v)\,z+(b-2\,i\,a\,k+i\,a\,m-2\,c\,s+c\,v)\,\sqrt{z}}\right)\Big/(d-\right.\right.$$
$$\left.\left.2\,i\,k\,p+i\,m\,p-2\,f\,s+f\,v)-\left(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d-2\,i\,k\,p+i\,m\,p-2\,f\,s+f\,v)}+2\,i\,(m-2\,k)\,q+2\,g\,(v-2\,s)-i\,m\,\pi}\,\sqrt{\pi}\,(b+a\,i\,(m-2\,k)+\right.\right.\right.$$
$$\left.\left.\left.c\,(v-2\,s))\operatorname{erfi}\left(\left(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d-2\,i\,k\,p+i\,m\,p-2\,f\,s+f\,v)\,\sqrt{z}\right)\Big/\right.\right.\right.$$
$$\left.\left.\left.\left(2\,\sqrt{d-2\,i\,k\,p+i\,m\,p-2\,f\,s+f\,v}\right)\right)\right)\Big/(d-2\,i\,k\,p+i\,m\,p-2\,f\,s+f\,v)^{3/2}+$$

$$\frac{2\,e^{\sqrt{z}\,(b+2\,i\,a\,k-i\,a\,m+2\,c\,s-c\,v)+(d+2\,i\,k\,p-i\,m\,p+2\,f\,s-f\,v)\,z}}{d+2\,i\,k\,p-i\,m\,p+2\,f\,s-f\,v}-\left(e^{-\frac{(b+2\,i\,a\,k-i\,a\,m+2\,c\,s-c\,v)^2}{4\,(d+2\,i\,k\,p-i\,m\,p+2\,f\,s-f\,v)}}\sqrt{\pi}\;(b+2\,i\,a\,k-i\,a\,m+\right.$$
$$\left.2\,c\,s-c\,v)\,\text{erfi}\left(\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+2\,i\,k\,p-i\,m\,p+2\,f\,s-f\,v)\,\sqrt{z}\right)\Big/\right.$$
$$\left.\left(2\,\sqrt{d+2\,i\,k\,p-i\,m\,p+2\,f\,s-f\,v}\right)\right)\Big/(d+2\,i\,k\,p-i\,m\,p+2\,f\,s-f\,v)^{3/2}\Bigg)+$$
$$e^{e-i\,(2\,k-m)\,q-g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\left(\left(2\,e^{-2\,i\,q\,m+i\,\pi\,m+4\,i\,k\,q+2\,g\,(v-2\,s)+(d+2\,i\,k\,p-i\,m\,p-2\,f\,s+f\,v)\,z+(b+2\,i\,a\,k-i\,a\,m-2\,c\,s+c\,v)\,\sqrt{z}}\right)\Big/\right.$$
$$(d+2\,i\,k\,p-i\,m\,p-2\,f\,s+f\,v)-\left(e^{-\frac{(b+2\,i\,a\,k-i\,a\,m-2\,c\,s+c\,v)^2}{4\,(d+2\,i\,k\,p-i\,m\,p-2\,f\,s+f\,v)}+4\,i\,k\,q-2\,i\,m\,q+2\,g\,(v-2\,s)+i\,m\,\pi}\right.$$
$$\sqrt{\pi}\;(b+2\,i\,a\,k-i\,a\,m-2\,c\,s+c\,v)\,\text{erfi}\left(\left(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+\right.\right.$$
$$\left.\left.2\,(d+2\,i\,k\,p-i\,m\,p-2\,f\,s+f\,v)\,\sqrt{z}\right)\Big/\left(2\,\sqrt{d+2\,i\,k\,p-i\,m\,p-2\,f\,s+f\,v}\right)\right)\Big/$$
$$(d+2\,i\,k\,p-i\,m\,p-2\,f\,s+f\,v)^{3/2}+\frac{2\,e^{\sqrt{z}\,(b-2\,i\,a\,k+i\,a\,m+2\,c\,s-c\,v)+(d-2\,i\,k\,p+i\,m\,p+2\,f\,s-f\,v)\,z}}{d-2\,i\,k\,p+i\,m\,p+2\,f\,s-f\,v}-$$
$$\left(e^{-\frac{(b-2\,i\,a\,k+i\,a\,m+2\,c\,s-c\,v)^2}{4\,(d-2\,i\,k\,p+i\,m\,p+2\,f\,s-f\,v)}}\sqrt{\pi}\;(b-2\,i\,a\,k+i\,a\,m+2\,c\,s-c\,v)\,\text{erfi}\left(\left(b+a\,i\,(m-2\,k)+c\,(2\,s-v)+\right.\right.\right.$$
$$\left.\left.\left.2\,(d-2\,i\,k\,p+i\,m\,p+2\,f\,s-f\,v)\,\sqrt{z}\right)\Big/\left(2\,\sqrt{d-2\,i\,k\,p+i\,m\,p+2\,f\,s-f\,v}\right)\right)\Big/(d-\right.$$
$$\left.\left.2\,i\,k\,p+i\,m\,p+2\,f\,s-f\,v)^{3/2}\right)\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving powers of sin and rational functions of exp

Involving $\sin^m(e\,z)\cosh^v(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.3790.01

$$\int\frac{\sin^m(e\,z)\cosh^v(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}\,dz==$$
$$2^{-m-v}\,a^{-n}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\cos\left(\frac{m\,\pi}{2}\right)\left(\frac{1}{2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v}\left(e^{(2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v}{d},\right.\right.\right.\right.$$
$$\left.\left.\left.\left.n;\,\frac{d+2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v}{d};-\frac{b\,e^{d\,z}}{a}\right)-e^{(-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,v)\,z}\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,v}{d},\,n;\,\frac{d-2\,i\,e\,k+i\,e\,m-2\,c\,s+c\,v}{d};-\frac{b\,e^{d\,z}}{a}\right)\right)+\right.$$
$$\left.\frac{1}{2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v}\left(e^{(2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v}{d},\,n;\right.\right.\right.$$

$$\frac{d+2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)-e^{(-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,v)\,z}$$
$${}_2F_1\Bigg(\frac{-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,v}{d},n;\frac{d-2\,i\,e\,k+i\,e\,m+2\,c\,s-c\,v}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)\Bigg)\Bigg)+$$
$$i\sin\Big(\frac{m\,\pi}{2}\Big)\Bigg(\frac{1}{2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v}\Bigg(e^{(-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,v)\,z}\,{}_2F_1\Bigg(\frac{-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,v}{d},$$
$$n;\frac{d-2\,i\,e\,k+i\,e\,m-2\,c\,s+c\,v}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)+e^{(2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v)\,z}$$
$${}_2F_1\Bigg(\frac{2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v}{d},n;\frac{d+2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,v}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)\Bigg)+$$
$$\frac{1}{2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v}\Bigg(e^{(2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v)\,z}\,{}_2F_1\Bigg(\frac{2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v}{d},n;$$
$$\frac{d+2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,v}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)+e^{(-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,v)\,z}$$
$${}_2F_1\Bigg(\frac{-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,v}{d},n;\frac{d-2\,i\,e\,k+i\,e\,m+2\,c\,s-c\,v}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)-$$
$$\frac{2^{-m-v}\,b^{-n}\,e^{-d\,n\,z}\,(1-m\bmod 2)\,(1-v\bmod 2)}{d\,n}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}{}_2F_1\Big(n,n;n+1;-\frac{a\,e^{-d\,z}}{b}\Big)-$$
$$\frac{i\,2^{-m-v}\,a^{-n}}{e}$$
$$\binom{v}{\frac{v}{2}}$$
$$(1-v\bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k}{m-2\,k}\binom{m}{k}\Bigg(e^{i\,e\,(m-2\,k)\,z-\frac{i\,m\,\pi}{2}}\,{}_2F_1\Bigg(\frac{i\,e\,(m-2\,k)}{d},n;\frac{d+e\,i\,(m-2\,k)}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)-$$
$$e^{\frac{i\,m\,\pi}{2}-i\,e\,(m-2\,k)\,z}\,{}_2F_1\Bigg(-\frac{i\,e\,(m-2\,k)}{d},n;\frac{d-i\,e\,(m-2\,k)}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)\Bigg)+$$
$$\frac{2^{-m-v}\,a^{-n}}{c}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\binom{v}{s}\Bigg(e^{c\,(v-2\,s)\,z}\,{}_2F_1\Bigg(\frac{c\,(v-2\,s)}{d},n;\frac{d+c\,(v-2\,s)}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)-$$
$$e^{-c\,(v-2\,s)\,z}\,{}_2F_1\Bigg(-\frac{c\,(v-2\,s)}{d},n;\frac{d-c\,(v-2\,s)}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)\Bigg)\Big/;\,n\in\mathbb{N}^+\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p\,z}\sin^m(e\,z)\cosh^v(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.3791.01

$$\int \frac{e^{p z} \sin^m(e z) \cosh^v(c z)}{\left(a + b\, e^{d z}\right)^n}\, dz == 2^{-m-v} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left((-1)^k \binom{m}{k} \left(e^{(e i (m-2k)+p) z - \frac{i m \pi}{2}} (i e (m-2k) - p)\, {}_2F_1\left(\frac{e i (m-2k) + p}{d}, n; \frac{d + e i (m-2k) + p}{d}; -\frac{b\, e^{d z}}{a}\right) - \right.\right.\right.$$

$$\left.\left.\left. e^{\frac{i \pi m}{2} + (p - i e (m-2k)) z} (e i (m-2k) + p)\, {}_2F_1\left(\frac{p - i e (m-2k)}{d}, n; \frac{d - i e (m-2k) + p}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\right) \Big/$$

$$\left.((i e (m-2k) - p)(e i (m-2k) + p))\right) a^{-n} + 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\binom{v}{s} \left(e^{(p + c (v-2s)) z} (c (v-2s) - p)\, {}_2F_1\left(\frac{p + c (v-2s)}{d}, n; \frac{d + p + c (v-2s)}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(p - c (v-2s)) z} (p + c (v-2s))\right.\right.\right.$$

$$\left.\left.\left. {}_2F_1\left(\frac{p - c (v-2s)}{d}, n; \frac{d + p - c (v-2s)}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\right) \Big/ ((c (v-2s) - p)(p + c (v-2s)))\right) a^{-n} +$$

$$2^{-m-v} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(\left(e^{(2 i e k - i e m + p + 2 c s - c v) z} (2 i e k - i e m - p + 2 c s - c v)\, {}_2F_1\left(\frac{2 i e k - i e m + p + 2 c s - c v}{d}, \right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left. n; \frac{d + 2 i e k - i e m + p + 2 c s - c v}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(-2 e i k + i e m + p - 2 c s + c v) z} (2 i e k - i e m + \right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left. p + 2 c s - c v)\, {}_2F_1\left(\frac{-2 e i k + i e m + p - 2 c s + c v}{d}, n; \frac{d - 2 i e k + i e m + p - 2 c s + c v}{d}; \right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left. -\frac{b\, e^{d z}}{a}\right)\right) \Big/ ((2 i e k - i e m - p + 2 c s - c v)(2 i e k - i e m + p + 2 c s - c v)) + \right.\right.\right.\right.$$

$$\left.\left.\left.\left. \left(e^{(2 i e k - i e m + p - 2 c s + c v) z} (2 i e k - i e m - p - 2 c s + c v)\, {}_2F_1\left(\frac{2 i e k - i e m + p - 2 c s + c v}{d}, \right.\right.\right.\right.$$

$$\left.\left.\left.\left. n; \frac{d + 2 i e k - i e m + p - 2 c s + c v}{d}; -\frac{b\, e^{d z}}{a}\right) - e^{(-2 e i k + i e m + p + 2 c s - c v) z} (2 i e k - i e m + \right.\right.\right.\right.$$

$$\left.\left.\left.\left. p - 2 c s + c v)\, {}_2F_1\left(\frac{-2 e i k + i e m + p + 2 c s - c v}{d}, n; \frac{d - 2 i e k + i e m + p + 2 c s - c v}{d}; \right.\right.\right.\right.$$

$$\left.\left.\left.\left. -\frac{b\, e^{d z}}{a}\right)\right) \Big/ ((2 i e k - i e m - p - 2 c s + c v)(2 i e k - i e m + p - 2 c s + c v))\right) \cos\left(\frac{m \pi}{2}\right) +$$

$$i \left(\left(\left(e^{(-2 e i k + i e m + p - 2 c s + c v) z} (2 i e k - i e m + p + 2 c s - c v)\, {}_2F_1\left(\frac{-2 e i k + i e m + p - 2 c s + c v}{d}, \right.\right.\right.\right.$$

$$\left.\left.\left.\left. n; \frac{d - 2 i e k + i e m + p - 2 c s + c v}{d}; -\frac{b\, e^{d z}}{a}\right) + e^{(2 i e k - i e m + p + 2 c s - c v) z} (2 i e k - i e m - \right.\right.\right.\right.$$

$$p+2cs-cv)\,{}_2F_1\left(\frac{2iek-iem+p+2cs-cv}{d},\,n;\,\frac{d+2iek-iem+p+2cs-cv}{d};\right.$$

$$\left.-\frac{b\,e^{dz}}{a}\right)\Big/\left((2iek-iem-p+2cs-cv)\,(2iek-iem+p+2cs-cv)\right)+$$

$$\left(e^{(2iek-iem+p-2cs+cv)z}\,(2iek-iem-p-2cs+cv)\,{}_2F_1\left(\frac{2iek-iem+p-2cs+cv}{d},\right.\right.$$

$$n;\,\frac{d+2iek-iem+p-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\Big)+e^{(-2eik+iem+p+2cs-cv)z}\,(2iek-iem+$$

$$p-2cs+cv)\,{}_2F_1\left(\frac{-2eik+iem+p+2cs-cv}{d},\,n;\,\frac{d-2iek+iem+p+2cs-cv}{d};\right.$$

$$\left.\left.\left.-\frac{b\,e^{dz}}{a}\right)\Big/\left((2iek-iem-p-2cs+cv)\,(2iek-iem+p-2cs+cv)\right)\right)\sin\left(\frac{m\pi}{2}\right)\right)$$

$$a^{-n}+\frac{2^{-m-v}\,e^{pz}\,a^{-n}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\,{}_2F_1\left(\frac{p}{d},\,n;\,\frac{d+p}{d};\,-\frac{b\,e^{dz}}{a}\right)(1-m \bmod 2)\,(1-v \bmod 2)}{p}\Big/;\,n\in$$

$\mathbb{Z}\wedge$
$n>$
$0\wedge$
$m\in$
$\mathbb{Z}\wedge$
$m>$
$0\wedge$
$v\in$
$\mathbb{Z}\wedge$
$v>$
0

Involving powers of sin and algebraic functions of exp

Involving $\left(a+b\,e^{dz}\right)^{\beta}\sin^{m}(ez)\cosh^{v}(cz)$

01.20.21.3792.01

$$\int\left(a+b\,e^{dz}\right)^{\beta}\sin^{m}(ez)\cosh^{v}(cz)\,dz==-\frac{1}{e}\left((2^{-m-v}\,i)\left(a+b\,e^{dz}\right)^{\beta}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^{k}\binom{m}{k}\left(e^{ie(m-2k)z-\frac{im\pi}{2}}\,{}_2F_1\left(\frac{ie(m-2k)}{d},\,-\beta;\,\frac{d+ei(m-2k)}{d};\,-\frac{b\,e^{dz}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{\frac{im\pi}{2}-ie(m-2k)z}\,{}_2F_1\left(-\frac{ie(m-2k)}{d},\,-\beta;\,\frac{d-ie(m-2k)}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\right)\left(\frac{e^{dz}\,b}{a}+1\right)^{-\beta}\right)+$$

$$\frac{1}{c}\left(2^{-m-\nu}\left(a+b\,e^{d\,z}\right)^{\beta}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{\nu-2\,s}\left(\binom{\nu}{s}\left(e^{c\,(\nu-2\,s)\,z}\,{}_2F_1\left(\frac{c\,(\nu-2\,s)}{d},\,-\beta;\,\frac{d+c\,(\nu-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.e^{-c\,(\nu-2\,s)\,z}\,{}_2F_1\left(-\frac{c\,(\nu-2\,s)}{d},\,-\beta;\,\frac{d-c\,(\nu-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\right)+2^{-m-\nu}\left(a+b\,e^{d\,z}\right)^{\beta}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\left(\left(e^{(2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu}{d},\,-\beta;\,\frac{d+2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu}{d};\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.-\frac{b\,e^{d\,z}}{a}\right)-e^{(-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,\nu}{d},\,-\beta;\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\frac{d-2\,i\,e\,k+i\,e\,m-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/(2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu)+\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\left(e^{(2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d+2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.e^{(-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,\nu}{d},\,-\beta;\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\frac{d-2\,i\,e\,k+i\,e\,m+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/(2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu)\right)\cos\left(\frac{m\,\pi}{2}\right)+\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.i\left(\left(e^{(-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{-2\,e\,i\,k+i\,e\,m-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d-2\,i\,e\,k+i\,e\,m-2\,c\,s+c\,\nu}{d};\right.\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\left.-\frac{b\,e^{d\,z}}{a}\right)+e^{(2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu}{d},\,-\beta;\right.\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\left.\frac{d+2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/(2\,i\,e\,k-i\,e\,m+2\,c\,s-c\,\nu)+\right.\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\left.\left(e^{(2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu)\,z}\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu}{d},\,-\beta;\,\frac{d+2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\left.e^{(-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,\nu)\,z}\,{}_2F_1\left(\frac{-2\,e\,i\,k+i\,e\,m+2\,c\,s-c\,\nu}{d},\,-\beta;\right.\right.\right.\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left.\left.\left.\frac{d-2\,i\,e\,k+i\,e\,m+2\,c\,s-c\,\nu}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/(2\,i\,e\,k-i\,e\,m-2\,c\,s+c\,\nu)\right)\sin\left(\frac{m\,\pi}{2}\right)\right)\right)$$

$$\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}+\frac{1}{d\,\beta}\left(2^{-m-\nu}\left(\frac{e^{-d\,z}\,a}{b}+1\right)^{-\beta}\left(a+b\,e^{d\,z}\right)^{\beta}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\beta,\,-\beta;\,1-\beta;\,-\frac{a\,e^{-d\,z}}{b}\right)\right.$$

$$(1-m \bmod 2)$$

$$\left.(1-\nu \bmod 2)\right)/;\,m\in\mathbb{Z}\wedge m>0\wedge\nu\in\mathbb{Z}\wedge\nu>0$$

Involving $e^{p z}\left(a+b\, e^{d z}\right)^{\beta} \sin^{m}(e z) \cosh^{v}(c z)$

01.20.21.3793.01

$$\int e^{p z}\left(a+b\, e^{d z}\right)^{\beta} \sin^{m}(e z) \cosh^{v}(c z)\, dz == 2^{-m-v}\left(a+b\, e^{d z}\right)^{\beta}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^{k}\binom{m}{k}\left(e^{(e i (m-2k)+p) z-\frac{i m \pi}{2}}(i e (m-2k)-p)\,{}_2F_1\left(\frac{e i (m-2k)+p}{d}, -\beta; \frac{d+e i (m-2k)+p}{d}; -\frac{b e^{d z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left. e^{\frac{i \pi m}{2}+(p-i e (m-2k)) z}(e i (m-2k)+p)\,{}_2F_1\left(\frac{p-i e (m-2k)}{d}, -\beta; \frac{d-i e (m-2k)+p}{d}; -\frac{b e^{d z}}{a}\right)\right)\right)\Big/$$

$$\left.((i e (m-2k)-p)(e i (m-2k)+p))\right)\left(\frac{e^{d z} b}{a}+1\right)^{-\beta}+2^{-m-v}\left(a+b\, e^{d z}\right)^{\beta}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\binom{v}{s}\left(e^{(p+c (v-2s)) z}(c (v-2s)-p)\,{}_2F_1\left(\frac{p+c (v-2s)}{d}, -\beta; \frac{d+p+c (v-2s)}{d}; -\frac{b e^{d z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left. e^{(p-c (v-2s)) z}(p+c (v-2s))\,{}_2F_1\left(\frac{p-c (v-2s)}{d}, -\beta; \frac{d+p-c (v-2s)}{d}; -\frac{b e^{d z}}{a}\right)\right)\right)\Big/$$

$$\left.((c (v-2s)-p)(p+c (v-2s)))\right)\left(\frac{e^{d z} b}{a}+1\right)^{-\beta}+2^{-m-v}\left(a+b\, e^{d z}\right)^{\beta}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(e^{(2 i e k-i e m+p+2 c s-c v) z}(2 i e k-i e m-p+2 c s-c v)\right.\right.\right.\right.$$

$${}_2F_1\left(\frac{2 i e k-i e m+p+2 c s-c v}{d}, -\beta; \frac{d+2 i e k-i e m+p+2 c s-c v}{d}; -\frac{b e^{d z}}{a}\right)-$$

$$e^{(-2 e i k+i e m+p-2 c s+c v) z}(2 i e k-i e m+p+2 c s-c v)\,{}_2F_1\left(\frac{-2 e i k+i e m+p-2 c s+c v}{d},\right.$$

$$\left.\left.-\beta; \frac{d-2 i e k+i e m+p-2 c s+c v}{d}; -\frac{b e^{d z}}{a}\right)\right)\Big/((2 i e k-i e m-p+2 c s-c v)$$

$$(2 i e k-i e m+p+2 c s-c v))+\left(e^{(2 i e k-i e m+p-2 c s+c v) z}(2 i e k-i e m-p-2 c s+c v)\right.$$

$${}_2F_1\left(\frac{2 i e k-i e m+p-2 c s+c v}{d}, -\beta; \frac{d+2 i e k-i e m+p-2 c s+c v}{d}; -\frac{b e^{d z}}{a}\right)-$$

$$e^{(-2 e i k+i e m+p+2 c s-c v) z}(2 i e k-i e m+p-2 c s+c v)$$

$$\left.{}_2F_1\left(\frac{-2 e i k+i e m+p+2 c s-c v}{d}, -\beta; \frac{d-2 i e k+i e m+p+2 c s-c v}{d}; -\frac{b e^{d z}}{a}\right)\right)\Big/$$

$$((2\,i\,e\,k-i\,e\,m-p-2\,c\,s+c\,v)\,(2\,i\,e\,k-i\,e\,m+p-2\,c\,s+c\,v))\Bigg)\cos\left(\frac{m\,\pi}{2}\right)+$$
$$i\left(\left(e^{(-2\,e\,i\,k+i\,e\,m+p-2\,c\,s+c\,v)\,z}\,(2\,i\,e\,k-i\,e\,m+p+2\,c\,s-c\,v)\,{}_2F_1\left(\frac{-2\,e\,i\,k+i\,e\,m+p-2\,c\,s+c\,v}{d},\right.\right.\right.$$
$$\left.-\beta;\,\frac{d-2\,i\,e\,k+i\,e\,m+p-2\,c\,s+c\,v}{d};-\frac{b\,e^{d\,z}}{a}\right)+e^{(2\,i\,e\,k-i\,e\,m+p+2\,c\,s-c\,v)\,z}\,(2\,i\,e\,k-i\,e\,m-$$
$$p+2\,c\,s-c\,v)\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m+p+2\,c\,s-c\,v}{d},\,-\beta;\,\frac{d+2\,i\,e\,k-i\,e\,m+p+2\,c\,s-c\,v}{d};\right.$$
$$\left.\left.-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/((2\,i\,e\,k-i\,e\,m-p+2\,c\,s-c\,v)\,(2\,i\,e\,k-i\,e\,m+p+2\,c\,s-c\,v))+$$
$$\left(e^{(2\,i\,e\,k-i\,e\,m+p-2\,c\,s+c\,v)\,z}\,(2\,i\,e\,k-i\,e\,m-p-2\,c\,s+c\,v)\,{}_2F_1\left(\frac{2\,i\,e\,k-i\,e\,m+p-2\,c\,s+c\,v}{d},\,-\beta;\right.\right.$$
$$\frac{d+2\,i\,e\,k-i\,e\,m+p-2\,c\,s+c\,v}{d};-\frac{b\,e^{d\,z}}{a}\Bigg)+e^{(-2\,e\,i\,k+i\,e\,m+p+2\,c\,s-c\,v)\,z}\,(2\,i\,e\,k-i\,e\,m+p-$$
$$2\,c\,s+c\,v)\,{}_2F_1\left(\frac{-2\,e\,i\,k+i\,e\,m+p+2\,c\,s-c\,v}{d},\,-\beta;\,\frac{d-2\,i\,e\,k+i\,e\,m+p+2\,c\,s-c\,v}{d};\right.$$
$$\left.\left.\left.-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/((2\,i\,e\,k-i\,e\,m-p-2\,c\,s+c\,v)\,(2\,i\,e\,k-i\,e\,m+p-2\,c\,s+c\,v))\right)\sin\left(\frac{m\,\pi}{2}\right)\Bigg)\Bigg)$$

$$\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}+\frac{1}{p}\left(2^{-m-v}\,e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\,{}_2F_1\left(\frac{p}{d},\,-\beta;\,\frac{d+p}{d};-\frac{b\,e^{d\,z}}{a}\right)\right.$$
$$(1-m\bmod 2)$$
$$\left.(1-v\bmod 2)\right)/;\,m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving cos and exp

Involving $e^{p\,z}\cos(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3794.01

$$\int e^{p\,z}\cos(c\,z)\cosh^{\nu}(a\,z)\,d\,z==\frac{1}{2}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\left(\frac{e^{(p+i\,c)\,z}}{p+i\,c-a\,\nu}\,{}_2F_1\left(\frac{p+i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{p+i\,c-a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)+\right.$$
$$\left.\frac{e^{(p-i\,c)\,z}}{p-i\,c-a\,\nu}\,{}_2F_1\left(\frac{p-i\,c-a\,\nu}{2\,a},\,-\nu;\,\frac{p-i\,c-a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)\right)$$

01.20.21.3795.01

$$\int e^{p z} \cos(c z) \cosh^{\nu}(a z)\, dz == -2^{-\nu-1} \left(\frac{2 e^{p z} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) (p \cos(c z) + c \sin(c z))}{c^2 + p^2} + \right.$$

$$\left. \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\frac{e^{(-i c+p-2 a s+a \nu) z}}{i c - p + 2 a s - a \nu} - \frac{e^{(i c+p+2 a s-a \nu) z}}{i c + p + 2 a s - a \nu} + \frac{e^{(-i c+p+2 a s-a \nu) z}}{i c - p + a (\nu - 2 s)} - \frac{e^{(i c+p-2 a s+a \nu) z}}{i c + p - 2 a s + a \nu} \right) \binom{\nu}{s} \right) /; \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving $e^{p z} \cos(c z + d) \cosh^{\nu}(a z)$

01.20.21.3796.01

$$\int e^{p z} \cos(d + c z) \cosh^{\nu}(a z)\, dz ==$$

$$\frac{1}{2} e^{-i d} \left(1 + e^{-2 a z}\right)^{-\nu} \cosh^{\nu}(a z) \left(\frac{e^{2 i d + (i c+p) z}}{i c + p + a \nu} {}_2F_1\left(-\frac{i c + p + a \nu}{2 a}, -\nu; -\frac{i c + p + a (\nu - 2)}{2 a}; -e^{-2 a z} \right) - \right.$$

$$\left. \frac{e^{(-i c+p) z}}{i c - p - a \nu} {}_2F_1\left(-\frac{-i c + p + a \nu}{2 a}, -\nu; \frac{1}{2} \left(\frac{i c - p}{a} - \nu + 2 \right); -e^{-2 a z} \right) \right)$$

01.20.21.3797.01

$$\int e^{p z} \cos(c z + d) \cosh^{\nu}(a z)\, dz == -2^{-\nu-1} \left(\frac{2 e^{p z} (p \cos(d + c z) + c \sin(d + c z)) (\nu \bmod 2 - 1)}{c^2 + p^2} \binom{\nu}{\frac{\nu}{2}} + \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-i d} \right.$$

$$\left. \left(-e^{2 i d} \left(\frac{e^{(i c+p+2 a s-a \nu) z}}{i c + p + 2 a s - a \nu} + \frac{e^{(i c+p-2 a s+a \nu) z}}{i c + p - 2 a s + a \nu} \right) + \frac{e^{(-i c+p-2 a s+a \nu) z}}{i c - p + 2 a s - a \nu} + \frac{e^{(-i c+p+2 a s-a \nu) z}}{i c - p + a (\nu - 2 s)} \right) \binom{\nu}{s} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z} \cos(c z) \cosh^{\nu}(a z + b)$

01.20.21.3798.01

$$\int e^{p z} \cos(c z) \cosh^{\nu}(b + a z)\, dz ==$$

$$\frac{1}{2} \left(1 + e^{-2 (b+a z)}\right)^{-\nu} \cosh^{\nu}(b + a z) \left(\frac{e^{(i c+p) z}}{i c + p + a \nu} {}_2F_1\left(-\frac{i c + p + a \nu}{2 a}, -\nu; -\frac{i c + p + a (\nu - 2)}{2 a}; -e^{-2 (b+a z)} \right) - \right.$$

$$\left. \frac{e^{(-i c+p) z}}{i c - p - a \nu} {}_2F_1\left(-\frac{-i c + p + a \nu}{2 a}, -\nu; \frac{1}{2} \left(\frac{i c - p}{a} - \nu + 2 \right); -e^{-2 (b+a z)} \right) \right)$$

01.20.21.3799.01

$$\int e^{p z} \cos(c z) \cosh^{\nu}(a z+b)\, dz == -2^{-\nu-1}\left(\frac{2\, e^{p z}\,(p\cos(c z)+c\sin(c z))\,(\nu \bmod 2-1)}{c^2+p^2}\binom{\nu}{\frac{\nu}{2}}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-b(2s+\nu)}\right.$$
$$\left.\left(-\frac{e^{4bs+(ic+p+2as-a\nu)z}}{ic+p+2as-a\nu}-\frac{e^{2b\nu+(ic+p-2as+a\nu)z}}{ic+p-2as+a\nu}+\frac{e^{2b\nu+(-ic+p-2as+a\nu)z}}{ic-p+2as-a\nu}+\frac{e^{4bs+(-ic+p+2as-a\nu)z}}{ic-p+a(\nu-2s)}\right)\binom{\nu}{s}\right) /;\ \nu\in\mathbb{N}^+$$

Involving $e^{p z} \cos(c z+d) \cosh^{\nu}(a z+b)$

01.20.21.3800.01

$$\int e^{p z} \cos(d+c z) \cosh^{\nu}(b+a z)\, dz ==$$
$$\frac{1}{2} e^{-i d}\left(1+e^{-2(b+a z)}\right)^{-\nu}\cosh^{\nu}(b+a z)\left(\frac{e^{2id+(ic+p)z}}{ic+p+a\nu}\,{}_2F_1\left(-\frac{ic+p+a\nu}{2a},-\nu;-\frac{ic+p+a(\nu-2)}{2a};-e^{-2(b+az)}\right)-\right.$$
$$\left.\frac{e^{(-ic+p)z}}{ic-p-a\nu}\,{}_2F_1\left(-\frac{-ic+p+a\nu}{2a},-\nu;\frac{1}{2}\left(\frac{ic-p}{a}-\nu+2\right);-e^{-2(b+az)}\right)\right)$$

01.20.21.3801.01

$$\int e^{p z} \cos(c z+d) \cosh^{\nu}(a z+b)\, dz == -2^{-\nu-1}\left(\frac{2\, e^{p z}\,(p\cos(d+c z)+c\sin(d+c z))\,(\nu \bmod 2-1)}{c^2+p^2}\binom{\nu}{\frac{\nu}{2}}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-id-b(2s+\nu)}\right.$$
$$\left.\left(-e^{2id}\left(\frac{e^{4bs+(ic+p+2as-a\nu)z}}{ic+p+2as-a\nu}+\frac{e^{2b\nu+(ic+p-2as+a\nu)z}}{ic+p-2as+a\nu}\right)+\frac{e^{2b\nu+(-ic+p-2as+a\nu)z}}{ic-p+2as-a\nu}+\frac{e^{4bs+(-ic+p+2as-a\nu)z}}{ic-p+a(\nu-2s)}\right)\binom{\nu}{s}\right) /;\ \nu\in\mathbb{N}^+$$

Involving $e^{p z^r} \cos\left(b z^r\right) \cosh^{\nu}(c z)$

01.20.21.3802.01

$$\int e^{p z^2} \cos\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$
$$\frac{2^{-\nu-2}\sqrt{\pi}}{b^2+p^2}\left(\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-ib+p}\ (ib+p)\,\text{erfi}\left(\sqrt{-ib+p}\ z\right)+(-ib+p)\sqrt{ib+p}\ \text{erfi}\left(\sqrt{ib+p}\ z\right)\right)(1-\nu \bmod 2)+\right.$$
$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{c^2(\nu-2s)^2}{4(ib-p)}}\sqrt{-ib+p}\ (ib+p)\left(\text{erfi}\left(\frac{2cs-c\nu-2ibz+2pz}{2\sqrt{-ib+p}}\right)+\text{erfi}\left(\frac{c(\nu-2s)+2(-ib+p)z}{2\sqrt{-ib+p}}\right)\right)-\right.$$
$$\left.\left.e^{-\frac{c^2(\nu-2s)^2}{4(ib+p)}}(ib-p)\sqrt{ib+p}\left(\text{erfi}\left(\frac{c(2s-\nu)+2(ib+p)z}{2\sqrt{ib+p}}\right)+\text{erfi}\left(\frac{c(\nu-2s)+2(ib+p)z}{2\sqrt{ib+p}}\right)\right)\right)\right) /;\ \nu\in\mathbb{N}^+$$

01.20.21.3803.01

$$\int e^{p\sqrt{z}}\cos\left(b\sqrt{z}\right)\cosh^{\nu}(c\,z)\,dz == \frac{1}{(i\,b-p)^2\,(i\,b+p)^2}$$
$$\left(2^{1-\nu}\,e^{p\sqrt{z}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\left(\sqrt{z}\;p^3-p^2+b^2\left(\sqrt{z}\;p+1\right)\right)\cos\left(b\sqrt{z}\right)-b\left(-\sqrt{z}\;b^2+2\,p-p^2\sqrt{z}\right)\sin\left(b\sqrt{z}\right)\right)\right)+$$
$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{2\,e^{-c(2k+\nu)z}\left(e^{(-ib+p)\sqrt{z}}+e^{(ib+p)\sqrt{z}}\right)\left(e^{4ckz}-e^{2c\nu z}\right)}{c\,(2\,k-\nu)}+\right.$$
$$\frac{e^{\frac{(-ib+p)^2}{c(8k-4\nu)}}(i\,b-p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{ib-p+2c(2k-\nu)\sqrt{z}}{2\sqrt{c(\nu-2k)}}\right)}{c\,(2\,k-\nu)\sqrt{c\,(\nu-2\,k)}}+\frac{e^{\frac{(ib+p)^2}{c(8k-4\nu)}}(i\,b+p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{ib+p+2c(\nu-2k)\sqrt{z}}{2\sqrt{c(\nu-2k)}}\right)}{c\,(2\,k-\nu)\sqrt{c\,(\nu-2\,k)}}-$$
$$\left.\frac{e^{-\frac{(-ib+p)^2}{c(8k-4\nu)}}(-i\,b+p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{-ib+p+2c(2k-\nu)\sqrt{z}}{2\sqrt{c(2k-\nu)}}\right)}{(c\,(2\,k-\nu))^{3/2}}-\frac{e^{-\frac{(ib+p)^2}{c(8k-4\nu)}}(i\,b+p)\sqrt{\pi}\;\operatorname{erfi}\left(\frac{ib+p+2c(2k-\nu)\sqrt{z}}{2\sqrt{c(2k-\nu)}}\right)}{(c\,(2\,k-\nu))^{3/2}}\right)/;\;\nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z^r}\cos(b\,z)\cosh^{\nu}(c\,z)$

01.20.21.3804.01

$$\int e^{p\,z^2}\cos(b\,z)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-2}\,e^{\frac{b^2}{4p}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\operatorname{erfi}\left(\frac{-ib+2pz}{2\sqrt{p}}\right)+\operatorname{erfi}\left(\frac{ib+2pz}{2\sqrt{p}}\right)\right)(1-\nu \bmod 2)}{\sqrt{p}}+$$
$$\frac{1}{\sqrt{p}}\left(2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{(-ib-2ck+c\nu)^2}{4p}}\operatorname{erfi}\left(\frac{-ib-2ck+c\nu+2pz}{2\sqrt{p}}\right)+e^{-\frac{(ib-2ck+c\nu)^2}{4p}}\operatorname{erfi}\left(\frac{ib-2ck+c\nu+2pz}{2\sqrt{p}}\right)+\right.\right.$$
$$\left.\left.e^{-\frac{(-ib+2ck-c\nu)^2}{4p}}\operatorname{erfi}\left(\frac{-ib+2ck-c\nu+2pz}{2\sqrt{p}}\right)+e^{-\frac{(ib+2ck-c\nu)^2}{4p}}\operatorname{erfi}\left(\frac{ib+2ck-c\nu+2pz}{2\sqrt{p}}\right)\right)\right)/;\;\nu\in\mathbb{Z}\wedge\nu>0$$

01.20.21.3805.01

$$\int e^{p\sqrt{z}} \cos(b\,z) \cosh^{\nu}(c\,z)\, dz ==$$

$$2^{-\nu-2}\left(-\frac{e^{-\frac{i\,p^2}{4\,b}}\, p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2\,i\,b\,\sqrt{z}}{2\sqrt{-i\,b}}\right)}{(-i\,b)^{3/2}}+\frac{4\,e^{p\sqrt{z}}\sin(b\,z)}{b}-\frac{e^{\frac{i\,p^2}{4\,b}}\, p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,i\,b\,\sqrt{z}}{2\sqrt{i\,b}}\right)}{(i\,b)^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\,e^{p\sqrt{z}}\left(\frac{2\sinh((i\,b+2\,c\,k-c\,\nu)\,z)}{i\,b+2\,c\,k-c\,\nu}+\frac{2\sinh((i\,b+c\,(\nu-2\,k))\,z)}{i\,b+c\,(\nu-2\,k)}\right)-\right.$$

$$\frac{e^{-\frac{p^2}{4\,(-i\,b-2\,c\,k+c\,\nu)}}\, p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(-i\,b-2\,c\,k+c\,\nu)\,\sqrt{z}}{2\sqrt{-i\,b-2\,c\,k+c\,\nu}}\right)}{(-i\,b-2\,c\,k+c\,\nu)^{3/2}}-\frac{e^{-\frac{p^2}{4\,(i\,b-2\,c\,k+c\,\nu)}}\, p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(i\,b-2\,c\,k+c\,\nu)\,\sqrt{z}}{2\sqrt{i\,b-2\,c\,k+c\,\nu}}\right)}{(i\,b-2\,c\,k+c\,\nu)^{3/2}}-$$

$$\left.\frac{e^{-\frac{p^2}{4\,(-i\,b+2\,c\,k-c\,\nu)}}\, p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(-i\,b+2\,c\,k-c\,\nu)\,\sqrt{z}}{2\sqrt{-i\,b+2\,c\,k-c\,\nu}}\right)}{(-i\,b+2\,c\,k-c\,\nu)^{3/2}}-\frac{e^{-\frac{p^2}{4\,(i\,b+2\,c\,k-c\,\nu)}}\, p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,(i\,b+2\,c\,k-c\,\nu)\,\sqrt{z}}{2\sqrt{i\,b+2\,c\,k-c\,\nu}}\right)}{(i\,b+2\,c\,k-c\,\nu)^{3/2}}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\cos\left(b\,z^{r}\right)\cosh^{\nu}(c\,z)$

01.20.21.3806.01

$$\int e^{p\,z}\cos\left(b\,z^2\right)\cosh^{\nu}(c\,z)\, dz ==$$

$$\frac{1}{b}\left(i\,2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-i\,b}\;e^{-\frac{i\,p^2}{4\,b}}\operatorname{erfi}\left(\frac{p-2\,i\,b\,z}{2\sqrt{-i\,b}}\right)-\sqrt{i\,b}\;e^{\frac{i\,p^2}{4\,b}}\operatorname{erfi}\left(\frac{p+2\,i\,b\,z}{2\sqrt{i\,b}}\right)\right)(1-\nu \bmod 2)\right)-$$

$$\frac{1}{b}\left(i\,2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(-\sqrt{-i\,b}\;e^{-\frac{i\,(-2\,c\,k+p+c\,\nu)^2}{4\,b}}\operatorname{erfi}\left(\frac{-2\,c\,k+p+c\,\nu-2\,i\,b\,z}{2\sqrt{-i\,b}}\right)-\right.\right.$$

$$\sqrt{-i\,b}\;e^{-\frac{i\,(2\,c\,k+p-c\,\nu)^2}{4\,b}}\operatorname{erfi}\left(\frac{2\,c\,k+p-c\,\nu-2\,i\,b\,z}{2\sqrt{-i\,b}}\right)+\sqrt{i\,b}\;e^{\frac{i\,(-2\,c\,k+p+c\,\nu)^2}{4\,b}}\operatorname{erfi}\left(\frac{-2\,c\,k+p+c\,\nu+2\,i\,b\,z}{2\sqrt{i\,b}}\right)+$$

$$\left.\left.\sqrt{i\,b}\;e^{\frac{i\,(2\,c\,k+p-c\,\nu)^2}{4\,b}}\operatorname{erfi}\left(\frac{2\,c\,k+p-c\,\nu+2\,i\,b\,z}{2\sqrt{i\,b}}\right)\right)\right)/;\ \nu\in\mathbb{Z}\wedge\nu>0$$

01.20.21.3807.01

$$\int e^{p z} \cos\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(\frac{4\, e^{p z} \cos\left(b \sqrt{z}\right)}{p} + \frac{b\, e^{\frac{b^2}{4 p}}\, i \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-i b+2 p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} - \frac{i b\, e^{\frac{b^2}{4 p}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{i b+2 p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2) +$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\left(\frac{2\, e^{(2 c k+p-c \nu) z} \cos\left(b \sqrt{z}\right)}{2 c k+p-c \nu} + \frac{2\, e^{(p+c(\nu-2k)) z} \cos\left(b \sqrt{z}\right)}{p+c(\nu-2 k)}\right)+\right.$$

$$\frac{b\, e^{\frac{b^2}{4(-2 c k+p+c \nu)}}\, i \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-i b+2(-2 c k+p+c \nu)\sqrt{z}}{2\sqrt{-2 c k+p+c \nu}}\right)}{(-2 c k+p+c \nu)^{3/2}} + \frac{b\, e^{\frac{b^2}{4(2 c k+p-c \nu)}}\, i \sqrt{\pi}\ \operatorname{erfi}\left(\frac{-i b+2(2 c k+p-c \nu)\sqrt{z}}{2\sqrt{2 c k+p-c \nu}}\right)}{(2 c k+p-c \nu)^{3/2}} -$$

$$\left.\frac{i b\, e^{\frac{b^2}{4(2 c k+p-c \nu)}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{i b+2(2 c k+p-c \nu)\sqrt{z}}{2\sqrt{2 c k+p-c \nu}}\right)}{(2 c k+p-c \nu)^{3/2}} - \frac{i b\, e^{\frac{b^2}{4(p+c(\nu-2k))}} \sqrt{\pi}\ \operatorname{erfi}\left(\frac{i b+2(p+c(\nu-2k))\sqrt{z}}{2\sqrt{p+c(\nu-2k)}}\right)}{(p+c(\nu-2 k))^{3/2}}\right) /;\ \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving $e^{p z} \cos(b z) \cosh^{\nu}(c z^r)$

01.20.21.3808.01

$$\int e^{p z} \cos(b z) \cosh^{\nu}\left(c z^2\right) dz == 2^{-\nu-1}\left(\frac{e^{(i b+p) z}}{i b+p} + \frac{e^{(-i b+p) z}}{-i b+p}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2) +$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{1}{(2 c k-c \nu)(c \nu-2 c k)}\left(e^{-\frac{(i b+p)^2}{4(c \nu-2 c k)}}\sqrt{c \nu-2 c k}\ (2 c k-c \nu)\operatorname{erfi}\left(\frac{i b+p-2(2 c k-c \nu) z}{2\sqrt{c \nu-2 c k}}\right)+\right.\right.$$

$$\left.e^{-\frac{(-i b+p)^2}{4(2 c k-c \nu)}}(c \nu-2 c k)\sqrt{2 c k-c \nu}\ \operatorname{erfi}\left(\frac{-i b+p+2(2 c k-c \nu) z}{2\sqrt{2 c k-c \nu}}\right)\right)+$$

$$\frac{1}{(2 c k-c \nu)(c \nu-2 c k)}\left(e^{-\frac{(-i b+p)^2}{4(c \nu-2 c k)}}\sqrt{c \nu-2 c k}\ (2 c k-c \nu)\operatorname{erfi}\left(\frac{-i b+p-2(2 c k-c \nu) z}{2\sqrt{c \nu-2 c k}}\right)+\right.$$

$$\left.\left.e^{-\frac{(i b+p)^2}{4(2 c k-c \nu)}}(c \nu-2 c k)\sqrt{2 c k-c \nu}\ \operatorname{erfi}\left(\frac{i b+p+2(2 c k-c \nu) z}{2\sqrt{2 c k-c \nu}}\right)\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3809.01

$$\int e^{p z} \cos(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz == \frac{(-1)^{\nu} 2^{-\nu-1} e^{(-i b+p) z} \left(-b+i p+e^{2 i b z} (b+i p)\right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)}{(b+i p) (i b+p)} +$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{4 e^{(-i b+p) z} \cosh\left(c (\nu-2 s) \sqrt{z}\right)}{-i b+p} + \frac{4 e^{(i b+p) z} \cosh\left(c (\nu-2 s) \sqrt{z}\right)}{i b+p} - \right.$$

$$\frac{c e^{-\frac{c^2 (\nu-2 s)^2}{4 (-i b+p)}} \sqrt{\pi} (\nu-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z} (i b-p)+c (\nu-2 s)}{2 \sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}} - \frac{c e^{-\frac{c^2 (\nu-2 s)^2}{4 (-i b+p)}} \sqrt{\pi} (\nu-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z} (-i b+p)+c (\nu-2 s)}{2 \sqrt{-i b+p}}\right)}{(-i b+p)^{3/2}} -$$

$$\left. \frac{c e^{-\frac{c^2 (\nu-2 s)^2}{4 (i b+p)}} \sqrt{\pi} (\nu-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z} (-i b-p)+c (\nu-2 s)}{2 \sqrt{i b+p}}\right)}{(i b+p)^{3/2}} - \frac{c e^{-\frac{c^2 (\nu-2 s)^2}{4 (i b+p)}} \sqrt{\pi} (\nu-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z} (i b+p)+c (\nu-2 s)}{2 \sqrt{i b+p}}\right)}{(i b+p)^{3/2}} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos(b z) \cosh^{\nu}\left(c z^r\right)$

01.20.21.3810.01

$$\int e^{p z^2} \cos(b z) \cosh^{\nu}\left(c z^2\right) dz == \frac{2^{-\nu-2} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \left(e^{\frac{b^2}{4 p}} \operatorname{erfi}\left(\frac{-i b+2 p z}{2 \sqrt{p}}\right) + e^{\frac{b^2}{4 p}} \operatorname{erfi}\left(\frac{i b+2 p z}{2 \sqrt{p}}\right)\right) (1-\nu \bmod 2)}{\sqrt{p}} + 2^{-\nu-2} \sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\left(e^{\frac{b^2}{4 (-2 c k+p+c \nu)}} \sqrt{-2 c k+p+c \nu} (2 c k+p-c \nu) \operatorname{erfi}\left(\frac{i b+2 p z-2 (2 c k-c \nu) z}{2 \sqrt{-2 c k+p+c \nu}}\right) + e^{\frac{b^2}{4 (2 c k+p-c \nu)}} (-2 c k+p+ \right.\right.$$

$$\left.\left. c \nu) \sqrt{2 c k+p-c \nu} \operatorname{erfi}\left(\frac{-i b+2 (2 c k+p-c \nu) z}{2 \sqrt{2 c k+p-c \nu}}\right)\right) \Big/ ((2 c k+p-c \nu) (-2 c k+p+c \nu)) + \right.$$

$$\left(e^{\frac{b^2}{4 (-2 c k+p+c \nu)}} \sqrt{-2 c k+p+c \nu} (2 c k+p-c \nu) \operatorname{erfi}\left(\frac{-i b+2 p z-2 (2 c k-c \nu) z}{2 \sqrt{-2 c k+p+c \nu}}\right) + e^{\frac{b^2}{4 (2 c k+p-c \nu)}} (-2 c k+p+c \nu) \right.$$

$$\left. \left. \sqrt{2 c k+p-c \nu} \operatorname{erfi}\left(\frac{i b+2 (2 c k+p-c \nu) z}{2 \sqrt{2 c k+p-c \nu}}\right)\right) \Big/ ((2 c k+p-c \nu) (-2 c k+p+c \nu)) \right) /; \nu \in \mathbb{Z} \wedge \nu > 0$$

01.20.21.3811.01

$$\int e^{p\sqrt{z}}\cos(b\,z)\cosh^{\nu}\left(c\sqrt{z}\right)dz ==$$

$$2^{-\nu-2}\left(-\frac{e^{-\frac{i\,p^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{(-i\,b)^{3/2}}+\frac{4\,e^{p\sqrt{z}}\sin(b\,z)}{b}-\frac{e^{\frac{i\,p^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{(i\,b)^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{c\,e^{-\frac{i\,(p+c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(\nu-2\,s)\operatorname{erfi}\left(\frac{-p-c\,(\nu-2\,s)+2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{(-i\,b)^{3/2}}+\right.$$

$$\frac{c\,e^{-\frac{i\,(p-c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(\nu-2\,s)\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{(-i\,b)^{3/2}}+\frac{c\,e^{\frac{i\,(p-c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(\nu-2\,s)\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{(i\,b)^{3/2}}+$$

$$\frac{c\,e^{\frac{i\,(p+c\,(\nu-2\,s))^2}{4\,b}}\sqrt{\pi}\,(\nu-2\,s)\operatorname{erfi}\left(\frac{-p-c\,(\nu-2\,s)-2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{(i\,b)^{3/2}}+\frac{4\,e^{(p-c\,(2\,s+\nu))\sqrt{z}}\left(e^{4\,c\,s\sqrt{z}}+e^{2\,c\,\nu\sqrt{z}}\right)\sin(b\,z)}{b}-$$

$$\frac{e^{-\frac{i\,(p+c\,(\nu-2\,s))^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+c\,(\nu-2\,s)-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{(-i\,b)^{3/2}}-\frac{e^{-\frac{i\,(p-c\,(\nu-2\,s))^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)-2\,i\,b\sqrt{z}}{2\sqrt{-i\,b}}\right)}{(-i\,b)^{3/2}}-$$

$$\left.\frac{e^{\frac{i\,(p+c\,(\nu-2\,s))^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+c\,(\nu-2\,s)+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{(i\,b)^{3/2}}-\frac{e^{\frac{i\,(p-c\,(\nu-2\,s))^2}{4\,b}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-c\,(\nu-2\,s)+2\,i\,b\sqrt{z}}{2\sqrt{i\,b}}\right)}{(i\,b)^{3/2}}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\cos\left(b\,z^{r}\right)\cosh^{\nu}\left(c\,z^{r}\right)$

01.20.21.3812.01

$$\int e^{p z} \cos\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$\frac{1}{b}\left(i\, 2^{-\nu-2} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \left(\sqrt{-i b}\; e^{-\frac{i p^2}{4 b}} \operatorname{erfi}\left(\frac{p-2 i b z}{2\sqrt{-i b}}\right) - \sqrt{i b}\; e^{\frac{i p^2}{4 b}} \operatorname{erfi}\left(\frac{p+2 i b z}{2\sqrt{i b}}\right)\right)(1-\nu \bmod 2)\right) +$$

$$2^{-\nu-2} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(\left(e^{-\frac{p^2}{4(i b-2 c k+c \nu)}} \sqrt{i b-2 c k+c \nu}\; (-i b+2 c k-c \nu) \operatorname{erfi}\left(\frac{p-2(-i b+2 c k-c \nu) z}{2\sqrt{i b-2 c k+c \nu}}\right) + e^{-\frac{p^2}{4(-i b+2 c k-c \nu)}} (i b-2 c k+c \nu) \sqrt{-i b+2 c k-c \nu}\; \operatorname{erfi}\left(\frac{p+2(-i b+2 c k-c \nu) z}{2\sqrt{-i b+2 c k-c \nu}}\right)\right) \Big/ \right.$$

$$\left((-i b+2 c k-c \nu)(i b-2 c k+c \nu)\right) + \left(e^{-\frac{p^2}{4(-i b-2 c k+c \nu)}} \sqrt{-i b-2 c k+c \nu}\; (i b+2 c k-c \nu) \right.$$

$$\operatorname{erfi}\left(\frac{p-2(i b+2 c k-c \nu) z}{2\sqrt{-i b-2 c k+c \nu}}\right) + e^{-\frac{p^2}{4(i b+2 c k-c \nu)}} (-i b-2 c k+c \nu) \sqrt{i b+2 c k-c \nu}$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{p+2(i b+2 c k-c \nu) z}{2\sqrt{i b+2 c k-c \nu}}\right)\right) \Big/ \left((i b+2 c k-c \nu)(-i b-2 c k+c \nu)\right)\right); \nu \in \mathbb{Z} \wedge \nu > 0$$

01.20.21.3813.01

$$\int e^{p z} \cos\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-2}\left(\frac{4\, e^{p z} \cos\left(b \sqrt{z}\right)}{p} + \frac{b\, e^{\frac{b^2}{4 p}} \sqrt{\pi}\left(\operatorname{erf}\left(\frac{b+2 i p \sqrt{z}}{2\sqrt{p}}\right) + \operatorname{erf}\left(\frac{b-2 i p \sqrt{z}}{2\sqrt{p}}\right)\right)}{p^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1 - \nu \bmod 2) +$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\frac{4\, e^{p z}\left(\cos\left((b + 2 i c k - i c \nu)\sqrt{z}\right) + \cos\left((b + c i (\nu - 2 k))\sqrt{z}\right)\right)}{p} + \right.$$

$$\frac{e^{\frac{(b+2 i c k-i c \nu)^2}{4 p}} \sqrt{\pi}\,(b + 2 i c k - i c \nu) \operatorname{erf}\left(\frac{b+c i (2 k-\nu)+2 i p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} -$$

$$\frac{e^{\frac{(b+c i (\nu-2 k))^2}{4 p}} \sqrt{\pi}\,(b + c i (\nu - 2 k)) \operatorname{erf}\left(\frac{-b+c i (2 k-\nu)-2 i p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} +$$

$$\frac{e^{\frac{(-b-2 i c k+i c \nu)^2}{4 p}} \sqrt{\pi}\,(b + 2 i c k - i c \nu) \operatorname{erf}\left(\frac{b+c i (2 k-\nu)-2 i p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} -$$

$$\left.\frac{i\, e^{\frac{(b+c i (\nu-2 k))^2}{4 p}} \sqrt{\pi}\,(b + c i (\nu - 2 k)) \operatorname{erfi}\left(\frac{i b-c (\nu-2 k)+2 p \sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}}\right) /;\ \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos\left(b z^r\right) \cosh^{\nu}\left(c z^r\right)$

01.20.21.3814.01

$$\int e^{p z^r} \cos(b z^r) \cosh^{\nu}(c z^r)\, dz ==$$

$$-\frac{2^{-\nu-1} z}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{1}{r}, (-i b-p) z^r\right)((-i b-p) z^r)^{-1/r}+((i b-p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (i b-p) z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{1}{r}, (-i b-p-2 c s+c \nu) z^r\right)((-i b-p-2 c s+c \nu) z^r)^{-1/r}+\right.$$

$$((i b-p-2 c s+c \nu) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (i b-p-2 c s+c \nu) z^r\right)+((-i b-p+2 c s-c \nu) z^r)^{-1/r}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{r}, (-i b-p+2 c s-c \nu) z^r\right)+((i b-p+2 c s-c \nu) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (i b-p+2 c s-c \nu) z^r\right)\right)\right)\Big/; \nu \in \mathbb{N}^+$$

01.20.21.3815.01

$$\int e^{p z^2} \cos\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz == 2^{-\nu-2}\left(\frac{\operatorname{erfi}\left(\sqrt{-i b+p}\ z\right)}{\sqrt{-i b+p}}+\frac{\operatorname{erfi}\left(\sqrt{i b+p}\ z\right)}{\sqrt{i b+p}}\right)\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\operatorname{erfi}\left(\sqrt{-i b+p-2 c s+c \nu}\ z\right)}{\sqrt{-i b+p-2 c s+c \nu}}+\frac{\operatorname{erfi}\left(\sqrt{i b+p-2 c s+c \nu}\ z\right)}{\sqrt{i b+p-2 c s+c \nu}}+\right.$$

$$\left.\frac{\operatorname{erfi}\left(\sqrt{-i b+p+2 c s-c \nu}\ z\right)}{\sqrt{-i b+p+2 c s-c \nu}}+\frac{\operatorname{erfi}\left(\sqrt{i b+p+2 c s-c \nu}\ z\right)}{\sqrt{i b+p+2 c s-c \nu}}\right)\Big/; \nu \in \mathbb{Z} \wedge \nu > 0$$

01.20.21.3816.01

$$\int e^{p \sqrt{z}} \cos\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz == \frac{1}{\left(b^2+p^2\right)^2}$$

$$\left(2^{1-\nu} e^{p \sqrt{z}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(\left(\left(\sqrt{z}\ p+1\right) b^2+p^2\left(p \sqrt{z}-1\right)\right)\cos\left(b \sqrt{z}\right)+b\left(\sqrt{z}\ b^2-2 p+p^2 \sqrt{z}\right)\sin\left(b \sqrt{z}\right)\right)\right)+$$

$$2^{1-\nu} e^{p \sqrt{z}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(\left(p^2\left(p \sqrt{z}-1\right)-(-i b-2 c s+c \nu)^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left((-i b-2 c s+c \nu) \sqrt{z}\right)-(-i b-2 c s+c \nu)\right.\right.$$

$$\left.\left(\sqrt{z}\ p^2-2 p-(-i b-2 c s+c \nu)^2 \sqrt{z}\right)\sinh\left((-i b-2 c s+c \nu) \sqrt{z}\right)\right)\Big/\left(p^2-(-i b-2 c s+c \nu)^2\right)^2+$$

$$\left(\left(p^2\left(p \sqrt{z}-1\right)-(-i b+2 c s-c \nu)^2\left(\sqrt{z}\ p+1\right)\right)\cosh\left((-i b+2 c s-c \nu) \sqrt{z}\right)-(-i b+2 c s-c \nu)\left(\sqrt{z}\ p^2-\right.\right.$$

$$\left.\left.\left.2 p-(-i b+2 c s-c \nu)^2 \sqrt{z}\right)\sinh\left((-i b+2 c s-c \nu) \sqrt{z}\right)\right)\Big/\left(p^2-(-i b+2 c s-c \nu)^2\right)^2\right)\Big/; \nu \in \mathbb{N}^+$$

Involving $e^{b z^r+e} \cos\left(a z^r+q\right) \cosh^{\nu}\left(c z^r+g\right)$

01.20.21.3817.01

$$\int e^{b z^r+e} \cos(a z^r+q) \cosh^{\nu}(c z^r+g)\, dz ==$$

$$-\frac{2^{-\nu-1} z}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e+i q}\,\Gamma\left(\frac{1}{r},(-b-i a) z^r\right)((-b-i a) z^r)^{-1/r}+e^{e-i q}((i a-b) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i a-b) z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+i q+2 g s-g \nu}\,\Gamma\left(\frac{1}{r},(-b-i a-2 c s+c \nu) z^r\right)((-b-i a-2 c s+c \nu) z^r)^{-1/r}+\right.$$

$$e^{e-i q+2 g s-g \nu}((-b+i a-2 c s+c \nu) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+i a-2 c s+c \nu) z^r\right)+$$

$$e^{e+i q-2 g s+g \nu}((-b-i a+2 c s-c \nu) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-i a+2 c s-c \nu) z^r\right)+$$

$$\left.\left.e^{e-i q-2 g s+g \nu}((-b+i a+2 c s-c \nu) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+i a+2 c s-c \nu) z^r\right)\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3818.01

$$\int e^{b z^2+e} \cos\left(a z^2+q\right) \cosh^{\nu}\left(c z^2+g\right) dz == 2^{-\nu-2}\left(\frac{e^{-2 i q}\,\operatorname{erfi}\left(\sqrt{b-i a}\ z\right)}{\sqrt{b-i a}}+\frac{\operatorname{erfi}\left(\sqrt{b+i a}\ z\right)}{\sqrt{b+i a}}\right) e^{e+i q}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{e-i q+g(\nu-2 s)}\,\operatorname{erfi}\left(\sqrt{b-i a+c(\nu-2 s)}\ z\right)}{\sqrt{b-i a+c(\nu-2 s)}}+\frac{e^{e+i q+g(\nu-2 s)}\,\operatorname{erfi}\left(\sqrt{b+i a+c(\nu-2 s)}\ z\right)}{\sqrt{b+i a+c(\nu-2 s)}}+\right.$$

$$\left.\frac{e^{e-i q-g(\nu-2 s)}\,\operatorname{erfi}\left(\sqrt{b-i a-c(\nu-2 s)}\ z\right)}{\sqrt{b-i a-c(\nu-2 s)}}+\frac{e^{e+i q-g(\nu-2 s)}\,\operatorname{erfi}\left(\sqrt{b+i a-c(\nu-2 s)}\ z\right)}{\sqrt{b+i a-c(\nu-2 s)}}\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3819.01

$$\int e^{\sqrt{z}\ b+e}\cos\left(\sqrt{z}\ a+q\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-\nu}\left(\frac{e^{\sqrt{z}\ (b-i\,a)+e-i\,q}\left((b-i\,a)\sqrt{z}\ -1\right)}{(b-i\,a)^2}+\frac{e^{\sqrt{z}\ (b+i\,a)+e+i\,q}\left((b+i\,a)\sqrt{z}\ -1\right)}{(b+i\,a)^2}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\frac{e^{e-i\,q+g\,(\nu-2\,s)+(b-i\,a+c\,(\nu-2\,s))\sqrt{z}}\left((b-i\,a+c\,(\nu-2\,s))\sqrt{z}\ -1\right)}{(b-i\,a+c\,(\nu-2\,s))^2}+\right.$$

$$\frac{e^{e+i\,q+g\,(\nu-2\,s)+(b+i\,a+c\,(\nu-2\,s))\sqrt{z}}\left((b+i\,a+c\,(\nu-2\,s))\sqrt{z}\ -1\right)}{(b+i\,a+c\,(\nu-2\,s))^2}+$$

$$\frac{e^{e-i\,q-g\,(\nu-2\,s)+(b-i\,a-c\,(\nu-2\,s))\sqrt{z}}\left((b-i\,a-c\,(\nu-2\,s))\sqrt{z}\ -1\right)}{(b-i\,a-c\,(\nu-2\,s))^2}+$$

$$\left.\frac{e^{e+i\,q-g\,(\nu-2\,s)+(b+i\,a-c\,(\nu-2\,s))\sqrt{z}}\left((b+i\,a-c\,(\nu-2\,s))\sqrt{z}\ -1\right)}{(b+i\,a-c\,(\nu-2\,s))^2}\right)\binom{\nu}{s}\ /;\ \nu\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\cos\left(a\,z^r+p\,z+q\right)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.3820.01

$$\int e^{b z^2+d z+e} \cos\left(a z^2+p z+q\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$\frac{1}{(b-i a)(b+i a)}\left(2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b-i a}\,(b+i a)\,e^{-\frac{(d-i p)^2-4(b-i a)(e-i q)}{4(b-i a)}}\operatorname{erfi}\left(\frac{d-i p-2 i a z+2 b z}{2\sqrt{b-i a}}\right)+\right.\right.$$

$$\left.\left.(b-i a)\sqrt{b+i a}\;e^{-\frac{(d+i p)^2-4(b+i a)(e+i q)}{4(b+i a)}}\operatorname{erfi}\left(\frac{d+i p+2(b+i a) z}{2\sqrt{b+i a}}\right)\right)(1-\nu \bmod 2)\right)+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\left(e^{-\frac{(d-2 f k+i p+f \nu)^2-4(b+i a-2 c k+c \nu)(e-2 g k+i q+g \nu)}{4(b+i a-2 c k+c \nu)}}\sqrt{b+i a-2 c k+c \nu}\,(b-i a+2 c k-c \nu)\right.\right.$$

$$\operatorname{erfi}\left(\frac{d-2 f k+i p+f \nu+2 b z-2(-i a+2 c k-c \nu) z}{2\sqrt{b+i a-2 c k+c \nu}}\right)+$$

$$e^{-\frac{(d+2 f k-i p-f \nu)^2-4(b-i a+2 c k-c \nu)(e+2 g k-i q-g \nu)}{4(b-i a+2 c k-c \nu)}}(b+i a-2 c k+c \nu)\sqrt{b-i a+2 c k-c \nu}$$

$$\left.\left.\operatorname{erfi}\left(\frac{d+2 f k-i p-f \nu+2(b-i a+2 c k-c \nu) z}{2\sqrt{b-i a+2 c k-c \nu}}\right)\right)\Big/((b-i a+2 c k-c \nu)(b+i a-2 c k+c \nu))+\right.$$

$$\left(e^{-\frac{(d-2 f k-i p+f \nu)^2-4(b-i a-2 c k+c \nu)(e-2 g k-i q+g \nu)}{4(b-i a-2 c k+c \nu)}}\sqrt{b-i a-2 c k+c \nu}\,(b+i a+2 c k-c \nu)\right.$$

$$\operatorname{erfi}\left(\frac{d-2 f k-i p+f \nu+2 b z-2(i a+2 c k-c \nu) z}{2\sqrt{b-i a-2 c k+c \nu}}\right)+e^{-\frac{(d+2 f k+i p-f \nu)^2-4(b+i a+2 c k-c \nu)(e+2 g k+i q-g \nu)}{4(b+i a+2 c k-c \nu)}}$$

$$\left.\left.(b-i a-2 c k+c \nu)\sqrt{b+i a+2 c k-c \nu}\,\operatorname{erfi}\left(\frac{d+2 f k+i p-f \nu+2(b+i a+2 c k-c \nu) z}{2\sqrt{b+i a+2 c k-c \nu}}\right)\right)\Big/\right.$$

$$\left.((b+i a+2 c k-c \nu)(b-i a-2 c k+c \nu))\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.3821.01

$$\int e^{\sqrt{z}\ b+d z+e}\cos\left(\sqrt{z}\ a+p z+q\right)\cosh^{\nu}\left(\sqrt{z}\ c+f z+g\right)dz ==$$

$$2^{-\nu-2}\,e^{e-i q}\left(-\frac{(b+i a)\,e^{2 i q-\frac{(b+i a)^2}{4(d+i p)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+i a+2(d+i p)\sqrt{z}}{2\sqrt{d+i p}}\right)}{(d+i p)^{3/2}}+\frac{(i a-b)\,e^{-\frac{(b-i a)^2}{4(d-i p)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b-i a+2(d-i p)\sqrt{z}}{2\sqrt{d-i p}}\right)}{(d-i p)^{3/2}}+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b+i a)+2 i q+(d+i p)z}}{d+i p}+\frac{2\,e^{\sqrt{z}\ (b-i a)+(d-i p)z}}{d-i p}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(2\,e^{e-2 g k-i q-g\nu}\left(\frac{e^{2 g\nu+(d-2 f k-i p+f\nu)z+(b-i a-2 c k+c\nu)\sqrt{z}}}{d-2 f k-i p+f\nu}+\frac{e^{4 g k+2 i q+(d+2 f k+i p-f\nu)z+(b+i a+2 c k-c\nu)\sqrt{z}}}{d+2 f k+i p-f\nu}+\right.\right.$$

$$\left.\frac{e^{4 g k+(d+2 f k-i p-f\nu)z+(b-i a+2 c k-c\nu)\sqrt{z}}}{d+2 f k-i p-f\nu}+\frac{e^{2 i q+2 g\nu+(d-2 f k+i p+f\nu)z+(b+i a-2 c k+c\nu)\sqrt{z}}}{d-2 f k+i p+f\nu}\right)-$$

$$\frac{1}{(d-2 f k-i p+f\nu)^{3/2}}\left(e^{-\frac{(b-i a-2 c k+c\nu)^2}{4(d-2 f k-i p+f\nu)}+e-2 g k-i q+g\nu}\sqrt{\pi}\ (b-i a-2 c k+c\nu)\right.$$

$$\left.\operatorname{erfi}\left(\frac{b-i a-2 c k+c\nu+2(d-2 f k-i p+f\nu)\sqrt{z}}{2\sqrt{d-2 f k-i p+f\nu}}\right)\right)-$$

$$\left(e^{-\frac{(b+i a+2 c k-c\nu)^2}{4(d+2 f k+i p-f\nu)}+e+2 g k+i q-g\nu}\sqrt{\pi}\ (b+i a+2 c k-c\nu)\operatorname{erfi}\left(\frac{b+i a+2 c k-c\nu+2(d+2 f k+i p-f\nu)\sqrt{z}}{2\sqrt{d+2 f k+i p-f\nu}}\right)\right)\Big/$$

$$(d+2 f k+i p-f\nu)^{3/2}-\frac{1}{(d+2 f k-i p-f\nu)^{3/2}}\left(e^{-\frac{(b-i a+2 c k-c\nu)^2}{4(d+2 f k-i p-f\nu)}+e+2 g k-i q-g\nu}\sqrt{\pi}\right.$$

$$\left.(b-i a+2 c k-c\nu)\operatorname{erfi}\left(\frac{b-i a+2 c k-c\nu+2(d+2 f k-i p-f\nu)\sqrt{z}}{2\sqrt{d+2 f k-i p-f\nu}}\right)\right)-$$

$$\left(e^{-\frac{(b+i a+c(\nu-2k))^2}{4(d+i p+f(\nu-2k))}+e-2 g k+i q+g\nu}\sqrt{\pi}\ (b+i a+c(\nu-2k))\operatorname{erfi}\left(\frac{b+i a-2 c k+c\nu+2(d+i p+f(\nu-2k))\sqrt{z}}{2\sqrt{d+i p+f(\nu-2k)}}\right)\right)\Big/$$

$$\left.(d+i p+f(\nu-2k))^{3/2}\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving cos and rational functions of exp

Involving $\cos(e\,z)\cosh^{\nu}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.3822.01

$$\int \frac{\cos(e\,z)\cosh^{\nu}(c\,z)}{\left(a+b\,e^{d\,z}\right)^{n}}\,dz ==$$

$$2^{-\nu-1}\,a^{-n}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{-i\,e+c\,(2\,s-\nu)}\left(e^{(-i\,e+c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{-i\,e+c\,(2\,s-\nu)}{d},\,n;\,\frac{d-i\,e+c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.e^{(i\,e-c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{i\,e-c\,(2\,s-\nu)}{d},\,n;\,\frac{d+i\,e\,-c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-i\,e-c\,(2\,s-\nu)}\left(e^{(-i\,e-c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{-i\,e-c\,(2\,s-\nu)}{d},\,n;\,\frac{d-i\,e-c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.\left.e^{(i\,e+c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{i\,e+c\,(2\,s-\nu)}{d},\,n;\,\frac{d+i\,e\,+c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)-$$

$$\frac{i\,2^{-\nu-1}\,a^{-n}\,(1-\nu \bmod 2)}{e}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e\,z}\,{}_2F_1\left(\frac{i\,e}{d},\,n;\,\frac{d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-i\,e\,z}\,{}_2F_1\left(-\frac{i\,e}{d},\,n;\,\frac{d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/;\,n\in$$

$\mathbb{N}^{+}\bigwedge \nu\in$

$\mathbb{N}^{+}$

Involving $e^{p\,z}\cos(e\,z)\cosh^{\nu}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.3823.01

$$\int \frac{e^{p z} \cos(e z) \cosh^{v}(c z)}{\left(a + b\, e^{d z}\right)^{n}} dz ==$$

$$2^{-v-1}\, a^{-n} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{(-i e+p+c (2 s-v)) z} (-i e - p + c (2 s - v))\, {}_2F_1\left(\frac{-i e + p + c (2 s - v)}{d}, n; \frac{d - i e + p + c (2 s - v)}{d}; -\frac{b\, e^{d z}}{a} \right) - \right. \right.$$

$$\left. \left. e^{(i e+p-c (2 s-v)) z} (-i e + p + c (2 s - v))\, {}_2F_1\left(\frac{i e + p - c (2 s - v)}{d}, n; \frac{d + i e + p - c (2 s - v)}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \Big/$$

$$((-i e - p + c (2 s - v)) (-i e + p + c (2 s - v))) +$$

$$\left(e^{(-i e+p-c (2 s-v)) z} (-i e - p - c (2 s - v))\, {}_2F_1\left(\frac{-i e + p - c (2 s - v)}{d}, n; \frac{d - i e + p - c (2 s - v)}{d}; -\frac{b\, e^{d z}}{a} \right) - \right.$$

$$\left. e^{(i e+p+c (2 s-v)) z} (-i e + p - c (2 s - v))\, {}_2F_1\left(\frac{i e + p + c (2 s - v)}{d}, n; \frac{d + i e + p + c (2 s - v)}{d}; -\frac{b\, e^{d z}}{a} \right) \right) \Big/$$

$$\left. ((-i e - p - c (2 s - v)) (-i e + p - c (2 s - v))) \right) +$$

$$\frac{1}{(i e - p) (i e + p)} \left(2^{-v-1}\, a^{-n} \binom{v}{\frac{v}{2}} \left(e^{(i e+p) z} (i e - p)\, {}_2F_1\left(\frac{i e + p}{d}, n; \frac{d + i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) - \right. \right.$$

$$\left. \left. e^{(-i e+p) z} (i e + p)\, {}_2F_1\left(\frac{-i e + p}{d}, n; \frac{d - i e + p}{d}; -\frac{b\, e^{d z}}{a} \right) \right) (1 - v \bmod 2) \right) /; n \in \mathbb{N}^{+} \bigwedge v \in \mathbb{N}^{+}$$

Involving cos and algebraic functions of exp

Involving $\left(a + b\, e^{d z}\right)^{\beta} \cos(e z) \cosh^{v}(c z)$

01.20.21.3824.01

$$\int \left(a+b\,e^{d\,z}\right)^{\beta}\cos(e\,z)\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{-i\,e+c\,(2\,s-\nu)}\left(e^{(-i\,e+c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{-i\,e+c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d-i\,e+c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.e^{(i\,e-c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{i\,e-c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d+i\,e\,-c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-i\,e-c\,(2\,s-\nu)}\left(e^{(-i\,e-c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{-i\,e-c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d-i\,e-c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.\left.e^{(i\,e+c\,(2\,s-\nu))\,z}\,{}_2F_1\left(\frac{i\,e+c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d+i\,e\,+c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)-$$

$$\frac{1}{e}\left(i\,2^{-\nu-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\left(e^{i\,e\,z}\,{}_2F_1\left(\frac{i\,e}{d},\,-\beta;\,\frac{d+i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{-i\,e\,z}\,{}_2F_1\left(-\frac{i\,e}{d},\,-\beta;\,\frac{d-i\,e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right.$$

$$\left.(1-\nu\bmod 2)\right)/;\,\nu\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cos(e\,z)\cosh^{\nu}(c\,z)$

01.20.21.3825.01

$$\int e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\cos(e\,z)\cosh^{\nu}(c\,z)\,dz == 2^{-\nu-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(e^{(-i\,e+p+c\,(2\,s-\nu))\,z}\,(-i\,e-p+c\,(2\,s-\nu))\,{}_2F_1\left(\frac{-i\,e+p+c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d-i\,e+p+c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.e^{(i\,e+p-c\,(2\,s-\nu))\,z}\,(-i\,e+p+c\,(2\,s-\nu))\,{}_2F_1\left(\frac{i\,e+p-c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d+i\,e\,+p-c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$

$$((-i\,e-p+c\,(2\,s-\nu))\,(-i\,e+p+c\,(2\,s-\nu)))+$$

$$\left(e^{(-i\,e+p-c\,(2\,s-\nu))\,z}\,(-i\,e-p-c\,(2\,s-\nu))\,{}_2F_1\left(\frac{-i\,e+p-c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d-i\,e+p-c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.e^{(i\,e+p+c\,(2\,s-\nu))\,z}\,(-i\,e+p-c\,(2\,s-\nu))\,{}_2F_1\left(\frac{i\,e+p+c\,(2\,s-\nu)}{d},\,-\beta;\,\frac{d+i\,e\,+p+c\,(2\,s-\nu)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$

$$\left.((-i\,e-p-c\,(2\,s-\nu))\,(-i\,e+p-c\,(2\,s-\nu)))\right)+\frac{1}{(i\,e-p)\,(i\,e+p)}$$

$$\left(2^{-\nu-1}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\left(e^{(i\,e+p)\,z}\,(i\,e-p)\,{}_2F_1\left(\frac{i\,e+p}{d},\,-\beta;\,\frac{d+i\,e\,+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.\left.e^{(-i\,e+p)\,z}\,(i\,e+p)\,{}_2F_1\left(\frac{-i\,e+p}{d},\,-\beta;\,\frac{d-i\,e+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)(1-\nu\bmod 2)\right)/;\,\nu\in\mathbb{N}^{+}$$

Involving powers of cos and exp

Involving $e^{p z} \cos^{\mu}(c z) \cosh^{\nu}(a z)$

01.20.21.3826.01

$$\int e^{p z} \cos^{m}(c z) \cosh^{\nu}(a z)\, dz == 2^{-m-\nu}\left(\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{e^{-(-p-i c (m-2 s)) z}}{-p-i c (m-2 s)}+\frac{e^{-(i c (m-2 s)-p) z}}{i c (m-2 s)-p}\right)+\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\frac{(m \bmod 2-1)(\nu \bmod 2-1)}{p}e^{p z}+\right.$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-(-p-a (\nu-2 s)) z}}{-p-a (\nu-2 s)}+\frac{e^{-(-p-2 a s+a \nu) z}}{-p-2 a s+a \nu}\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{(p+2 i c k-i c m-2 a s+a \nu) z}}{p+2 i c k-i c m-2 a s+a \nu}+\frac{e^{(p-2 i c k+i c m+2 a s-a \nu) z}}{p-2 i c k+i c m+2 a s-a \nu}+\right.$$

$$\left.\left.\frac{e^{(p-i c (m-2 k)+2 a s-a \nu) z}}{p+2 i c k-i c m+2 a s-a \nu}+\frac{e^{(p-2 i c k+i c m-2 a s+a \nu) z}}{p-2 i c k+i c m-2 a s+a \nu}\right)\right) /; m \in \mathbb{N}^{+} \bigwedge \nu \in \mathbb{N}^{+}$$

01.20.21.3827.01

$$\int e^{p z} \cos^{\mu}(c z) \cosh^{\nu}(a z)\, dz == 2^{-\nu} \cos^{\mu}(c z)\left(1+e^{2 i c z}\right)^{-\mu}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{(p+a (\nu-2 s)) z}}{p+a (\nu-2 s)-i c \mu}{}_2F_1\left(-\frac{i (p+a (\nu-2 s)-i c \mu)}{2 c}, -\mu; 1-\frac{i (p+a (\nu-2 s)-i c \mu)}{2 c}; -e^{2 i c z}\right)+\right.$$

$$\left.\frac{e^{(p-a (\nu-2 s)) z}}{p-a (\nu-2 s)-i c \mu}{}_2F_1\left(-\frac{i (p-a (\nu-2 s)-i c \mu)}{2 c}, -\mu; 1-\frac{i (p-a (\nu-2 s)-i c \mu)}{2 c}; -e^{2 i c z}\right)\right)+$$

$$\frac{2^{-\nu} e^{p z}\left(1+e^{2 i c z}\right)^{-\mu} \cos^{\mu}(c z)(1-\nu \bmod 2)}{p-i c \mu}\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(-\frac{i (p-i c \mu)}{2 c}, -\mu; 1-\frac{i (p-i c \mu)}{2 c}; -e^{2 i c z}\right) /; \nu \in \mathbb{N}$$

01.20.21.3828.01

$$\int e^{p z} \cos^{m}(c z) \cosh^{\nu}(a z)\, dz ==$$

$$\frac{2^{-m} e^{p z} \cosh^{\nu}(a z)(1-m \bmod 2)\left(1+e^{2 a z}\right)^{-\nu}}{p-a \nu}\binom{m}{\frac{m}{2}}{}_2F_1\left(\frac{p-a \nu}{2 a}, -\nu; \frac{p-a \nu}{2 a}+1; -e^{2 a z}\right)+2^{-m} \cosh^{\nu}(a z)\left(1+e^{2 a z}\right)^{-\nu}$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\frac{e^{(p+c i (m-2 s)) z}}{p+c i (m-2 s)-a \nu}{}_2F_1\left(\frac{p+c i (m-2 s)-a \nu}{2 a}, -\nu; \frac{p+c i (m-2 s)-a \nu}{2 a}+1; -e^{2 a z}\right)+\right.$$

$$\left.\frac{e^{(p-i c (m-2 s)) z}}{p-i c (m-2 s)-a \nu}{}_2F_1\left(\frac{p-i c (m-2 s)-a \nu}{2 a}, -\nu; \frac{p-i c (m-2 s)-a \nu}{2 a}+1; -e^{2 a z}\right)\right) /; m \in \mathbb{N}$$

Involving $e^{p z} \cos^{\mu}(c z+d) \cosh^{\nu}(a z)$

01.20.21.3829.01

$$\int e^{p z} \cos^{\mu}(d+c z) \cosh^{\nu}(a z)\, dz ==$$

$$\frac{2^{-\nu}\, e^{p z} \left(1+e^{2 (i d+i c z)}\right)^{-\mu} (1-\nu \bmod 2)}{p-i c \mu} \binom{\nu}{\frac{\nu}{2}} \cos^{\mu}(d+c z)\, {}_2F_1\left(-\frac{i (p-i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i p}{c}-\mu+2\right); -e^{2 (i d+i c z)}\right) +$$

$$2^{-\nu} \left(1+e^{-2 (i d+i c z)}\right)^{-\mu} \cos^{\mu}(d+c z) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{e^{(p+a (\nu-2 s)) z}}{p+a (\nu-2 s)+i c \mu} \right.$$

$${}_2F_1\left(\frac{i (p+a (\nu-2 s)+i c \mu)}{2 c}, -\mu; \frac{i (p+a (\nu-2 s)+c i (\mu-2))}{2 c}; -e^{-2 (i d+i c z)}\right) - \frac{e^{(p-a (\nu-2 s)) z}}{-p+a (\nu-2 s)-i c \mu}$$

$$\left. {}_2F_1\left(\frac{i (p-a (\nu-2 s)+i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i (a (\nu-2 s)-p)}{c}-\mu+2\right); -e^{-2 (i d+i c z)}\right) \right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3830.01

$$\int e^{p z} \cos^{m}(d+c z) \cosh^{\nu}(a z)\, dz == \frac{2^{-m}\, e^{p z} \left(1+e^{-2 a z}\right)^{-\nu} \cosh^{\nu}(a z)}{p+a \nu} \binom{m}{\frac{m}{2}}$$

$${}_2F_1\left(-\frac{p+a \nu}{2 a}, -\nu; \frac{1}{2}\left(-\frac{p}{a}-\nu+2\right); -e^{-2 a z}\right) (1-m \bmod 2) + 2^{-m} \left(1+e^{2 a z}\right)^{-\nu} \cosh^{\nu}(a z)$$

$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{-i d (m-2 s)} \binom{m}{s} \left(\frac{e^{2 d i (m-2 s)+(p+c i (m-2 s)) z}}{p+c i (m-2 s)-a \nu}\, {}_2F_1\left(\frac{p+c i (m-2 s)-a \nu}{2 a}, -\nu; \frac{p+c i (m-2 s)-a (\nu-2)}{2 a}; -e^{2 a z}\right) - \right.$$

$$\left. \frac{e^{(p-i c (m-2 s)) z}}{-p+c i (m-2 s)+a \nu}\, {}_2F_1\left(\frac{p-i c (m-2 s)-a \nu}{2 a}, -\nu; \frac{1}{2}\left(-\frac{i c (m-2 s)-p}{a}-\nu+2\right); -e^{2 a z}\right) \right) /;\ m \in \mathbb{N}^+$$

01.20.21.3831.01

$$\int e^{p z} \cos^{m}(d+c z) \cosh^{\nu}(a z)\, dz ==$$

$$2^{-m-\nu} \left(\binom{\nu}{\frac{\nu}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{-i d (m-2 s)} \left(\frac{e^{2 i d (m-2 s)-(-p-i c (m-2 s)) z}}{-p-i c (m-2 s)} + \frac{e^{-(i c (m-2 s)-p) z}}{i c (m-2 s)-p} \right) \binom{m}{s} \right) (\nu \bmod 2-1) + \right.$$

$$\frac{e^{p z} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (m \bmod 2-1) (\nu \bmod 2-1)}{p} + \binom{m}{\frac{m}{2}} (m \bmod 2-1) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\frac{e^{(p+a (\nu-2 s)) z}}{-p-a (\nu-2 s)} + \frac{e^{-(-p-2 a s+a \nu) z}}{-p-2 a s+a \nu} \right) \binom{\nu}{s} -$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-i d (2 k+m)} \left(e^{2 i d m} \left(\frac{e^{-(c i (2 k-m)-p+2 a s-a \nu) z}}{c i (2 k-m)-p+2 a s-a \nu} + \frac{e^{-(c i (2 k-m)-p-2 a s+a \nu) z}}{c i (2 k-m)-p-2 a s+a \nu} \right) + \right.$$

$$\left. \left. e^{4 i d k} \left(\frac{e^{-(-2 c i k+i c m-p+2 a s-a \nu) z}}{-2 c i k+i c m-p+2 a s-a \nu} + \frac{e^{-(c i (m-2 k)-p-2 a s+a \nu) z}}{c i (m-2 k)-p-2 a s+a \nu} \right) \right) \binom{\nu}{s} \right) /;\ m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

Involving $e^{p z} \cos^{\mu}(c z) \cosh^{\nu}(a z + b)$

01.20.21.3832.01

$$\int e^{p z} \cos^{\mu}(c z) \cosh^{\nu}(b + a z)\, dz == \frac{2^{-\nu} e^{p z} \left(1 + e^{2 i c z}\right)^{-\mu} (1 - \nu \bmod 2)}{p - i c \mu} \binom{\nu}{\frac{\nu}{2}}$$
$$\cos^{\mu}(c z)\, {}_2F_1\left(-\frac{i (p - i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i p}{c} - \mu + 2\right); -e^{2 i c z}\right) + 2^{-\nu} \left(1 + e^{-2 i c z}\right)^{-\mu} \cos^{\mu}(c z)$$
$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (\nu - 2 s)} \binom{\nu}{s} \left(\frac{e^{2 b (\nu - 2 s) + (p + a (\nu - 2 s)) z}}{p + a (\nu - 2 s) + i c \mu}\, {}_2F_1\left(\frac{i (p + a (\nu - 2 s) + i c \mu)}{2 c}, -\mu; \frac{i (p + a (\nu - 2 s) + c i (\mu - 2))}{2 c}; -e^{-2 i c z}\right) - \right.$$
$$\left. \frac{e^{(p - a (\nu - 2 s)) z}}{-p + a (\nu - 2 s) - i c \mu}\, {}_2F_1\left(\frac{i (p - a (\nu - 2 s) + i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i (a (\nu - 2 s) - p)}{c} - \mu + 2\right); -e^{-2 i c z}\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3833.01

$$\int e^{p z} \cos^{m}(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-m} \cosh^{\nu}(b + a z)$$
$$\left(\left(1 + e^{2 (b + a z)}\right)^{-\nu} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\frac{e^{(p + c i (m - 2 s)) z}}{p + c i (m - 2 s) - a \nu}\, {}_2F_1\left(\frac{p + c i (m - 2 s) - a \nu}{2 a}, -\nu; \frac{p + c i (m - 2 s) - a (\nu - 2)}{2 a}; -e^{2 (b + a z)}\right) + \right.\right.$$
$$\left.\left. \frac{e^{(p - i c (m - 2 s)) z}}{p - i c (m - 2 s) - a \nu}\, {}_2F_1\left(\frac{p - i c (m - 2 s) - a \nu}{2 a}, -\nu; \frac{p - i c (m - 2 s) - a (\nu - 2)}{2 a}; -e^{2 (b + a z)}\right)\right) -$$
$$\left. \frac{e^{p z} \left(1 + e^{-2 (b + a z)}\right)^{-\nu} (m \bmod 2 - 1)}{p + a \nu} \binom{m}{\frac{m}{2}}\, {}_2F_1\left(-\frac{p + a \nu}{2 a}, -\nu; \frac{1}{2}\left(-\frac{p}{a} - \nu + 2\right); -e^{-2 (b + a z)}\right) \right) /; m \in \mathbb{N}^+$$

01.20.21.3834.01

$$\int e^{p z} \cos^{m}(c z) \cosh^{\nu}(b + a z)\, dz ==$$
$$2^{-m-\nu} \left(\binom{\nu}{\frac{\nu}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\frac{e^{-(-p - i c (m - 2 s)) z}}{-p - i c (m - 2 s)} + \frac{e^{-(i c (m - 2 s) - p) z}}{i c (m - 2 s) - p} \right) \binom{m}{s} \right) (\nu \bmod 2 - 1) + \frac{e^{p z} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (m \bmod 2 - 1) (\nu \bmod 2 - 1)}{p} + \right.$$
$$\binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (2 s + \nu)} \left(\frac{e^{2 b \nu - (-p - a (\nu - 2 s)) z}}{-p - a (\nu - 2 s)} + \frac{e^{4 b s - (-p - 2 a s + a \nu) z}}{-p - 2 a s + a \nu} \right) \binom{\nu}{s} -$$
$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (2 s + \nu)} \left(\frac{e^{4 b s - (c i (m - 2 k) - p - 2 a s + a \nu) z}}{c i (m - 2 k) - p - 2 a s + a \nu} + \frac{e^{2 b \nu - (c i (2 k - m) - p + 2 a s - a \nu) z}}{c i (2 k - m) - p + 2 a s - a \nu} + \right.$$
$$\left. \left. \frac{e^{2 b \nu - (-2 c i k + i c m - p + 2 a s - a \nu) z}}{-2 c i k + i c m - p + 2 a s - a \nu} + \frac{e^{4 b s - (c i (2 k - m) - p - 2 a s + a \nu) z}}{c i (2 k - m) - p - 2 a s + a \nu} \right) \binom{\nu}{s} \right) /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

Involving $e^{p z} \cos^{\mu}(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.3835.01

$$\int e^{p z} \cos^{\mu}(d + c z) \cosh^{\nu}(b + a z)\, dz ==$$

$$\frac{2^{-\nu} e^{p z} \left(1 + e^{2 (i d + i c z)}\right)^{-\mu} (1 - \nu \bmod 2)}{p - i c \mu} \binom{\nu}{\frac{\nu}{2}} \cos^{\mu}(d + c z)\, {}_2F_1\left(-\frac{i (p - i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i p}{c} - \mu + 2\right); -e^{2 (i d + i c z)}\right) +$$

$$2^{-\nu} \left(1 + e^{-2 (i d + i c z)}\right)^{-\mu} \cos^{\mu}(d + c z) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (\nu - 2 s)} \binom{\nu}{s} \left(\frac{e^{2 b (\nu - 2 s) + (p + a (\nu - 2 s)) z}}{p + a (\nu - 2 s) + i c \mu} \right.$$

$$\left. {}_2F_1\left(\frac{i (p + a (\nu - 2 s) + i c \mu)}{2 c}, -\mu; \frac{i (p + a (\nu - 2 s) + c i (\mu - 2))}{2 c}; -e^{-2 (i d + i c z)}\right) - \right.$$

$$\left. \frac{e^{(p - a (\nu - 2 s)) z}}{-p + a (\nu - 2 s) - i c \mu} {}_2F_1\left(\frac{i (p - a (\nu - 2 s) + i c \mu)}{2 c}, -\mu; \frac{1}{2}\left(-\frac{i (a (\nu - 2 s) - p)}{c} - \mu + 2\right); -e^{-2 (i d + i c z)}\right) \right) /; \nu \in \mathbb{N}^+$$

01.20.21.3836.01

$$\int e^{p z} \cos^{m}(d + c z) \cosh^{\nu}(b + a z)\, dz == \frac{2^{-m} e^{p z} \left(1 + e^{-2 (b + a z)}\right)^{-\nu} \cosh^{\nu}(b + a z) (1 - m \bmod 2)}{p + a \nu}$$

$$\binom{m}{\frac{m}{2}} {}_2F_1\left(-\frac{p + a \nu}{2 a}, -\nu; \frac{1}{2}\left(-\frac{p}{a} - \nu + 2\right); -e^{-2 (b + a z)}\right) + 2^{-m} \left(1 + e^{2 (b + a z)}\right)^{-\nu} \cosh^{\nu}(b + a z)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{-i d (m - 2 s)} \binom{m}{s} \left(\frac{e^{2 d i (m - 2 s) + (p + c i (m - 2 s)) z}}{p + c i (m - 2 s) - a \nu} {}_2F_1\left(\frac{p + c i (m - 2 s) - a \nu}{2 a}, -\nu; \frac{p + c i (m - 2 s) - a (\nu - 2)}{2 a}; -e^{2 (b + a z)}\right) - \right.\right.$$

$$\left.\left. \frac{e^{(p - i c (m - 2 s)) z}}{-p + c i (m - 2 s) + a \nu} {}_2F_1\left(\frac{p - i c (m - 2 s) - a \nu}{2 a}, -\nu; \frac{1}{2}\left(-\frac{i c (m - 2 s) - p}{a} - \nu + 2\right); -e^{2 (b + a z)}\right) \right) /; m \in \mathbb{N}^+$$

01.20.21.3837.01

$$\int e^{p z} \cos^m(d + c z) \cosh^v(b + a z)\, dz ==$$

$$2^{-m-v}\left(\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-i d (m-2 s)}\left(\frac{e^{2 i d (m-2 s)-(-p-i c (m-2 s)) z}}{-p-i c (m-2 s)}+\frac{e^{-(i c (m-2 s)-p) z}}{i c (m-2 s)-p}\right)\binom{m}{s}\right)(v \bmod 2-1)+\right.$$

$$\frac{e^{p z}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{p}+$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-b (2 s+v)}\left(\frac{e^{2 b v-(-p-a (v-2 s)) z}}{-p-a (v-2 s)}+\frac{e^{4 b s-(-p-2 a s+a v) z}}{-p-2 a s+a v}\right)\binom{v}{s}-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-i d (2 k+m)-b (2 s+v)}\left(e^{2 i d m}\left(\frac{e^{2 b v-(c i (2 k-m)-p+2 a s-a v) z}}{c i (2 k-m)-p+2 a s-a v}+\frac{e^{4 b s-(c i (2 k-m)-p-2 a s+a v) z}}{c i (2 k-m)-p-2 a s+a v}\right)+e^{4 i d k}\right.$$

$$\left.\left.\left(\frac{e^{2 b v-(-2 c i k+i c m-p+2 a s-a v) z}}{-2 c i k+i c m-p+2 a s-a v}+\frac{e^{4 b s-(c i (m-2 k)-p-2 a s+a v) z}}{c i (m-2 k)-p-2 a s+a v}\right)\right)\binom{v}{s}\right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

Involving $e^{p z^r} \cos^m(b z^r) \cosh^v(c z)$

01.20.21.3838.01

$$\int e^{p z^2} \cos^m\left(b z^2\right) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\binom{m}{s} \left((p+b\,i\,(m-2\,s)) \sqrt{p-i\,b\,(m-2\,s)}\ \operatorname{erfi}\left(\frac{2\,p\,z-2\,i\,b\,(m-2\,s)\,z}{2\sqrt{p-i\,b\,(m-2\,s)}} \right) + \right.\right.\right.$$

$$\left.\left.\left. \sqrt{p+b\,i\,(m-2\,s)}\ (p-i\,b\,(m-2\,s)) \operatorname{erfi}\left(\sqrt{p+b\,i\,(m-2\,s)}\ z \right) \right) \right) \Big/ ((p-i\,b\,(m-2\,s))\,(p+b\,i\,(m-2\,s))) \right)$$

$$(1-v \bmod 2) + \frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\ z\right) (1-m \bmod 2)\,(1-v \bmod 2)}{\sqrt{p}} +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,p}} \operatorname{erfi}\left(\frac{2\,p\,z-c\,(v-2\,s)}{2\sqrt{p}} \right) + e^{-\frac{c^2\,(v-2\,s)^2}{4\,p}} \operatorname{erfi}\left(\frac{c\,(v-2\,s)+2\,p\,z}{2\sqrt{p}} \right) \right) \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\left(e^{-\frac{(2\,c\,k-c\,v)^2}{4\,(-i\,b\,m+p+2\,i\,b\,s)}} \sqrt{-i\,b\,m+p+2\,i\,b\,s}\ (i\,b\,m+p-2\,i\,b\,s) \right.\right.$$

$$\left. \operatorname{erfi}\left(\frac{2\,c\,k-c\,v+2\,(-i\,b\,m+p+2\,i\,b\,s)\,z}{2\sqrt{-i\,b\,m+p+2\,i\,b\,s}} \right) + e^{-\frac{(c\,v-2\,c\,k)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}} (-i\,b\,m+p+2\,i\,b\,s) \sqrt{i\,b\,m+p-2\,i\,b\,s} \right.$$

$$\left.\left. \operatorname{erfi}\left(\frac{-2\,c\,k+c\,v+2\,p\,z-2\,(2\,i\,b\,s-i\,b\,m)\,z}{2\sqrt{i\,b\,m+p-2\,i\,b\,s}} \right) \right) \Big/ ((i\,b\,m+p-2\,i\,b\,s)\,(-i\,b\,m+p+2\,i\,b\,s)) + \right.$$

$$\left(e^{-\frac{(c\,v-2\,c\,k)^2}{4\,(-i\,b\,m+p+2\,i\,b\,s)}} \sqrt{-i\,b\,m+p+2\,i\,b\,s}\ (i\,b\,m+p-2\,i\,b\,s) \operatorname{erfi}\left(\frac{-2\,c\,k+c\,v+2\,p\,z-2\,(i\,b\,m-2\,i\,b\,s)\,z}{2\sqrt{-i\,b\,m+p+2\,i\,b\,s}} \right) + \right.$$

$$\left.\left. e^{-\frac{(2\,c\,k-c\,v)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}} (-i\,b\,m+p+2\,i\,b\,s) \sqrt{i\,b\,m+p-2\,i\,b\,s}\ \operatorname{erfi}\left(\frac{2\,c\,k-c\,v+2\,(i\,b\,m+p-2\,i\,b\,s)\,z}{2\sqrt{i\,b\,m+p-2\,i\,b\,s}} \right) \right) \Big/ \right.$$

$$\left. ((i\,b\,m+p-2\,i\,b\,s)\,(-i\,b\,m+p+2\,i\,b\,s)) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3839.01

$$\int e^{p\sqrt{z}}\cos^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz ==$$

$$2^{-m-v+2}\,e^{p\sqrt{z}}\binom{v}{\frac{v}{2}}\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\binom{m}{s}\left(\left(\sqrt{z}\;p^3-p^2+b^2\,(m-2\,s)^2\left(\sqrt{z}\;p+1\right)\right)\cos\left(b\,(m-2\,s)\,\sqrt{z}\right)-b\,(m-2\,s)\right.\right.\right.$$

$$\left.\left.\left.\left(-\sqrt{z}\;p^2+2\,p-b^2\,(m-2\,s)^2\,\sqrt{z}\right)\sin\left(b\,(m-2\,s)\,\sqrt{z}\right)\right)\right)\Big/\left((i\,b\,(m-2\,s)-p)^2\,(p+b\,i\,(m-2\,s))^2\right)\right)$$

$$(1-v\bmod 2)+\frac{2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{p^2}+$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{e^{\frac{p^2}{4\,c\,(v-2\,s)}}\,p\sqrt{\pi}\;\operatorname{erfi}\left(\frac{p-2\,c\,(v-2\,s)\,\sqrt{z}}{2\sqrt{-c\,(v-2\,s)}}\right)}{(-c\,(v-2\,s))^{3/2}}+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\;p+c\,(v-2\,s)\,z}}{c\,(v-2\,s)}-\frac{2\,e^{p\sqrt{z}-c\,(v-2\,s)\,z}}{c\,(v-2\,s)}-\frac{e^{-\frac{p^2}{4\,c\,(v-2\,s)}}\,p\sqrt{\pi}\;\operatorname{erfi}\left(\frac{p+2\,c\,(v-2\,s)\,\sqrt{z}}{2\sqrt{c\,(v-2\,s)}}\right)}{(c\,(v-2\,s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\frac{2\,e^{-c\,(2\,k+v)\,z}\left(e^{(p-i\,b\,(m-2\,s))\,\sqrt{z}}+e^{(p+b\,i\,(m-2\,s))\,\sqrt{z}}\right)\left(e^{4\,c\,k\,z}-e^{2\,c\,v\,z}\right)}{c\,(2\,k-v)}+\right.$$

$$\frac{e^{\frac{(-i\,b\,m+p+2\,i\,b\,s)^2}{c\,(8\,k-4\,v)}}\sqrt{\pi}\;(i\,b\,(m-2\,s)-p)\operatorname{erfi}\left(\frac{-p+b\,i\,(m-2\,s)+2\,c\,(2\,k-v)\,\sqrt{z}}{2\sqrt{c\,(v-2\,k)}}\right)}{c\,(2\,k-v)\sqrt{c\,(v-2\,k)}}+$$

$$\frac{e^{\frac{(p+b\,i\,(m-2\,s))^2}{c\,(8\,k-4\,v)}}\sqrt{\pi}\;(p+b\,i\,(m-2\,s))\operatorname{erfi}\left(\frac{p+b\,i\,(m-2\,s)+2\,c\,(v-2\,k)\,\sqrt{z}}{2\sqrt{c\,(v-2\,k)}}\right)}{c\,(2\,k-v)\sqrt{c\,(v-2\,k)}}-$$

$$\frac{1}{(c\,(2\,k-v))^{3/2}}\left(e^{-\frac{(-i\,b\,m+p+2\,i\,b\,s)^2}{c\,(8\,k-4\,v)}}\sqrt{\pi}\;(-i\,b\,m+p+2\,i\,b\,s)\operatorname{erfi}\left(\frac{-i\,b\,m+p+2\,i\,b\,s+2\,c\,(2\,k-v)\,\sqrt{z}}{2\sqrt{c\,(2\,k-v)}}\right)\right)-$$

$$\left.\frac{e^{-\frac{(p+b\,i\,(m-2\,s))^2}{c\,(8\,k-4\,v)}}\sqrt{\pi}\;(p+b\,i\,(m-2\,s))\operatorname{erfi}\left(\frac{p+b\,i\,(m-2\,s)+2\,c\,(2\,k-v)\,\sqrt{z}}{2\sqrt{c\,(2\,k-v)}}\right)}{(c\,(2\,k-v))^{3/2}}\right)/;\;m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p z^r} \cos^m(b z) \cosh^v(c z)$

01.20.21.3840.01

$$\int e^{p z^2} \cos^m(b z) \cosh^v(c z)\, dz == \frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{\frac{b^2 (m-2s)^2}{4p}} \binom{m}{s} \left(\operatorname{erfi}\left(\frac{2 p z - i b (m-2 s)}{2 \sqrt{p}} \right) + \operatorname{erfi}\left(\frac{b i (m-2 s) + 2 p z}{2 \sqrt{p}} \right) \right) \right) +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{-\frac{c^2 (v-2s)^2}{4p}} \binom{v}{s} \left(\operatorname{erfi}\left(\frac{2 p z - c (v-2 s)}{2 \sqrt{p}} \right) + \operatorname{erfi}\left(\frac{c (v-2 s) + 2 p z}{2 \sqrt{p}} \right) \right) \right) +$$

$$\frac{1}{\sqrt{p}} \left(2^{-m-v-1} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{(-2ck - ibm + 2ibs + cv)^2}{4p}} \operatorname{erfi}\left(\frac{-2ck - ibm + 2ibs + cv + 2pz}{2\sqrt{p}} \right) + e^{-\frac{(-2ck + ibm - 2ibs + cv)^2}{4p}} \right.\right.$$

$$\left. \operatorname{erfi}\left(\frac{-2ck + ibm - 2ibs + cv + 2pz}{2\sqrt{p}} \right) + e^{-\frac{(2ck - ibm + 2ibs - cv)^2}{4p}} \operatorname{erfi}\left(\frac{2ck - ibm + 2ibs - cv + 2pz}{2\sqrt{p}} \right) + \right.$$

$$\left.\left. e^{-\frac{(2ck + ibm - 2ibs - cv)^2}{4p}} \operatorname{erfi}\left(\frac{2ck + ibm - 2ibs - cv + 2pz}{2\sqrt{p}} \right) \right) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3841.01

$$\int e^{p \sqrt{z}} \cos^m(b z) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\frac{2 i e^{p \sqrt{z} - i b (m-2s) z}}{b (m-2 s)} - \frac{2 i e^{\sqrt{z}\, p + b i (m-2s) z}}{b (m-2 s)} - \frac{e^{-\frac{i p^2}{4 b (m-2s)}}\, p \sqrt{\pi}\, \operatorname{erfi}\left(\frac{p - 2 i b (m-2s) \sqrt{z}}{2 \sqrt{-i b (m-2s)}} \right)}{(-i b (m-2 s))^{3/2}} - \right.\right.$$

$$\left.\left. \frac{e^{\frac{i p^2}{4 b (m-2s)}}\, p \sqrt{\pi}\, \operatorname{erfi}\left(\frac{p + 2 b i (m-2s) \sqrt{z}}{2 \sqrt{i b (m-2s)}} \right)}{(i b (m-2 s))^{3/2}} \right) (1 - v \bmod 2) \right) +$$

$$\frac{2^{-m-v+1} e^{p \sqrt{z}} \left(p \sqrt{z} - 1 \right) \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p^2} + 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(- \frac{e^{\frac{p^2}{4 c (v-2s)}}\, p \sqrt{\pi}\, \operatorname{erfi}\left(\frac{p - 2 c (v-2s) \sqrt{z}}{2 \sqrt{-c (v-2s)}} \right)}{(-c (v-2 s))^{3/2}} + \frac{2 e^{\sqrt{z}\, p + c (v-2s) z}}{c (v-2 s)} - \right.$$

$$\frac{2\,e^{p\sqrt{z}-c(v-2s)z}}{c(v-2s)}-\frac{e^{-\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\Bigg)+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(2\,e^{p\sqrt{z}}\left(\frac{2\sinh((c(2k-v)-i\,b(m-2s))z)}{c(2k-v)-i\,b(m-2s)}+\frac{2\sinh((b\,i(m-2s)+c(2k-v))z)}{b\,i(m-2s)+c(2k-v)}\right)-$$

$$\frac{e^{-\frac{p^2}{4(-2ck-ibm+2ibs+cv)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(-2ck-ibm+2ibs+cv)\sqrt{z}}{2\sqrt{-2ck-ibm+2ibs+cv}}\right)}{(-2ck-ibm+2ibs+cv)^{3/2}}-$$

$$\frac{e^{-\frac{p^2}{4(-2ck+ibm-2ibs+cv)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(-2ck+ibm-2ibs+cv)\sqrt{z}}{2\sqrt{-2ck+ibm-2ibs+cv}}\right)}{(-2ck+ibm-2ibs+cv)^{3/2}}-$$

$$\frac{e^{-\frac{p^2}{4(2ck-ibm+2ibs-cv)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(2ck-ibm+2ibs-cv)\sqrt{z}}{2\sqrt{2ck-ibm+2ibs-cv}}\right)}{(2ck-ibm+2ibs-cv)^{3/2}}-$$

$$\frac{e^{-\frac{p^2}{4(2ck+ibm-2ibs-cv)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2(2ck+ibm-2ibs-cv)\sqrt{z}}{2\sqrt{2ck+ibm-2ibs-cv}}\right)}{(2ck+ibm-2ibs-cv)^{3/2}}\Bigg)\Bigg/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p\,z}\cos^m(b\,z^r)\cosh^v(c\,z)$

01.20.21.3842.01

$$\int e^{p z} \cos^m\left(b z^2\right) \cosh^v(c z)\, dz == \frac{2^{-m-v}\, e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{p} +$$

$$\frac{1}{b}\left(i\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2s}\left(\binom{m}{s}\left(e^{-\frac{i p^2}{4 b (m-2 s)}}\sqrt{-i b (m-2 s)}\ \operatorname{erfi}\left(\frac{p - 2 i b (m-2 s) z}{2\sqrt{-i b (m-2 s)}}\right) - \right.\right.\right.\right.$$

$$\left.\left.\left.\left. e^{\frac{i p^2}{4 b (m-2 s)}}\sqrt{i b (m-2 s)}\ \operatorname{erfi}\left(\frac{p + 2 b i (m-2 s) z}{2\sqrt{i b (m-2 s)}}\right)\right)\right)\right) +$$

$$2^{-m-v+1}\, e^{p z}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}(c (v-2 s)\sinh(c (v-2 s) z) - p\cosh(c (v-2 s) z))}{(c (v-2 s) - p)(p + c (v-2 s))} +$$

$$2^{-m-v+1}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\left(e^{-\frac{(2 c k + p - c v)^2}{4 (2 i b s - i b m)}}\sqrt{2 i b s - i b m}\ (i b m - 2 i b s)\operatorname{erfi}\left(\frac{2 c k + p - c v + 2 (2 i b s - i b m) z}{2\sqrt{2 i b s - i b m}}\right) + \right.\right.$$

$$\left.\left. e^{-\frac{(-2 c k + p + c v)^2}{4 (i b m - 2 i b s)}}(2 i b s - i b m)\sqrt{i b m - 2 i b s}\ \operatorname{erfi}\left(\frac{-2 c k + p + c v - 2 (2 i b s - i b m) z}{2\sqrt{i b m - 2 i b s}}\right)\right) \Big/ (4\right.$$

$$\left.(i b m - 2 i b s)(2 i b s - i b m)) + \right.$$

$$\left(e^{-\frac{(-2 c k + p + c v)^2}{4 (2 i b s - i b m)}}\sqrt{2 i b s - i b m}\ (i b m - 2 i b s)\operatorname{erfi}\left(\frac{-2 c k + p + c v - 2 (i b m - 2 i b s) z}{2\sqrt{2 i b s - i b m}}\right) + \right.$$

$$\left. e^{-\frac{(2 c k + p - c v)^2}{4 (i b m - 2 i b s)}}(2 i b s - i b m)\sqrt{i b m - 2 i b s}\ \operatorname{erfi}\left(\frac{2 c k + p - c v + 2 (i b m - 2 i b s) z}{2\sqrt{i b m - 2 i b s}}\right)\right) \Big/$$

$$\left.(4 (i b m - 2 i b s)(2 i b s - i b m))\right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3843.01

$$\int e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\frac{4 e^{p z} \cos\left(b (m-2 s) \sqrt{z}\right)}{p} + \frac{b e^{-\frac{(2 i b s - i b m)^2}{4 p}} i \sqrt{\pi}\, (m-2 s) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - i b (m-2 s)}{2 \sqrt{p}}\right)}{p^{3/2}} - \right.\right.$$

$$\left.\left. \frac{i b e^{\frac{b^2 (m-2 s)^2}{4 p}} \sqrt{\pi}\, (m-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z}\, p + b i (m-2 s)}{2 \sqrt{p}}\right)}{p^{3/2}} \right) \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} + 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\frac{e^{(p - c (v-2 s)) z}}{p - c (v-2 s)} + \frac{e^{(p + c (v-2 s)) z}}{p + c (v-2 s)} \right) \binom{v}{s} +$$

$$2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(2 \left(\frac{2 e^{(2 c k + p - c v) z} \cos\left(b (m-2 s) \sqrt{z}\right)}{2 c k + p - c v} + \frac{2 e^{(p + c (v-2 k)) z} \cos\left(b (m-2 s) \sqrt{z}\right)}{p + c (v-2 k)} \right) - \right.$$

$$\frac{e^{-\frac{(2 i b s - i b m)^2}{4 (-2 c k + p + c v)}} \sqrt{\pi}\, (2 i b s - i b m) \operatorname{erfi}\left(\frac{-i b m + 2 i b s + 2 (-2 c k + p + c v) \sqrt{z}}{2 \sqrt{-2 c k + p + c v}}\right)}{(-2 c k + p + c v)^{3/2}} -$$

$$\frac{e^{-\frac{(2 i b s - i b m)^2}{4 (2 c k + p - c v)}} \sqrt{\pi}\, (2 i b s - i b m) \operatorname{erfi}\left(\frac{-i b m + 2 i b s + 2 (2 c k + p - c v) \sqrt{z}}{2 \sqrt{2 c k + p - c v}}\right)}{(2 c k + p - c v)^{3/2}} -$$

$$\frac{e^{-\frac{(i b m - 2 i b s)^2}{4 (2 c k + p - c v)}} \sqrt{\pi}\, (i b m - 2 i b s) \operatorname{erfi}\left(\frac{i b m - 2 i b s + 2 (2 c k + p - c v) \sqrt{z}}{2 \sqrt{2 c k + p - c v}}\right)}{(2 c k + p - c v)^{3/2}} -$$

$$\left. \frac{i b e^{\frac{b^2 (m-2 s)^2}{4 (p + c (v-2 k))}} \sqrt{\pi}\, (m-2 s) \operatorname{erfi}\left(\frac{i b m - 2 i b s + 2 (p + c (v-2 k)) \sqrt{z}}{2 \sqrt{p + c (v-2 k)}}\right)}{(p + c (v-2 k))^{3/2}} \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

Involving $e^{p z} \cos^m(b z) \cosh^v\left(c z^r\right)$

01.20.21.3844.01

$$\int e^{p z} \cos^m(b z) \cosh^v\left(c z^2\right) dz == 2^{-m-v} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\frac{e^{(p-i b (m-2 s)) z}}{p - i b (m-2 s)} + \frac{e^{(p+b i (m-2 s)) z}}{p + b i (m-2 s)} \right) \binom{m}{s} \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} - \frac{1}{c} \left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \right.$$

$$\left. \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v - 2 s} \left(\binom{v}{s} \left(e^{\frac{p^2}{4 c (v-2 s)}} \sqrt{-c (v-2 s)} \operatorname{erfi}\left(\frac{p - 2 c (v-2 s) z}{2 \sqrt{-c (v-2 s)}} \right) - e^{-\frac{p^2}{4 c (v-2 s)}} \sqrt{c (v-2 s)} \operatorname{erfi}\left(\frac{p + 2 c (v-2 s) z}{2 \sqrt{c (v-2 s)}} \right) \right) \right) \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\left(e^{-\frac{(i b m + p - 2 i b s)^2}{4 (c v - 2 c k)}} \sqrt{c v - 2 c k} \, (2 c k - c v) \operatorname{erfi}\left(\frac{i b m + p - 2 i b s - 2 (2 c k - c v) z}{2 \sqrt{c v - 2 c k}} \right) + \right. \right.$$

$$\left. e^{-\frac{(-i b m + p + 2 i b s)^2}{4 (2 c k - c v)}} (c v - 2 c k) \sqrt{2 c k - c v} \operatorname{erfi}\left(\frac{-i b m + p + 2 i b s + 2 (2 c k - c v) z}{2 \sqrt{2 c k - c v}} \right) \right) \Big/ ((2 c k - c v)$$

$$(c v - 2 c k)) + \left(e^{-\frac{(-i b m + p + 2 i b s)^2}{4 (c v - 2 c k)}} \sqrt{c v - 2 c k} \, (2 c k - c v) \operatorname{erfi}\left(\frac{-i b m + p + 2 i b s - 2 (2 c k - c v) z}{2 \sqrt{c v - 2 c k}} \right) + \right.$$

$$\left. \left. e^{-\frac{(i b m + p - 2 i b s)^2}{4 (2 c k - c v)}} (c v - 2 c k) \sqrt{2 c k - c v} \operatorname{erfi}\left(\frac{i b m + p - 2 i b s + 2 (2 c k - c v) z}{2 \sqrt{2 c k - c v}} \right) \right) \Big/ \right.$$

$$\left. ((2 c k - c v) (c v - 2 c k)) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3845.01

$$\int e^{p z} \cos^m(b z) \cosh^v\left(c \sqrt{z}\right) dz == (-1)^v 2^{-m-v} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\frac{e^{(b i (m-2k)+p) z}}{b i (m-2k)+p} + \frac{e^{(p-i b (m-2k)) z}}{p - i b (m-2k)} \right) \binom{m}{k} \right) (1 - v \bmod 2) +$$

$$\frac{(-1)^v 2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} + 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{4 e^{p z} \cosh\left(c (v-2s) \sqrt{z}\right)}{p} - \frac{c e^{-\frac{c^2 (v-2s)^2}{4p}} \sqrt{\pi} (v-2s) \left(\operatorname{erfi}\left(\frac{2\sqrt{z} p + c (v-2s)}{2\sqrt{p}} \right) + \operatorname{erfi}\left(\frac{c (v-2s) - 2p\sqrt{z}}{2\sqrt{p}} \right) \right)}{p^{3/2}} \right) +$$

$$2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\frac{2 e^{(p-i b (2k-m)) z - c (v-2s) \sqrt{z}}}{p - i b (2k-m)} - \frac{c e^{-\frac{c^2 (v-2s)^2}{4 (p-i b (2k-m))}} \sqrt{\pi} (v-2s) \operatorname{erfi}\left(\frac{2\sqrt{z} (i b (2k-m) - p) + c (v-2s)}{2\sqrt{p - i b (2k-m)}} \right)}{(p - i b (2k-m))^{3/2}} + \right.$$

$$\frac{2 e^{c\sqrt{z} (v-2s) + (b i (2k-m)+p) z}}{b i (2k-m) + p} - \frac{c e^{-\frac{c^2 (v-2s)^2}{4 (b i (2k-m)+p)}} \sqrt{\pi} (v-2s) \operatorname{erfi}\left(\frac{2\sqrt{z} (b i (2k-m) + p) + c (v-2s)}{2\sqrt{b i (2k-m)+p}} \right)}{(b i (2k-m)+p)^{3/2}} +$$

$$\frac{2 e^{(p-i b (m-2k)) z - c (v-2s) \sqrt{z}}}{p - i b (m-2k)} - \frac{c e^{-\frac{c^2 (v-2s)^2}{4 (p-i b (m-2k))}} \sqrt{\pi} (v-2s) \operatorname{erfi}\left(\frac{2\sqrt{z} (i b (m-2k) - p) + c (v-2s)}{2\sqrt{p - i b (m-2k)}} \right)}{(p - i b (m-2k))^{3/2}} +$$

$$\left. \frac{2 e^{c\sqrt{z} (v-2s) + (b i (m-2k)+p) z}}{b i (m-2k) + p} - \frac{c e^{-\frac{c^2 (v-2s)^2}{4 (b i (m-2k)+p)}} \sqrt{\pi} (v-2s) \operatorname{erfi}\left(\frac{2\sqrt{z} (b i (m-2k) + p) + c (v-2s)}{2\sqrt{b i (m-2k)+p}} \right)}{(b i (m-2k)+p)^{3/2}} \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos^m(b z) \cosh^v\left(c z^r\right)$

01.20.21.3846.01

$$\int e^{p z^2} \cos^m(b z) \cosh^v\left(c z^2\right) dz == \frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} +$$

$$2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\binom{v}{s} \left((p + c (v - 2 s)) \sqrt{p - c (v - 2 s)}\, \operatorname{erfi}\left(\frac{2 p z - 2 c (v - 2 s) z}{2 \sqrt{p - c (v - 2 s)}} \right) + \right.\right.$$

$$\left.\left. \sqrt{p + c (v - 2 s)}\, (p - c (v - 2 s)) \operatorname{erfi}\left(\sqrt{p + c (v - 2 s)}\, z \right) \right) \right) \Big/ ((p - c (v - 2 s)) (p + c (v - 2 s))) + \frac{1}{\sqrt{p}}$$

$$\left(2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{\frac{b^2 (m-2 s)^2}{4 p}} \operatorname{erfi}\left(\frac{2 p z - i b (m - 2 s)}{2 \sqrt{p}} \right) + e^{\frac{b^2 (m-2 s)^2}{4 p}} \operatorname{erfi}\left(\frac{b i (m - 2 s) + 2 p z}{2 \sqrt{p}} \right) \right) \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\left(e^{-\frac{(i b m - 2 i b s)^2}{4 (-2 c k + p + c v)}} \sqrt{-2 c k + p + c v}\, (2 c k + p - c v) \right.\right.$$

$$\left. \operatorname{erfi}\left(\frac{i b m - 2 i b s + 2 p z - 2 (2 c k - c v) z}{2 \sqrt{-2 c k + p + c v}} \right) + e^{-\frac{(2 i b s - i b m)^2}{4 (2 c k + p - c v)}} (-2 c k + p + c v) \sqrt{2 c k + p - c v} \right.$$

$$\left.\left. \operatorname{erfi}\left(\frac{-i b m + 2 i b s + 2 (2 c k + p - c v) z}{2 \sqrt{2 c k + p - c v}} \right) \right) \Big/ ((2 c k + p - c v) (-2 c k + p + c v)) + \right.$$

$$\left(e^{-\frac{(2 i b s - i b m)^2}{4 (-2 c k + p + c v)}} \sqrt{-2 c k + p + c v}\, (2 c k + p - c v) \operatorname{erfi}\left(\frac{-i b m + 2 i b s + 2 p z - 2 (2 c k - c v) z}{2 \sqrt{-2 c k + p + c v}} \right) + \right.$$

$$\left. e^{-\frac{(i b m - 2 i b s)^2}{4 (2 c k + p - c v)}} (-2 c k + p + c v) \sqrt{2 c k + p - c v}\, \operatorname{erfi}\left(\frac{i b m - 2 i b s + 2 (2 c k + p - c v) z}{2 \sqrt{2 c k + p - c v}} \right) \right) \Big/$$

$$\left. ((2 c k + p - c v) (-2 c k + p + c v)) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3847.01

$$\int e^{p\sqrt{z}}\cos^m(b\,z)\cosh^v\left(c\sqrt{z}\right)dz == -2^{-m-v-1}\binom{v}{\frac{v}{2}}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{e^{-\frac{i\,p^2}{4\,b\,(m-2\,k)}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2\,i\,b\,(m-2\,k)\,\sqrt{z}}{2\sqrt{-i\,b\,(m-2\,k)}}\right)}{(-i\,b\,(m-2\,k))^{3/2}}+\frac{e^{\frac{i\,p^2}{4\,b\,(m-2\,k)}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\,b\,i\,\sqrt{z}\,(m-2\,k)+p}{2\sqrt{i\,b\,(m-2\,k)}}\right)}{(i\,b\,(m-2\,k))^{3/2}}+\frac{4\,e^{p\sqrt{z}}\sin(b\,(m-2\,k)\,z)}{b\,(2\,k-m)}\right)\right)$$

$$(1-v\bmod 2)+\frac{2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{p^2}+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{(p+c\,(v-2\,s))\sqrt{z}}\left(\frac{e^{-2\,c\,(v-2\,s)\sqrt{z}}\left(\sqrt{z}\,p-c\,(v-2\,s)\,\sqrt{z}-1\right)}{(p-c\,(v-2\,s))^2}+\frac{\sqrt{z}}{p+c\,(v-2\,s)}-\frac{1}{(-p-c\,(v-2\,s))^2}\right)\binom{v}{s}+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\frac{2\,i\,e^{(p+c\,(v-2\,s))\sqrt{z}-i\,b\,(2\,k-m)\,z}}{b\,(2\,k-m)}-\frac{2\,i\,e^{\sqrt{z}\,(p-c\,(v-2\,s))+b\,i\,(2\,k-m)\,z}}{b\,(2\,k-m)}+\frac{2\,i\,e^{(p+c\,(v-2\,s))\sqrt{z}-i\,b\,(m-2\,k)\,z}}{b\,(m-2\,k)}-\right.$$

$$\frac{2\,i\,e^{\sqrt{z}\,(p-c\,(v-2\,s))+b\,i\,(m-2\,k)\,z}}{b\,(m-2\,k)}-\frac{e^{-\frac{i\,(p+c\,(v-2\,s))^2}{4\,b\,(2\,k-m)}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-2\,i\,b\,\sqrt{z}\,(2\,k-m)+p+c\,(v-2\,s)}{2\sqrt{-i\,b\,(2\,k-m)}}\right)}{(-i\,b\,(2\,k-m))^{3/2}}+$$

$$\frac{c\,e^{-\frac{i\,(p+c\,(v-2\,s))^2}{4\,b\,(2\,k-m)}}\sqrt{\pi}\,(v-2\,s)\operatorname{erfi}\left(\frac{2\,b\,i\,\sqrt{z}\,(2\,k-m)-p-c\,(v-2\,s)}{2\sqrt{-i\,b\,(2\,k-m)}}\right)}{(-i\,b\,(2\,k-m))^{3/2}}-\frac{e^{\frac{i\,(p-c\,(v-2\,s))^2}{4\,b\,(2\,k-m)}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\,b\,i\,\sqrt{z}\,(2\,k-m)+p-c\,(v-2\,s)}{2\sqrt{i\,b\,(2\,k-m)}}\right)}{(i\,b\,(2\,k-m))^{3/2}}+$$

$$\frac{c\,e^{\frac{i\,(p-c\,(v-2\,s))^2}{4\,b\,(2\,k-m)}}\sqrt{\pi}\,(v-2\,s)\operatorname{erfi}\left(\frac{2\,b\,i\,\sqrt{z}\,(2\,k-m)+p-c\,(v-2\,s)}{2\sqrt{i\,b\,(2\,k-m)}}\right)}{(i\,b\,(2\,k-m))^{3/2}}-\frac{e^{-\frac{i\,(p+c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-2\,i\,b\,\sqrt{z}\,(m-2\,k)+p+c\,(v-2\,s)}{2\sqrt{-i\,b\,(m-2\,k)}}\right)}{(-i\,b\,(m-2\,k))^{3/2}}+$$

$$\frac{c\,e^{-\frac{i\,(p+c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\sqrt{\pi}\,(v-2\,s)\operatorname{erfi}\left(\frac{2\,b\,i\,\sqrt{z}\,(m-2\,k)-p-c\,(v-2\,s)}{2\sqrt{-i\,b\,(m-2\,k)}}\right)}{(-i\,b\,(m-2\,k))^{3/2}}-\frac{e^{\frac{i\,(p-c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\,p\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2\,b\,i\,\sqrt{z}\,(m-2\,k)+p-c\,(v-2\,s)}{2\sqrt{i\,b\,(m-2\,k)}}\right)}{(i\,b\,(m-2\,k))^{3/2}}+$$

$$\left.\frac{c\,e^{\frac{i\,(p-c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\sqrt{\pi}\,(v-2\,s)\operatorname{erfi}\left(\frac{2\,b\,i\,\sqrt{z}\,(m-2\,k)+p-c\,(v-2\,s)}{2\sqrt{i\,b\,(m-2\,k)}}\right)}{(i\,b\,(m-2\,k))^{3/2}}\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p\,z}\cos^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3848.01

$$\int e^{p z} \cos^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == \frac{2^{-m-v}\, e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{p} +$$

$$\frac{1}{b}\left(i\, 2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m-2s} \left(\binom{m}{s}\left(e^{-\frac{i p^2}{4 b (m-2s)}} \sqrt{-i b (m-2s)}\ \operatorname{erfi}\left(\frac{p - 2 i b (m-2s) z}{2\sqrt{-i b (m-2s)}}\right) - \right.\right.\right.$$

$$\left.\left.\left. e^{\frac{i p^2}{4 b (m-2s)}} \sqrt{i b (m-2s)}\ \operatorname{erfi}\left(\frac{p + 2 b i (m-2s) z}{2\sqrt{i b (m-2s)}}\right)\right)\right)\right) - \frac{1}{c}\left(2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \right.$$

$$\left. \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v-2s} \left(\binom{v}{s}\left(e^{\frac{p^2}{4 c (v-2s)}} \sqrt{-c (v-2s)}\ \operatorname{erfi}\left(\frac{p - 2 c (v-2s) z}{2\sqrt{-c (v-2s)}}\right) - e^{-\frac{p^2}{4 c (v-2s)}} \sqrt{c (v-2s)}\ \operatorname{erfi}\left(\frac{p + 2 c (v-2s) z}{2\sqrt{c (v-2s)}}\right)\right)\right)\right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\left(e^{-\frac{p^2}{4(-2ck+ibm-2ibs+cv)}} \sqrt{-2ck+ibm-2ibs+cv}\ (2ck-ibm+2ibs-cv) \right.\right.$$

$$\operatorname{erfi}\left(\frac{p - 2(2ck-ibm+2ibs-cv) z}{2\sqrt{-2ck+ibm-2ibs+cv}}\right) + e^{-\frac{p^2}{4(2ck-ibm+2ibs-cv)}} (-2ck+ibm-2ibs+cv)$$

$$\left.\sqrt{2ck-ibm+2ibs-cv}\ \operatorname{erfi}\left(\frac{p + 2(2ck-ibm+2ibs-cv) z}{2\sqrt{2ck-ibm+2ibs-cv}}\right)\right) \Big/ ((2ck-ibm+2ibs-cv)$$

$$(-2ck+ibm-2ibs+cv)) + \left(e^{-\frac{p^2}{4(-2ck-ibm+2ibs+cv)}} \sqrt{-2ck-ibm+2ibs+cv}\right.$$

$$(2ck+ibm-2ibs-cv) \operatorname{erfi}\left(\frac{p - 2(2ck+ibm-2ibs-cv) z}{2\sqrt{-2ck-ibm+2ibs+cv}}\right) + e^{-\frac{p^2}{4(2ck+ibm-2ibs-cv)}}$$

$$\left.(-2ck-ibm+2ibs+cv) \sqrt{2ck+ibm-2ibs-cv}\ \operatorname{erfi}\left(\frac{p + 2(2ck+ibm-2ibs-cv) z}{2\sqrt{2ck+ibm-2ibs-cv}}\right)\right) \Big/$$

$$\left.((2ck+ibm-2ibs-cv)(-2ck-ibm+2ibs+cv))\right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3849.01

$$\int e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh^v\left(c \sqrt{z}\right) dz ==$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\frac{4 e^{p z} \cos\left(b (m-2 s) \sqrt{z}\right)}{p} + \frac{b e^{-\frac{(2 i b s - i b m)^2}{4 p}} i \sqrt{\pi} (m-2 s) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - i b (m-2 s)}{2 \sqrt{p}}\right)}{p^{3/2}} - \right.\right.$$

$$\left.\left. \frac{i b e^{\frac{b^2 (m-2 s)^2}{4 p}} \sqrt{\pi} (m-2 s) \operatorname{erfi}\left(\frac{2 \sqrt{z}\ p + b i (m-2 s)}{2 \sqrt{p}}\right)}{p^{3/2}} \right) \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} + 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{4 e^{p z} \cosh\left(c (2 k - v) \sqrt{z}\right)}{p} + \right.$$

$$\left. \frac{c e^{-\frac{c^2 (v-2 k)^2}{4 p}} \sqrt{\pi} (v - 2 k) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - c (v-2 k)}{2 \sqrt{p}}\right)}{p^{3/2}} - \frac{e^{-\frac{(c v - 2 c k)^2}{4 p}} \sqrt{\pi} (c v - 2 c k) \operatorname{erfi}\left(\frac{2 p \sqrt{z} - c (2 k - v)}{2 \sqrt{p}}\right)}{p^{3/2}} \right) +$$

$$2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\frac{4 e^{p z} \cos\left((2 i c k - b m + 2 b s - i c v) \sqrt{z}\right)}{p} + \frac{4 e^{p z} \cos\left((2 i c k + b m - 2 b s - i c v) \sqrt{z}\right)}{p} + \right.$$

$$\frac{1}{p^{3/2}} \left(e^{\frac{(2 i c k + b m - 2 b s - i c v)^2}{4 p}} \sqrt{\pi} (2 i c k + b m - 2 b s - i c v) \operatorname{erf}\left(\frac{2 i \sqrt{z}\ p + b (m-2 s) + c i (2 k - v)}{2 \sqrt{p}}\right) \right) -$$

$$\frac{1}{p^{3/2}} \left(e^{\frac{(b (m-2 s) + c i (v-2 k))^2}{4 p}} \sqrt{\pi} (b (m-2 s) + c i (v-2 k)) \operatorname{erf}\left(\frac{-2 i \sqrt{z}\ p - b (m-2 s) + c i (2 k - v)}{2 \sqrt{p}}\right) \right) +$$

$$\frac{1}{p^{3/2}} \left(e^{\frac{(-2 c i k - b m + 2 b s + i c v)^2}{4 p}} \sqrt{\pi} (2 i c k + b m - 2 b s - i c v) \operatorname{erf}\left(\frac{-2 i \sqrt{z}\ p + b (m-2 s) + c i (2 k - v)}{2 \sqrt{p}}\right) \right) -$$

$$\frac{1}{p^{3/2}} \left(i e^{\frac{(b (m-2 s) + c i (v-2 k))^2}{4 p}} \sqrt{\pi} (b (m-2 s) + c i (v-2 k)) \right.$$

$$\left.\left.\left. \operatorname{erfi}\left(\frac{2 \sqrt{z}\ p + b i (m-2 s) - c (v-2 k)}{2 \sqrt{p}}\right) \right) \right) \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $e^{p z^r} \cos^m\left(b z^r\right) \cosh^v\left(c z^r\right)$

01.20.21.3850.01

$$\int e^{p\,z^r}\cos^m(b\,z^r)\cosh^v(c\,z^r)\,dz == -\frac{2^{-m-v}\,z}{r}\left(\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{r},\,-p\,z^r\right)(1-m \bmod 2)\,(1-v \bmod 2)\,(-p\,z^r)^{-1/r}+\right.$$

$$\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-p)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-p)\,z^r)^{-1/r}+\right.$$

$$\left.((2\,i\,b\,k-i\,b\,m-p)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-p)\,z^r\right)\right)+\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,(-p-2\,c\,s+c\,v)\,z^r\right)((-p-2\,c\,s+c\,v)\,z^r)^{-1/r}+((-p-c\,(v-2\,s))\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-p-c\,(v-2\,s))\,z^r\right)\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-p-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-p-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$((2\,i\,b\,k-i\,b\,m-p-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-p-2\,c\,s+c\,v)\,z^r\right)+$$

$$((-2\,b\,i\,k+i\,b\,m-p+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,i\,k+i\,b\,m-p+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.\left.((2\,i\,b\,k-i\,b\,m-p+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,b\,k-i\,b\,m-p+2\,c\,s-c\,v)\,z^r\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.3851.01

$$\int e^{p z^2} \cos^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz ==$$

$$2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(\frac{\operatorname{erfi}\left(\sqrt{p - i\, b\, (m-2k)}\ z\right)}{\sqrt{p - i\, b\, (m-2k)}} + \frac{\operatorname{erfi}\left(\sqrt{b\, i\, (m-2k) + p}\ z\right)}{\sqrt{b\, i\, (m-2k) + p}} \right) \right) (1 - v \bmod 2) +$$

$$\frac{2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\ z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} +$$

$$2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{\operatorname{erfi}\left(\sqrt{p + c\, (v-2s)}\ z\right)}{\sqrt{p + c\, (v-2s)}} + \frac{\operatorname{erfi}\left(\sqrt{p - c\, (v-2s)}\ z\right)}{\sqrt{p - c\, (v-2s)}} \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{\operatorname{erfi}\left(\sqrt{-2\, b\, i\, k + i\, b\, m + p - 2\, c\, s + c\, v}\ z\right)}{\sqrt{-2\, b\, i\, k + i\, b\, m + p - 2\, c\, s + c\, v}} + \right.$$

$$\frac{\operatorname{erfi}\left(\sqrt{2\, i\, b\, k - i\, b\, m + p - 2\, c\, s + c\, v}\ z\right)}{\sqrt{2\, i\, b\, k - i\, b\, m + p - 2\, c\, s + c\, v}} + \frac{\operatorname{erfi}\left(\sqrt{-2\, b\, i\, k + i\, b\, m + p + 2\, c\, s - c\, v}\ z\right)}{\sqrt{-2\, b\, i\, k + i\, b\, m + p + 2\, c\, s - c\, v}} +$$

$$\left. \frac{\operatorname{erfi}\left(\sqrt{2\, i\, b\, k - i\, b\, m + p + 2\, c\, s - c\, v}\ z\right)}{\sqrt{2\, i\, b\, k - i\, b\, m + p + 2\, c\, s - c\, v}} \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.3852.01

$$\int e^{p\sqrt{z}}\cos^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$2^{-m-v+2}\,e^{p\sqrt{z}}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\left(b^2(m-2k)^2+p^2\right)^2}\left(\binom{m}{k}\left(\left(b^2\left(\sqrt{z}\;p+1\right)(m-2k)^2+p^2\left(p\sqrt{z}-1\right)\right)\cos\left(b(m-2k)\sqrt{z}\right)+\right.\right.\right.$$

$$\left.\left.\left.b(m-2k)\left(b^2\sqrt{z}\;(m-2k)^2-2p+p^2\sqrt{z}\right)\sin\left(b(m-2k)\sqrt{z}\right)\right)\right)\right)(1-v\bmod 2)+$$

$$\frac{2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)(1-v\bmod 2)}{p^2}+2^{-m-v+2}\,e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\left(p^2-c^2(v-2s)^2\right)^2}\left(\binom{v}{s}\left(\left(p^2\left(p\sqrt{z}-1\right)-c^2(v-2s)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left(c(v-2s)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.c(v-2s)\left(\sqrt{z}\;p^2-2p-c^2(v-2s)^2\sqrt{z}\right)\sinh\left(c(v-2s)\sqrt{z}\right)\right)\right)+2^{-m-v+2}\,e^{p\sqrt{z}}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(p^2\left(p\sqrt{z}-1\right)-(2ibk-ibm-2cs+cv)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left((2ibk-ibm-2cs+cv)\sqrt{z}\right)-\right.\right.$$

$$(2ibk-ibm-2cs+cv)\left(\sqrt{z}\;p^2-2p-(2ibk-ibm-2cs+cv)^2\sqrt{z}\right)$$

$$\left.\left.\sinh\left((2ibk-ibm-2cs+cv)\sqrt{z}\right)\right)\Big/\left(p^2-(2ibk-ibm-2cs+cv)^2\right)^2+\right.$$

$$\left(\left(p^2\left(p\sqrt{z}-1\right)-(2ibk-ibm+2cs-cv)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left((2ibk-ibm+2cs-cv)\sqrt{z}\right)-\right.$$

$$(2ibk-ibm+2cs-cv)\left(\sqrt{z}\;p^2-2p-(2ibk-ibm+2cs-cv)^2\sqrt{z}\right)\sinh\left((2ibk-ibm+\right.$$

$$\left.\left.\left.2cs-cv)\sqrt{z}\right)\right)\Big/\left(p^2-(2ibk-ibm+2cs-cv)^2\right)^2\right)/;\;m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{bz^r+e}\cos^m\left(az^r+q\right)\cosh^v\left(cz^r+g\right)$

01.20.21.3853.01

$$\int e^{b z^r+e} \cos^m(a z^r+q) \cosh^v(c z^r+g)\, dz == -\frac{2^{-m-v} z}{r}\left(e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{1}{r}, -b z^r\right)(1-m \bmod 2)(1-v \bmod 2)(-b z^r)^{-1/r} + \right.$$

$$\binom{v}{\frac{v}{2}}(1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}\left(e^{e+2 i k q-i m q} \Gamma\left(\frac{1}{r}, (-b-2 i a k+i a m) z^r\right)((-b-2 i a k+i a m) z^r)^{-1/r} + \right.$$

$$\left. e^{e-2 i k q+i m q}((-b+2 i a k-i a m) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2 i a k-i a m) z^r\right)\right) +$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2 g s-g v} \Gamma\left(\frac{1}{r}, (-b-2 c s+c v) z^r\right)((-b-2 c s+c v) z^r)^{-1/r} + \right.$$

$$\left. e^{e-2 g s+g v}((-b+2 c s-c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2 c s-c v) z^r\right)\right) + \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2 i k q-i m q+2 g s-g v} \Gamma\left(\frac{1}{r}, (-b-2 i a k+i a m-2 c s+c v) z^r\right)((-b-2 i a k+i a m-2 c s+c v) z^r)^{-1/r} + \right.$$

$$e^{e-2 i k q+i m q+2 g s-g v}((-b+2 i a k-i a m-2 c s+c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2 i a k-i a m-2 c s+c v) z^r\right) +$$

$$e^{e+2 i k q-i m q-2 g s+g v}((-b-2 i a k+i a m+2 c s-c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b-2 i a k+i a m+2 c s-c v) z^r\right) +$$

$$\left. e^{e-2 i k q+i m q-2 g s+g v}((-b+2 i a k-i a m+2 c s-c v) z^r)^{-1/r} \right.$$

$$\left.\left. \Gamma\left(\frac{1}{r}, (-b+2 i a k-i a m+2 c s-c v) z^r\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3854.01

$$\int e^{b z^2+e} \cos^m\left(a z^2+q\right) \cosh^v\left(c z^2+g\right) dz ==$$

$$2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{e+i (m-2 k) q} \binom{m}{k} \left(\frac{\operatorname{erfi}\left(\sqrt{b+a i (m-2 k)}\ z\right)}{\sqrt{b+a i (m-2 k)}} + \frac{e^{-2 i (m-2 k) q} \operatorname{erfi}\left(\sqrt{b-i a (m-2 k)}\ z\right)}{\sqrt{b-i a (m-2 k)}} \right) \right)$$

$$(1-v \bmod 2) + \frac{2^{-m-v-1} e^e \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{b}\ z\right) (1-m \bmod 2) (1-v \bmod 2)}{\sqrt{b}} +$$

$$2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{e-g (v-2 k)} \binom{v}{k} \left(\frac{e^{2 g (v-2 k)} \operatorname{erfi}\left(\sqrt{b+c (v-2 k)}\ z\right)}{\sqrt{b+c (v-2 k)}} + \frac{\operatorname{erfi}\left(\sqrt{b-c (v-2 k)}\ z\right)}{\sqrt{b-c (v-2 k)}} \right) +$$

$$2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-i (m-2 k) q-g (v-2 s)} \right.$$

$$\left(\frac{e^{2 (i (m-2 k) q+g (v-2 s))} \operatorname{erfi}\left(\sqrt{b+a i (m-2 k)+c (v-2 s)}\ z\right)}{\sqrt{b+a i (m-2 k)+c (v-2 s)}} + \frac{\operatorname{erfi}\left(\sqrt{b-i a (m-2 k)-c (v-2 s)}\ z\right)}{\sqrt{b-i a (m-2 k)-c (v-2 s)}} \right) +$$

$$e^{e+i (m-2 k) q-g (v-2 s)} \left(\frac{e^{2 (g (v-2 s)-i (m-2 k) q)} \operatorname{erfi}\left(\sqrt{b-i a (m-2 k)+c (v-2 s)}\ z\right)}{\sqrt{b-i a (m-2 k)+c (v-2 s)}} + \right.$$

$$\left. \left. \frac{\operatorname{erfi}\left(\sqrt{b+a i (m-2 k)-c (v-2 s)}\ z\right)}{\sqrt{b+a i (m-2 k)-c (v-2 s)}} \right) \right) /;\ m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3855.01

$$\int e^{\sqrt{z}\,b+e}\cos^m\left(\sqrt{z}\,a+q\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\frac{e^{e+i\,(m-2\,k)\,q+(b+a\,i\,(m-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b+a\,i\,(m-2\,k)\,\sqrt{z}-1\right)}{(-b-i\,a\,(m-2\,k))^2}+\right.\right.$$

$$\left.\left.\frac{e^{e-i\,(m-2\,k)\,q+(b-i\,a\,(m-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b-i\,a\,(m-2\,k)\,\sqrt{z}-1\right)}{(b-i\,a\,(m-2\,k))^2}\right)\binom{m}{k}\right)(1-v \bmod 2)+$$

$$\frac{2^{-m-v+1}\,e^{\sqrt{z}\,b+e}\left(b\,\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{b^2}+2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\frac{e^{e+g\,(v-2\,k)+(b+c\,(v-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b+c\,(v-2\,k)\,\sqrt{z}-1\right)}{(b+c\,(v-2\,k))^2}+\right.$$

$$\left.\frac{e^{e-g\,(v-2\,k)+(b-c\,(v-2\,k))\,\sqrt{z}}\left(\sqrt{z}\,b-c\,(v-2\,k)\,\sqrt{z}-1\right)}{(c\,(v-2\,k)-b)^2}\right)\binom{v}{k}+$$

$$2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\left(e^{e-i\,(m-2\,k)\,q+g\,(v-2\,s)+(b-i\,a\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}\left(\sqrt{z}\,b+(c\,(v-2\,s)-i\,a\,(m-2\,k))\,\sqrt{z}-1\right)\right)\Big/\right.$$

$$(b-i\,a\,(m-2\,k)+c\,(v-2\,s))^2+\left(e^{e+i\,(m-2\,k)\,q+g\,(v-2\,s)+(b+a\,i\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}\right.$$

$$\left.\left(\sqrt{z}\,b+(a\,i\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}-1\right)\right)\Big/(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^2+$$

$$\left(e^{e+i\,(m-2\,k)\,q-g\,(v-2\,s)+(b+a\,i\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}}\left(\sqrt{z}\,b-(c\,(v-2\,s)-i\,a\,(m-2\,k))\,\sqrt{z}-1\right)\right)\Big/$$

$$(-b-i\,a\,(m-2\,k)+c\,(v-2\,s))^2+\left(e^{e-i\,(m-2\,k)\,q-g\,(v-2\,s)+(b-i\,a\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}}\left(\sqrt{z}\,b-\right.\right.$$

$$\left.\left.\left.(a\,i\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}-1\right)\right)\Big/(-b+a\,i\,(m-2\,k)+c\,(v-2\,s))^2\right)\binom{v}{s}\Big/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\cos^m\left(a\,z^r+p\,z+q\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int e^{b\,z^2+d\,z+e}\cos^m\left(a\,z^2+p\,z+q\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\binom{m}{s}\left(e^{-\frac{(d+i\,p\,(m-2\,s))^2-4\,(b+a\,i\,(m-2\,s))\,(e+i\,q\,(m-2\,s))}{4\,(b+a\,i\,(m-2\,s))}}\sqrt{b+a\,i\,(m-2\,s)}\right.\right.$$

$$(b-i\,a\,(m-2\,s))\,\text{erfi}\left(\frac{d+i\,p\,(m-2\,s)+2\,(b+a\,i\,(m-2\,s))\,z}{2\,\sqrt{b+a\,i\,(m-2\,s)}}\right)+e^{-\frac{(d-i\,p\,(m-2\,s))^2-4\,(b-i\,a\,(m-2\,s))\,(e-i\,q\,(m-2\,s))}{4\,(b-i\,a\,(m-2\,s))}}$$

$$\left.\left.(b+a\,i\,(m-2\,s))\,\sqrt{b-i\,a\,(m-2\,s)}\ \text{erfi}\left(\frac{d-i\,p\,(m-2\,s)+2\,b\,z-2\,i\,a\,(m-2\,s)\,z}{2\,\sqrt{b-i\,a\,(m-2\,s)}}\right)\right)\right)\Big/$$

$$((b-i\,a\,(m-2\,s))\,(b+a\,i\,(m-2\,s)))+\frac{2^{-m-v-1}\,e^{-\frac{d^2-4\,b\,e}{4\,b}}\,\sqrt{\pi}\;(1-m \bmod 2)\,(1-v \bmod 2)}{\sqrt{b}}$$

$$\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\,\sqrt{b}}\right)+2^{-m-v-1}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\binom{v}{s}\left(e^{-\frac{(d+f\,(v-2\,s))^2-4\,(b+c\,(v-2\,s))\,(e+g\,(v-2\,s))}{4\,(b+c\,(v-2\,s))}}\,\sqrt{b+c\,(v-2\,s)}\;(b-c\,(v-2\,s))\operatorname{erfi}\left(\frac{d+f\,(v-2\,s)+2\,(b+c\,(v-2\,s))\,z}{2\,\sqrt{b+c\,(v-2\,s)}}\right)+\right.\right.$$

$$\left.\left.e^{-\frac{(d-f\,(v-2\,s))^2-4\,(b-c\,(v-2\,s))\,(e-g\,(v-2\,s))}{4\,(b-c\,(v-2\,s))}}\,(b+c\,(v-2\,s))\,\sqrt{b-c\,(v-2\,s)}\;\operatorname{erfi}\left(\frac{d-f\,(v-2\,s)+2\,b\,z-2\,c\,(v-2\,s)\,z}{2\,\sqrt{b-c\,(v-2\,s)}}\right)\right)\right)\Big/$$

$$((b-c\,(v-2\,s))\,(b+c\,(v-2\,s)))+2^{-m-v-1}\,\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\left(e^{-\frac{(d-2\,f\,k+i\,m\,p-2\,i\,p\,s+f\,v)^2-4\,(b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v)\,(e-2\,g\,k+i\,m\,q-2\,i\,q\,s+g\,v)}{4\,(b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v)}}\,\sqrt{b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v}\;(b+2\,c\,k-i\,a\,m+\right.\right.$$

$$2\,i\,a\,s-c\,v)\operatorname{erfi}\left((d-2\,f\,k+i\,m\,p-2\,i\,p\,s+f\,v+2\,b\,z-2\,(2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)\,z)\Big/\left(2\,\sqrt{b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v}\right)\right)+e^{-\frac{(d+2\,f\,k-i\,m\,p+2\,i\,p\,s-f\,v)^2-4\,(b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)\,(e+2\,g\,k-i\,m\,q+2\,i\,q\,s-g\,v)}{4\,(b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)}}$$

$$(b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v)\,\sqrt{b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v}\;\operatorname{erfi}\left((d+2\,f\,k-i\,m\,p+\right.$$

$$\left.\left.2\,i\,p\,s-f\,v+2\,(b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)\,z)\Big/\left(2\,\sqrt{b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v}\right)\right)\right)\Big/$$

$$((b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)\,(b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v))+$$

$$\left(e^{-\frac{(d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v)^2-4\,(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v)\,(e-2\,g\,k-i\,m\,q+2\,i\,q\,s+g\,v)}{4\,(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v)}}\,\sqrt{b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v}\;(b+2\,c\,k+\right.$$

$$i\,a\,m-2\,i\,a\,s-c\,v)\operatorname{erfi}\left((d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v+2\,b\,z-2\,(2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)\,z)\Big/\left(2\,\sqrt{b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v}\right)\right)+e^{-\frac{(d+2\,f\,k+i\,m\,p-2\,i\,p\,s-f\,v)^2-4\,(b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)\,(e+2\,g\,k+i\,m\,q-2\,i\,q\,s-g\,v)}{4\,(b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)}}$$

$$(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v)\,\sqrt{b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v}\;\operatorname{erfi}\left((d+2\,f\,k+i\,m\,p-\right.$$

$$\left.\left.2\,i\,p\,s-f\,v+2\,(b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)\,z)\Big/\left(2\,\sqrt{b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v}\right)\right)\right)\Big/$$

$$\left.((b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)\,(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v))\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int e^{\sqrt{z}\;b+d\,z+e}\cos^m\left(\sqrt{z}\;a+p\,z+q\right)\cosh^v\left(\sqrt{z}\;c+f\,z+g\right)dz==$$

$$2^{-m-v-2}\left(\frac{4\,e^{\sqrt{z}\;b+d\,z}}{d}-\frac{2\,b\,e^{-\frac{b^2}{4\,d}}\,\sqrt{\pi}}{d^{3/2}}\operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\,\sqrt{d}}\right)\right)e^e\,\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{e-i\,q\,(m-2\,s)}\binom{m}{s}$$

$$\left(\frac{e^{-\frac{(b-i\,a\,m+2\,i\,a\,s)^2}{4\,(d-i\,m\,p+2\,i\,p\,s)}}\sqrt{\pi}\;(i\,a\,(m-2\,s)-b)\,\text{erfi}\left(\frac{b-i\,a\,(m-2\,s)+2\,(d-i\,m\,p+2\,i\,p\,s)\sqrt{z}}{2\sqrt{d-i\,m\,p+2\,i\,p\,s}}\right)}{(d-i\,m\,p+2\,i\,p\,s)^{3/2}}+\frac{2\,e^{2\,i\,q\,(m-2\,s)+(d+i\,p\,(m-2\,s))\,z+(b+a\,i\,(m-2\,s))\sqrt{z}}}{d+i\,p\,(m-2\,s)}-\right.$$

$$\left.\left(e^{2\,i\,q\,(m-2\,s)-\frac{(b+a\,i\,(m-2\,s))^2}{4\,(d+i\,p\,(m-2\,s))}}\sqrt{\pi}\;(b+a\,i\,(m-2\,s))\,\text{erfi}\left(\frac{b+a\,i\,(m-2\,s)+2\,(d+i\,m\,p-2\,i\,p\,s)\sqrt{z}}{2\sqrt{d+i\,p\,(m-2\,s)}}\right)\right)\Big/$$

$$\left.(d+i\,p\,(m-2\,s))^{3/2}+\frac{2\,e^{\sqrt{z}\;(b-i\,a\,(m-2\,s))+(d-i\,p\,(m-2\,s))\,z}}{d-i\,p\,(m-2\,s)}\right)+2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{e-g\,(v-2\,s)}\binom{v}{s}$$

$$\left(-\frac{e^{-\frac{(b+2\,c\,s-c\,v)^2}{4\,(d+2\,f\,s-f\,v)}}\sqrt{\pi}\;(b+2\,c\,s-c\,v)\,\text{erfi}\left(\frac{b+c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\sqrt{z}}{2\sqrt{d+2\,f\,s-f\,v}}\right)}{(d+2\,f\,s-f\,v)^{3/2}}+\frac{2\,e^{2\,g\,(v-2\,s)+(d+f\,(v-2\,s))\,z+(b+c\,(v-2\,s))\sqrt{z}}}{d+f\,(v-2\,s)}-\right.$$

$$\left.\frac{e^{2\,g\,(v-2\,s)-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}}\sqrt{\pi}\;(b+c\,(v-2\,s))\,\text{erfi}\left(\frac{b+c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\sqrt{z}}{2\sqrt{d+f\,(v-2\,s)}}\right)}{(d+f\,(v-2\,s))^{3/2}}+\frac{2\,e^{\sqrt{z}\;(b-c\,(v-2\,s))+(d-f\,(v-2\,s))\,z}}{d-f\,(v-2\,s)}\right)+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(2\,e^{e-2\,g\,k-i\,m\,q-2\,i\,q\,s-g\,v}\left(\frac{e^{2\,i\,m\,q+2\,g\,v+(d-2\,f\,k+i\,m\,p-2\,i\,p\,s+f\,v)\,z+(b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v)\sqrt{z}}}{d-2\,f\,k+i\,m\,p-2\,i\,p\,s+f\,v}+\right.\right.$$

$$\frac{e^{4\,g\,k+4\,i\,q\,s+(d+2\,f\,k-i\,m\,p+2\,i\,p\,s-f\,v)\,z+(b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)\sqrt{z}}}{d+2\,f\,k-i\,m\,p+2\,i\,p\,s-f\,v}+$$

$$\frac{e^{4\,g\,k+2\,i\,m\,q+(d+2\,f\,k+i\,m\,p-2\,i\,p\,s-f\,v)\,z+(b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)\sqrt{z}}}{d+2\,f\,k+i\,m\,p-2\,i\,p\,s-f\,v}+$$

$$\left.\left.\frac{e^{4\,i\,q\,s+2\,g\,v+(d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v)\,z+(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v)\sqrt{z}}}{d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v}\right)-\right.$$

$$\left(e^{-\frac{(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v)^2}{4\,(d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v)}+e-2\,g\,k-i\,m\,q+2\,i\,q\,s+g\,v}\sqrt{\pi}\;(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+c\,v)\,\text{erfi}\left(\left(b-2\,c\,k-i\,a\,m+2\,i\,a\,s+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.c\,v+2\,(d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v)\sqrt{z}\right)\Big/\left(2\sqrt{d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v}\right)\right)\right)\Big/$$

$$(d-2\,f\,k-i\,m\,p+2\,i\,p\,s+f\,v)^{3/2}-\left(e^{-\frac{(b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)^2}{4\,(d+2\,f\,k-i\,m\,p+2\,i\,p\,s-f\,v)}+e+2\,g\,k-i\,m\,q+2\,i\,q\,s-g\,v}\sqrt{\pi}\right.$$

$$(b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v)\,\text{erfi}\left(\left(b+2\,c\,k-i\,a\,m+2\,i\,a\,s-c\,v+2\,(d+2\,f\,k-i\,m\,p+2\,i\,p\,s-f\,v)\right.\right.$$
$$\left.\left.\sqrt{z}\right)\Big/\left(2\sqrt{d+2\,f\,k-i\,m\,p+2\,i\,p\,s-f\,v}\right)\right)\Big/(d+2\,f\,k-i\,m\,p+2\,i\,p\,s-f\,v)^{3/2}-$$
$$\left(e^{-\frac{(b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)^2}{4\,(d+2\,f\,k+i\,m\,p-2\,i\,p\,s-f\,v)}+e+2\,g\,k+i\,m\,q-2\,i\,q\,s-g\,v}\sqrt{\pi}\;(b+2\,c\,k+i\,a\,m-2\,i\,a\,s-c\,v)\,\text{erfi}\left(\left(b+2\,c\,k+i\,a\,m-2\,i\right.\right.\right.$$
$$\left.\left.\left.a\,s-c\,v+2\,(d+2\,f\,k+i\,m\,p-2\,i\,p\,s-f\,v)\,\sqrt{z}\right)\Big/\left(2\sqrt{d+2\,f\,k+i\,m\,p-2\,i\,p\,s-f\,v}\right)\right)\right)\Big/$$
$$(d+2\,f\,k+i\,m\,p-2\,i\,p\,s-f\,v)^{3/2}-\left(e^{-\frac{(b+a\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,(d+i\,p\,(m-2\,s)+f\,(v-2\,k))}+e-2\,g\,k+i\,m\,q-2\,i\,q\,s+g\,v}\sqrt{\pi}\;(b+a\,i\,(m-2\,s)+\right.$$
$$c\,(v-2\,k))\,\text{erfi}\left(\left(b-2\,c\,k+i\,a\,m-2\,i\,a\,s+c\,v+2\,(d+i\,p\,(m-2\,s)+f\,(v-2\,k))\,\sqrt{z}\right)\Big/\right.$$
$$\left.\left.\left(2\sqrt{d+i\,p\,(m-2\,s)+f\,(v-2\,k)}\right)\right)\Big/(d+i\,p\,(m-2\,s)+f\,(v-2\,k))^{3/2}\right)/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving powers of cos and rational functions of exp

Involving $\cos^m(e\,z)\cosh^v(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

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$$\int \frac{\cos^m(e\,z)\cosh^v(c\,z)}{\left(a+b\,e^{d\,z}\right)^n}\,dz ==$$

$$2^{-m-v}\,a^{-n}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{i\,e\,(2\,k-m)-c\,(2\,s-v)}\left(e^{(i\,e\,(2\,k-m)-c\,(2\,s-v))\,z}\,{}_2F_1\left(\frac{i\,e\,(2\,k-m)-c\,(2\,s-v)}{d},\right.\right.\right.$$

$$\left.\left.\left.n;\,\frac{d+e\,i\,(2\,k-m)-c\,(2\,s-v)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-e^{(c\,(2\,s-v)-i\,e\,(2\,k-m))\,z}\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{c\,(2\,s-v)-i\,e\,(2\,k-m)}{d},\,n;\,\frac{d-i\,e\,(2\,k-m)+c\,(2\,s-v)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+\frac{1}{e\,i\,(2\,k-m)+c\,(2\,s-v)}$$

$$\left(e^{(e\,i\,(2\,k-m)+c\,(2\,s-v))\,z}\,{}_2F_1\left(\frac{e\,i\,(2\,k-m)+c\,(2\,s-v)}{d},\,n;\,\frac{d+e\,i\,(2\,k-m)+c\,(2\,s-v)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.$$

$$\left.e^{(-i\,e\,(2\,k-m)-c\,(2\,s-v))\,z}\,{}_2F_1\left(\frac{-i\,e\,(2\,k-m)-c\,(2\,s-v)}{d},\,n;\,\frac{d-i\,e\,(2\,k-m)-c\,(2\,s-v)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Bigg)\Bigg)-$$

$$\frac{2^{-m-v}\,b^{-n}\,e^{-d\,n\,z}\,(m\bmod 2-1)\,(v\bmod 2-1)}{d\,n}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\,{}_2F_1\left(n,\,n;\,n+1;\,-\frac{a\,e^{-d\,z}}{b}\right)-$$

$$\frac{1}{e}$$

$$\left((2^{-m-v}\,a^{-n}\,i)\binom{v}{\frac{v}{2}}(1-v\bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left(\binom{m}{k}\left(e^{i\,e\,(m-2\,k)\,z}\,{}_2F_1\left(\frac{i\,e\,(m-2\,k)}{d},\,n;\,\frac{d+e\,i\,(m-2\,k)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.$$

$$\left.\left.e^{-i\,e\,(m-2\,k)\,z}\,{}_2F_1\left(-\frac{i\,e\,(m-2\,k)}{d},\,n;\,\frac{d-i\,e\,(m-2\,k)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)+$$

$$\frac{1}{c}\left((2^{-m-v}\,a^{-n})\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(\binom{v}{s}\left(e^{c\,(v-2\,s)\,z}\,{}_2F_1\left(\frac{c\,(v-2\,s)}{d},\,n;\,\frac{d+c\,(v-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{-c\,(v-2\,s)\,z}\,{}_2F_1\left(-\frac{c\,(v-2\,s)}{d},\,n;\,\frac{d-c\,(v-2\,s)}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\right)/;\,n\in\mathbb{N}^+\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p\,z}\cos^m(e\,z)\cosh^v(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.3859.01

$$\int \frac{e^{p z} \cos^m(e z) \cosh^v(c z)}{\left(a + b\, e^{d z}\right)^n}\, dz == 2^{-m-v} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left(\binom{m}{k} \left(e^{(e i (m-2k)+p) z} (i e (m-2k) - p)\, {}_2F_1\left(\frac{e i (m-2k)+p}{d}, n; \frac{d + e i (m-2k) + p}{d}; -\frac{b e^{d z}}{a}\right) - e^{(p - i e (m-2k)) z} (e i (m-2k) + p)\, {}_2F_1\left(\frac{p - i e (m-2k)}{d}, n; \frac{d - i e (m-2k) + p}{d}; -\frac{b e^{d z}}{a}\right)\right)\right) \Big/ \right.$$

$$\left. ((i e (m-2k) - p) (e i (m-2k) + p))\right) a^{-n} + 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\binom{v}{s} \left(e^{(p + c (v-2s)) z} (c (v-2s) - p)\, {}_2F_1\left(\frac{p + c (v-2s)}{d}, n; \frac{d + p + c (v-2s)}{d}; -\frac{b e^{d z}}{a}\right) - e^{(p - c (v-2s)) z} (p + c (v-2s))\right.\right.\right.$$

$$\left.\left.\left. {}_2F_1\left(\frac{p - c (v-2s)}{d}, n; \frac{d + p - c (v-2s)}{d}; -\frac{b e^{d z}}{a}\right)\right)\right) \Big/ ((c (v-2s) - p) (p + c (v-2s)))\right) a^{-n} +$$

$$2^{-m-v} \left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{(e i (2k-m)+p-c (2s-v)) z} (e i (2k-m) - p - c (2s-v))\, {}_2F_1\left(\frac{e i (2k-m) + p - c (2s-v)}{d}, \right.\right.\right.\right.$$

$$\left.\left.\left.\left. n; \frac{d + e i (2k-m) + p - c (2s-v)}{d}; -\frac{b e^{d z}}{a}\right) - e^{(-i e (2k-m)+p+c (2s-v)) z} (e i (2k-m) + p - c (2s-v))\, {}_2F_1\left(\frac{-i e (2k-m) + p + c (2s-v)}{d}, n; \frac{d - i e (2k-m) + p + c (2s-v)}{d}; -\frac{b e^{d z}}{a}\right)\right) \Big/ \right.$$

$$\left. ((e i (2k-m) - p - c (2s-v)) (e i (2k-m) + p - c (2s-v))) + \right.$$

$$\left(e^{(e i (2k-m)+p+c (2s-v)) z} (e i (2k-m) - p + c (2s-v))\, {}_2F_1\left(\frac{e i (2k-m) + p + c (2s-v)}{d}, n; \right.\right.$$

$$\left.\left. \frac{d + e i (2k-m) + p + c (2s-v)}{d}; -\frac{b e^{d z}}{a}\right) - e^{(-i e (2k-m)+p-c (2s-v)) z} (e i (2k-m) + p + c (2s-v))\, {}_2F_1\left(\frac{-i e (2k-m) + p - c (2s-v)}{d}, n; \frac{d - i e (2k-m) + p - c (2s-v)}{d}; -\frac{b e^{d z}}{a}\right)\right) \Big/$$

$$\left. ((e i (2k-m) - p + c (2s-v)) (e i (2k-m) + p + c (2s-v)))\right) a^{-n} +$$

$$\frac{2^{-m-v} e^{p z} a^{-n} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} {}_2F_1\left(\frac{p}{d}, n; \frac{d+p}{d}; -\frac{b e^{d z}}{a}\right) (1 - m \bmod 2) (1 - v \bmod 2)}{p} /; n \in$$

$\mathbb{Z} \wedge$

$n >$

$0 \wedge$
$m \in$
$\mathbb{Z} \wedge$
$m >$
$0 \wedge$
$v \in$
$\mathbb{Z} \wedge v >$
0

Involving powers of cos and algebraic functions of exp

Involving $\left(a + b\, e^{d\,z}\right)^{\beta} \cos^{m}(e\,z) \cosh^{v}(c\,z)$

01.20.21.3860.01

$$\int \left(a + b\, e^{d\,z}\right)^{\beta} \cos^{m}(e\,z) \cosh^{v}(c\,z)\, dz == -\frac{2^{-m-v}\, i}{e} \left(a + b\, e^{d\,z}\right)^{\beta} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\left(\frac{e^{d\,z}\, b}{a} + 1\right)^{-\beta} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m - 2\,k} \left(\binom{m}{k} \left(e^{i\,e\,(m-2\,k)\,z}\, {}_2F_1\left(\frac{i\,e\,(m-2\,k)}{d}, -\beta; \frac{d + e\,i\,(m-2\,k)}{d}; -\frac{b\, e^{d\,z}}{a}\right) - \right.\right.$$

$$\left.\left. e^{-i\,e\,(m-2\,k)\,z}\, {}_2F_1\left(-\frac{i\,e\,(m-2\,k)}{d}, -\beta; \frac{d - i\,e\,(m-2\,k)}{d}; -\frac{b\, e^{d\,z}}{a}\right)\right)\right) + \frac{2^{-m-v}}{c} \left(a + b\, e^{d\,z}\right)^{\beta} \binom{m}{\frac{m}{2}}$$

$$(1 - m \bmod 2) \left(\frac{e^{d\,z}\, b}{a} + 1\right)^{-\beta} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v - 2\,s} \left(\binom{v}{s} \left(e^{c\,(v-2\,s)\,z}\, {}_2F_1\left(\frac{c\,(v-2\,s)}{d}, -\beta; \frac{d + c\,(v-2\,s)}{d}; -\frac{b\, e^{d\,z}}{a}\right) - \right.\right.$$

$$\left.\left. e^{-c\,(v-2\,s)\,z}\, {}_2F_1\left(-\frac{c\,(v-2\,s)}{d}, -\beta; \frac{d - c\,(v-2\,s)}{d}; -\frac{b\, e^{d\,z}}{a}\right)\right)\right) +$$

$$2^{-m-v} \left(a + b\, e^{d\,z}\right)^{\beta} \left(\frac{e^{d\,z}\, b}{a} + 1\right)^{-\beta} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{1}{i\,e\,(2\,k-m) - c\,(2\,s-v)} \left(e^{(i\,e\,(2\,k-m) - c\,(2\,s-v))\,z}\right.\right.$$

$$\left. {}_2F_1\left(\frac{i\,e\,(2\,k-m) - c\,(2\,s-v)}{d}, -\beta; \frac{d + e\,i\,(2\,k-m) - c\,(2\,s-v)}{d}; -\frac{b\, e^{d\,z}}{a}\right) - e^{(c\,(2\,s-v) - i\,e\,(2\,k-m))\,z}\, {}_2F_1\right.$$

$$\left.\left(\frac{c\,(2\,s-v) - i\,e\,(2\,k-m)}{d}, -\beta; \frac{d - i\,e\,(2\,k-m) + c\,(2\,s-v)}{d}; -\frac{b\, e^{d\,z}}{a}\right)\right) + \frac{1}{e\,i\,(2\,k-m) + c\,(2\,s-v)}$$

$$\left(e^{(e\,i\,(2\,k-m) + c\,(2\,s-v))\,z}\, {}_2F_1\left(\frac{e\,i\,(2\,k-m) + c\,(2\,s-v)}{d}, -\beta; \frac{d + e\,i\,(2\,k-m) + c\,(2\,s-v)}{d}; -\frac{b\, e^{d\,z}}{a}\right) - \right.$$

$$\left.\left. e^{(-i\,e\,(2\,k-m) - c\,(2\,s-v))\,z}\, {}_2F_1\left(\frac{-i\,e\,(2\,k-m) - c\,(2\,s-v)}{d}, -\beta; \frac{d - i\,e\,(2\,k-m) - c\,(2\,s-v)}{d}; -\frac{b\, e^{d\,z}}{a}\right)\right)\right) +$$

$$\frac{2^{-m-v}\, (m \bmod 2 - 1)\, (v \bmod 2 - 1)}{d\,\beta} \left(\frac{e^{-d\,z}\, a}{b} + 1\right)^{-\beta} \left(a + b\, e^{d\,z}\right)^{\beta} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} {}_2F_1\left(-\beta, -\beta; 1 - \beta; -\frac{a\, e^{-d\,z}}{b}\right) \; /;$$

$m \in \mathbb{N}^{+} \bigwedge v \in \mathbb{N}^{+}$

Involving $e^{p z}\left(a+b\, e^{d z}\right)^{\beta} \cos^{m}(e z) \cosh^{\nu}(c z)$

01.20.21.3861.01

$$\int e^{p z}\left(a+b\, e^{d z}\right)^{\beta} \cos^{m}(e z) \cosh^{\nu}(c z)\, dz == 2^{-m-\nu}\left(a+b\, e^{d z}\right)^{\beta}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left(\binom{m}{k}\left(e^{(e i (m-2k)+p) z}\,(i e (m-2k)-p)\,{}_2F_1\left(\frac{e i (m-2k)+p}{d}, -\beta; \frac{d+e i (m-2k)+p}{d}; -\frac{b e^{d z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left. e^{(p-i e (m-2k)) z}\,(e i (m-2k)+p)\,{}_2F_1\left(\frac{p-i e (m-2k)}{d}, -\beta; \frac{d-i e (m-2k)+p}{d}; -\frac{b e^{d z}}{a}\right)\right)\right)\Big/$$

$$\left.((i e (m-2k)-p)(e i (m-2k)+p))\right)\left(\frac{e^{d z} b}{a}+1\right)^{-\beta}+2^{-m-\nu}\left(a+b\, e^{d z}\right)^{\beta}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}\left(e^{(p+c (\nu-2s)) z}\,(c (\nu-2s)-p)\,{}_2F_1\left(\frac{p+c (\nu-2s)}{d}, -\beta; \frac{d+p+c (\nu-2s)}{d}; -\frac{b e^{d z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left. e^{(p-c (\nu-2s)) z}\,(p+c (\nu-2s))\,{}_2F_1\left(\frac{p-c (\nu-2s)}{d}, -\beta; \frac{d+p-c (\nu-2s)}{d}; -\frac{b e^{d z}}{a}\right)\right)\right)\Big/$$

$$\left.((c (\nu-2s)-p)(p+c (\nu-2s)))\right)\left(\frac{e^{d z} b}{a}+1\right)^{-\beta}+2^{-m-\nu}\left(a+b\, e^{d z}\right)^{\beta}$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(e^{(e i (2k-m)+p-c (2s-\nu)) z}\,(e i (2k-m)-p-c (2s-\nu))\,{}_2F_1\left(\frac{e i (2k-m)+p-c (2s-\nu)}{d},\right.\right.\right.\right.$$

$$\left.\left.\left.\left. -\beta; \frac{d+e i (2k-m)+p-c (2s-\nu)}{d}; -\frac{b e^{d z}}{a}\right)-e^{(-i e (2k-m)+p+c (2s-\nu)) z}\,(e i (2k-m)+\right.\right.\right.$$

$$\left.\left.\left. p-c (2s-\nu))\,{}_2F_1\left(\frac{-i e (2k-m)+p+c (2s-\nu)}{d}, -\beta; \frac{d-i e (2k-m)+p+c (2s-\nu)}{d};\right.\right.\right.$$

$$\left.\left.\left. -\frac{b e^{d z}}{a}\right)\right)\Big/((e i (2k-m)-p-c (2s-\nu))(e i (2k-m)+p-c (2s-\nu)))+\right.$$

$$\left(e^{(e i (2k-m)+p+c (2s-\nu)) z}\,(e i (2k-m)-p+c (2s-\nu))\,{}_2F_1\left(\frac{e i (2k-m)+p+c (2s-\nu)}{d}, -\beta;\right.\right.$$

$$\left.\left.\frac{d+e i (2k-m)+p+c (2s-\nu)}{d}; -\frac{b e^{d z}}{a}\right)-e^{(-i e (2k-m)+p-c (2s-\nu)) z}\,(e i (2k-m)+p+c (2s-\nu))\,{}_2F_1\left(\frac{-i e (2k-m)+p-c (2s-\nu)}{d}, -\beta; \frac{d-i e (2k-m)+p-c (2s-\nu)}{d}; -\frac{b e^{d z}}{a}\right)\right)\Big/$$

$$((e\,i\,(2\,k-m)-p+c\,(2\,s-v))\,(e\,i\,(2\,k-m)+p+c\,(2\,s-v)))\Bigg)\Bigg(\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}+$$

$$\frac{1}{p}\Bigg(2^{-m-v}\,e^{p\,z}\left(a+b\,e^{d\,z}\right)^{\beta}\left(\frac{e^{d\,z}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}{}_2F_1\left(\frac{p}{d},\,-\beta;\,\frac{d+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)(1-m \bmod 2)$$

$$(1-v \bmod 2)\Bigg)/;\, m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving tan and exp

01.20.21.3862.01

$$\int e^{p\,z}\tan(b\,z)\cosh^{v}(c\,z)\,dz ==$$

$$2^{-v}\Bigg(\frac{i\,e^{p\,z}\,{}_2F_1\left(-\frac{i\,p}{2\,b},\,1;\,1-\frac{i\,p}{2\,b};\,-e^{2\,i\,b\,z}\right)}{p}-\frac{e^{(2\,i\,b+p)\,z}\,{}_2F_1\left(\frac{2\,b-i\,p}{2\,b},\,1;\,\frac{4\,b-i\,p}{2\,b};\,-e^{2\,i\,b\,z}\right)}{2\,b-i\,p}\Bigg)\binom{v}{\frac{v}{2}}(1-v \bmod 2)+$$

$$2^{-v}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\frac{i\,e^{(p+c\,(v-2\,s))\,z}\,{}_2F_1\left(-\frac{i\,(p+c\,(v-2\,s))}{2\,b},\,1;\,1-\frac{i\,(p+c\,(v-2\,s))}{2\,b};\,-e^{2\,i\,b\,z}\right)}{p+c\,(v-2\,s)}+$$

$$\frac{i\,e^{(p-c\,(v-2\,s))\,z}\,{}_2F_1\left(-\frac{i\,(p-c\,(v-2\,s))}{2\,b},\,1;\,1-\frac{i\,(p-c\,(v-2\,s))}{2\,b};\,-e^{2\,i\,b\,z}\right)}{p-c\,(v-2\,s)}-$$

$$\frac{e^{(2\,i\,b+p-c\,(v-2\,s))\,z}\,{}_2F_1\left(\frac{2\,b-i\,p+c\,i\,(v-2\,s)}{2\,b},\,1;\,\frac{4\,b-i\,p+c\,i\,(v-2\,s)}{2\,b};\,-e^{2\,i\,b\,z}\right)}{2\,b-i\,p+c\,i\,(v-2\,s)}-$$

$$\frac{e^{(2\,i\,b+p+c\,(v-2\,s))\,z}\,{}_2F_1\left(\frac{2\,b-i\,(p+c\,(v-2\,s))}{2\,b},\,1;\,\frac{4\,b-i\,(p+c\,(v-2\,s))}{2\,b};\,-e^{2\,i\,b\,z}\right)}{2\,b-i\,(p+c\,(v-2\,s))}\Bigg)/;\, v\in\mathbb{Z}\wedge v>0$$

Involving cot and exp

01.20.21.3863.01

$$\int e^{p z} \cot(b z) \cosh^{\nu}(c z)\, dz ==$$

$$-2^{-\nu}\left(\frac{e^{(2 i b+p) z}\, {}_2F_1\left(\frac{2 b-i p}{2 b}, 1; \frac{4 b-i p}{2 b}; e^{2 i b z}\right)}{2 b-i p}+\frac{e^{p z}\, i\, {}_2F_1\left(-\frac{i p}{2 b}, 1; 1-\frac{i p}{2 b}; e^{2 i b z}\right)}{p}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{(2 i b+p-c(\nu-2 s)) z}\, {}_2F_1\left(\frac{2 b-i p+c i(\nu-2 s)}{2 b}, 1; \frac{4 b-i p+c i(\nu-2 s)}{2 b}; e^{2 i b z}\right)}{2 b-i p+c i(\nu-2 s)}+\right.$$

$$\frac{e^{(2 i b+p+c(\nu-2 s)) z}\, {}_2F_1\left(\frac{2 b-i(p+c(\nu-2 s))}{2 b}, 1; \frac{4 b-i(p+c(\nu-2 s))}{2 b}; e^{2 i b z}\right)}{2 b-i(p+c(\nu-2 s))}+$$

$$\frac{i\, e^{(p+c(\nu-2 s)) z}\, {}_2F_1\left(-\frac{i(p+c(\nu-2 s))}{2 b}, 1; 1-\frac{i(p+c(\nu-2 s))}{2 b}; e^{2 i b z}\right)}{p+c(\nu-2 s)}+$$

$$\left.\frac{i\, e^{(p-c(\nu-2 s)) z}\, {}_2F_1\left(-\frac{i(p-c(\nu-2 s))}{2 b}, 1; 1-\frac{i(p-c(\nu-2 s))}{2 b}; e^{2 i b z}\right)}{p-c(\nu-2 s)}\right) /; \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving csc and exp

01.20.21.3864.01

$$\int e^{p z} \csc(b z) \cosh^{\nu}(c z)\, dz == -\frac{2^{1-\nu}\, e^{(i b+p) z}\,(b-i p)\,(1-\nu \bmod 2)}{b^2-2 i p b-p^2}\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(\frac{b-i p}{2 b}, 1; \frac{3 b-i p}{2 b}; e^{2 i b z}\right)-$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(e^{(i b+p-c(\nu-2 s)) z}\binom{\nu}{s}\left((b-i(p+c(\nu-2 s)))\, {}_2F_1\left(\frac{b-i p+c i(\nu-2 s)}{2 b}, 1; \frac{3 b-i p+c i(\nu-2 s)}{2 b}; e^{2 i b z}\right)+\right.\right.$$

$$\left.\left.e^{2 c(\nu-2 s) z}(b-i(p-c(\nu-2 s)))\, {}_2F_1\left(\frac{b-i(p+c(\nu-2 s))}{2 b}, 1; \frac{3 b-i(p+c(\nu-2 s))}{2 b}; e^{2 i b z}\right)\right)\right) \Big/ \left(b^2-2\right.$$

$$\left.i p b-p^2+c^2(\nu-2 s)^2\right) /; \nu \in \mathbb{N}^+$$

Involving sec and exp

01.20.21.3865.01

$$\int e^{p z} \sec(b z) \cosh^{\nu}(c z)\, dz == \frac{2^{1-\nu}\, e^{(i b+p) z}\,(1-\nu \bmod 2)}{i b+p}\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(\frac{b-i p}{2 b}, 1; \frac{3 b-i p}{2 b}; -e^{2 i b z}\right)+$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(e^{(i b+p-c(\nu-2 s)) z}\binom{\nu}{s}\left((b-i(p+c(\nu-2 s)))\, {}_2F_1\left(\frac{b-i p+c i(\nu-2 s)}{2 b}, 1; \frac{3 b-i p+c i(\nu-2 s)}{2 b}; -e^{2 i b z}\right)+\right.\right.$$

$$\left.\left.e^{2 c(\nu-2 s) z}(b-i(p-c(\nu-2 s)))\, {}_2F_1\left(\frac{b-i(p+c(\nu-2 s))}{2 b}, 1; \frac{3 b-i(p+c(\nu-2 s))}{2 b}; -e^{2 i b z}\right)\right)\right) \Big/$$

$$((i b+p-c(\nu-2 s))(b-i(p+c(\nu-2 s)))) /; \nu \in \mathbb{N}^+$$

Involving products of the direct function, trigonometric and exponential functions

Involving sin and exp

Involving $e^{p z} \sin(a z) \cosh(b z) \cosh(c z)$

01.20.21.3866.01

$$\int e^{p z} \sin(a z) \cosh(b z) \cosh(c z)\, dz == -\frac{1}{4} i\, e^{p z} \left(\frac{(b + c - i a) \cosh((-b - c + i a) z) + p \sinh((-b - c + i a) z)}{(a + i (b + c - p)) (a + i (b + c + p))} + \frac{(-b + c - i a) \cosh((b - c + i a) z) + p \sinh((b - c + i a) z)}{(b - c + i a + p) (-b + c - i a + p)} + \frac{(b - c - i a) \cosh((-b + c + i a) z) + p \sinh((-b + c + i a) z)}{(b - c - i a + p) (-b + c + i a + p)} + \frac{(b + c + i a) \cosh((b + c + i a) z) - p \sinh((b + c + i a) z)}{(b + c + i a - p) (b + c + i a + p)} \right)$$

Involving rational functions of sin and exp

Involving $\frac{e^{p z} \cosh(e z) \cosh(d z)}{a + b \sin(c z)}$

01.20.21.3867.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(d z)}{a + b \sin(c z)} dz ==$$

$$\frac{1}{4}\left(-\left(i e^{(-d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}\,(-d-e+i c+p)\right)-\frac{1}{b\sqrt{a^2-b^2}\,(d-e+i c+p)}\left(i e^{(d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\frac{1}{b\sqrt{a^2-b^2}\,(-d+e+i c+p)}\left(i e^{(-d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\frac{1}{b\sqrt{a^2-b^2}\,(d+e+i c+p)}\left(i e^{(d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \cosh(e z) \cosh(d z) (a + b \sin(c z))^{-n}$

01.20.21.3868.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(d z)}{(a + b \sin(c z))^2} dz ==$$

$$\frac{1}{4}\left(\left(i e^{(-d-e+i c+p) z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; -\frac{i b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; \frac{i b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.\right.$$

$$\left(a^2+\sqrt{a^2-b^2}\ a-b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+$$

$$\left(-a^2+\sqrt{a^2-b^2}\ a+b^2\right){}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c\,+p)\right)+\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c\,+p)}$$

$$\left(i\,e^{(d-e+i\,c\,+p)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\ a-b^2\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+$$

$$\left.\left(-a^2+\sqrt{a^2-b^2}\ a+b^2\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)+$$

$$\left(i\,e^{(-d+e+i\,c\,+p)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\ a-b^2\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+$$

$$\left.\left(-a^2+\sqrt{a^2-b^2}\ a+b^2\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg/$$

$$\left(b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c\,+p)\right)+\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c\,+p)}$$

$$\left(i\,e^{(d+e+i\,c\,+p)\,z}\left(-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\ -a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2-b^2}\;a-b^2\right){}_2F_1\left(-\frac{i\,(d+e+i\,c+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+$$

$$\left(-a^2+\sqrt{a^2-b^2}\;a+b^2\right){}_2F_1\left(-\frac{i\,(d+e+i\,c+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{e^{p\,z}\cosh(e\,z)\cosh(d\,z)}{a+b\sin^2(c\,z)}$

01.20.21.3869.01

$$\int\frac{e^{p\,z}\cosh(e\,z)\cosh(d\,z)}{a+b\sin^2(c\,z)}\,dz==$$

$$\frac{1}{4}\left(-\left(e^{(-d-e-2\,i\,c+p)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{i\,(-d-e+p)}{2\,c}+1,\,1;\,\frac{i\,(-d-e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{i\,(-d-e+p)}{2\,c}+1,\,1;\,\frac{i\,(-d-e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{a}\;b\sqrt{a+b}\;(-d-e-2\,i\,c+p)\right)-\left(e^{(d-e-2\,i\,c+p)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{i\,(d-e+p)}{2\,c}+1,\right.\right.\right.$$

$$\left.\left.\left.1;\,\frac{i\,(d-e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b}\right)+\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{i\,(d-e+p)}{2\,c}+1,\right.\right.\right.$$

$$\left.\left.\left.1;\,\frac{i\,(d-e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b}\right)\right)\right)\Bigg/\left(\sqrt{a}\;b\sqrt{a+b}\;(d-e-2\,i\,c+p)\right)-$$

$$\left(e^{(-d+e-2\,i\,c+p)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{i\,(-d+e+p)}{2\,c}+1,\,1;\,\frac{i\,(-d+e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b}\right)+\right.\right.$$

$$\left.\left.\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{i\,(-d+e+p)}{2\,c}+1,\,1;\,\frac{i\,(-d+e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{a}\;b\sqrt{a+b}\;(-d+e-2\,i\,c+p)\right)-\left(e^{(d+e-2\,i\,c+p)\,z}\left(\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{i\,(d+e+p)}{2\,c}+1,\right.\right.\right.$$

$$\left.\left.\left.1;\,\frac{i\,(d+e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b}\right)+\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{i\,(d+e+p)}{2\,c}+1,\right.\right.\right.$$

$$\left.\left.\left.1;\,\frac{i\,(d+e+p)}{2\,c}+2;\,-\frac{b\,e^{-2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b}\right)\right)\right)\Bigg/\left(\sqrt{a}\;b\sqrt{a+b}\;(d+e-2\,i\,c+p)\right)\Bigg)$$

Involving $e^{p\,z}\cosh(e\,z)\cosh(d\,z)\left(a+b\sin^2(c\,z)\right)^{-n}$

01.20.21.3870.01

$$\int \frac{e^{p z}\cosh(e z)\cosh(d z)}{\left(a+b\sin^2(c z)\right)^2}\,dz ==$$

$$\frac{1}{4}\left(-\left(e^{(-d-e+2ic+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}-b}\right)+(2a+b)\left(-2a+2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}-b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},2;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},2;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(-d-e+2ic+p)\right)-\left(e^{(d-e+2ic+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},1;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}-b}\right)+(2a+b)\left(-2a+2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},1;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}-b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},2;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},2;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}-b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d-e+2ic+p)\right)-\left(e^{(-d+e+2ic+p)z}\left((2a+b)\left(2a+2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d+e+p)}{2c},1;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}-b}\right)+(2a+b)\left(-2a+2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d+e+p)}{2c},1;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{-2a-2\sqrt{a+b}\ \sqrt{a}-b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a+b}\ a-2b\sqrt{a}-b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d+e+p)}{2c},2;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{-2a+2\sqrt{a+b}\ \sqrt{a}-b}\right)+\left(2a^{3/2}-2\sqrt{a+b}\ a+2b\sqrt{a}-b\sqrt{a+b}\right)\right.\right.\right.$$

$$ {}_2F_1\left(1-\frac{i\,(-d+e+p)}{2\,c},\,2;\,2-\frac{i\,(-d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\,\sqrt{a}\,-b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-d+e+2\,i\,c\,+p)\right)-\Bigg(e^{(d+e+2\,i\,c+p)\,z}\Bigg((2\,a+b)\left(2\,a+2\sqrt{a+b}\,\sqrt{a}\,+b\right)$$

$${}_2F_1\left(1-\frac{i\,(d+e+p)}{2\,c},\,1;\,2-\frac{i\,(d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\,\sqrt{a}\,-b}\right)+(2\,a+b)$$

$$\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}\,-b\right){}_2F_1\left(1-\frac{i\,(d+e+p)}{2\,c},\,1;\,2-\frac{i\,(d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\,\sqrt{a}\,-b}\right)+$$

$$2\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}-2\sqrt{a+b}\,a-2\,b\sqrt{a}\,-b\sqrt{a+b}\,\right){}_2F_1\left(1-\frac{i\,(d+e+p)}{2\,c},\,2;\,2-\frac{i\,(d+e+p)}{2\,c};\right.$$

$$\left.-\frac{b\,e^{2\,i\,c\,z}}{-2\,a+2\sqrt{a+b}\,\sqrt{a}\,-b}\right)+\left(2\,a^{3/2}-2\sqrt{a+b}\,a+2\,b\sqrt{a}\,-b\sqrt{a+b}\,\right){}_2F_1\left(1-\frac{i\,(d+e+p)}{2\,c},\right.$$

$$\left.2;\,2-\frac{i\,(d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{-2\,a-2\sqrt{a+b}\,\sqrt{a}\,-b}\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(d+e+2\,i\,c\,+p)\right)\Bigg)$$

Involving algebraic functions of sin and exp

Involving $e^{p\,z}\cosh(d\,z)\cosh(e\,z)\,(a+b\sin(c\,z))^{\beta}$

01.20.21.3871.01

$$\int e^{p\,z}\cosh(d\,z)\cosh(e\,z)\,(a+b\sin(c\,z))^{\beta}\,dz==\frac{1}{4}\left(1+\frac{i\,b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)^{-\beta}\left(1-\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)^{-\beta}(a+b\sin(c\,z))^{\beta}$$

$$\left(-\frac{e^{-(d+e-p)\,z}}{d+e-p+i\,c\,\beta}F_1\left(\frac{i\,(d+e-p+i\,c\,\beta)}{c};\,-\beta,\,-\beta;\,\frac{-\beta\,c+c+i\,(d+e-p)}{c};\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{i\,b\,e^{i\,c\,z}}{a-\sqrt{a^2-b^2}}\right)+\right.$$

$$\frac{e^{(d-e+p)\,z}}{d-e+p-i\,c\,\beta}F_1\left(-\frac{i\,(d-e+p)}{c}-\beta;\,-\beta,\,-\beta;\,-\frac{i\,(d-e+p)}{c}-\beta+1;\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{i\,b\,e^{i\,c\,z}}{a-\sqrt{a^2-b^2}}\right)+$$

$$\frac{e^{(-d+e+p)\,z}}{-d+e+p-i\,c\,\beta}F_1\left(-\frac{i\,(-d+e+p)}{c}-\beta;\,-\beta,\,-\beta;\,-\frac{i\,(-d+e+p)}{c}-\beta+1;\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{i\,b\,e^{i\,c\,z}}{a-\sqrt{a^2-b^2}}\right)+$$

$$\left.\frac{e^{(d+e+p)\,z}}{d+e+p-i\,c\,\beta}F_1\left(-\frac{i\,(d+e+p)}{c}-\beta;\,-\beta,\,-\beta;\,-\frac{i\,(d+e+p)}{c}-\beta+1;\,\frac{i\,b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{i\,b\,e^{i\,c\,z}}{a-\sqrt{a^2-b^2}}\right)\right)$$

Involving $e^{p\,z}\cosh(d\,z)\cosh(e\,z)\left(a+b\sin^2(c\,z)\right)^{\beta}$

01.20.21.3872.01

$$\int e^{p z} \cosh(d z) \cosh(e z) \left(a + b \sin^2(c z)\right)^{\beta} dz ==$$
$$\frac{1}{4}\left(1 - \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)^{-\beta}\left(1 - \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}\right)^{-\beta}\left(a - \frac{1}{4} b e^{-2 i c z}\left(-1 + e^{2 i c z}\right)^2\right)^{\beta}$$
$$\left(\frac{e^{(d-e+p) z}}{d - e + p - 2 i c \beta} F_1\left(-\frac{i (d - e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d - e + p)}{2 c} - \beta + 1; \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \right.\right.$$
$$\left.\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{(d+e+p) z}}{d + e + p - 2 i c \beta} F_1\left(-\frac{i (d + e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d + e + p)}{2 c} - \beta + 1; \right.$$
$$\left.\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) - \frac{e^{(-d+e+p) z}}{d - e - p + 2 i c \beta} F_1\left(-\frac{i (-d + e + p)}{2 c} - \beta; -\beta, \right.$$
$$\left.-\beta; -\frac{i (-d + e + p)}{2 c} - \beta + 1; \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) - \frac{e^{-(d+e-p) z}}{d + e - p + 2 i c \beta}$$
$$\left.F_1\left(\frac{i (d + e - p + 2 i c \beta)}{2 c}; -\beta, -\beta; \frac{i (d + e - p)}{2 c} - \beta + 1; \frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, \frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right)$$

Involving cos and exp

Involving $e^{p z} \cos(a z) \cosh(b z) \cosh(c z)$

01.20.21.3873.01

$$\int e^{p z} \cos(a z) \cosh(b z) \cosh(c z) dz == \frac{1}{4} e^{p z}$$
$$\left(\frac{p \cosh((-b - c + i a) z) + (b + c - i a) \sinh((-b - c + i a) z)}{(a + i (b + c - p)) (a + i (b + c + p))} + \frac{p \cosh((b - c + i a) z) + (-b + c - i a) \sinh((b - c + i a) z)}{(b - c + i a + p) (-b + c - i a + p)} + \right.$$
$$\left.\frac{p \cosh((-b + c + i a) z) + (b - c - i a) \sinh((-b + c + i a) z)}{(b - c - i a + p) (-b + c + i a + p)} - \frac{p \cosh((b + c + i a) z) - (b + c + i a) \sinh((b + c + i a) z)}{(b + c + i a - p) (b + c + i a + p)}\right)$$

Involving rational functions of cos and exp

Involving $\frac{e^{p z} \cosh(e z) \cosh(d z)}{a + b \cos(c z)}$

01.20.21.3874.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(d z)}{a + b \cos(c z)} dz == \frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\ (-d-e+i c+p)}\right.$$
$$\left(e^{(-d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left.{}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+\frac{1}{b\sqrt{a^2-b^2}\ (d-e+i c+p)}$$
$$\left(e^{(d-e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left.{}_2F_1\left(-\frac{i(d-e+i c+p)}{c}, 1; 2-\frac{i(d-e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+\frac{1}{b\sqrt{a^2-b^2}\ (-d+e+i c+p)}$$
$$\left(e^{(-d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left.{}_2F_1\left(-\frac{i(-d+e+i c+p)}{c}, 1; 2-\frac{i(-d+e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+\frac{1}{b\sqrt{a^2-b^2}\ (d+e+i c+p)}$$
$$\left(e^{(d+e+i c+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(d+e+i c+p)}{c}, 1; 2-\frac{i(d+e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \cosh(e z) \cosh(d z) (a + b \cos(c z))^{-n}$

01.20.21.3875.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(d z)}{(a + b \cos(c z))^2} dz ==$$
$$\frac{1}{4}\left(\left(e^{(-d-e+i c+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; \frac{b e^{i c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(-\frac{i(-d-e+i c+p)}{c}, 1; 2-\frac{i(-d-e+p)}{c}; -\frac{b e^{i c z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.\right.$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\,\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(-\frac{i\,(-d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/$$

$$\left(b\left(a^2-b^2\right)^{3/2}(-d-e+i\,c\,+p)\right)+\frac{1}{b\left(a^2-b^2\right)^{3/2}(d-e+i\,c\,+p)}$$

$$\left(e^{(d-e+i\,c\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\,\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(-\frac{i\,(d-e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d-e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$\left(e^{(-d+e+i\,c\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$ {}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)- $$

$$ a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+ $$

$$ {}_2F_1\left(-\frac{i\,(-d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(-d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg)\Bigg/ $$

$$ \left(b\left(a^2-b^2\right)^{3/2}(-d+e+i\,c\,+p)\right)+\frac{1}{b\left(a^2-b^2\right)^{3/2}(d+e+i\,c\,+p)} $$

$$ \left(e^{(d+e+i\,c\,+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right. $$

$$ a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,1;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)+ $$

$$ \left(b^2-a^2\right)\left({}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right. $$

$$ {}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)- $$

$$ a\sqrt{a^2-b^2}\left({}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,\frac{b\,e^{i\,c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+ $$

$$ \left.\left.\left.{}_2F_1\left(-\frac{i\,(d+e+i\,c\,+p)}{c},\,2;\,2-\frac{i\,(d+e+p)}{c};\,-\frac{b\,e^{i\,c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right) $$

Involving $\frac{e^{p\,z}\cosh(e\,z)\cosh(d\,z)}{a+b\cos^2(c\,z)}$

01.20.21.3876.01

$$\int \frac{e^{p z}\cosh(e z)\cosh(d z)}{a+b\cos^2(c z)}\,dz ==$$
$$\frac{1}{4}\left(-\left(e^{(-d-e+2 i c+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(-d-e+2 i c+p)\right)-\left(e^{(d-e+2 i c+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},1;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d-e+p)}{2c},1;2-\frac{i(d-e+p)}{2c};-\frac{b e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(d-e+2 i c+p)\right)-\left(e^{(-d+e+2 i c+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d+e+p)}{2c},1;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d+e+p)}{2c},1;2-\frac{i(-d+e+p)}{2c};-\frac{b e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(-d+e+2 i c+p)\right)-\left(e^{(d+e+2 i c+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},1;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},1;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(d+e+2 i c+p)\right)\right)$$

Involving $e^{p z}\cosh(e z)\cosh(d z)\left(a+b\cos^2(c z)\right)^{-n}$

01.20.21.3877.01

$$\int \frac{e^{p z}\cosh(e z)\cosh(d z)}{\left(a+b\cos^2(c z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(-\left(e^{(-d-e+2 i c+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},1;2-\frac{i(-d-e+p)}{2c};-\frac{b e^{2icz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(-d-e+p)}{2c},2;2-\frac{i(-d-e+p)}{2c};\right.\right.\right.$$

$$-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\left(1-\frac{i\,(-d-e+p)}{2\,c},\,2;\,2-\frac{i\,(-d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-d-e+2\,i\,c+p)\right)-\Bigg(e^{(d-e+2\,i\,c+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$${}_2F_1\left(1-\frac{i\,(d-e+p)}{2\,c},\,1;\,2-\frac{i\,(d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(d-e+p)}{2\,c},\,1;\,2-\frac{i\,(d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(d-e+p)}{2\,c},\,2;\,2-\frac{i\,(d-e+p)}{2\,c};\right.$$

$$\left.-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\left(1-\frac{i\,(d-e+p)}{2\,c},\,2;\,2-\frac{i\,(d-e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(d-e+2\,i\,c+p)\right)-\Bigg(e^{(-d+e+2\,i\,c+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$${}_2F_1\left(1-\frac{i\,(-d+e+p)}{2\,c},\,1;\,2-\frac{i\,(-d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2\,a-b)$$

$$\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(-d+e+p)}{2\,c},\,1;\,2-\frac{i\,(-d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{i\,(-d+e+p)}{2\,c},\,2;\,2-\frac{i\,(-d+e+p)}{2\,c};\right.$$

$$\left.-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$${}_2F_1\left(1-\frac{i\,(-d+e+p)}{2\,c},\,2;\,2-\frac{i\,(-d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(-d+e+2\,i\,c+p)\right)-\Bigg(e^{(d+e+2\,i\,c+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$${}_2F_1\left(1-\frac{i\,(d+e+p)}{2\,c},\,1;\,2-\frac{i\,(d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{i\,(d+e+p)}{2\,c},\,1;\,2-\frac{i\,(d+e+p)}{2\,c};\,-\frac{b\,e^{2\,i\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},2;2-\frac{i(d+e+p)}{2c};\right.\right.$$
$$\left.-\frac{b e^{2icz}}{2a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\;a+2b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{i(d+e+p)}{2c},\right.$$
$$\left.\left.\left.2;2-\frac{i(d+e+p)}{2c};-\frac{b e^{2icz}}{2a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(d+e+2ic\;+p)\right)\Bigg)$$

Involving algebraic functions of cos and exp

Involving $e^{pz}\cosh(ez)\cosh(dz)(a+b\cos(cz))^{\beta}$

01.20.21.3878.01

$$\int e^{pz}\cosh(ez)\cosh(dz)(a+b\cos(cz))^{\beta}\,dz == \frac{1}{4}\left(\frac{e^{icz}b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{icz}b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}b e^{-icz}\left(1+e^{2icz}\right)\right)^{\beta}$$
$$\left(-\frac{e^{-(d+e-p)z}}{d+e-p+ic\beta}F_1\left(\frac{i(d+e-p+ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c+i(d+e-p)}{c};-\frac{b e^{icz}}{a+\sqrt{a^2-b^2}},\frac{b e^{icz}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$
$$\frac{e^{(d-e+p)z}}{d-e+p-ic\beta}F_1\left(-\frac{i(d-e+p-ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c-i(d-e+p)}{c};-\frac{b e^{icz}}{a+\sqrt{a^2-b^2}},\frac{b e^{icz}}{\sqrt{a^2-b^2}\;-a}\right)-$$
$$\frac{e^{(-d+e+p)z}}{d-e-p+ic\beta}F_1\left(-\frac{i(-d+e+p-ic\beta)}{c};-\beta,-\beta;\frac{i(d-e-p)}{c}-\beta+1;-\frac{b e^{icz}}{a+\sqrt{a^2-b^2}},\frac{b e^{icz}}{\sqrt{a^2-b^2}\;-a}\right)+$$
$$\left.\frac{e^{(d+e+p)z}}{d+e+p-ic\beta}F_1\left(-\frac{i(d+e+p-ic\beta)}{c};-\beta,-\beta;\frac{-\beta c+c-i(d+e+p)}{c};-\frac{b e^{icz}}{a+\sqrt{a^2-b^2}},\frac{b e^{icz}}{\sqrt{a^2-b^2}\;-a}\right)\right)$$

Involving $e^{pz}\cosh(ez)\cosh(dz)\left(a+b\cos^2(cz)\right)^{\beta}$

01.20.21.3879.01

$$\int e^{p z} \cosh(e z) \cosh(d z) \left(a + b \cos^2(c z)\right)^{\beta} dz ==$$

$$\frac{1}{4}\left(\frac{e^{2 i c z} b}{2 a + b - 2\sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{e^{2 i c z} b}{2 a + b + 2\sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{1}{4} b e^{-2 i c z} \left(1 + e^{2 i c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(d-e+p) z}}{d - e + p - 2 i c \beta} F_1\left(-\frac{i (d - e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d - e + p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{(-d+e+p) z}}{-d + e + p - 2 i c \beta} F_1\left(-\frac{i (-d + e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (-d + e + p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{(d+e+p) z}}{d + e + p - 2 i c \beta} F_1\left(-\frac{i (d + e + p)}{2 c} - \beta; -\beta, -\beta; -\frac{i (d + e + p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) - \frac{e^{-(d+e-p) z}}{d + e - p + 2 i c \beta} F_1\left(\frac{i (d + e - p + 2 i c \beta)}{2 c}; -\beta, -\beta; \frac{i (d + e - p)}{2 c} - \beta + 1; -\frac{b e^{2 i c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 i c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right)$$

Involving rational functions of the direct function, trigonometric and exponential functions

Involving sin and exp

Involving $\frac{e^{p z} \sin(d z)}{a + b \cosh(c z)}$

01.20.21.3880.01

$$\int \frac{e^{p z} \sin(d z)}{a + b \cosh(c z)} dz ==$$

$$\frac{1}{2} i \left(\frac{1}{b\sqrt{a^2 - b^2}\ (c - i d + p)} \left(e^{(c - i d + p) z} \left(\left(a + \sqrt{a^2 - b^2}\right) {}_2F_1\left(\frac{c - i d + p}{c}, 1; \frac{-i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) + \left(\sqrt{a^2 - b^2} - a\right) {}_2F_1\left(\frac{c - i d + p}{c}, 1; \frac{-i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}\right)\right)\right) - \frac{1}{b\sqrt{a^2 - b^2}\ (c + i d + p)} \left(e^{(c + i d + p) z} \left(\left(a + \sqrt{a^2 - b^2}\right) {}_2F_1\left(\frac{c + i d + p}{c}, 1; \frac{i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) + \left(\sqrt{a^2 - b^2} - a\right) {}_2F_1\left(\frac{c + i d + p}{c}, 1; \frac{i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \sin(d z) (a + b \cosh(c z))^{-n}$

01.20.21.3881.01

$$\int \frac{e^{p z} \sin(d z)}{(a + b \cosh(c z))^2} dz ==$$

$$\frac{1}{2} i \left(\frac{1}{b \left(a^2 - b^2\right)^{3/2} (c - i d + p)} \left(e^{(c - i d + p) z} \left(a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - i d + p}{c}, 1; \frac{-i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$

$$a \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c - i d + p}{c}, 1; \frac{-i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) + \left(b^2 - a^2\right)$$

$$\left({}_2F_1\left(\frac{c - i d + p}{c}, 2; \frac{-i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) - {}_2F_1\left(\frac{c - i d + p}{c}, 2; \frac{-i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) -$$

$$a \sqrt{a^2 - b^2} \left({}_2F_1\left(\frac{c - i d + p}{c}, 2; \frac{-i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right.$$

$$\left. \left. \left. {}_2F_1\left(\frac{c - i d + p}{c}, 2; \frac{-i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \right) -$$

$$\frac{1}{b \left(a^2 - b^2\right)^{3/2} (c + i d + p)} \left(e^{(c + i d + p) z} \left(a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c + i d + p}{c}, 1; \frac{i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$

$$a \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c + i d + p}{c}, 1; \frac{i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) + \left(b^2 - a^2\right) \left({}_2F_1\left(\frac{c + i d + p}{c}, 2; \right. \right.$$

$$\left. \left. \frac{i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) - {}_2F_1\left(\frac{c + i d + p}{c}, 2; \frac{i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) - a \sqrt{a^2 - b^2}$$

$$\left. \left({}_2F_1\left(\frac{c + i d + p}{c}, 2; \frac{i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + {}_2F_1\left(\frac{c + i d + p}{c}, 2; \frac{i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \right)$$

Involving $\frac{e^{p z} \sin(d z)}{a + b \cosh^2(c z)}$

01.20.21.3882.01

$$\int \frac{e^{p z} \sin(d z)}{a + b \cosh^2(c z)}\, dz ==$$
$$\frac{1}{2} i \left(\frac{1}{\sqrt{a}\ b \sqrt{a+b}\ (2c + i d + p)} \left(e^{(2c + i d + p) z} \left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{i d + p}{2c} + 1, 1; \frac{i d + p}{2c} + 2; \right. \right. \right. \right.$$
$$\left. - \frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \left(-2a - 2\sqrt{a+b}\ \sqrt{a} - b \right)$$
$$\left. {}_2F_1\left(\frac{i d + p}{2c} + 1, 1; \frac{i d + p}{2c} + 2; - \frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \Bigg) - \frac{1}{\sqrt{a}\ b \sqrt{a+b}\ (2c - i d + p)}$$
$$\left(e^{(2c - i d + p) z} \left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{-i d + p}{2c} + 1, 1; \frac{-i d + p}{2c} + 2; - \frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \right. \right.$$
$$\left. \left. \left(-2a - 2\sqrt{a+b}\ \sqrt{a} - b \right) {}_2F_1\left(\frac{-i d + p}{2c} + 1, 1; \frac{-i d + p}{2c} + 2; - \frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \right) \Bigg)$$

Involving $e^{p z} \sin(d z) \left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.3883.01

$$\int \frac{e^{p z} \sin(d z)}{\left(a + b \cosh^2(c z)\right)^2} dz ==$$

$$\frac{1}{2} i \left(\left(e^{(2c+i d+p) z} \left(-(2a+b) \left(-2a + 2\sqrt{a+b}\ \sqrt{a} - b \right) {}_2F_1\left(\frac{i d+p}{2c} + 1, 1; \frac{i d+p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \right. \right. \right.$$

$$(-2a-b) \left(2a + 2\sqrt{a+b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{i d+p}{2c} + 1, 1; \frac{i d+p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) +$$

$$2\sqrt{a} \left(\left(-2a^{3/2} + 2\sqrt{a+b}\ a - 2b\sqrt{a} + b\sqrt{a+b} \right) {}_2F_1\left(\frac{i d+p}{2c} + 1, 2; \frac{i d+p}{2c} + \right. \right.$$

$$\left. 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \left(2a^{3/2} + 2\sqrt{a+b}\ a + 2b\sqrt{a} + b\sqrt{a+b} \right)$$

$$\left. \left. {}_2F_1\left(\frac{i d+p}{2c} + 1, 2; \frac{i d+p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \right) \Big/ \left(2a^{3/2} b (a+b)^{3/2} (2c + i d + p) \right) -$$

$$\left(e^{(2c-i d+p) z} \left(-(2a+b) \left(-2a + 2\sqrt{a+b}\ \sqrt{a} - b \right) {}_2F_1\left(\frac{-i d+p}{2c} + 1, 1; \frac{-i d+p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \right. \right.$$

$$(-2a-b) \left(2a + 2\sqrt{a+b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{-i d+p}{2c} + 1, 1; \frac{-i d+p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) +$$

$$2\sqrt{a} \left(\left(-2a^{3/2} + 2\sqrt{a+b}\ a - 2b\sqrt{a} + b\sqrt{a+b} \right) {}_2F_1\left(\frac{-i d+p}{2c} + 1, 2; \frac{-i d+p}{2c} + \right. \right.$$

$$\left. 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \left(2a^{3/2} + 2\sqrt{a+b}\ a + 2b\sqrt{a} + b\sqrt{a+b} \right)$$

$$\left. \left. {}_2F_1\left(\frac{-i d+p}{2c} + 1, 2; \frac{-i d+p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \right) \Big/ \left(2a^{3/2} b (a+b)^{3/2} (2c - i d + p) \right) \Bigg)$$

Involving $\frac{e^{p z} \sin(d z) \cosh(e z)}{a + b \cosh(c z)}$

01.20.21.3884.01

$$\int \frac{e^{p z} \sin(d z) \cosh(e z)}{a + b \cosh(c z)} dz ==$$
$$-\frac{1}{4} i \left(\left(e^{(c-e+i d+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - e + i d + p}{c}, 1; \frac{-e + i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \left(\sqrt{a^2 - b^2} - a \right) \right. \right. \right.$$
$$\left. \left. \left. {}_2F_1\left(\frac{c - e + i d + p}{c}, 1; \frac{-e + i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \Big/ \left(b \sqrt{a^2 - b^2} (c - e + i d + p) \right) +$$
$$\left(e^{(c+e+i d+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c + e + i d + p}{c}, 1; \frac{e + i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \left(\sqrt{a^2 - b^2} - a \right) \right. \right.$$
$$\left. \left. {}_2F_1\left(\frac{c + e + i d + p}{c}, 1; \frac{e + i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \Big/ \left(b \sqrt{a^2 - b^2} (c + e + i d + p) \right) -$$
$$\left(e^{(c-i d-e+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - i d - e + p}{c}, 1; \frac{-e - i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \left(\sqrt{a^2 - b^2} - a \right) \right. \right.$$
$$\left. \left. {}_2F_1\left(\frac{c - i d - e + p}{c}, 1; \frac{-e - i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \Big/ \left(b \sqrt{a^2 - b^2} (c - i d - e + p) \right) -$$
$$\left(e^{(c-i d+e+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - i d + e + p}{c}, 1; \frac{e - i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$
$$\left. \left. \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c - i d + e + p}{c}, 1; \frac{e - i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \Big/ \left(b \sqrt{a^2 - b^2} (c - i d + e + p) \right) \right)$$

Involving $e^{p z} \sin(d z) \cosh(e z) (a + b \cosh(c z))^{-n}$

01.20.21.3885.01

$$\int \frac{e^{p z} \sin(d z) \cosh(e z)}{(a + b \cosh(c z))^2} dz ==$$
$$-\frac{1}{4} i \left(\left(e^{(c-e+i d+p) z} \left(a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - e + i d + p}{c}, 1; \frac{-e + i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right. \right.$$
$$\left. \left. \left. a \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c - e + i d + p}{c}, 1; \frac{-e + i d + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) + \right. \right.$$
$$\left. \left. \left(b^2 - a^2 \right) \left({}_2F_1\left(\frac{c - e + i d + p}{c}, 2; \frac{-e + i d + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) - {}_2F_1\left(\frac{c - e + i d + p}{c}, 2; \frac{-e + i d + p}{c} + \right. \right. \right. \right.$$

$$2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\Bigg)\Bigg)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-e+i\,d+p}{c},\,2;\,\frac{-e+i\,d+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+$$

$${}_2F_1\left(\frac{c-e+i\,d+p}{c},\,2;\,\frac{-e+i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-e+i\,d+p)\right)+$$

$$\left(e^{(c+e+i\,d+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+e+i\,d+p}{c},\,1;\,\frac{e+i\,d+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+e+i\,d+p}{c},\,1;\,\frac{e+i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+e+i\,d+p}{c},\,2;\,\frac{e+i\,d+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+e+i\,d+p}{c},\,2;\,\frac{e+i\,d+p}{c}+2;\right.\right.$$

$$\left.\left.-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+e+i\,d+p}{c},\,2;\,\frac{e+i\,d+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(\frac{c+e+i\,d+p}{c},\,2;\,\frac{e+i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c+e+i\,d+p)\right)-\right.$$

$$\left(e^{(c-i\,d-e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d-e+p}{c},\,1;\,\frac{-e-i\,d+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d-e+p}{c},\,1;\,\frac{-e-i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-i\,d-e+p}{c},\,2;\,\frac{-e-i\,d+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$

$$\left.{}_2F_1\left(\frac{c-i\,d-e+p}{c},\,2;\,\frac{-e-i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i\,d-e+p}{c},\,2;\,\frac{-e-i\,d+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(\frac{c-i\,d-e+p}{c},\,2;\,\frac{-e-i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)\Bigg)\Bigg)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-i\,d-e+p)\right)-\right.$$

$$\left(e^{(c-i\,d+e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d+e+p}{c},\,1;\,\frac{e-i\,d\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(\frac{c-i\,d+e+p}{c},\,1;\,\frac{e-i\,d\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-{}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\right.\right.$$

$$\left.\left.-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$

$$\left.\left.\left.\left.{}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-i\,d+e+p)\right)\right)$$

Involving $\frac{e^{p\,z}\sin(d\,z)\cosh(e\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.3886.01

$$\int \frac{e^{p z} \sin(d z) \cosh(e z)}{a + b \cosh^2(c z)}\, dz ==$$
$$-\frac{1}{4} i \left(\left(e^{(2c - i d - e + p) z} \left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{-e - i d + p}{2c} + 1, 1; \frac{-e - i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \right. \right. \right.$$
$$\left. \left. \left. \left(-2a - 2\sqrt{a+b}\ \sqrt{a} - b \right) {}_2F_1\left(\frac{-e - i d + p}{2c} + 1, 1; \frac{-e - i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \right) \Big/$$
$$\left(\sqrt{a}\ b \sqrt{a+b}\ (2c - i d - e + p) \right) + \left(e^{(2c - i d + e + p) z} \left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b \right) \right. \right.$$
$${}_2F_1\left(\frac{e - i d + p}{2c} + 1, 1; \frac{e - i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \left(-2a - 2\sqrt{a+b}\ \sqrt{a} - b \right)$$
$$\left. \left. {}_2F_1\left(\frac{e - i d + p}{2c} + 1, 1; \frac{e - i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (2c - i d + e + p) \right) -$$
$$\left(e^{(2c - e + i d + p) z} \left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{-e + i d + p}{2c} + 1, 1; \frac{-e + i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \right. \right.$$
$$\left. \left. \left(-2a - 2\sqrt{a+b}\ \sqrt{a} - b \right) {}_2F_1\left(\frac{-e + i d + p}{2c} + 1, 1; \frac{-e + i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \right) \Big/$$
$$\left(\sqrt{a}\ b \sqrt{a+b}\ (2c - e + i d + p) \right) - \left(e^{(2c + e + i d + p) z} \left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b \right) \right. \right.$$
$${}_2F_1\left(\frac{e + i d + p}{2c} + 1, 1; \frac{e + i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \left(-2a - 2\sqrt{a+b}\ \sqrt{a} - b \right)$$
$$\left. \left. {}_2F_1\left(\frac{e + i d + p}{2c} + 1, 1; \frac{e + i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) \right) \right) \Big/ \left(\sqrt{a}\ b \sqrt{a+b}\ (2c + e + i d + p) \right) \Bigg)$$

Involving $e^{p z} \sin(d z) \cosh(e z) \left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.3887.01

$$\int \frac{e^{p z} \sin(d z) \cosh(e z)}{\left(a + b \cosh^2(c z)\right)^2}\, dz == -\frac{1}{4} i \left(\left(e^{(2c - i d - e + p) z} \right. \right.$$
$$\left(-(2a + b) \left(-2a + 2\sqrt{a+b}\ \sqrt{a} - b \right) {}_2F_1\left(\frac{-e - i d + p}{2c} + 1, 1; \frac{-e - i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \right.$$
$$(-2a - b) \left(2a + 2\sqrt{a+b}\ \sqrt{a} + b \right) {}_2F_1\left(\frac{-e - i d + p}{2c} + 1, 1; \frac{-e - i d + p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b} \right) +$$
$$2\sqrt{a} \left(\left(-2a^{3/2} + 2\sqrt{a+b}\ a - 2b\sqrt{a} + b\sqrt{a+b} \right) {}_2F_1\left(\frac{-e - i d + p}{2c} + 1, 2; \frac{-e - i d + p}{2c} + \right. \right.$$
$$\left. \left. 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b} \right) + \left(2a^{3/2} + 2\sqrt{a+b}\ a + 2b\sqrt{a} + b\sqrt{a+b} \right) \right.$$

$$ {}_2F_1\left(\frac{-e-i\,d+p}{2\,c}+1,\,2;\,\frac{-e-i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-i\,d-e+p)\right)+\Bigg(e^{(2\,c-i\,d+e+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$ {}_2F_1\left(\frac{e-i\,d+p}{2\,c}+1,\,1;\,\frac{e-i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-i\,d+p}{2\,c}+1,\,1;\,\frac{e-i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{e-i\,d+p}{2\,c}+1,\,2;\,\frac{e-i\,d+p}{2\,c}+$$

$$2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$$ {}_2F_1\left(\frac{e-i\,d+p}{2\,c}+1,\,2;\,\frac{e-i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-i\,d+e+p)\right)-\Bigg(e^{(2\,c-e+i\,d+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$ {}_2F_1\left(\frac{-e+i\,d+p}{2\,c}+1,\,1;\,\frac{-e+i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e+i\,d+p}{2\,c}+1,\,1;\,\frac{-e+i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{-e+i\,d+p}{2\,c}+1,\,2;\,\frac{-e+i\,d+p}{2\,c}+$$

$$2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)$$

$$ {}_2F_1\left(\frac{-e+i\,d+p}{2\,c}+1,\,2;\,\frac{-e+i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-e+i\,d+p)\right)-\Bigg(e^{(2\,c+e+i\,d+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$ {}_2F_1\left(\frac{e+i\,d+p}{2\,c}+1,\,1;\,\frac{e+i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e+i\,d+p}{2\,c}+1,\,1;\,\frac{e+i\,d+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{e+i\,d+p}{2\,c}+1,\,2;\,\frac{e+i\,d+p}{2\,c}+2;\right.$$

$$\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{e+i\,d+p}{2\,c}+\right.$$

$$\frac{e+i\,d+p}{}\qquad\qquad\frac{b\,e^{2\,c\,z}}{}\qquad\qquad\Bigg)\Bigg)\Bigg)\Bigg/\Bigg(\qquad\qquad\Bigg)$$

Involving cos and exp

Involving $\frac{e^{p z} \cos(d z)}{a+b \cosh(c z)}$

01.20.21.3888.01

$$\int \frac{e^{p z} \cos(d z)}{a + b \cosh(c z)}\, dz ==$$
$$\frac{1}{2}\left(\frac{1}{b\sqrt{a^2-b^2}\ (c+i d+p)}\left(e^{(c+i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+i d+p}{c}, 1; \frac{i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+i d+p}{c}, 1; \frac{i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\ (c-i d+p)}\left(e^{(c-i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i d+p}{c}, 1; \frac{-i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i d+p}{c}, 1; \frac{-i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \cos(d z) (a + b \cosh(c z))^{-n}$

01.20.21.3889.01

$$\int \frac{e^{p z} \cos(d z)}{(a+b \cosh(c z))^2}\, dz ==$$

$$\frac{1}{2}\left(\left(e^{(c+i d+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+i d+p}{c}, 1; \frac{i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$${}_2F_1\left(\frac{c+i d+p}{c}, 1; \frac{i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+i d+p}{c}, 2; \frac{i d+p}{c}+2;\right.\right.$$
$$\left.\left.\frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+i d+p}{c}, 2; \frac{i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$
$$\left.\left.\left({}_2F_1\left(\frac{c+i d+p}{c}, 2; \frac{i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+i d+p}{c}, 2; \frac{i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\Big/$$
$$\left(b\left(a^2-b^2\right)^{3/2}(c+i d+p)\right)+\left(e^{(c-i d+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i d+p}{c}, 1; \frac{-i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i d+p}{c}, 1; \frac{-i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)$$
$$\left({}_2F_1\left(\frac{c-i d+p}{c}, 2; \frac{-i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-i d+p}{c}, 2; \frac{-i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i d+p}{c}, 2; \frac{-i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c-i d+p}{c}, 2; \frac{-i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-i d+p)\right)\right)$$

Involving $\frac{e^{p z} \cos(d z)}{a+b \cosh^2(c z)}$

01.20.21.3890.01

$$\int \frac{e^{p z} \cos(d z)}{a + b \cosh^2(c z)}\, dz ==$$

$$\frac{1}{2}\left(-\left(e^{(2c+i d+p) z}\left(\left(2a-2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{i d+p}{2c}+1, 1; \frac{i d+p}{2c}+2; -\frac{b e^{2 c z}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2a-2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(\frac{i d+p}{2c}+1, 1; \frac{i d+p}{2c}+2; -\frac{b e^{2 c z}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/$$

$$\left(\sqrt{a}\ b\sqrt{a+b}\ (2c+i d+p)\right)-\left(e^{(2c-i d+p) z}\left(\left(2a-2\sqrt{a+b}\ \sqrt{a}+b\right)\right.\right.$$

$${}_2F_1\left(\frac{-i d+p}{2c}+1, 1; \frac{-i d+p}{2c}+2; -\frac{b e^{2 c z}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\ \sqrt{a}-b\right)$$

$$\left.\left.{}_2F_1\left(\frac{-i d+p}{2c}+1, 1; \frac{-i d+p}{2c}+2; -\frac{b e^{2 c z}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\ b\sqrt{a+b}\ (2c-i d+p)\right)\Bigg)$$

Involving $e^{p z} \cos(d z)\left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.3891.01

$$\int \frac{e^{p z} \cos(d z)}{\left(a + b \cosh^2(c z)\right)^2} dz ==$$

$$\frac{1}{2}\left(-\left(e^{(2c+i d+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i d+p}{2c}+1,1;\frac{i d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i d+p}{2c}+1,1;\frac{i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{i d+p}{2c}+1,2;\frac{i d+p}{2c}+2;\right.\right.$$
$$\left.-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.\left.{}_2F_1\left(\frac{i d+p}{2c}+1,2;\frac{i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c+i d+p)\right)-$$
$$\left(e^{(2c-i d+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-i d+p}{2c}+1,1;\frac{-i d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-i d+p}{2c}+1,1;\frac{-i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-i d+p}{2c}+1,2;\frac{-i d+p}{2c}+\right.\right.$$
$$2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\left.\left.\left.

01.20.21.3892.01

$$\int \frac{e^{p z} \cos(d z) \cosh(e z)}{a + b \cosh(c z)} dz ==$$

$$\frac{1}{4}\left(\left(e^{(c-e+i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-e+i d+p}{c}, 1; \frac{-e+i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c-e+i d+p}{c}, 1; \frac{-e+i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}\,(c-e+i d+p)\right)+$$
$$\left(e^{(c-i d-e+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i d-e+p}{c}, 1; \frac{-e-i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left.{}_2F_1\left(\frac{c-i d-e+p}{c}, 1; \frac{-e-i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\Big/\left(b\sqrt{a^2-b^2}\,(c-i d-e+p)\right)+$$
$$\left(e^{(c+e+i d+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+e+i d+p}{c}, 1; \frac{e+i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.$$
$$\left.\left.{}_2F_1\left(\frac{c+e+i d+p}{c}, 1; \frac{e+i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\Big/\left(b\sqrt{a^2-b^2}\,(c+e+i d+p)\right)+$$
$$\left(e^{(c-i d+e+p) z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i d+e+p}{c}, 1; \frac{e-i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i d+e+p}{c}, 1; \frac{e-i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\sqrt{a^2-b^2}\,(c-i d+e+p)\right)\Bigg)$$

Involving $e^{p z} \cos(d z) \cosh(e z) (a + b \cosh(c z))^{-n}$

01.20.21.3893.01

$$\int \frac{e^{p z} \cos(d z) \cosh(e z)}{(a + b \cosh(c z))^2} dz ==$$

$$\frac{1}{4}\left(\left(e^{(c-e+i d+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-e+i d+p}{c}, 1; \frac{-e+i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.{}_2F_1\left(\frac{c-e+i d+p}{c}, 1; \frac{-e+i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-e+i d+p}{c}, 2;\right.\right.\right.\right.$$
$$\left.\left.\left.\left.\frac{-e+i d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-e+i d+p}{c}, 2; \frac{-e+i d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)-\right.$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-e+i\,d+p}{c},2;\frac{-e+i\,d+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.{}_2F_1\left(\frac{c-e+i\,d+p}{c},2;\frac{-e+i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-e+i\,d+p)\right)+$$

$$\left(e^{(c-i\,d-e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d-e+p}{c},1;\frac{-e-i\,d+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-i\,d-e+p}{c},1;\frac{-e-i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-i\,d-e+p}{c},2;\frac{-e-i\,d+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-i\,d-e+p}{c},2;\frac{-e-i\,d+p}{c}+2;\right.\right.$$

$$\left.\left.-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i\,d-e+p}{c},2;\frac{-e-i\,d+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(\frac{c-i\,d-e+p}{c},2;\frac{-e-i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-i\,d-e+p)\right)+$$

$$\left(e^{(c+e+i\,d+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+e+i\,d+p}{c},1;\frac{e+i\,d+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+e+i\,d+p}{c},1;\frac{e+i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+e+i\,d+p}{c},2;\frac{e+i\,d+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$

$$\left.{}_2F_1\left(\frac{c+e+i\,d+p}{c},2;\frac{e+i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+e+i\,d+p}{c},2;\frac{e+i\,d+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.{}_2F_1\left(\frac{c+e+i\,d+p}{c},2;\frac{e+i\,d+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c+e+i\,d+p)\right)+$$

$$\left(e^{(c-i\,d+e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-i\,d+e+p}{c},\,1;\,\frac{e-i\,d\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(\frac{c-i\,d+e+p}{c},\,1;\,\frac{e-i\,d\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-\right.$$

$$\left.{}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{c-i\,d+e+p}{c},\,2;\,\frac{e-i\,d\,+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\Big/\left(b\left(a^2-b^2\right)^{3/2}(c-i\,d+e+p)\right)\Bigg)$$

Involving $\frac{e^{p\,z}\cos(d\,z)\cosh(e\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.3894.01

$$\int \frac{e^{p z}\cos(d z)\cosh(e z)}{a+b\cosh^2(c z)}\,dz =$$
$$\frac{1}{4}\left(-\left(e^{(2c-e+i d+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e+i d+p}{2c}+1,1;\frac{-e+i d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-e+i d+p}{2c}+1,1;\frac{-e+i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c-e+i d+p)\right)-\left(e^{(2c-i d-e+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e-i d+p}{2c}+1,1;\frac{-e-i d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-e-i d+p}{2c}+1,1;\frac{-e-i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c-i d-e+p)\right)-\left(e^{(2c+e+i d+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e+i d+p}{2c}+1,1;\frac{e+i d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e+i d+p}{2c}+1,1;\frac{e+i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c+e+i d+p)\right)-\left(e^{(2c-i d+e+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-i d+p}{2c}+1,1;\frac{e-i d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-i d+p}{2c}+1,1;\frac{e-i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c-i d+e+p)\right)\right)$$

Involving $e^{p z}\cos(d z)\cosh(e z)\left(a+b\cosh^2(c z)\right)^{-n}$

01.20.21.3895.01

$$\int \frac{e^{p z}\cos(d z)\cosh(e z)}{\left(a+b\cosh^2(c z)\right)^2}\,dz =$$
$$\frac{1}{4}\left(-\left(e^{(2c-e+i d+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-e+i d+p}{2c}+1,1;\frac{-e+i d+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e+i d+p}{2c}+1,1;\frac{-e+i d+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-e+i d+p}{2c}+1,2;\frac{-e+i d+p}{2c}+2;\right.\right.\right.\right.$$

$$-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$${}_2F_1\left(\frac{-e+id+p}{2c}+1,\,2;\,\frac{-e+id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(2c-e+id+p)\right)-\Bigg(e^{(2c-id-e+p)z}\Bigg(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right)$$
$${}_2F_1\left(\frac{-e-id+p}{2c}+1,\,1;\,\frac{-e-id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-e-id+p}{2c}+1,\,1;\,\frac{-e-id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\,\Bigg(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-e-id+p}{2c}+1,\,2;\,\frac{-e-id+p}{2c}+\right.$$
$$\left.2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$${}_2F_1\left(\frac{-e-id+p}{2c}+1,\,2;\,\frac{-e-id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(2c-id-e+p)\right)-\Bigg(e^{(2c+e+id+p)z}\Bigg(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right)$$
$${}_2F_1\left(\frac{e+id+p}{2c}+1,\,1;\,\frac{e+id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e+id+p}{2c}+1,\,1;\,\frac{e+id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\,\Bigg(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e+id+p}{2c}+1,\,2;\,\frac{e+id+p}{2c}+\right.$$
$$\left.2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$${}_2F_1\left(\frac{e+id+p}{2c}+1,\,2;\,\frac{e+id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(2c+e+id+p)\right)-\Bigg(e^{(2c-id+e+p)z}\Bigg(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right)$$
$${}_2F_1\left(\frac{e-id+p}{2c}+1,\,1;\,\frac{e-id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-id+p}{2c}+1,\,1;\,\frac{e-id+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$

$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\;a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e-i\,d+p}{2c}+1,\,2;\,\frac{e-i\,d+p}{2c}+2;\right.\right.$$
$$\left.-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\;a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e-i\,d+p}{2c}+\right.$$
$$\left.\left.\left.1,\,2;\,\frac{e-i\,d+p}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-i\,d+e+p)\right)\Bigg)$$

Involving algebraic functions of the direct function, trigonometric and exponential functions

Involving sin and exp

Involving $e^{pz}\sin(dz)(a+b\cosh(cz))^{\beta}$

01.20.21.3896.01

$$\int e^{pz}\sin(dz)(a+b\cosh(cz))^{\beta}\,dz==$$
$$-\left(i\left(\frac{e^{cz}b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{cz}b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}b\,e^{-cz}\left(1+e^{2cz}\right)\right)^{\beta}\left(e^{(id+p)z}(id-p+c\beta)F_1\left(\frac{id+p-c\beta}{c};-\beta,\right.\right.\right.$$
$$\left.-\beta;\frac{-\beta c+c+i\,d+p}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+e^{(-id+p)z}(id+p-c\beta)F_1\left(-\frac{id-p+c\beta}{c};\right.$$
$$\left.\left.\left.-\beta,-\beta;\frac{-\beta c+c-id+p}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}},\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)\right)\right)\Big/(2(id+p-c\beta)(id-p+c\beta))$$

Involving $e^{pz}\sin(dz)\left(a+b\cosh^2(cz)\right)^{\beta}$

01.20.21.3897.01

$$\int e^{pz}\sin(dz)\left(a+b\cosh^2(cz)\right)^{\beta}\,dz==$$
$$-\left(i\left(\frac{e^{2cz}b}{2a+b-2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2cz}b}{2a+b+2\sqrt{a(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}b\,e^{-2cz}\left(1+e^{2cz}\right)^2+a\right)^{\beta}\right.$$
$$\left(e^{(id+p)z}(id-p+2c\beta)F_1\left(\frac{id+p-2c\beta}{2c};-\beta,-\beta;\frac{id+p}{2c}-\beta+1;-\frac{b\,e^{2cz}}{2a+b+2\sqrt{a(a+b)}},\right.\right.$$
$$\left.-\frac{b\,e^{2cz}}{2a+b-2\sqrt{a(a+b)}}\right)+e^{(-id+p)z}(id+p-2c\beta)F_1\left(-\frac{id-p+2c\beta}{2c};-\beta,-\beta;\frac{-id+p}{2c}-\beta+1;\right.$$
$$\left.\left.\left.-\frac{b\,e^{2cz}}{2a+b+2\sqrt{a(a+b)}},-\frac{b\,e^{2cz}}{2a+b-2\sqrt{a(a+b)}}\right)\right)\right)\Big/(2(id+p-2c\beta)(id-p+2c\beta))$$

Involving $e^{p z} \sin(d z) \cosh(e z) (a + b \cosh(c z))^{\beta}$

01.20.21.3898.01

$$\int e^{p z} \sin(d z) \cosh(e z) (a + b \cosh(c z))^{\beta} dz == -\frac{1}{4} i \left(\frac{e^{c z} b}{a - \sqrt{a^2 - b^2}} + 1\right)^{-\beta} \left(\frac{e^{c z} b}{a + \sqrt{a^2 - b^2}} + 1\right)^{-\beta} \left(a + \frac{1}{2} b e^{-c z} \left(1 + e^{2 c z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(-e+i d+p) z}}{-e+i d+p-c \beta} F_1\left(\frac{-e+i d+p-c \beta}{c}; -\beta, -\beta; \frac{-\beta c+c-e+i d+p}{c}; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}, \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right) + \right.$$
$$\frac{e^{(e-i d+p) z}}{-e+i d-p+c \beta} F_1\left(\frac{e-i d+p-c \beta}{c}; -\beta, -\beta; \frac{-\beta c+c-i d+e+p}{c}; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}, \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right) +$$
$$\frac{e^{(e+i d+p) z}}{e+i d+p-c \beta} F_1\left(\frac{e+i d+p-c \beta}{c}; -\beta, -\beta; \frac{-\beta c+c+e+i d+p}{c}; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}, \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right) +$$
$$\left.\frac{e^{(-e-i d+p) z}}{e+i d-p+c \beta} F_1\left(-\frac{e+i d-p+c \beta}{c}; -\beta, -\beta; \frac{-\beta c+c-i d-e+p}{c}; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}, \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)\right)$$

Involving $e^{p z} \sin(d z) \cosh(e z) \left(a + b \cosh^2(c z)\right)^{\beta}$

01.20.21.3899.01

$$\int e^{p z} \sin(d z) \cosh(e z) \left(a + b \cosh^2(c z)\right)^{\beta} dz ==$$
$$-\frac{1}{4} i \left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(-e+i d+p) z}}{-e+i d+p-2 c \beta} F_1\left(\frac{-e+i d+p-2 c \beta}{2 c}; -\beta, -\beta; \frac{-e+i d+p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, \right.\right.$$
$$\left.-\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}}\right) + \frac{e^{(e+i d+p) z}}{e+i d+p-2 c \beta} F_1\left(\frac{e+i d+p-2 c \beta}{2 c}; -\beta, -\beta; \frac{e+i d+p}{2 c} - \beta + 1; \right.$$
$$\left.-\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}}\right) + \frac{e^{(-e-i d+p) z}}{e+i d-p+2 c \beta} F_1\left(-\frac{e+i d-p+2 c \beta}{2 c}; -\beta, \right.$$
$$\left.-\beta; -\frac{e+i d-p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}}\right) - \frac{e^{(e-i d+p) z}}{e-i d+p-2 c \beta}$$
$$\left.F_1\left(\frac{e-i d+p-2 c \beta}{2 c}; -\beta, -\beta; \frac{e-i d+p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}}\right)\right)$$

Involving cos and exp

Involving $e^{p z} \cos(d z) (a + b \cosh(c z))^{\beta}$

01.20.21.3900.01

$$\int e^{p z} \cos(d z) (a + b \cosh(c z))^{\beta} \, dz ==$$

$$\frac{1}{2}\left(\frac{1}{-i d + p - c \beta}\left(e^{(-i d+p) z}\left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)^{-\beta}\left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}\right.\right.$$

$$\left.F_1\left(\frac{-i d + p - c \beta}{c}; -\beta, -\beta; \frac{-i d + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)\right) +$$

$$\frac{1}{i d + p - c \beta}\left(e^{(i d+p) z}\left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)^{-\beta}\left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{i d + p - c \beta}{c}; -\beta, -\beta; \frac{i d + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)\right)\right)$$

Involving $e^{p z} \cos(d z) \left(a + b \cosh^2(c z)\right)^{\beta}$

01.20.21.3901.01

$$\int e^{p z} \cos(d z) \left(a + b \cosh^2(c z)\right)^{\beta} \, dz ==$$

$$\frac{1}{2}\left(\frac{1}{-i d + p - 2 c \beta}\left(e^{(-i d+p) z}\left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}\right.\right.$$

$$\left.F_1\left(\frac{-i d + p}{2 c} - \beta; -\beta, -\beta; \frac{-i d + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right)\right) +$$

$$\frac{1}{i d + p - 2 c \beta}\left(e^{(i d+p) z}\left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{i d + p}{2 c} - \beta; -\beta, -\beta; \frac{i d + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right)\right)\right)$$

Involving $e^{p z} \cos(d z) \cosh(e z) (a + b \cosh(c z))^{\beta}$

01.20.21.3902.01

$$\int e^{p z} \cos(d z) \cosh(e z) (a + b \cosh(c z))^{\beta} dz == \frac{1}{4}\left(\frac{e^{c z} b}{a - \sqrt{a^2 - b^2}} + 1\right)^{-\beta}\left(\frac{e^{c z} b}{a + \sqrt{a^2 - b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(-e+i d+p) z}}{-e + i d + p - c \beta} F_1\left(\frac{-e + i d + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - e + i d + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) + \right.$$
$$\frac{e^{(e-i d+p) z}}{e - i d + p - c \beta} F_1\left(\frac{e - i d + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - i d + e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) +$$
$$\frac{e^{(e+i d+p) z}}{e + i d + p - c \beta} F_1\left(\frac{e + i d + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + e + i d + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) -$$
$$\left.\frac{e^{(-e-i d+p) z}}{e + i d - p + c \beta} F_1\left(-\frac{e + i d - p + c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - i d - e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right)\right)$$

Involving $e^{p z} \cos(d z) \cosh(e z) \left(a + b \cosh^2(c z)\right)^{\beta}$

01.20.21.3903.01

$$\int e^{p z} \cos(d z) \cosh(e z) \left(a + b \cosh^2(c z)\right)^{\beta} dz ==$$
$$\frac{1}{4}\left(\frac{e^{2 c z} b}{2 a + b - 2\sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2\sqrt{a (a + b)}} + 1\right)^{-\beta}\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(-e+i d+p) z}}{-e + i d + p - 2 c \beta} F_1\left(\frac{-e + i d + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{-e + i d + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a + b)}}, \right.\right.$$
$$\left.-\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a + b)}}\right) + \frac{e^{(e-i d+p) z}}{e - i d + p - 2 c \beta} F_1\left(\frac{e - i d + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{e - i d + p}{2 c} - \beta + 1; \right.$$
$$\left.-\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a + b)}}\right) + \frac{e^{(e+i d+p) z}}{e + i d + p - 2 c \beta} F_1\left(\frac{e + i d + p - 2 c \beta}{2 c}; -\beta, \right.$$
$$\left.-\beta; \frac{e + i d + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a + b)}}\right) + \frac{e^{(-e-i d+p) z}}{-e - i d + p - 2 c \beta}$$
$$\left.F_1\left(-\frac{e + i d - p + 2 c \beta}{2 c}; -\beta, -\beta; -\frac{e + i d - p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a + b)}}\right)\right)$$

Involving functions of the direct function, trigonometric, exponential and a power functions

Involving powers of the direct function, trigonometric, exponential and a power functions

Involving sin, exp and power

Involving $z^{\alpha-1}\, e^{p\,z}\, \sin(c\,z)\, \cosh^{\nu}(a\,z)$

01.20.21.3904.01

$$\int z^{\alpha-1}\, e^{p\,z}\, \sin(c\,z)\, \cosh^{\nu}(a\,z)\, dz ==$$

$$-i\, 2^{-\nu-1}\, z^{\alpha} \left(\binom{\nu}{\frac{\nu}{2}} (E_{1-\alpha}((-p-i\,c)\,z) - E_{1-\alpha}((i\,c-p)\,z))\, (\nu \bmod 2 - 1) - \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (-E_{1-\alpha}((-p+i\,c\, -2\,a\,s+a\,\nu)\,z) + \right.$$

$$\left. E_{1-\alpha}((-p-i\,c-2\,a\,s+a\,\nu)\,z) - E_{1-\alpha}((-p+i\,c\, +2\,a\,s-a\,\nu)\,z) + E_{1-\alpha}((-p-i\,c+2\,a\,s-a\,\nu)\,z)) \right) /;\, \nu \in \mathbb{N}^{+}$$

01.20.21.3905.01

$$\int z^{n}\, e^{p\,z}\, \sin(c\,z)\, \cosh^{\nu}(a\,z)\, dz ==$$

$$\frac{1}{2}\, i \left(1 + e^{-2\,a\,z}\right)^{-\nu} n!\, \cosh^{\nu}(a\,z) \left(e^{(-i\,c+p)\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (-i\,c+p+a\,\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-i\,c+p+a\,\nu}{2\,a}, \ldots, -\frac{-i\,c+p+a\,\nu}{2\,a}, \right.\right.$$

$$\left. -\nu;\, 1 - \frac{-i\,c+p+a\,\nu}{2\,a}, \ldots, 1 - \frac{-i\,c+p+a\,\nu}{2\,a};\, -e^{-2\,a\,z} \right) - e^{(i\,c+p)\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (i\,c+p+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left. {}_{j+2}F_{j+1}\left(-\frac{i\,c+p+a\,\nu}{2\,a}, \ldots, -\frac{i\,c+p+a\,\nu}{2\,a}, -\nu;\, 1 - \frac{i\,c+p+a\,\nu}{2\,a}, \ldots, 1 - \frac{i\,c+p+a\,\nu}{2\,a};\, -e^{-2\,a\,z} \right) \right) /;\, n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \sin(c\,z+d)\, \cosh^{\nu}(a\,z)$

01.20.21.3906.01

$$\int z^{\alpha-1}\, e^{p\,z}\, \sin(d+c\,z)\, \cosh^{\nu}(a\,z)\, dz ==$$

$$2^{-\nu-1}\, z^{\alpha}\, i \left(e^{-i\,d} \binom{\nu}{\frac{\nu}{2}} \left(e^{2\,i\,d}\, ((-i\,c-p)\,z)^{-\alpha}\, \Gamma(\alpha, -i\,c\,z-p\,z) - (i\,(c+i\,p)\,z)^{-\alpha}\, \Gamma(\alpha, i\,c\,z-p\,z) \right) (1 - \nu \bmod 2) - \right.$$

$$e^{-i\,d} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{2\,i\,d}\, \Gamma(\alpha, (-i\,c-p+2\,a\,s-a\,\nu)\,z)\, ((-i\,c-p+2\,a\,s-a\,\nu)\,z)^{-\alpha} + \right.$$

$$((i\,c-p-2\,a\,s+a\,\nu)\,z)^{-\alpha}\, \Gamma(\alpha, (i\,c-p-2\,a\,s+a\,\nu)\,z) - e^{2\,i\,d}\, ((-i\,c-p-2\,a\,s+a\,\nu)\,z)^{-\alpha}$$

$$\left. \left. \Gamma(\alpha, (-i\,c-p-2\,a\,s+a\,\nu)\,z) + ((i\,c-p+2\,a\,s-a\,\nu)\,z)^{-\alpha}\, \Gamma(\alpha, (i\,c-p+2\,a\,s-a\,\nu)\,z) \right) \right) /;\, \nu \in \mathbb{N}^{+}$$

01.20.21.3907.01

$$\int z^n e^{p z} \sin(d + c z) \cosh^{\nu}(a z)\, dz == \frac{1}{2} i \left(1 + e^{-2 a z}\right)^{-\nu} n! \cosh^{\nu}(a z)$$
$$\left(e^{-i d + (-i c + p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-i c + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-i c + p + a \nu}{2 a}, \ldots, -\frac{-i c + p + a \nu}{2 a}, -\nu;\right.\right.$$
$$\left. 1 - \frac{-i c + p + a \nu}{2 a}, \ldots, 1 - \frac{-i c + p + a \nu}{2 a}; -e^{-2 a z}\right) - e^{i d + (i c + p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (i c + p + a \nu)^{-j-1}}{(n-j)!}$$
$$\left. {}_{j+2}F_{j+1}\left(-\frac{i c + p + a \nu}{2 a}, \ldots, -\frac{i c + p + a \nu}{2 a}, -\nu; 1 - \frac{i c + p + a \nu}{2 a}, \ldots, 1 - \frac{i c + p + a \nu}{2 a}; -e^{-2 a z}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z} \sin(c z) \cosh^{\nu}(a z + b)$

01.20.21.3908.01

$$\int z^{\alpha-1} e^{p z} \sin(c z) \cosh^{\nu}(b + a z)\, dz ==$$
$$2^{-\nu-1} z^{\alpha} i \left(\binom{\nu}{\frac{\nu}{2}} (((-i c - p) z)^{-\alpha} \Gamma(\alpha, -i c z - p z) - (i (c + i p) z)^{-\alpha} \Gamma(\alpha, i c z - p z))\, (1 - \nu \bmod 2) - \right.$$
$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (2 s + \nu)} \binom{\nu}{s} \left(-e^{2 b \nu} \Gamma(\alpha, (-i c - p + 2 a s - a \nu) z)\, ((-i c - p + 2 a s - a \nu) z)^{-\alpha} + \right.$$
$$e^{4 b s} (((i c - p - 2 a s + a \nu) z)^{-\alpha} \Gamma(\alpha, (i c - p - 2 a s + a \nu) z) - ((-i c - p - 2 a s + a \nu) z)^{-\alpha}$$
$$\left.\left. \Gamma(\alpha, (-i c - p - 2 a s + a \nu) z)) + e^{2 b \nu} ((i c - p + 2 a s - a \nu) z)^{-\alpha} \Gamma(\alpha, (i c - p + 2 a s - a \nu) z)\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3909.01

$$\int z^n e^{p z} \sin(c z) \cosh^{\nu}(b + a z)\, dz == \frac{1}{2} i \left(1 + e^{-2 (b + a z)}\right)^{-\nu} n! \cosh^{\nu}(b + a z)$$
$$\left(e^{(-i c + p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-i c + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-i c + p + a \nu}{2 a}, \ldots, -\frac{-i c + p + a \nu}{2 a}, -\nu;\right.\right.$$
$$\left. 1 - \frac{-i c + p + a \nu}{2 a}, \ldots, 1 - \frac{-i c + p + a \nu}{2 a}; -e^{-2 (b + a z)}\right) - e^{(i c + p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (i c + p + a \nu)^{-j-1}}{(n-j)!}$$
$$\left. {}_{j+2}F_{j+1}\left(-\frac{i c + p + a \nu}{2 a}, \ldots, -\frac{i c + p + a \nu}{2 a}, -\nu; 1 - \frac{i c + p + a \nu}{2 a}, \ldots, 1 - \frac{i c + p + a \nu}{2 a}; -e^{-2 (b + a z)}\right)\right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z} \sin(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.3910.01

$$\int z^{\alpha-1}\, e^{p\,z} \sin(c\,z+d) \cosh^{\nu}(a\,z+b)\, dz == -i\, 2^{-\nu-1}\, z^{\alpha}\left(e^{-i\,d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,i\,d}\, E_{1-\alpha}((-i\,c-p)\,z) - E_{1-\alpha}((i\,c-p)\,z)\right)(\nu \bmod 2-1) - \right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-i\,d-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(e^{2\,i\,d+4\,b\,s}\, E_{1-\alpha}((-i\,c-p-2\,a\,s+a\,\nu)\,z) - e^{4\,b\,s}\, E_{1-\alpha}((i\,c-p-2\,a\,s+a\,\nu)\,z) + \right.$$

$$\left.\left. e^{2\,(i\,d+b\,\nu)}\, E_{1-\alpha}((-i\,c-p+2\,a\,s-a\,\nu)\,z) - e^{2\,b\,\nu}\, E_{1-\alpha}((i\,c-p+2\,a\,s-a\,\nu)\,z)\right)\right) /;\ \nu\in\mathbb{N}^{+}$$

01.20.21.3911.01

$$\int z^{n}\, e^{p\,z} \sin(d+c\,z) \cosh^{\nu}(b+a\,z)\, dz == \frac{1}{2}\, i\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu} n!\, \cosh^{\nu}(b+a\,z)$$

$$\left(e^{-i\,d+(-i\,c+p)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\, z^{n-j}\,(-i\,c+p+a\,\nu)^{-j-1}}{(n-j)!}\ {}_{j+2}F_{j+1}\left(-\frac{-i\,c+p+a\,\nu}{2\,a},\ \ldots,\ -\frac{-i\,c+p+a\,\nu}{2\,a},\ -\nu;\right.\right.$$

$$\left.1-\frac{-i\,c+p+a\,\nu}{2\,a},\ \ldots,\ 1-\frac{-i\,c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right) - e^{i\,d+(i\,c+p)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\, z^{n-j}\,(i\,c+p+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left.\left.{}_{j+2}F_{j+1}\left(-\frac{i\,c+p+a\,\nu}{2\,a},\ \ldots,\ -\frac{i\,c+p+a\,\nu}{2\,a},\ -\nu;\ 1-\frac{i\,c+p+a\,\nu}{2\,a},\ \ldots,\ 1-\frac{i\,c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right)\right) /;\ n\in\mathbb{N}$$

Involving $z^{n}\, e^{p\,z^{r}} \sin\left(b\,z^{r}\right) \cosh^{\nu}(c\,z)$

01.20.21.3912.01

$$\int z^n e^{p z^2} \sin\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$i 2^{-\nu-2} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \left(\left((-i b-p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-i b-p) z^2\right) - \left((i b-p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (i b-p) z^2\right)\right) (1-\nu \bmod 2) -$$

$$\frac{i 2^{-\nu-2}}{\sqrt{-i b+p}\ \sqrt{i b+p}}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{\frac{c^2 p (\nu-2 s)^2}{2 (i b-p) (i b+p)}} \binom{\nu}{s} \left(e^{\frac{c^2 (\nu-2 s)^2}{4 (i b+p)}} \sqrt{i b+p} \sum_{q=0}^{n} 2^{q-n} (-i b+p)^{-n-\frac{1}{2}} (c (\nu-2 s))^{n-q} \left(\frac{(c (\nu-2 s)+2 (i b-p) z)^2}{i b-p} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$(2 c s - c \nu - 2 i b z + 2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c (\nu-2 s)+2 (i b-p) z)^2}{4 (i b-p)}\right) + e^{\frac{c^2 (\nu-2 s)^2}{4 (i b+p)}} \sqrt{i b+p}$$

$$\sum_{q=0}^{n} (-i b+p)^{-n-\frac{1}{2}} \left(c \left(s-\frac{\nu}{2}\right)\right)^{n-q} (-2 c s + c \nu - 2 i b z + 2 p z)^{q+1} \left(\frac{(-2 c s + c \nu - 2 i b z + 2 p z)^2}{i b-p} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2 c s + c \nu - 2 i b z + 2 p z)^2}{4 (i b-p)}\right) - e^{\frac{c^2 (\nu-2 s)^2}{4 (-i b+p)}} \sqrt{-i b+p}$$

$$\left(\sum_{q=0}^{n} 2^{q-n} (i b+p)^{-n-\frac{1}{2}} (c (\nu-2 s))^{n-q} (c (2 s-\nu)+2 (i b+p) z)^{q+1} \left(-\frac{(c (2 s-\nu)+2 (i b+p) z)^2}{i b+p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(c (2 s-\nu)+2 (i b+p) z)^2}{4 (i b+p)}\right) + \sum_{q=0}^{n} (i b+p)^{-n-\frac{1}{2}} \left(c \left(s-\frac{\nu}{2}\right)\right)^{n-q} (c (\nu-2 s)+2 (i b+p) z)^{q+1}$$

$$\left. \left. \left(-\frac{(c (\nu-2 s)+2 (i b+p) z)^2}{i b+p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c (\nu-2 s)+2 (i b+p) z)^2}{4 (i b+p)}\right) \right) \right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3913.01

$$\int z^n e^{p \sqrt{z}} \sin\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$i 2^{-\nu} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \left(\left((-i b-p) \sqrt{z}\right)^{-2 (n+1)} \Gamma\left(2 (n+1), (-i b-p) \sqrt{z}\right) - \left((i b-p) \sqrt{z}\right)^{-2 (n+1)} \Gamma\left(2 (n+1), (i b-p) \sqrt{z}\right)\right)$$

$$(1-\nu \bmod 2) - \frac{i 2^{-2 n-\nu-2}}{c^2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{(\nu-2 s)^2} \binom{\nu}{s} \left(e^{-\frac{(i b+p)^2}{8 c s-4 c \nu}} (c (2 s-\nu))^{-2 n} \right.$$

$$\left. \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (i b+p)^{-h-k+2 n} \left(i b+p+2 c (2 s-\nu) \sqrt{z}\right)^{h+k} \left(-\frac{\left(i b+p+2 c (2 s-\nu) \sqrt{z}\right)^2}{c (2 s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h}\binom{n}{k}\left((i\,b+p)\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$\left.2\,c\,(2\,s-v)\sqrt{-\frac{\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)-$$

$$e^{-\frac{(i\,b-p)^2}{8\,c\,s-4\,c\,v}}\,(c\,(2\,s-v))^{-2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b+p)^{-h-k+2\,n}\left(-i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(i\,b-p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-i\,b+p)\left(-i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(i\,b-p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$\left.2\,c\,(2\,s-v)\sqrt{-\frac{\left(i\,b-p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b-p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{(i\,b-p)^2}{8\,c\,s-4\,c\,v}}\,(c\,(v-2\,s))^{-2\,n}\left(e^{\frac{i\,b\,p}{2\,c\,s-c\,v}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b+p)^{-h-k+2\,n}\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(-\frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((i\,b+p)\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\,\frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\,(v-2\,s)\sqrt{-\frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)-\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b+p)^{-h-k+2\,n}\right.$$

$$\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-i\,b+p)\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$2\,c\,(v-2\,s)\sqrt{-\frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\right)\Big/;\ v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sin(b\,z)\cosh^v(c\,z)$

01.20.21.3914.01

$$\int z^n e^{p z^2} \sin(b z) \cosh^{\nu}(c z)\, dz ==$$

$$i\, 2^{-\nu-2} e^{\frac{b^2}{4p}} p^{-n-1} \left(-e^{-\frac{b^2}{4p}} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{c^2 (\nu-2s)^2 - b^2}{2p}} \binom{\nu}{s} \left(-e^{\frac{(i b+2 c s-c \nu)^2}{4p}} \sum_{q=0}^{n} p^{-n-\frac{1}{2}} \left(c\left(s-\frac{\nu}{2}\right)-\frac{i b}{2}\right)^{n-q} (i b-2 c s+c \nu+2 p z)^{q+1} \right.\right.\right.$$

$$\left(-\frac{(i b-2 c s+c \nu+2 p z)^2}{p}\right)^{-\frac{q}{2}-\frac{1}{2}} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b-2 c s+c \nu+2 p z)^2}{4p}\right) -$$

$$e^{\frac{(i b-2 c s+c \nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (-i b-2 c s+c \nu)^{n-q} (i b+2 c s-c \nu+2 p z)^{q+1}$$

$$\left(-\frac{(i b+2 c s-c \nu+2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b+2 c s-c \nu+2 p z)^2}{4p}\right) +$$

$$e^{\frac{(i b+2 c s-c \nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (i b-2 c s+c \nu)^{n-q} \left(-\frac{(i b-2 c s+c \nu-2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$(-i b+2 c s-c \nu+2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b-2 c s+c \nu-2 p z)^2}{4p}\right) +$$

$$e^{\frac{(i b-2 c s+c \nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (i b+2 c s-c \nu)^{n-q} \left(-\frac{(i b+2 c s-c \nu-2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.(-i b-2 c s+c \nu+2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b+2 c s-c \nu-2 p z)^2}{4p}\right)\right)\right) p^{n+\frac{1}{2}} -$$

$$\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (-i b)^{n-q} (i b+2 p z)^{q+1} \left(-\frac{(i b+2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b+2 p z)^2}{4p}\right) +$$

$$\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1)$$

$$\left.\sum_{q=0}^{n} 2^{q-n} (i b)^{n-q} \left(-\frac{(i b-2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)} (-i b+2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b-2 p z)^2}{4p}\right)\right) /; \nu \in \mathbb{Z} \wedge \nu > 0 \wedge n \in \mathbb{N}$$

01.20.21.3915.01

$$\int z^n e^{p \sqrt{z}} \sin(b z) \cosh^{\nu}(c z)\, dz == -i\, 2^{-2n-\nu-2} e^{\frac{i p^2}{4b}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) (i b)^{-2n-2}$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p+2 i b \sqrt{z}\right)^{h+k} \left(\frac{i \left(p+2 i b \sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}\right| p \left(p+2 i b \sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{i\left(p+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)+2\sqrt{\frac{i\left(p+2\,i\,b\,\sqrt{z}\right)^2}{b}}\ b\,i\,\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{i\left(p+2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\Bigg)-$$

$$e^{-\frac{i\,p^2}{2\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p-2\,i\,b\,\sqrt{z}\right)^{h+k}\left(-\frac{i\left(p-2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(p\left(p-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{i\left(p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)-$$

$$2\,i\,b\sqrt{-\frac{i\left(p-2\,i\,b\,\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{i\left(p-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\Bigg)\Bigg)-$$

$$i\,2^{-2\,n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(-e^{\frac{p^2}{4\,i\,b+8\,c\,s-4\,c\,\nu}}\,(-i\,b-2\,c\,s+c\,\nu)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p+2\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{i\,b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(h+k+1),$$

$$\frac{\left(p+2\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{4\,i\,b+8\,c\,s-4\,c\,\nu}\Bigg)+2\,(-i\,b-2\,c\,s+c\,\nu)\sqrt{\frac{\left(p+2\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{i\,b+2\,c\,s-c\,\nu}}\ \Gamma\Bigg($$

$$\frac{1}{2}(h+k+2),\ \frac{\left(p+2\,(-i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{4\,i\,b+8\,c\,s-4\,c\,\nu}\Bigg)\Bigg)-e^{\frac{p^2}{4\,i\,b-8\,c\,s+4\,c\,\nu}}\,(-i\,b+2\,c\,s-c\,\nu)^{-2\,(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p-2\,(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2\,(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(p\left(p-2\,(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(p-2\,(i\,b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{4\,(i\,b-2\,c\,s+c\,\nu)}\right)-2\,(i\,b-2\,c\,s+c\,\nu)$$

$$\sqrt{\frac{\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,v}}\;\Gamma\left(\frac{1}{2}\left(h+k+2\right),\;\frac{\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b-2\,c\,s+c\,v\right)}\right)\Bigg)+$$

$$e^{\frac{p^2}{-4\,i\,b+8\,c\,s-4\,c\,v}}\left(i\,b-2\,c\,s+c\,v\right)^{-2\left(n+1\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+k+1\right),\;-\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b-2\,c\,s+c\,v\right)}\Bigg)+2\sqrt{-\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,v}}$$

$$\left(i\,b-2\,c\,s+c\,v\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),\;-\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b-2\,c\,s+c\,v\right)}\right)\Bigg)+$$

$$e^{\frac{p^2}{-4\,i\,b-8\,c\,s+4\,c\,v}}\left(i\,b+2\,c\,s-c\,v\right)^{-2\left(n+1\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\left(i\,b+2\,c\,s-c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\left(i\,b+2\,c\,s-c\,v\right)\sqrt{z}\right)^2}{i\,b+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\left(i\,b+2\,c\,s-c\,v\right)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\left(h+k+1\right),\;-\frac{\left(p+2\left(i\,b+2\,c\,s-c\,v\right)\sqrt{z}\right)^2}{4\,i\,b+8\,c\,s-4\,c\,v}\Bigg)+2\sqrt{-\frac{\left(p+2\left(i\,b+2\,c\,s-c\,v\right)\sqrt{z}\right)^2}{i\,b+2\,c\,s-c\,v}}$$

$$\left(i\,b+2\,c\,s-c\,v\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),\;-\frac{\left(p+2\left(i\,b+2\,c\,s-c\,v\right)\sqrt{z}\right)^2}{4\,i\,b+8\,c\,s-4\,c\,v}\right)\Bigg)\Bigg)\;/;\;v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin\left(b\,z^r\right)\cosh^v\left(c\,z\right)$

01.20.21.3916.01

$$\int z^n e^{p z} \sin\left(b z^2\right) \cosh^{\nu}(c z)\, dz == -i\, 2^{-\nu-2} (i b)^{-n-1}$$

$$\left(e^{\frac{i p^2}{4 b}} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \left(\sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p + 2 i b z)^{q+1} \left(\frac{i (p + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (p + 2 i b z)^2}{4 b} \right) + \right.\right.$$

$$(-1)^n e^{-\frac{i p^2}{2 b}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p - 2 i b z)^{q+1} \left(-\frac{i (p - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (p - 2 i b z)^2}{4 b} \right) \Bigg) -$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{\frac{i (p + c (\nu - 2 s))^2}{4 b}} \binom{\nu}{s} \left(\sum_{q=0}^{n} 2^{q-n} (-p + 2 c s - c \nu)^{n-q} (p - 2 c s + c \nu + 2 i b z)^{q+1} \left(\frac{i (p - 2 c s + c \nu + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.$$

$$\Gamma\left(\frac{q+1}{2}, \frac{i (p - 2 c s + c \nu + 2 i b z)^2}{4 b} \right) + e^{-\frac{i c p (\nu - 2 s)}{b}} \sum_{q=0}^{n} 2^{q-n} (-p - 2 c s + c \nu)^{n-q} (p + 2 c s - c \nu + 2 i b z)^{q+1}$$

$$\left(\frac{i (p + 2 c s - c \nu + 2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (p + 2 c s - c \nu + 2 i b z)^2}{4 b} \right) +$$

$$(-1)^n e^{-\frac{i (p + c (\nu - 2 s))^2}{2 b}} \sum_{q=0}^{n} 2^{q-n} (-p + 2 c s - c \nu)^{n-q} (p - 2 c s + c \nu - 2 i b z)^{q+1}$$

$$\left(-\frac{i (p - 2 c s + c \nu - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (p - 2 c s + c \nu - 2 i b z)^2}{4 b} \right) +$$

$$(-1)^n e^{-\frac{i \left(p^2 + c^2 (\nu - 2 s)^2\right)}{2 b}} \sum_{q=0}^{n} 2^{q-n} (c (\nu - 2 s) - p)^{n-q} (p + 2 c s - c \nu - 2 i b z)^{q+1}$$

$$\left. \left. \left(-\frac{i (p + 2 c s - c \nu - 2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (p + 2 c s - c \nu - 2 i b z)^2}{4 b} \right) \right) \right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3917.01

$$\int z^n e^{p z} \sin\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$-i\, 2^{-2 n-\nu-2} \left(e^{\frac{b^2}{4 p}} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-i b)^{-h-k+2 n} \left(-\frac{\left(i b - 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-k-1)} \right.\right.$$

$$\left. \left. \left(-i b + 2 p \sqrt{z}\right)^{h+k} \binom{k}{h} \binom{n}{k} \left(b i \left(i b - 2 p \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h + k + 1), -\frac{\left(i b - 2 p \sqrt{z}\right)^2}{4 p} \right) + \right. \right. \right.$$

$$2\sqrt{-\frac{\left(i\,b-2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b-2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)-$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b)^{-h-k+2\,n}\left(i\,b+2\,p\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(i\,b+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\,i\left(i\,b+2\,p\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\,-\frac{\left(i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\Bigg)+2\sqrt{-\frac{\left(i\,b+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)\Bigg)$$

$$p^{-2\,(n+1)}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(e^{-\frac{b^2}{-4\,p+8\,c\,s-4\,c\,\nu}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b)^{-h-k+2\,n}\left(i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\,i\left(i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,\nu)}\right)+2\sqrt{-\frac{\left(i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,\nu}}$$

$$(p-2\,c\,s+c\,\nu)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,\nu)}\right)\Bigg)-$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b)^{-h-k+2\,n}\left(-\frac{\left(i\,b-2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(-i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(2\,(p-2\,c\,s+c\,\nu)\sqrt{-\frac{\left(i\,b-2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,\nu}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b-2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,\nu)}\right)-i\,b\left(-i\,b+2\,(p-2\,c\,s+c\,\nu)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(i\,b-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\Bigg)\Bigg)(p-2\,c\,s+c\,v)^{-2\,(n+1)}+$$

$$e^{-\frac{b^2}{-4\,p-8\,c\,s+4\,c\,v}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b)^{-h-k+2\,n}\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\,i\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)+2\sqrt{-\frac{\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}$$

$$(p+2\,c\,s-c\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)\Bigg)-$$

$$e^{-\frac{b^2}{-4\,p-8\,c\,s+4\,c\,v}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b)^{-h-k+2\,n}\left(-\frac{\left(i\,b-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(-i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(2\,(p+2\,c\,s-c\,v)\sqrt{-\frac{\left(i\,b-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(i\,b-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)-i\,b\left(-i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(i\,b-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Big/;\,v\in\mathbb{Z}\wedge v>0\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin(b\,z)\,\cosh^v\left(c\,z^r\right)$

01.20.21.3918.01

$$\int z^n e^{p z} \sin(b z) \cosh^{\nu}\left(c z^2\right) dz == -i\, 2^{-\nu-2}\left(2 z^{n+1}\binom{\nu}{\frac{\nu}{2}}\left(E_{-n}((-i b-p) z)-E_{-n}((i b-p) z)\right)(\nu \bmod 2-1)-\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-\frac{1}{\sqrt{c(\nu-2 s)}}\left(e^{\frac{(i b-p)^2}{c(8 s-4 \nu)}}\sum_{q=0}^{n}2^{q-n}(i b-p)^{n-q}(c(\nu-2 s))^{-n-\frac{1}{2}}(-i b+p+2 c(\nu-2 s) z)^{q+1}\right.\right.$$

$$\left.\left(-\frac{(-i b+p+2 c(\nu-2 s) z)^2}{c(\nu-2 s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-i b+p+2 c(\nu-2 s) z)^2}{c(8 s-4 \nu)}\right)\right)+$$

$$\frac{1}{\sqrt{c(\nu-2 s)}}\left(e^{\frac{(i b+p)^2}{c(8 s-4 \nu)}}\sum_{q=0}^{n}\left(-\frac{1}{2}(i b)-\frac{p}{2}\right)^{n-q}(c(\nu-2 s))^{-n-\frac{1}{2}}(i b+p+2 c(\nu-2 s) z)^{q+1}\right.$$

$$\left.\left(-\frac{(i b+p+2 c(\nu-2 s) z)^2}{c(\nu-2 s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(i b+p+2 c(\nu-2 s) z)^2}{c(8 s-4 \nu)}\right)\right)-$$

$$\frac{1}{\sqrt{c(2 s-\nu)}}\left(e^{\frac{(i b-p)^2}{4 c(\nu-2 s)}}\sum_{q=0}^{n}2^{q-n}(i b-p)^{n-q}(c(2 s-\nu))^{-n-\frac{1}{2}}(-i b+p+4 c s z-2 c \nu z)^{q+1}\right.$$

$$\left.\left(-\frac{(-i b+p+4 c s z-2 c \nu z)^2}{2 c s-c \nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(i b-p+2 c(\nu-2 s) z)^2}{c(8 s-4 \nu)}\right)\right)+$$

$$\frac{1}{\sqrt{c(2 s-\nu)}}\left(e^{\frac{(i b+p)^2}{4 c(\nu-2 s)}}\sum_{q=0}^{n}\left(-\frac{1}{2}(i b)-\frac{p}{2}\right)^{n-q}(c(2 s-\nu))^{-n-\frac{1}{2}}(i b+p+4 c s z-2 c \nu z)^{q+1}\right.$$

$$\left.\left.\left.\left(-\frac{(i b+p+4 c s z-2 c \nu z)^2}{2 c s-c \nu}\right)^{-\frac{q}{2}-\frac{1}{2}}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(i b+p+4 c s z-2 c \nu z)^2}{4(2 c s-c \nu)}\right)\right)\right)\right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3919.01

$$\int z^n e^{p z} \sin(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$i\, 2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((-i b-p)^{-n-1}\Gamma(n+1,(-i b-p) z)-(i b-p)^{-n-1}\Gamma(n+1,(i b-p) z)\right)(1-\nu \bmod 2)-$$

$$i\, 2^{-2 n-\nu-2}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(-e^{-\frac{c^2(2 k-\nu)^2}{4(-i b+p)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j(c(2 k-\nu))^{-h-j+2 n}\left(2\sqrt{z}\,(-i b+p)+c(2 k-\nu)\right)^{h+j}\right.\right.$$

$$\left(-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(2\,k-v)\right)^2}{-i\,b+p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(2\,k-v)\left(2\sqrt{z}\ (-i\,b+p)+c\,(2\,k-v)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(2\,k-v)\right)^2}{4\,(-i\,b+p)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(2\,k-v)\right)^2}{-i\,b+p}}\right.$$

$$\left.(-i\,b+p)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(2\,k-v)\right)^2}{4\,(-i\,b+p)}\right)\right)(-i\,b+p)^{-2\,n-2}-$$

$$e^{-\frac{c^2\,(v-2\,k)^2}{4\,(-i\,b+p)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,k)\right)^{h+j}\right.$$

$$\left(-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,k)\right)^2}{-i\,b+p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,k)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,k)\right)^2}{4\,(-i\,b+p)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,k)\right)^2}{-i\,b+p}}\right.$$

$$\left.\left.(-i\,b+p)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,k)\right)^2}{4\,(-i\,b+p)}\right)\right)(-i\,b+p)^{-2\,n-2}+$$

$$e^{-\frac{c^2\,(2\,k-v)^2}{4\,(i\,b+p)}}\,(i\,b+p)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(2\,k-v))^{-h-j+2\,n}\left(2\sqrt{z}\ (i\,b+p)+c\,(2\,k-v)\right)^{h+j}$$

$$\left(-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(2\,k-v)\right)^2}{i\,b+p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left(c\,(2\,k-v)\left(2\sqrt{z}\ (i\,b+p)+c\,(2\,k-v)\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(2\,k-v)\right)^2}{4\,(i\,b+p)}\right)+\right.$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(2\,k-v)\right)^2}{i\,b+p}}\ (i\,b+p)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(2\,k-v)\right)^2}{4\,(i\,b+p)}\right)+$$

$$e^{-\frac{c^2\,(v-2\,k)^2}{4\,(i\,b+p)}}\,(i\,b+p)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(c\,(v-2\,k))^{-h-j+2\,n}\left(2\sqrt{z}\ (i\,b+p)+c\,(v-2\,k)\right)^{h+j}$$

$$\left(-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(v-2\,k)\right)^2}{i\,b+p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left(c\,(v-2\,k)\left(2\sqrt{z}\ (i\,b+p)+c\,(v-2\,k)\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(v-2\,k)\right)^2}{4\,(i\,b+p)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(v-2\,k)\right)^2}{i\,b+p}}$$

$$\left.\left.(i\,b+p)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(2\sqrt{z}\ (i\,b+p)+c\,(v-2\,k)\right)^2}{4\,(i\,b+p)}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{p\,z^r}\,\sin(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.3920.01

$$\int z^n e^{p z^2} \sin(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$-i 2^{-\nu-2} e^{\frac{b^2}{4 p}} p^{-n-1} \left(e^{-\frac{b^2}{4 p}} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(e^{\frac{b^2 p}{2 (p+2 c s-c \nu) (p-2 c s+c \nu)}} \binom{\nu}{s} \left(e^{-\frac{b^2}{4 p+8 c s-4 c \nu}} \sqrt{p+2 c s-c \nu} \left(\sum_{q=0}^{n} 2^{q-n} (i b)^{n-q} (p-2 c s+c \nu)^{-n-\frac{1}{2}} \right.\right.\right.\right.\right.$$

$$\left(-\frac{(i b-2 (p-2 c s+c \nu) z)^2}{p-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)} (-i b+2 (p-2 c s+c \nu) z)^{q+1}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b-2 (p-2 c s+c \nu) z)^2}{4 (p-2 c s+c \nu)}\right) -$$

$$\sum_{q=0}^{n} 2^{q-n} (-i b)^{n-q} (p-2 c s+c \nu)^{-n-\frac{1}{2}} (i b+2 (p-2 c s+c \nu) z)^{q+1}$$

$$\left.\left(-\frac{(i b+2 (p-2 c s+c \nu) z)^2}{p-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b+2 (p-2 c s+c \nu) z)^2}{4 (p-2 c s+c \nu)}\right)\right) -$$

$$e^{-\frac{b^2}{4 p-8 c s+4 c \nu}} \sqrt{p-2 c s+c \nu} \sum_{q=0}^{n} 2^{q-n} (-i b)^{n-q} (p+2 c s-c \nu)^{-n-\frac{1}{2}} (i b+2 (p+2 c s-c \nu) z)^{q+1}$$

$$\left(-\frac{(i b+2 (p+2 c s-c \nu) z)^2}{p+2 c s-c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(i b+2 (p+2 c s-c \nu) z)^2}{4 (p+2 c s-c \nu)}\right) +$$

$$e^{-\frac{b^2}{4 p-8 c s+4 c \nu}} \sqrt{p-2 c s+c \nu} \sum_{q=0}^{n} 2^{q-n} (i b)^{n-q} (p+2 c s-c \nu)^{-n-\frac{1}{2}} \left(-\frac{(i b-2 (p+2 c s-c \nu) z)^2}{p+2 c s-c \nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.

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$$\int z^n e^{p\sqrt{z}} \sin(b z) \cosh^{\nu}\left(c\sqrt{z}\right) dz ==$$

$$(-1)^{n-1} 2^{-2n-\nu-2} i \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) b^{-2n-2} \left(e^{-\frac{i p^2}{4b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j p^{-h-j+2n} \left(p-2 i b \sqrt{z}\right)^{h+j} \right.$$

$$\left(-\frac{i\left(p-2 i b \sqrt{z}\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(p\left(p-2 i b \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{i\left(p-2 i b \sqrt{z}\right)^2}{4b}\right) - \right.$$

$$\left. 2 i b \sqrt{-\frac{i\left(p-2 i b \sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{i\left(p-2 i b \sqrt{z}\right)^2}{4b}\right) \right) -$$

$$e^{\frac{i p^2}{4b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j p^{-h-j+2n} \left(p+2 i b \sqrt{z}\right)^{h+j} \left(\frac{i\left(p+2 i b \sqrt{z}\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j} \left(p\left(p+2 i b \sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(p+2 i b \sqrt{z}\right)^2}{4b}\right) + 2\sqrt{\frac{i\left(p+2 i b \sqrt{z}\right)^2}{b}}\ b i \Gamma\left(\frac{1}{2}(h+j+2), \frac{i\left(p+2 i b \sqrt{z}\right)^2}{4b}\right) \right) +$$

$$(-1)^{n-1} 2^{-2n-\nu-2} i b^{-2n-2} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(-e^{\frac{i(p+c(\nu-2k))^2}{4b}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (p+c(\nu-2k))^{-h-j+2n} \right.$$

$$\left(p+c(\nu-2k)+2 i b \sqrt{z}\right)^{h+j} \left(\frac{i\left(p+c(\nu-2k)+2 i b \sqrt{z}\right)^2}{b} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h} \binom{n}{j}$$

$$\left((p+c(\nu-2k)) \left(p+c(\nu-2k)+2 i b \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), \frac{i\left(p+c(\nu-2k)+2 i b \sqrt{z}\right)^2}{4b}\right) + \right.$$

$$\left. \left. 2\sqrt{\frac{i\left(p+c(\nu-2k)+2 i b \sqrt{z}\right)^2}{b}}\ b i \Gamma\left(\frac{1}{2}(h+j+2), \frac{i\left(p+c(\nu-2k)+2 i b \sqrt{z}\right)^2}{4b}\right) \right) - e^{\frac{i(p-c(\nu-2k))^2}{4b}} \right.$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(p-c\,(v-2\,k))^{-h-j+2\,n}\left(p-c\,(v-2\,k)+2\,i\,b\,\sqrt{z}\right)^{h+j}\left(\frac{i\left(p-c\,(v-2\,k)+2\,i\,b\,\sqrt{z}\right)^{2}}{b}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((p-c\,(v-2\,k))\left(p-c\,(v-2\,k)+2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(p-c\,(v-2\,k)+2\,i\,b\,\sqrt{z}\right)^{2}}{4\,b}\right)+$$

$$2\sqrt{\frac{i\left(p-c\,(v-2\,k)+2\,i\,b\,\sqrt{z}\right)^{2}}{b}}\ b\,i\,\Gamma\left(\frac{1}{2}\,(h+j+2),\ \frac{i\left(p-c\,(v-2\,k)+2\,i\,b\,\sqrt{z}\right)^{2}}{4\,b}\right)\Bigg)+$$

$$e^{-\frac{i\,(p+c\,(v-2\,k))^{2}}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(p+c\,(v-2\,k))^{-h-j+2\,n}\left(p+c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(p+c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((p+c\,(v-2\,k))\left(p+c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(p+c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{4\,b}\right)-\right.$$

$$\left.2\,i\,b\sqrt{-\frac{i\left(p+c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{b}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{i\left(p+c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{4\,b}\right)\right)+$$

$$e^{-\frac{i\,(p-c\,(v-2\,k))^{2}}{4\,b}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^{j}\,(p-c\,(v-2\,k))^{-h-j+2\,n}\left(p-c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{b}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((p-c\,(v-2\,k))\left(p-c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)\Gamma\right.\left(\frac{1}{2}\,(h+j+1),\ -\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{4\,b}\right)-2\,i\,b\sqrt{-\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{b}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\ -\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,\sqrt{z}\right)^{2}}{4\,b}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n e^{p z} \sin(b z^r) \sinh^v(c z^r)$

01.20.21.3922.01

$$\int z^n e^{p z} \sin\left(b z^2\right) \cosh^v\left(c z^2\right) dz == -\frac{i 2^{-v-2}}{\sqrt{b^2}} e^{\frac{i p^2}{4 b}}$$

$$\left(\sqrt{b^2}\, e^{-\frac{i p^2}{4 b}} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{1}{\sqrt{-i b+2 c s-c v}} e^{\frac{p^2}{4 i b-8 c s+4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-i b+2 c s-c v)^{-n-\frac{1}{2}} (p-2 (i b-2 c s+c v) z)^{q+1} \right.\right.$$

$$\left(\frac{(p-2 (i b-2 c s+c v) z)^2}{i b-2 c s+c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2 (i b-2 c s+c v) z)^2}{4 (i b-2 c s+c v)} \right) +$$

$$\frac{1}{\sqrt{-i b-2 c s+c v}} e^{\frac{p^2}{4 i b+8 c s-4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-i b-2 c s+c v)^{-n-\frac{1}{2}} (p-2 (i b+2 c s-c v) z)^{q+1}$$

$$\left(\frac{(p-2 (i b+2 c s-c v) z)^2}{i b+2 c s-c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2 (i b+2 c s-c v) z)^2}{4 (i b+2 c s-c v)} \right) -$$

$$\frac{1}{\sqrt{i b-2 c s+c v}} e^{\frac{p^2}{-4 i b+8 c s-4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (i b-2 c s+c v)^{-n-\frac{1}{2}} (p+2 (i b-2 c s+c v) z)^{q+1}$$

$$\left(-\frac{(p+2 (i b-2 c s+c v) z)^2}{i b-2 c s+c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 (i b-2 c s+c v) z)^2}{4 (i b-2 c s+c v)} \right) -$$

$$\frac{1}{\sqrt{i b+2 c s-c v}} e^{\frac{p^2}{-4 i b-8 c s+4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (i b+2 c s-c v)^{-n-\frac{1}{2}} (p+2 (i b+2 c s-c v) z)^{q+1}$$

$$\left.\left(\frac{(p+2 (i b+2 c s-c v) z)^2}{-i b-2 c s+c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2 (i b+2 c s-c v) z)^2}{-4 i b-8 c s+4 c v} \right) \right) +$$

$$\sqrt{-i b} \binom{v}{\frac{v}{2}} (v \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (i b)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 i b z)^{q+1} \left(\frac{i (p+2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (p+2 i b z)^2}{4 b} \right) -$$

$$\sqrt{i b}\, e^{-\frac{i p^2}{2 b}} \binom{v}{\frac{v}{2}} (v \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (-i b)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2 i b z)^{q+1} \left(-\frac{i (p-2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (p-2 i b z)^2}{4 b} \right) \right) /; v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3923.01

$$\int z^n e^{p z} \sin\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz =$$

$$i\, 2^{-2n-\nu-2}\, p^{-2n-2} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(e^{\frac{b^2}{4p}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b)^{-h-j+2n} \left(-i\,b+2\,p\sqrt{z}\right)^{h+j} \left(-\frac{\left(-i\,b+2\,p\sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-j-1)} \right.$$

$$\binom{j}{h}\binom{n}{j} \left(2\,p \sqrt{-\frac{\left(-i\,b+2\,p\sqrt{z}\right)^2}{p}}\ \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(-i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right) - \right.$$

$$\left. i\,b \left(-i\,b+2\,p\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(-i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right) \right) -$$

$$e^{\frac{b^2}{4p}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (i\,b)^{-h-j+2n} \left(i\,b+2\,p\sqrt{z}\right)^{h+j} \left(-\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j} \left(b\,i \left(i\,b+2\,p\sqrt{z}\right) \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right) + 2 \sqrt{-\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{p}}\ p\,\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right) \right) \right) -$$

$$i\, 2^{-2n-\nu-2}\, p^{-2n-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{-\frac{(-i\,b-c\,(2\,s-\nu))^2}{4\,p}} \sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h}\, 4^j\, (-i\,b-c\,(2\,s-\nu))^{-h-j+2n} \right.$$

$$\left(-i\,b-c\,(2\,s-\nu)+2\,p\sqrt{z}\right)^{h+j} \left(-\frac{\left(-i\,b-c\,(2\,s-\nu)+2\,p\sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b-c\,(2\,s-\nu)) \left(-i\,b-c\,(2\,s-\nu)+2\,p\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(-i\,b-c\,(2\,s-\nu)+2\,p\sqrt{z}\right)^2}{4\,p}\right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(-i\,b-c\,(2\,s-\nu)+2\,p\sqrt{z}\right)^2}{p}}\ p\,\Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(-i\,b-c\,(2\,s-\nu)+2\,p\sqrt{z}\right)^2}{4\,p}\right) \right) \right) +$$

$$e^{-\frac{(i\,b-c\,(2\,s-v))^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(2\,s-v))^{-h-j+2\,n}\left(i\,b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((i\,b-c\,(2\,s-v))\left(i\,b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(i\,b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(i\,b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(i\,b-c\,(2\,s-v)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)-$$

$$e^{-\frac{(-i\,b-c\,(v-2\,s))^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(-i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(-i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(-i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\left((-i\,b-c\,(v-2\,s))\left(-i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(-i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(-i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(i\,b-c\,(v-2\,s))^2}{4\,p}}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(i\,b-c\,(v-2\,s))^{-h-j+2\,n}\left(i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((i\,b-c\,(v-2\,s))\left(i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+j+1),-\frac{\left(i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\right.$$

$$\left.\left.1\qquad\left(i\,b-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2\right)\right)\Bigg)$$

Involving $z^{\alpha-1}\, e^{p\, z^r}\, \sin(b\, z^r)\, \cosh^{\nu}(c\, z^r)$

01.20.21.3924.01

$$\int z^{\alpha-1}\, e^{p\, z^r}\, \sin(b\, z^r)\, \cosh^{\nu}(c\, z^r)\, dz ==$$

$$-\frac{1}{r}\left(\left(i\, 2^{-\nu-1}\, z^{\alpha}\right)\left(\binom{\nu}{\frac{\nu}{2}}\right)\left(((-i\, b-p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (-i\, b-p)\, z^r\right)-((i\, b-p)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (i\, b-p)\, z^r\right)\right)(\nu \bmod 2-1)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-\Gamma\left(\frac{\alpha}{r},\, (-i\, b-p-2\, c\, s+c\, \nu)\, z^r\right)((-i\, b-p-2\, c\, s+c\, \nu)\, z^r)^{-\frac{\alpha}{r}}+((i\, b-p-2\, c\, s+c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\right.$$

$$\Gamma\left(\frac{\alpha}{r},\, (i\, b-p-2\, c\, s+c\, \nu)\, z^r\right)-((-i\, b-p+2\, c\, s-c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (-i\, b-p+2\, c\, s-c\, \nu)\, z^r\right)+$$

$$\left.\left.((i\, b-p+2\, c\, s-c\, \nu)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r},\, (i\, b-p+2\, c\, s-c\, \nu)\, z^r\right)\right)\right)\Big/;\ \nu\in\mathbb{Z}\wedge\nu>0$$

01.20.21.3925.01

$$\int z^n\, e^{p\, z^2}\, \sin\left(b\, z^2\right)\cosh^{\nu}\left(c\, z^2\right)dz == 2^{-\nu-2}\, i\binom{\nu}{\frac{\nu}{2}}$$

$$\left(\left((-i\, b-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (-i\, b-p)\, z^2\right)-\left((i\, b-p)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (i\, b-p)\, z^2\right)\right)(1-\nu \bmod 2)\, z^{n+1}+2^{-\nu-2}\, i$$

$$z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{n+1}{2},\, (-i\, b-p-2\, c\, s+c\, \nu)\, z^2\right)\left((-i\, b-p-2\, c\, s+c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)}-\left((i\, b-p-2\, c\, s+c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},\, (i\, b-p-2\, c\, s+c\, \nu)\, z^2\right)+\left((-i\, b-p+2\, c\, s-c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (-i\, b-p+2\, c\, s-c\, \nu)\, z^2\right)-$$

$$\left.\left((i\, b-p+2\, c\, s-c\, \nu)\, z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2},\, (i\, b-p+2\, c\, s-c\, \nu)\, z^2\right)\right)\Big/;\ \nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

01.20.21.3926.01

$$\int z^n\, e^{p\sqrt{z}}\, \sin\left(b\sqrt{z}\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz ==$$

$$2^{-\nu}\, i\binom{\nu}{\frac{\nu}{2}}\left((i\, b+p)^{-2(n+1)}\, \Gamma\left(2\,(n+1),\, (-i\, b-p)\sqrt{z}\right)-(i\, b-p)^{-2(n+1)}\, \Gamma\left(2\,(n+1),\, (i\, b-p)\sqrt{z}\right)\right)(1-\nu \bmod 2)+$$

$$2^{-\nu}\, i\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(2\,(n+1),\, (-i\, b-p-2\, c\, s+c\, \nu)\sqrt{z}\right)(-i\, b-p-2\, c\, s+c\, \nu)^{-2(n+1)}-(i\, b-p-2\, c\, s+c\, \nu)^{-2(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\, (i\, b-p-2\, c\, s+c\, \nu)\sqrt{z}\right)+(-i\, b-p+2\, c\, s-c\, \nu)^{-2(n+1)}\, \Gamma\left(2\,(n+1),\, (-i\, b-p+2\, c\, s-c\, \nu)\sqrt{z}\right)-$$

$$\left.(i\, b-p+2\, c\, s-c\, \nu)^{-2(n+1)}\, \Gamma\left(2\,(n+1),\, (i\, b-p+2\, c\, s-c\, \nu)\sqrt{z}\right)\right)\Big/;\ \nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{b\, z^r+e}\, \sin\left(a\, z^r+q\right)\cosh^{\nu}\left(c\, z^r+g\right)$

01.20.21.3927.01

$$\int z^{\alpha-1}\, e^{b z^r+e} \sin(a z^r+q) \cosh^{\nu}(c z^r+g)\, dz ==$$

$$-\frac{2^{-\nu-1} z^{\alpha}}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e+i q-\frac{i\pi}{2}} \Gamma\left(\frac{\alpha}{r}, (-b-i a) z^r\right)((-b-i a) z^r)^{-\frac{\alpha}{r}}+e^{e-i q+\frac{i\pi}{2}} ((i a-b) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (i a-b) z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+i q+2 g s-g \nu-\frac{i\pi}{2}} \Gamma\left(\frac{\alpha}{r}, (-b-i a-2 c s+c \nu) z^r\right)((-b-i a-2 c s+c \nu) z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-i q+2 g s-g \nu+\frac{i\pi}{2}} ((-b+i a-2 c s+c \nu) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b+i a-2 c s+c \nu) z^r\right)+$$

$$e^{e+i q-2 g s+g \nu-\frac{i\pi}{2}} ((-b-i a+2 c s-c \nu) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b-i a+2 c s-c \nu) z^r\right)+$$

$$\left.\left.e^{e-i q-2 g s+g \nu+\frac{i\pi}{2}} ((-b+i a+2 c s-c \nu) z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b+i a+2 c s-c \nu) z^r\right)\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.3928.01

$$\int z^n\, e^{b z^2+e} \sin\left(a z^2+q\right) \cosh^{\nu}\left(c z^2+g\right) dz == 2^{-\nu-2}\, i\, z^{n+1}\binom{\nu}{\frac{\nu}{2}}$$

$$\left(e^{e+i q}\left((-b-i a) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-i a) z^2\right)-e^{e-i q}\left((i a-b) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (i a-b) z^2\right)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu-2}\, i\, z^{n+1} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{e+i q-g(\nu-2 s)} \Gamma\left(\frac{n+1}{2}, (-b-i a+c(\nu-2 s)) z^2\right)\left((-b-i a+c(\nu-2 s)) z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$e^{e-i q-g(\nu-2 s)}\left((-b+i a+c(\nu-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+i a+c(\nu-2 s)) z^2\right)-$$

$$e^{e+i q+g(\nu-2 s)}\left((-b-i a-c(\nu-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-i a-c(\nu-2 s)) z^2\right)+$$

$$\left.e^{e-i q+g(\nu-2 s)}\left((-b+i a-c(\nu-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+i a-c(\nu-2 s)) z^2\right)\right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3929.01

$$\int z^n\, e^{\sqrt{z}\, b+e} \sin\left(\sqrt{z}\, a+q\right) \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz ==$$

$$2^{-\nu}\, i\binom{\nu}{\frac{\nu}{2}}\left(e^{e+i q}(b+i a)^{-2(n+1)} \Gamma\left(2(n+1), (-b-i a)\sqrt{z}\right)-e^{e-i q}(i a-b)^{-2(n+1)} \Gamma\left(2(n+1), (i a-b)\sqrt{z}\right)\right)(1-\nu \bmod 2)+$$

$$2^{-\nu}\, i \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+i q+2 g s-g \nu} \Gamma\left(2(n+1), (-b-i a-2 c s+c \nu)\sqrt{z}\right)(-b-i a-2 c s+c \nu)^{-2(n+1)}-\right.$$

$$e^{e-i q+2 g s-g \nu}(-b+i a-2 c s+c \nu)^{-2(n+1)} \Gamma\left(2(n+1), (-b+i a-2 c s+c \nu)\sqrt{z}\right)+$$

$$e^{e+i q-2 g s+g \nu}(-b-i a+2 c s-c \nu)^{-2(n+1)} \Gamma\left(2(n+1), (-b-i a+2 c s-c \nu)\sqrt{z}\right)-$$

$$\left.e^{e-i q-2 g s+g \nu}(-b+i a+2 c s-c \nu)^{-2(n+1)} \Gamma\left(2(n+1), (-b+i a+2 c s-c \nu)\sqrt{z}\right)\right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^n e^{b z^r+d z+e} \sin(a z^r+p z+q) \cosh^v(c z^r+f z+g)$

01.20.21.3930.01

$$\int z^n e^{b z^2+d z+e} \sin(a z^2+p z+q) \cosh^v(c z^2+f z+g)\, dz ==$$

$$-i 2^{-v-2} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \left((b-i a)^{-n-1} e^{-\frac{(d-i p)^2}{4(b-i a)}+e-i q} \sum_{j=0}^{n} 2^{j-n} (i p-d)^{n-j} (d-i p+2(b-i a) z)^{j+1} \right.$$

$$\left(-\frac{(d-i p+2(b-i a) z)^2}{b-i a} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-i p+2(b-i a) z)^2}{4(b-i a)} \right) -$$

$$(b+i a)^{-n-1} e^{-\frac{(d+i p)^2}{4(b+i a)}+e+i q} \sum_{j=0}^{n} 2^{j-n} (-d-i p)^{n-j} (d+i p+2(b+i a) z)^{j+1}$$

$$\left. \left(-\frac{(d+i p+2(b+i a) z)^2}{b+i a} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+i p+2(b+i a) z)^2}{4(b+i a)} \right) \right) - i 2^{-v-2}$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{(d-i p+f(2 s-v))^2}{4(b-i a+c(2 s-v))}+e-i q+g(2 s-v)} \left(\sum_{j=0}^{n} 2^{j-n} (-d+i p-f(2 s-v))^{n-j} (d-i p+f(2 s-v)+2(b-i a+c(2 s-v)) z)^{j+1} \right. \right.$$

$$\left(-\frac{(d-i p+f(2 s-v)+2(b-i a+c(2 s-v)) z)^2}{b-i a+c(2 s-v)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\left. \left. \Gamma\left(\frac{j+1}{2}, -\frac{(d-i p+f(2 s-v)+2(b-i a+c(2 s-v)) z)^2}{4(b-i a+c(2 s-v))} \right) \right) \right)$$

$$(b-i a+c(2 s-v))^{-n-1} - e^{-\frac{(d+i p+f(2 s-v))^2}{4(b+i a+c(2 s-v))}+e+i q+g(2 s-v)} (b+i a+c(2 s-v))^{-n-1}$$

$$\sum_{j=0}^{n} 2^{j-n} (-d-i p-f(2 s-v))^{n-j} (d+i p+f(2 s-v)+2(b+i a+c(2 s-v)) z)^{j+1}$$

$$\left(-\frac{(d+i p+f(2 s-v)+2(b+i a+c(2 s-v)) z)^2}{b+i a+c(2 s-v)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2}, -\frac{(d+i p+f(2 s-v)+2(b+i a+c(2 s-v)) z)^2}{4(b+i a+c(2 s-v))} \right) + e^{-\frac{(d-i p+f(v-2 s))^2}{4(b-i a+c(v-2 s))}+e-i q+g(v-2 s)}$$

$$(b-i a+c(v-2 s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d+i p-f(v-2 s))^{n-j} (d-i p+f(v-2 s)+2(b-i a+c(v-2 s)) z)^{j+1}$$

$$\left(-\frac{(d-i p+f(v-2 s)+2(b-i a+c(v-2 s)) z)^2}{b-i a+c(v-2 s)} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d-i\,p+f\,(v-2\,s)+2\,(b-i\,a\,+c\,(v-2\,s))\,z)^2}{4\,(b-i\,a\,+c\,(v-2\,s))}\right)-e^{-\frac{(d+i\,p+f\,(v-2\,s))^2}{4\,(b+i\,a+c\,(v-2\,s))}+e+i\,q+g\,(v-2\,s)}$$

$$(b+i\,a\,+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-i\,p-f\,(v-2\,s))^{n-j}\,(d+i\,p+f\,(v-2\,s)+2\,(b+i\,a\,+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d+i\,p+f\,(v-2\,s)+2\,(b+i\,a\,+c\,(v-2\,s))\,z)^2}{b+i\,a\,+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},-\frac{(d+i\,p+f\,(v-2\,s)+2\,(b+i\,a\,+c\,(v-2\,s))\,z)^2}{4\,(b+i\,a\,+c\,(v-2\,s))}\right)\right/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3931.01

$$\int z^n\,e^{\sqrt{z}\,b+e+d\,z}\sin\left(\sqrt{z}\,a+q+p\,z\right)\cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right)dz==$$

$$2^{-2\,n-\nu-2}\,i\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{-\frac{(b-i\,a)^2}{4\,(d-i\,p)}+e-i\,q}\,(d-i\,p)^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-i\,a)^{-h-j+2\,n}\left(b-i\,a\,+2\,(d-i\,p)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{\left(b-i\,a\,+2\,(d-i\,p)\,\sqrt{z}\right)^2}{d-i\,p}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((b-i\,a)\left(b-i\,a\,+2\,(d-i\,p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b-i\,a\,+2\,(d-i\,p)\,\sqrt{z}\right)^2}{4\,(d-i\,p)}\right)+2\sqrt{-\frac{\left(b-i\,a\,+2\,(d-i\,p)\,\sqrt{z}\right)^2}{d-i\,p}}$$

$$\left.(d-i\,p)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b-i\,a\,+2\,(d-i\,p)\,\sqrt{z}\right)^2}{4\,(d-i\,p)}\right)\right)-e^{-\frac{(b+i\,a)^2}{4\,(d+i\,p)}+e+i\,q}\,(d+i\,p)^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b+i\,a)^{-h-j+2\,n}\left(b+i\,a\,+2\,(d+i\,p)\,\sqrt{z}\right)^{h+j}\left(-\frac{\left(b+i\,a\,+2\,(d+i\,p)\,\sqrt{z}\right)^2}{d+i\,p}\right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j}\left((b+i\,a)\left(b+i\,a\,+2\,(d+i\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{\left(b+i\,a\,+2\,(d+i\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,p)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(b+i\,a\,+2\,(d+i\,p)\,\sqrt{z}\right)^2}{d+i\,p}}\;(d+i\,p)\,\Gamma\left(\frac{1}{2}(h+j+2),-\frac{\left(b+i\,a\,+2\,(d+i\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,p)}\right)\right)\right)+$$

$$2^{-2n-\nu-2}\, i \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{-\frac{(b+i a+c(2s-\nu))^2}{4(d+i p+f(2s-\nu))}+e+i q+g(2s-\nu)} \left(\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (b+i a+c(2s-\nu))^{-h-j+2n} \left(b+i a+c(2s-\nu)+ \right.\right.\right.$$

$$\left. 2(d+i p+f(2s-\nu))\sqrt{z} \right)^{h+j} \left(-\frac{\left(b+i a+c(2s-\nu)+2(d+i p+f(2s-\nu))\sqrt{z} \right)^2}{d+i p+f(2s-\nu)} \right)^{\frac{1}{2}(-h-j-1)}$$

$$\binom{j}{h}\binom{n}{j} \left((b+i a+c(2s-\nu)) \left(b+i a+c(2s-\nu)+2(d+i p+f(2s-\nu))\sqrt{z} \right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+j+1), -\frac{\left(b+i a+c(2s-\nu)+2(d+i p+f(2s-\nu))\sqrt{z} \right)^2}{4(d+i p+f(2s-\nu))} \right) + 2$$

$$(d+i p+f(2s-\nu))\, \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b+i a+c(2s-\nu)+2(d+i p+f(2s-\nu))\sqrt{z} \right)^2}{4(d+i p+f(2s-\nu))} \right)$$

$$\left. \left. \sqrt{-\frac{\left(b+i a+c(2s-\nu)+2(d+i p+f(2s-\nu))\sqrt{z} \right)^2}{d+i p+f(2s-\nu)}} \right) \right)$$

$$(d+i p+f(2s-\nu))^{-2n-2} + e^{-\frac{(b-i a+c(2s-\nu))^2}{4(d-i p+f(2s-\nu))}+e-i q+g(2s-\nu)} (d-i p+f(2s-\nu))^{-2n-2}$$

$$\sum_{j=0}^{n} \sum_{h=0}^{j} (-1)^{j-h} 4^j (b-i a+c(2s-\nu))^{-h-j+2n} \left(b-i a+c(2s-\nu)+2(d-i p+f(2s-\nu))\sqrt{z} \right)^{h+j}$$

$$\left(-\frac{\left(b-i a+c(2s-\nu)+2(d-i p+f(2s-\nu))\sqrt{z} \right)^2}{d-i p+f(2s-\nu)} \right)^{\frac{1}{2}(-h-j-1)} \binom{j}{h}\binom{n}{j}$$

$$\left((b-i a+c(2s-\nu)) \left(b-i a+c(2s-\nu)+2(d-i p+f(2s-\nu))\sqrt{z} \right) \Gamma\left(\right.\right.$$

$$\left. \frac{1}{2}(h+j+1), -\frac{\left(b-i a+c(2s-\nu)+2(d-i p+f(2s-\nu))\sqrt{z} \right)^2}{4(d-i p+f(2s-\nu))} \right) +$$

$$2(d-i p+f(2s-\nu))\, \Gamma\left(\frac{1}{2}(h+j+2), -\frac{\left(b-i a+c(2s-\nu)+2(d-i p+f(2s-\nu))\sqrt{z} \right)^2}{4(d-i p+f(2s-\nu))} \right)$$

$$\sqrt{-\frac{\left(b-i\,a+c\,(2\,s-v)+2\,(d-i\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d-i\,p+f\,(2\,s-v)}}\Bigg)-$$

$$e^{-\frac{(b+i\,a+c\,(v-2\,s))^2}{4\,(d+i\,p+f\,(v-2\,s))}+e+i\,q+g\,(v-2\,s)}\,(d+i\,p+f\,(v-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b+i\,a+c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(b+i\,a+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b+i\,a+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+i\,p+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((b+i\,a+c\,(v-2\,s))\left(b+i\,a+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+j+1),\,-\frac{\left(b+i\,a+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+i\,p+f\,(v-2\,s))}\Bigg)+$$

$$2\,(d+i\,p+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+j+2),\,-\frac{\left(b+i\,a+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+i\,p+f\,(v-2\,s))}\right)$$

$$\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+i\,p+f\,(v-2\,s)}}\Bigg)+$$

$$e^{-\frac{(b-i\,a+c\,(v-2\,s))^2}{4\,(d-i\,p+f\,(v-2\,s))}+e-i\,q+g\,(v-2\,s)}\,(d-i\,p+f\,(v-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(b-i\,a+c\,(v-2\,s))^{-h-j+2\,n}$$

$$\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d-i\,p+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg((b-i\,a+c\,(v-2\,s))\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+j+1), -\frac{\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d-i\,p+f\,(v-2\,s))}\Bigg)+$$

$$2\,(d-i\,p+f\,(v-2\,s))\,\Gamma\Bigg(\frac{1}{2}(h+j+2), -\frac{\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d-i\,p+f\,(v-2\,s))}$$

$$\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d-i\,p+f\,(v-2\,s)}}\Bigg)\Bigg)\,/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving powers of sin, exp and power

Involving $z^{\alpha-1}\,e^{p\,z}\,\sin^{\mu}(c\,z)\,\cosh^{\nu}(a\,z)$

01.20.21.3932.01

$$\int z^{\alpha-1}\,e^{p\,z}\sin^m(c\,z)\cosh^{\nu}(a\,z)\,dz == -2^{-m-\nu}\,z^{\alpha}\,(-p\,z)^{-\alpha}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\Gamma(\alpha,-p\,z)\,(1-m\bmod 2)\,(1-\nu\bmod 2)-$$

$$i^{-m}\,2^{-m-\nu}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{i\,m\,\pi}\,E_{1-\alpha}((-p-2\,i\,c\,k+i\,c\,m)\,z)+E_{1-\alpha}((-p+2\,i\,c\,k-i\,c\,m)\,z)\right)-$$

$$2^{-m-\nu}\,z^{\alpha}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}((-p-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-p-a\,(\nu-2\,s))\,z))-$$

$$i^{-m}\,2^{-m-\nu}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(E_{1-\alpha}((-p+2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)+\right.$$

$$e^{i\,m\,\pi}\,(E_{1-\alpha}((-p+c\,i\,(m-2\,k)-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-p-2\,i\,c\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z))+$$

$$\left.E_{1-\alpha}((-p+2\,i\,c\,k-i\,c\,m+2\,a\,s-a\,\nu)\,z)\right)\,/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3933.01

$$\int z^n e^{p z} \sin^{\mu}(c z) \cosh^{\nu}(a z)\, dz == 2^{-\nu} e^{p z} \binom{\nu}{\frac{\nu}{2}} n! (1 - \nu \bmod 2) \sin^{\mu}(c z)$$

$$\left(\sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p - i c \mu)^{j+1}}\, {}_{j+2}F_{j+1}\left(-\frac{i p + c \mu}{2 c}, \ldots, -\frac{i p + c \mu}{2 c}, -\mu; 1 - \frac{i p + c \mu}{2 c}, \ldots, 1 - \frac{i p + c \mu}{2 c}; e^{2 i c z}\right)\right)$$

$$\left(1 - e^{2 i c z}\right)^{-\mu} + 2^{-\nu} n! \sin^{\mu}(c z) \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s}\right.$$

$$\left(e^{(p - a(\nu - 2s)) z} \sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p - a(\nu - 2s) - i c \mu)^{j+1}}\, {}_{j+2}F_{j+1}\left(-\frac{i(p - a(\nu - 2s)) + c \mu}{2 c}, \ldots, -\frac{i(p - a(\nu - 2s)) + c \mu}{2 c},\right.\right.$$

$$\left.-\mu; 1 - \frac{i(p - a(\nu - 2s)) + c \mu}{2 c}, \ldots, 1 - \frac{i(p - a(\nu - 2s)) + c \mu}{2 c}; e^{2 i c z}\right) + e^{(p + a(\nu - 2s)) z}$$

$$\sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p + a(\nu - 2s) - i c \mu)^{j+1}}\, {}_{j+2}F_{j+1}\left(-\frac{i(p + a(\nu - 2s)) + c \mu}{2 c}, \ldots, -\frac{i(p + a(\nu - 2s)) + c \mu}{2 c}, -\mu;\right.$$

$$\left.\left.\left.1 - \frac{i(p + a(\nu - 2s)) + c \mu}{2 c}, \ldots, 1 - \frac{i(p + a(\nu - 2s)) + c \mu}{2 c}; e^{2 i c z}\right)\right)\right) \left(1 - e^{2 i c z}\right)^{-\mu} /;\ \nu \in \mathbb{N} \wedge n \in \mathbb{N}$$

01.20.21.3934.01

$$\int z^n e^{p z} \sin^{m}(c z) \cosh^{\nu}(a z)\, dz == 2^{-m} e^{p z} \binom{m}{\frac{m}{2}} \cosh^{\nu}(a z)\, n! (1 - m \bmod 2)$$

$$\left(\sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p - a \nu)^{j+1}}\, {}_{j+2}F_{j+1}\left(\frac{p - a \nu}{2 a}, \ldots, \frac{p - a \nu}{2 a}, -\nu; \frac{p - a \nu}{2 a} + 1, \ldots, \frac{p - a \nu}{2 a} + 1; -e^{2 a z}\right)\right) \left(1 + e^{2 a z}\right)^{-\nu} +$$

$$2^{-m} \cosh^{\nu}(a z)\, n! \left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{m+s} \binom{m}{s} \left(e^{-i \frac{1}{2}(m \pi) + (p - i c (m - 2s)) z}\right.\right.$$

$$\sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p - i c (m - 2s) - a \nu)^{j+1}}\, {}_{j+2}F_{j+1}\left(\frac{p - i c (m - 2s) - a \nu}{2 a}, \ldots, \frac{p - i c (m - 2s) - a \nu}{2 a}, -\nu;\right.$$

$$\left.\frac{p - i c (m - 2s) - a \nu}{2 a} + 1, \ldots, \frac{p - i c (m - 2s) - a \nu}{2 a} + 1; -e^{2 a z}\right) + e^{\frac{1}{2} i (m \pi) + (p + c i (m - 2s)) z}$$

$$\sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p + c i (m - 2s) - a \nu)^{j+1}}\, {}_{j+2}F_{j+1}\left(\frac{p + i c (m - 2s) - a \nu}{2 a}, \ldots, \frac{p + i c (m - 2s) - a \nu}{2 a},\right.$$

$$\left.\left.\left.-\nu; \frac{p + i c (m - 2s) - a \nu}{2 a} + 1, \ldots, \frac{p + i c (m - 2s) - a \nu}{2 a} + 1; -e^{2 a z}\right)\right)\right) \left(1 + e^{2 a z}\right)^{-\nu} /;\ m \in \mathbb{N} \wedge n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z} \sin^{\mu}(c z + d) \cosh^{\nu}(a z)$

01.20.21.3935.01

$$\int z^{\alpha-1}\, e^{p z} \sin^m(d+c z) \cosh^\nu(a z)\, dz ==$$

$$-2^{-m-\nu} z^\alpha (-p z)^{-\alpha} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} \Gamma(\alpha, -p z) (1 - m \bmod 2) (1 - \nu \bmod 2) - i^{-m} 2^{-m-\nu} z^\alpha \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-i d (2k+m)} \binom{m}{k} \left(e^{4 i d k + i m \pi} E_{1-\alpha}((-2 c i k + i c m - p) z) + e^{2 i d m} E_{1-\alpha}((2 i c k - i c m - p) z) \right) -$$

$$2^{-m-\nu} z^\alpha \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} (E_{1-\alpha}((-p - 2 a s + a \nu) z) + E_{1-\alpha}((-p - a (\nu - 2 s)) z)) -$$

$$i^{-m} 2^{-m-\nu} z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-2 d i k - i d m} \binom{m}{k}$$

$$\left(e^{2 i d m} (E_{1-\alpha}((2 i c k - i c m - p - 2 a s + a \nu) z) + E_{1-\alpha}((2 i c k - i c m - p + 2 a s - a \nu) z)) + e^{4 i d k + i m \pi} \right.$$

$$\left. (E_{1-\alpha}((c i (m - 2 k) - p - 2 a s + a \nu) z) + E_{1-\alpha}((-2 c i k + i c m - p + 2 a s - a \nu) z)) \right) /;\ m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3936.01

$$\int z^n\, e^{p z} \sin^\mu(d+c z) \cosh^\nu(a z)\, dz == 2^{-\nu} e^{p z} \binom{\nu}{\frac{\nu}{2}} n! (1 - \nu \bmod 2) \sin^\mu(d+c z) \left(1 - e^{2 i (d+c z)}\right)^{-\mu}$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + c \mu}{2 c}, \ldots, -\frac{i p + c \mu}{2 c}, -\mu; 1 - \frac{i p + c \mu}{2 c}, \ldots, 1 - \frac{i p + c \mu}{2 c}; e^{2 i (d+c z)} \right) +$$

$$2^{-\nu} n! \sin^\mu(d+c z) \left(1 - e^{2 i (d+c z)}\right)^{-\mu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{(p - a (\nu - 2 k)) z} \right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a (\nu - 2 k) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p - i a (\nu - 2 k) + c \mu}{2 c}, \ldots, -\frac{i p - i a (\nu - 2 k) + c \mu}{2 c}, \right.$$

$$\left. -\mu; 1 - \frac{i p - i a (\nu - 2 k) + c \mu}{2 c}, \ldots, 1 - \frac{i p - i a (\nu - 2 k) + c \mu}{2 c}; e^{2 i (d+c z)} \right) + e^{(p + a (\nu - 2 k)) z}$$

$$\left. \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a (\nu - 2 k) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + i a (\nu - 2 k) + c \mu}{2 c}, \ldots, -\frac{i p + i a (\nu - 2 k) + c \mu}{2 c}, \right. \right.$$

$$\left. \left. -\mu; 1 - \frac{i p + i a (\nu - 2 k) + c \mu}{2 c}, \ldots, 1 - \frac{i p + i a (\nu - 2 k) + c \mu}{2 c}; e^{2 i (d+c z)} \right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3937.01

$$\int z^n e^{p z} \sin^m(d + c z) \cosh^\nu(a z)\, dz == 2^{-m}\, e^{p z} \binom{m}{\frac{m}{2}} n!\, (1 - m \bmod 2) \cosh^\nu(a z) \left(1 + e^{-2 a z}\right)^{-\nu}$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p + a \nu}{2 a}, \ldots, -\frac{p + a \nu}{2 a}, -\nu; 1 - \frac{p + a \nu}{2 a}, \ldots, 1 - \frac{p + a \nu}{2 a}; -e^{-2 a z}\right) +$$

$$2^{-m} n! \cosh^\nu(a z) \left(1 + e^{-2 a z}\right)^{-\nu} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$\left(e^{\frac{i \pi m}{2} - i d (m-2k) + (p - i c (m-2k)) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-i c (m-2k) + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{2 i c k - i c m + p + a \nu}{2 a}, \ldots, -\frac{2 i c k - i c m + p + a \nu}{2 a}, -\nu; 1 - \frac{2 i c k - i c m + p + a \nu}{2 a}, \ldots, 1 - \frac{2 i c k - i c m + p + a \nu}{2 a}; -e^{-2 a z}\right) + \right.$$

$$e^{-\frac{1}{2} i \pi m + d i (m-2k) + (c i (m-2k) + p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c i (m-2k) + p + a \nu)^{-j-1}}{(n-j)!}$$

$$\left. {}_{j+2}F_{j+1}\left(-\frac{-2 i c k + i c m + p + a \nu}{2 a}, \ldots, -\frac{-2 i c k + i c m + p + a \nu}{2 a}, -\nu; 1 - \frac{-2 i c k + i c m + p + a \nu}{2 a}, \ldots, 1 - \frac{-2 i c k + i c m + p + a \nu}{2 a}; -e^{-2 a z}\right) \right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1}\, e^{p z}\, \sin^\mu(c z) \cosh^\nu(a z + b)$

01.20.21.3938.01

$$\int z^{\alpha-1} e^{p z} \sin^m(c z) \cosh^\nu(b + a z)\, dz == -2^{-m-\nu} z^\alpha (-p z)^{-\alpha} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} \Gamma(\alpha, -p z) (1 - m \bmod 2) (1 - \nu \bmod 2) -$$

$$i^{-m} 2^{-m-\nu} z^\alpha \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} ((-1)^m E_{1-\alpha}((-2 c i k + i c m - p) z) + E_{1-\alpha}((2 i c k - i c m - p) z)) -$$

$$2^{-m-\nu} z^\alpha \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (2 s + \nu)} \binom{\nu}{s} \left(e^{4 b s} E_{1-\alpha}((-p - 2 a s + a \nu) z) + e^{2 b \nu} E_{1-\alpha}((-p - a (\nu - 2 s)) z)\right) -$$

$$i^{-m} 2^{-m-\nu} z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-2 b s - b \nu} \binom{m}{k} \left(e^{4 b s} E_{1-\alpha}((2 i c k - i c m - p - 2 a s + a \nu) z) + \right.$$

$$\left. (-1)^m \left(e^{4 b s} E_{1-\alpha}((c i (m-2k) - p - 2 a s + a \nu) z) + e^{2 b \nu} E_{1-\alpha}((-2 c i k + i c m - p + 2 a s - a \nu) z)\right) + e^{2 b \nu} E_{1-\alpha}((2 i c k - i c m - p + 2 a s - a \nu) z)\right) /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3939.01

$$\int z^n e^{p z} \sin^{\mu}(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-\nu} e^{p z} \binom{\nu}{\frac{\nu}{2}} n! (1 - \nu \bmod 2) \sin^{\mu}(c z) \left(1 - e^{2 i c z}\right)^{-\mu}$$
$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + c \mu}{2 c}, \ldots, -\frac{i p + c \mu}{2 c}, -\mu; 1 - \frac{i p + c \mu}{2 c}, \ldots, 1 - \frac{i p + c \mu}{2 c}; e^{2 i c z}\right) +$$
$$2^{-\nu} n! \sin^{\mu}(c z) \left(1 - e^{2 i c z}\right)^{-\mu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-b(\nu-2k) + (p - a(\nu-2k)) z} \right.$$
$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a(\nu-2k) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p - i a(\nu-2k) + c \mu}{2 c}, \ldots, -\frac{i p - i a(\nu-2k) + c \mu}{2 c}, \right.$$
$$\left. -\mu; 1 - \frac{i p - i a(\nu-2k) + c \mu}{2 c}, \ldots, 1 - \frac{i p - i a(\nu-2k) + c \mu}{2 c}; e^{2 i c z}\right) + e^{b(\nu-2k) + (p + a(\nu-2k)) z}$$
$$\left. \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a(\nu-2k) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + i a(\nu-2k) + c \mu}{2 c}, \ldots, -\frac{i p + i a(\nu-2k) + c \mu}{2 c}, \right.\right.$$
$$\left.\left. -\mu; 1 - \frac{i p + i a(\nu-2k) + c \mu}{2 c}, \ldots, 1 - \frac{i p + i a(\nu-2k) + c \mu}{2 c}; e^{2 i c z}\right)\right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3940.01

$$\int z^n e^{p z} \sin^{m}(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-m} e^{p z} \binom{m}{\frac{m}{2}} n! (1 - m \bmod 2) \cosh^{\nu}(b + a z) \left(1 + e^{-2(b + a z)}\right)^{-\nu}$$
$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p + a \nu}{2 a}, \ldots, -\frac{p + a \nu}{2 a}, -\nu; 1 - \frac{p + a \nu}{2 a}, \ldots, 1 - \frac{p + a \nu}{2 a}; -e^{-2(b + a z)}\right) +$$
$$2^{-m} n! \cosh^{\nu}(b + a z) \left(1 + e^{-2(b + a z)}\right)^{-\nu} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i \pi m}{2} + (p - i c(m-2k)) z} \right.$$
$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-i c(m-2k) + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{2 i c k - i c m + p + a \nu}{2 a}, \ldots, -\frac{2 i c k - i c m + p + a \nu}{2 a}, \right.$$
$$\left. -\nu; 1 - \frac{2 i c k - i c m + p + a \nu}{2 a}, \ldots, 1 - \frac{2 i c k - i c m + p + a \nu}{2 a}; -e^{-2(b + a z)}\right) + e^{-\frac{1}{2} i \pi m + (c i (m-2k) + p) z}$$
$$\left. \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c i (m-2k) + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-2 i c k + i c m + p + a \nu}{2 a}, \ldots, -\frac{-2 i c k + i c m + p + a \nu}{2 a}, \right.\right.$$
$$\left.\left. -\nu; 1 - \frac{-2 i c k + i c m + p + a \nu}{2 a}, \ldots, 1 - \frac{-2 i c k + i c m + p + a \nu}{2 a}; -e^{-2(b + a z)}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1} e^{p z} \sin^{\mu}(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.3941.01

$$\int z^{\alpha-1}\, e^{p\,z} \sin^m(c\,z+d) \cosh^\nu(a\,z+b)\, dz ==$$

$$-2^{-m-\nu}\, z^\alpha\, (-p\,z)^{-\alpha} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} \Gamma(\alpha, -p\,z)\, (1-m \bmod 2)\, (1-\nu \bmod 2) - i^{-m}\, 2^{-m-\nu}\, z^\alpha \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k\, e^{-i\,d\,(2\,k+m)} \binom{m}{k} \left(e^{4\,i\,d\,k+i\,m\,\pi}\, E_{1-\alpha}((-2\,c\,i\,k+i\,c\,m-p)\,z) + e^{2\,i\,d\,m}\, E_{1-\alpha}((2\,i\,c\,k-i\,c\,m-p)\,z) \right) -$$

$$2^{-m-\nu}\, z^\alpha \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b\,(2\,s+\nu)} \binom{\nu}{s} \left(e^{4\,b\,s}\, E_{1-\alpha}((-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((-p-a\,(\nu-2\,s))\,z) \right) -$$

$$i^{-m}\, 2^{-m-\nu}\, z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k\, e^{-2\,d\,i\,k-i\,d\,m-2\,b\,s-b\,\nu} \binom{m}{k} \left(e^{2\,i\,d\,m} \left(e^{4\,b\,s}\, E_{1-\alpha}((2\,i\,c\,k-i\,c\,m-p-2\,a\,s+a\,\nu)\,z) + \right.\right.$$
$$\left. e^{2\,b\,\nu}\, E_{1-\alpha}((2\,i\,c\,k-i\,c\,m-p+2\,a\,s-a\,\nu)\,z) \right) + e^{4\,i\,d\,k+i\,m\,\pi} \left(e^{4\,b\,s}\, E_{1-\alpha}((c\,i\,(m-2\,k)-p-2\,a\,s+a\,\nu)\,z) + \right.$$
$$\left.\left. e^{2\,b\,\nu}\, E_{1-\alpha}((-2\,c\,i\,k+i\,c\,m-p+2\,a\,s-a\,\nu)\,z) \right) \right) /;\ m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3942.01

$$\int z^n\, e^{p\,z} \sin^\mu(d+c\,z) \cosh^\nu(b+a\,z)\, dz == 2^{-\nu}\, e^{p\,z} \binom{\nu}{\frac{\nu}{2}} n!\, (1-\nu \bmod 2) \sin^\mu(d+c\,z) \left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu}$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p-i\,c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i\,p+c\,\mu}{2\,c}, \ldots, -\frac{i\,p+c\,\mu}{2\,c}, -\mu; 1-\frac{i\,p+c\,\mu}{2\,c}, \ldots, 1-\frac{i\,p+c\,\mu}{2\,c}; e^{2\,i\,(d+c\,z)} \right) +$$

$$2^{-\nu}\, n!\, \sin^\mu(d+c\,z) \left(1-e^{2\,i\,(d+c\,z)}\right)^{-\mu} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{-b\,(\nu-2\,k)+(p-a\,(\nu-2\,k))\,z} \right.$$
$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p-a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i\,p-i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{i\,p-i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}, \right.$$
$$\left. -\mu; 1-\frac{i\,p-i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{i\,p-i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}; e^{2\,i\,(d+c\,z)} \right) + e^{b\,(\nu-2\,k)+(p+a\,(\nu-2\,k))\,z}$$
$$\left. \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+a\,(\nu-2\,k)-i\,c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i\,p+i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{i\,p+i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}, \right.\right.$$
$$\left.\left. -\mu; 1-\frac{i\,p+i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{i\,p+i\,a\,(\nu-2\,k)+c\,\mu}{2\,c}; e^{2\,i\,(d+c\,z)} \right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3943.01

$$\int z^n e^{p z} \sin^m(d+c z) \cosh^\nu(b+a z)\, dz == 2^{-m} e^{p z} \binom{m}{\frac{m}{2}} n!\, (1-m \bmod 2) \cosh^\nu(b+a z) \left(1+e^{-2(b+a z)}\right)^{-\nu}$$
$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p+a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\nu}{2a}, \ldots, -\frac{p+a\nu}{2a}, -\nu; 1-\frac{p+a\nu}{2a}, \ldots, 1-\frac{p+a\nu}{2a}; -e^{-2(b+a z)}\right) + 2^{-m} n!$$
$$\cosh^\nu(b+a z) \left(1+e^{-2(b+a z)}\right)^{-\nu} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{\frac{i\pi m}{2} - i d (m-2k) + (p - i c (m-2k)) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-i c (m-2k) + p + a\nu)^{-j-1}}{(n-j)!} \right.$$
$$ {}_{j+2}F_{j+1}\left(-\frac{2 i c k - i c m + p + a\nu}{2a}, \ldots, -\frac{2 i c k - i c m + p + a\nu}{2a}, -\nu; 1-\frac{2 i c k - i c m + p + a\nu}{2a}, \right.$$
$$ \left. \left. \ldots, 1-\frac{2 i c k - i c m + p + a\nu}{2a}; -e^{-2(b+a z)}\right) + e^{-\frac{1}{2} i \pi m + d i (m-2k) + (c i (m-2k) + p) z} \right.$$
$$ \left. \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c i (m-2k) + p + a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{-2 i c k + i c m + p + a\nu}{2a}, \ldots, -\frac{-2 i c k + i c m + p + a\nu}{2a}, \right.\right.$$
$$ \left. \left. -\nu; 1-\frac{-2 i c k + i c m + p + a\nu}{2a}, \ldots, 1-\frac{-2 i c k + i c m + p + a\nu}{2a}; -e^{-2(b+a z)}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n e^{p z^r} \sin^m(b z^r) \cosh^\nu(c z)$

01.20.21.3944.01

$$\int z^n e^{p z^2} \sin^m\left(b z^2\right) \cosh^\nu(c z)\, dz == -2^{-m-\nu-1} z^{n+1} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} E_{\frac{1}{2}-\frac{n}{2}}\left(-p z^2\right) (1-m \bmod 2)\, (1-\nu \bmod 2) -$$
$$i^{-m} 2^{-m-\nu-1} z^{n+1} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left((-1)^m \Gamma\left(\frac{n+1}{2}, (-2 b i k + i b m - p) z^2\right) \right.$$
$$ \left. \left((-2 b i k + i b m - p) z^2\right)^{\frac{1}{2}(-n-1)} + \left((-i b (m-2k) - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-i b (m-2k) - p) z^2\right)\right) -$$
$$2^{-m-\nu-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{c^2 (\nu-2s)^2}{4p}} p^{-n-1} \binom{\nu}{s} \left(\sum_{q=0}^{n} 2^{q-n} (c(\nu-2s))^{n-q} (2 c s - c\nu + 2 p z)^{q+1} \right.$$
$$ \left(-\frac{(2 c s - c\nu + 2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2 c s - c\nu + 2 p z)^2}{4p}\right) + \sum_{q=0}^{n} 2^{q-n} (c(2s-\nu))^{n-q}$$
$$ \left. (c(\nu-2s) + 2 p z)^{q+1} \left(-\frac{(c(\nu-2s) + 2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c(\nu-2s) + 2 p z)^2}{4p}\right)\right) -$$
$$2^{-m-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left((-1)^k e^{\frac{1}{4}\left(-\frac{c^2 (\nu-2s)^2}{2 i b k - i b m + p} - \frac{c^2 (\nu-2s)^2}{b i (m-2k) + p} - 2\pi i m\right)} \binom{m}{k} \binom{\nu}{s} \left(e^{\frac{c^2 (\nu-2s)^2}{4(2 i b k - i b m + p)}} \sqrt{2 i b k - i b m + p} \right.\right.$$

$$\left(\sum_{q=0}^{n} 2^{q-n}\,(-2\,b\,i\,k+i\,b\,m+p)^{-n-\frac{1}{2}}\,(c\,(v-2\,s))^{n-q}\,(c\,(2\,s-v)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^{q+1}\right.$$

$$\left(-\frac{(c\,(2\,s-v)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2}{-2\,b\,i\,k+i\,b\,m+p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(c\,(2\,s-v)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2}{4\,(-2\,b\,i\,k+i\,b\,m+p)}\right)+\sum_{q=0}^{n}(-2\,b\,i\,k+i\,b\,m+p)^{-n-\frac{1}{2}}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}$$

$$(c\,(v-2\,s)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^{q+1}\left(-\frac{(c\,(v-2\,s)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2}{-2\,b\,i\,k+i\,b\,m+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c\,(v-2\,s)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2}{4\,(-2\,b\,i\,k+i\,b\,m+p)}\right)\right)+$$

$$e^{\frac{c^2\,(v-2\,s)^2}{4\,(b\,i\,(m-2\,k)+p)}+i\,m\,\pi}\sqrt{b\,i\,(m-2\,k)+p}\sum_{q=0}^{n}2^{q-n}\,(2\,i\,b\,k-i\,b\,m+p)^{-n-\frac{1}{2}}\,(c\,(v-2\,s))^{n-q}$$

$$(c\,(2\,s-v)+2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^{q+1}\left(-\frac{(c\,(2\,s-v)+2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^2}{2\,i\,b\,k-i\,b\,m+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c\,(2\,s-v)+2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^2}{4\,(2\,i\,b\,k-i\,b\,m+p)}\right)+$$

$$e^{\frac{c^2\,(v-2\,s)^2}{4\,(-2\,b\,i\,k+i\,b\,m+p)}+i\,m\,\pi}\sqrt{-2\,b\,i\,k+i\,b\,m+p}\sum_{q=0}^{n}(2\,i\,b\,k-i\,b\,m+p)^{-n-\frac{1}{2}}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}$$

$$(c\,(v-2\,s)+2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^{q+1}\left(-\frac{(c\,(v-2\,s)+2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^2}{2\,i\,b\,k-i\,b\,m+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c\,(v-2\,s)+2\,(2\,i\,b\,k-i\,b\,m+p)\,z)^2}{4\,(2\,i\,b\,k-i\,b\,m+p)}\right)\right)\right/$$

$$\left(\sqrt{2\,i\,b\,k-i\,b\,m+p}\,\sqrt{b\,i\,(m-2\,k)+p}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n\,e^{p\sqrt{z}}\,\sin^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz==$$

$$-2^{-m-v+1}\,p^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2\,(n+1),\,-p\sqrt{z}\right)(1-m\bmod 2)\,(1-v\bmod 2)-i^{-m}\,2^{-m-v+1}\,z^{n+1}\binom{v}{\frac{v}{2}}$$

$$(1-v\bmod 2)\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\left(\Gamma\left(2\,(n+1),\,(-i\,b\,m-p+2\,i\,b\,u)\sqrt{z}\right)\left((-i\,b\,m-p+2\,i\,b\,u)\sqrt{z}\right)^{-2\,(n+1)}+\right.$$

$$\left.(-1)^m\left((i\,b\,m-p-2\,i\,b\,u)\sqrt{z}\right)^{-2\,(n+1)}\Gamma\left(2\,(n+1),\,(i\,b\,m-p-2\,i\,b\,u)\sqrt{z}\right)\right)+$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}2^{-2(n+1)}\,e^{\frac{p^2}{4cv-8cs}}\,(c(2s-v))^{-2n}\,(c(v-2s))^{-2(n+1)}\binom{v}{s}$$

$$\left(e^{\frac{p^2}{4cs-2cv}}\,(c(2s-v))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2c(v-2s)\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)+\right.$$

$$\left.\left.2c\sqrt{\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}}\,(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)+\right.$$

$$(c(v-2s))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2c(2s-v)\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2c(2s-v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)+\right.$$

$$\left.\left.2c(2s-v)\sqrt{-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}}\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)\right)+$$

$$\frac{i^{-m}\,2^{-m-2n-v-1}}{c^2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2s)^2}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\left(e^{-\frac{(ibm+p-2ibu)^2}{8cs-4cv}}\,(c(2s-v))^{-2n}\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(ibm+p-2ibu)^{-h-k+2n}\left(p+bi(m-2u)+2c(2s-v)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+bi(m-2u)+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((ibm+p-2ibu)\right.$$

$$\left.\left.\left(p+bi(m-2u)+2c(2s-v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(p+bi(m-2u)+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)+\right.\right.$$

$$2\,c\,(2\,s-v)\sqrt{-\frac{\left(p+b\,i\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.-\frac{\left(p+b\,i\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+e^{i\,m\,\pi-\frac{(-i\,b\,m+p+2\,i\,b\,u)^2}{c\,(8\,s-4\,v)}}\,(c\,(2\,s-v))^{-2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b\,m+p+2\,i\,b\,u)^{-h-k+2\,n}\left(p-i\,b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((-i\,b\,m+p+2\,i\,b\,u)\right.$$

$$\left(p-i\,b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),-\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+$$

$$2\,c\,(2\,s-v)\sqrt{-\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),-\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$(c\,(v-2\,s))^{-2\,n}\left(e^{\frac{(i\,b\,m+p-2\,i\,b\,u)^2}{8\,c\,s-4\,c\,v}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,m+p-2\,i\,b\,u)^{-h-k+2\,n}\right.$$

$$\left(p+b\,i\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+b\,i\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((i\,b\,m+p-2\,i\,b\,u)\left(p+b\,i\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+1),\frac{\left(p+b\,i\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+$$

$$2\,c\,(v-2\,s)\sqrt{-\frac{\left(p+b\,i\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\frac{\left(p+b\,i\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+e^{\frac{(-i\,b\,m+p+2\,i\,b\,u)^2}{8\,c\,s-4\,c\,v}+i\,m\,\pi}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b\,m+p+2\,i\,b\,u)^{-h-k+2\,n}\left(p-i\,b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-i\,b\,m+p+2\,i\,b\,u)\left(p-i\,b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+$$

$$2\,c\,(v-2\,s)\sqrt{-\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.\frac{\left(p-i\,b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\right)\Big/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sin^m(b\,z)\cosh^v(c\,z)$

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$$\int z^n\,e^{p\,z^2}\sin^m(b\,z)\cosh^v(c\,z)\,dz==-2^{-m-v-1}\,z^{n+1}\left(-p\,z^2\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{n+1}{2},\,-p\,z^2\right)(1-m\bmod 2)\,(1-v\bmod 2)-$$

$$i^{-m}\,2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{\frac{b^2\,(m-2\,k)^2}{4\,p}}\,p^{-n-1}\binom{m}{k}\left((-1)^m\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{n-q}\,(2\,i\,b\,k-i\,b\,m+2\,p\,z)^{q+1}\right.$$

$$\left(-\frac{(2\,i\,b\,k-i\,b\,m+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,i\,b\,k-i\,b\,m+2\,p\,z)^2}{4\,p}\right)+\sum_{q=0}^{n}\left(i\,b\left(k-\frac{m}{2}\right)\right)^{n-q}$$

$$(b\,i\,(m-2\,k)+2\,p\,z)^{q+1}\left(-\frac{(b\,i\,(m-2\,k)+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b\,i\,(m-2\,k)+2\,p\,z)^2}{4\,p}\right)\Bigg)-$$

$$2^{-m-v-1}\,p^{-n-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{c^2\,(v-2\,s)^2}{4\,p}}\binom{v}{s}\Bigg(\sum_{q=0}^{n}2^{q-n}\,(c\,(v-2\,s))^{n-q}\,(2\,c\,s-c\,v+2\,p\,z)^{q+1}$$

$$\left(-\frac{(2\,c\,s-c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,c\,s-c\,v+2\,p\,z)^2}{4\,p}\right)+$$

$$\sum_{q=0}^{n}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}(c\,(v-2\,s)+2\,p\,z)^{q+1}\left(-\frac{(c\,(v-2\,s)+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c\,(v-2\,s)+2\,p\,z)^2}{4\,p}\right)\Bigg)-$$

$$\frac{1}{\sqrt{p}}\Bigg(2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{-b^2\,(m-2\,k)^2+c^2\,(v-2\,s)^2+i\,m\,p\,\pi}{2\,p}}\binom{m}{k}\Bigg(e^{\frac{(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^2}{4\,p}}\sum_{q=0}^{n}p^{-n-\frac{1}{2}}\left(\left(s-\frac{v}{2}\right)c+\left(k-\frac{m}{2}\right)b\,i\right)^{n-q}$$

$$(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^{q+1}\left(-\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{4\,p}\right)+$$

$$e^{\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^2}{4\,p}+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,p^{-n-\frac{1}{2}}\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{n-q}$$

$$(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^{q+1}\left(-\frac{(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{4\,p}\right)+$$

$$e^{\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^2}{4\,p}}\sum_{q=0}^{n}2^{q-n}\,p^{-n-\frac{1}{2}}\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{n-q}\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v+2\,p\,z)^{q+1}$$

$$\left(-\frac{(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.-\frac{(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v+2\,p\,z)^2}{4\,p}\right)+e^{\frac{(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^2}{4\,p}+i\,m\,\pi}$$

$$\sum_{q=0}^{n}2^{q-n}\,p^{-n-\frac{1}{2}}\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{n-q}\left(-\frac{(b\,i\,(m-2\,k)-2\,c\,s+c\,v-2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v+2\,p\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

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$$\int z^n e^{p\sqrt{z}} \sin^m(b z) \cosh^v(c z)\, dz == -2^{-m-v+1} p^{-2(n+1)} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(2(n+1), -p\sqrt{z}\right) (1 - m \bmod 2)(1 - v \bmod 2) -$$

$$i^{-m} 2^{-m-2n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u e^{\frac{p^2}{8ibu-4ibm}} \left(b^2 (m-2u)^2\right)^{-2n-1} \binom{m}{u}$$

$$\left((-i b (m-2u))^{2n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p + 2 b i (m-2u)\sqrt{z}\right)^{h+k} \left(\frac{i \left(p + 2 b i (m-2u)\sqrt{z}\right)^2}{b(m-2u)} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(p \left(p + 2 b i (m-2u)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{i \left(p + 2 b i (m-2u)\sqrt{z}\right)^2}{4 b (m-2u)} \right) + 2 b i (m-2u) \right.$$

$$\left. \left. \sqrt{\frac{i \left(p + 2 b i (m-2u)\sqrt{z}\right)^2}{b(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{i \left(p + 2 b i (m-2u)\sqrt{z}\right)^2}{4 b (m-2u)} \right) \right) + (-1)^m e^{\frac{p^2}{2ibm-4ibu}}$$

$$(i b (m-2u))^{2n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p - 2 i b (m-2u)\sqrt{z}\right)^{h+k} \left(-\frac{i \left(p - 2 i b (m-2u)\sqrt{z}\right)^2}{b(m-2u)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(p \left(p - 2 i b (m-2u)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{i \left(p - 2 i b (m-2u)\sqrt{z}\right)^2}{4 b (m-2u)} \right) - \right.$$

$$\left. \left. 2 i b (m-2u) \sqrt{-\frac{i \left(p - 2 i b (m-2u)\sqrt{z}\right)^2}{b(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{i \left(p - 2 i b (m-2u)\sqrt{z}\right)^2}{4 b (m-2u)} \right) \right) \right) +$$

$$2^{-m-2n-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{\frac{p^2}{4cv-8cs}} (c(2s-v))^{-2n} (c(v-2s))^{-2(n+1)} \binom{v}{s}$$

$$\left(e^{\frac{p^2}{4cs-2cv}} (c(2s-v))^{2n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p + 2 c (v-2s)\sqrt{z}\right)^{h+k} \left(-\frac{\left(p + 2 c (v-2s)\sqrt{z}\right)^2}{c(v-2s)} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\left. \binom{k}{h} \binom{n}{k} \left(p \left(p + 2 c (v-2s)\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(p + 2 c (v-2s)\sqrt{z}\right)^2}{c(8s-4v)} \right) + \right. \right.$$

$$2\,c\,\sqrt{\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)+$$

$$(c\,(v-2\,s))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+$$

$$2\,c\,(2\,s-v)\,\sqrt{-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)\Bigg)+$$

$$i^{-m}\,2^{-m-2\,n-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\Bigg((-1)^m\,e^{\frac{p^2}{4\,i\,b\,m+8\,c\,s-8\,i\,b\,u-4\,c\,v}}\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)^{-2\,(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p+2\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)\,\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\Big(p+2\,(-i\,b\,m-2\,c\,s+$$

$$2\,i\,b\,u+c\,v)\,\sqrt{z}\Big)\,\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(p+2\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)\,\sqrt{z}\right)^2}{4\,i\,b\,m+8\,c\,s-8\,i\,b\,u-4\,c\,v}\right)+$$

$$2\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)\,\sqrt{\frac{\left(p+2\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)\,\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(p+2\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)\,\sqrt{z}\right)^2}{4\,i\,b\,m+8\,c\,s-8\,i\,b\,u-4\,c\,v}\right)\Bigg)+(-1)^m\,e^{\frac{p^2}{4\,i\,b\,m-8\,c\,s-8\,i\,b\,u+4\,c\,v}}$$

$$(-i\,b\,m+2\,c\,s+2\,i\,b\,u-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p-2\,(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\right.\right.$$

$$\left.\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)}\right)-$$

$$2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{\frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)}\right)\right)+e^{\frac{p^2}{-4\,b\,i\,m+8\,c\,s+8\,i\,b\,u-4\,c\,v}}$$

$$\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\right.\right.$$

$$\left.\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)}\right)+$$

$$2\sqrt{-\frac{\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}}\ \left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)}\right)\right)+e^{\frac{p^2}{-4\,b\,i\,m-8\,c\,s+8\,i\,b\,u+4\,c\,v}}$$

$$\left(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v\right)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2\left(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\left(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v\right)\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v\right)\right.\right.$$

$$\sqrt{z}\,\Big)\,\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(p+2\,(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\,\sqrt{z}\right)^2}{8\,c\,s+4\,b\,i\,(m-2\,u)-4\,c\,v}\right)+$$

$$2\sqrt{-\frac{\left(p+2\,(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\,\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}}\;(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(p+2\,(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\,\sqrt{z}\right)^2}{8\,c\,s+4\,b\,i\,(m-2\,u)-4\,c\,v}\right)\Bigg)\Bigg)\Big/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin^m\left(b\,z^r\right)\cosh^v(c\,z)$

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$$\int z^n\,e^{p\,z}\sin^m\left(b\,z^2\right)\cosh^v(c\,z)\,dz==-2^{-m-v}\,(-p)^{-n-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(1-m\bmod 2)\,(1-v\bmod 2)-$$

$$2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}z^{n+1}\binom{v}{s}\left(E_{-n}((-p-2\,c\,s+c\,v)\,z)+E_{-n}((-p-c\,(v-2\,s))\,z)\right)-$$

$$i^{-m}\,2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(\frac{(-1)^m}{\sqrt{i\,b\,(2\,k-m)}}\,e^{\frac{p^2}{4\,i\,b\,m-8\,i\,b\,k}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(2\,k-m))^{-n-\frac{1}{2}}\,(-p)^{n-q}$$

$$(p+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^{q+1}\left(\frac{i\,(p+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{i\,(p+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)+$$

$$\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\,e^{\frac{p^2}{8\,i\,b\,k-4\,i\,b\,m}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{-n-\frac{1}{2}}\,(-p)^{n-q}\,(p+2\,b\,i\,(m-2\,k)\,z)^{q+1}$$

$$\left(-\frac{i\,(p+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{i\,(p+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(8\,k-4\,m)}\right)\Bigg)+$$

$$i^{-m}\,2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(-\frac{1}{\sqrt{i\,b\,(2\,k-m)}}\,e^{i\,m\,\pi-\frac{(p+2\,c\,s-c\,v)^2}{4\,(2\,i\,b\,k-i\,b\,m)}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(2\,k-m))^{-n-\frac{1}{2}}\,(c\,(v-2\,s)-p)^{n-q}$$

$$(p+2\,c\,s-c\,v+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^{q+1}\left(-\frac{(p+2\,c\,s-c\,v+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{2\,i\,b\,k-i\,b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(p+2\,c\,s-c\,v+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{4\,(2\,i\,b\,k-i\,b\,m)}\right)-$$

$$\frac{1}{\sqrt{i\,b\,(2\,k-m)}}\,e^{i\,m\,\pi-\frac{(p-2\,c\,s+c\,v)^2}{4\,(2\,i\,b\,k-i\,b\,m)}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(2\,k-m))^{-n-\frac{1}{2}}\,(-p+2\,c\,s-c\,v)^{n-q}$$

$$(p-2\,c\,s+c\,v+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^{q+1}\left(-\frac{(p-2\,c\,s+c\,v+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{2\,i\,b\,k-i\,b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p-2\,c\,s+c\,v+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{4\,(2\,i\,b\,k-i\,b\,m)}\right)-\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\,e^{-\frac{i\,(p+2\,c\,s-c\,v)^2}{b\,(8\,k-4\,m)}}$$

$$\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{-n-\frac{1}{2}}\,(c\,(v-2\,s)-p)^{n-q}\,(p+c\,(2\,s-v)+2\,b\,i\,(m-2\,k)\,z)^{q+1}$$

$$\left(-\frac{i\,(p+c\,(2\,s-v)+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{i\,(p+c\,(2\,s-v)+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(8\,k-4\,m)}\right)-$$

$$\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\,e^{-\frac{i\,(p+c\,(v-2\,s))^2}{b\,(8\,k-4\,m)}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{-n-\frac{1}{2}}\,(-p+2\,c\,s-c\,v)^{n-q}$$

$$(p+c\,(v-2\,s)+2\,b\,i\,(m-2\,k)\,z)^{q+1}\left(-\frac{i\,(p+c\,(v-2\,s)+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{i\,(p+c\,(v-2\,s)+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(8\,k-4\,m)}\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n\,e^{p\,z}\sin^m\left(b\,\sqrt{z}\right)\cosh^v(c\,z)\,dz==$$

$$-2^{-m-v}\,(-p)^{-n-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(1-m\bmod 2)\,(1-v\bmod 2)+2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\Gamma(n+1,\,(-p-c\,(v-2\,s))\,z)\,(c\,(2\,s-v)-p)^{-n-1}-(-p-2\,c\,s+c\,v)^{-n-1}\,\Gamma(n+1,\,(-p-2\,c\,s+c\,v)\,z)\right)+$$

$$i^{-m}\,2^{-m-2\,n-v-1}\,p^{-2\,(n+1)}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\,e^{\frac{b^2\,(m-2\,u)^2}{4\,p}}\binom{m}{u}$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,(m-2\,u))^{-h-k+2\,n}\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,u)\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,u)\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(b\,i\,(m-2\,u)\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,u)\right)^2}{4\,p}\right)+\right.\right.$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\ p+b\,i\,(m-2\,u)\right)^2}{p}}\ p\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(2\sqrt{z}\ p+b\,i\,(m-2\,u)\right)^2}{4\,p}\right)\Bigg)+(-1)^m$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b\,(m-2\,u))^{-h-k+2\,n}\left(-\frac{\left(i\,b\,(m-2\,u)-2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\left(-i\,b\,m+2\,i\,b\,u+2\,p\,\sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,i\,(m-2\,u)\left(i\,b\,(m-2\,u)-2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(i\,b\,(m-2\,u)-2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+$$

$$2\sqrt{-\frac{\left(i\,b\,(m-2\,u)-2\,p\,\sqrt{z}\right)^2}{p}}\ p\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(i\,b\,(m-2\,u)-2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)\Bigg)+$$

$$i^{-m}\,2^{-m-2\,n-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\Bigg(e^{\frac{b^2\,(m-2\,u)^2}{4\,(p-2\,c\,s+c\,v)}}\,(p-2\,c\,s+c\,v)^{-2\,(n+1)}$$

$$\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,(m-2\,u))^{-h-k+2\,n}\left(b\,i\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b\,i\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\,i\,(m-2\,u)\left(b\,i\,(m-2\,u)+\right.$$

$$\left.2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b\,i\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)+$$

$$2\sqrt{-\frac{\left(b\,i\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}\ (p-2\,c\,s+c\,v)$$

$$\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b\,i\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\Bigg)+$$

$$(-1)^m \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-i\,b\,(m-2\,u))^{-h-k+2\,n} \left(-\frac{\left(i\,b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(-i\,b\,m+2\,i\,b\,u+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k} \binom{k}{h} \binom{n}{k}$$

$$\left(2\,(p-2\,c\,s+c\,v) \sqrt{-\frac{\left(i\,b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.-\frac{\left(i\,b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)-i\,b\,(m-2\,u)\left(-i\,b\,m+2\,i\,b\,u+\right.$$

$$\left.\left.2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(i\,b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\right)\Bigg) +$$

$$e^{\frac{b^2\,(m-2\,u)^2}{4\,(p+2\,c\,s-c\,v)}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\,4^k\,(i\,b\,(m-2\,u))^{-h-k+2\,n} \left(b\,i\,(m-2\,u)+\right.$$

$$\left.2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b\,i\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,i\,(m-2\,u)\left(b\,i\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}$$

$$\left.(p+2\,c\,s-c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,i\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)\right)+$$

$$(-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{4\,(p+2\,c\,s-c\,v)}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\,4^k\,(-i\,b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(-\frac{\left(i\,b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)} \left(2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\ -i\,b\,(m-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(p+2\,c\,s-c\,v)\sqrt{-\frac{\left(i\,b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(i\,b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)-$$

$$i\,b\,(m-2\,u)\left(2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\,-i\,b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.$$

$$\left.\left.-\frac{\left(i\,b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin^m(b\,z)\cosh^v\left(c\,z^r\right)$

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$$\int z^n\,e^{p\,z}\sin^m(b\,z)\cosh^v\left(c\,z^2\right)dz==-2^{-m-v}\,(-p)^{-n-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(1-m\bmod 2)\,(1-v\bmod 2)-$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{1}{2}i\,m\,\pi}\,z^{n+1}\binom{m}{k}\left(e^{i\,m\,\pi}\,E_{-n}((-2\,b\,i\,k+i\,b\,m-p)\,z)+E_{-n}((-i\,b\,(m-2\,k)-p)\,z)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{c\,(v-2\,s)}}\,e^{\frac{p^2}{8\,c\,s-4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(c\,(v-2\,s))^{-n-\frac{1}{2}}\,(p+2\,c\,(v-2\,s)\,z)^{q+1}\left(-\frac{(p+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(p+2\,c\,(v-2\,s)\,z)^2}{c\,(8\,s-4\,v)}\right)+\frac{1}{\sqrt{c\,(2\,s-v)}}\,e^{\frac{p^2}{4\,c\,v-8\,c\,s}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(c\,(2\,s-v))^{-n-\frac{1}{2}}$$

$$\left.(p+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\left(-\frac{(p+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(p+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(8\,s-4\,v)}\right)\right)-$$

$$i^{-m}\,2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{\sqrt{c\,(v-2\,s)}}\,e^{\frac{(2\,i\,b\,k-i\,b\,m+p)^2}{c\,(8\,s-4\,v)}+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k)-p)^{n-q}\,(c\,(v-2\,s))^{-n-\frac{1}{2}}\right.$$

$$\left.(2\,i\,b\,k-i\,b\,m+p+2\,c\,(v-2\,s)\,z)^{q+1}\left(-\frac{(2\,i\,b\,k-i\,b\,m+p+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.$$

$$\Gamma\left(\frac{q+1}{2},\ \frac{(b\,i\,(2\,k-m)+p+2\,c\,(v-2\,s)\,z)^2}{c\,(8\,s-4\,v)}\right)+\frac{1}{\sqrt{c\,(v-2\,s)}}\,e^{\frac{(b\,i\,(m-2\,k)+p)^2}{c\,(8\,s-4\,v)}}\sum_{q=0}^{n}\left(i\,b\left(k-\frac{m}{2}\right)-\frac{p}{2}\right)^{n-q}$$

$$(c\,(v-2\,s))^{-n-\frac{1}{2}}\,(b\,i\,(m-2\,k)+p+2\,c\,(v-2\,s)\,z)^{q+1}\left(-\frac{(b\,i\,(m-2\,k)+p+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{(b\,i\,(m-2\,k)+p+2\,c\,(v-2\,s)\,z)^2}{c\,(8\,s-4\,v)}\right)+\frac{1}{\sqrt{c\,(2\,s-v)}}\,e^{\frac{(b\,i\,(m-2\,k)+p)^2}{4\,c\,(v-2\,s)}}$$

$$\sum_{q=0}^{n}\left(i\,b\left(k-\frac{m}{2}\right)-\frac{p}{2}\right)^{n-q}(c\,(2\,s-v))^{-n-\frac{1}{2}}\left(-\frac{(-2\,b\,i\,k+i\,b\,m+p+4\,c\,s\,z-2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$(b\,i\,(m-2\,k)+p+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{(-2\,b\,i\,k+i\,b\,m+p+4\,c\,s\,z-2\,c\,v\,z)^2}{4\,(2\,c\,s-c\,v)}\right)+$$

$$\frac{1}{\sqrt{c\,(2\,s-v)}}\,e^{\frac{(2\,i\,b\,k-i\,b\,m+p)^2}{4\,c\,(v-2\,s)}+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k)-p)^{n-q}\,(c\,(2\,s-v))^{-n-\frac{1}{2}}$$

$$(2\,i\,b\,k-i\,b\,m+p+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\left(-\frac{(2\,i\,b\,k-i\,b\,m+p+4\,c\,s\,z-2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{(2\,i\,b\,k-i\,b\,m+p+4\,c\,s\,z-2\,c\,v\,z)^2}{4\,(2\,c\,s-c\,v)}\right)\Bigg)\ /;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n\,e^{p\,z}\sin^m(b\,z)\cosh^v\left(c\,\sqrt{z}\right)dz==-2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(1-m\bmod 2)\,(1-v\bmod 2)\,(-p)^{-n-1}-$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{1}{2}i\,m\,\pi}\,\Gamma(n+1,\,(-i\,b\,(m-2\,k)-p)\,z)\,(-i\,b\,(m-2\,k)-p)^{-n-1}+\right.$$

$$\left.e^{\frac{i\,m\,\pi}{2}}\,(i\,b\,(m-2\,k)-p)^{-n-1}\,\Gamma(n+1,\,(i\,b\,(m-2\,k)-p)\,z)\right)+2^{-m-2\,n-v-1}\,p^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{c^2\,(v-2\,s)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c\,(v-2\,s))^{-h-i+2\,n}\left(2\,p\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\,p\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left(2\,p\,\sqrt{-\frac{\left(2\,p\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{p}}\ \Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,p\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,p}\right)-\right.$$

$$c\,(v-2\,s)\left(2\,p\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,p\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,p}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s))^{-h-i+2\,n}\left(2\,\sqrt{z}\,\,p+c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\,\sqrt{z}\,\,p+c\,(v-2\,s)\right)^2}{p}\right)^{\frac{1}{2}\,(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\Bigg(c\,(v-2\,s)\left(2\,\sqrt{z}\,\,p+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,\sqrt{z}\,\,p+c\,(v-2\,s)\right)^2}{4\,p}\right)+$$

$$2\sqrt{-\frac{\left(2\,\sqrt{z}\,\,p+c\,(v-2\,s)\right)^2}{p}}\;\;p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,\sqrt{z}\,\,p+c\,(v-2\,s)\right)^2}{4\,p}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{i\,m\,\pi}{2}-\frac{c^2\,(v-2\,s)^2}{4\,(p-i\,b\,(m-2\,k))}}\Bigg(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(2\,(p-i\,b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\,(p-i\,b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{p-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\Bigg(2\,(p-i\,b\,(m-2\,k))\sqrt{-\frac{\left(2\,(p-i\,b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{p-i\,b\,(m-2\,k)}}\;\;\Gamma\left(\frac{1}{2}\,(h+i+2),\right.$$

$$\left.-\frac{\left(2\,(p-i\,b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(p-i\,b\,(m-2\,k))}\right)-c\,(v-2\,s)\left(2\,(p-i\,b\,(m-2\,k))\,\sqrt{z}\,-\right.$$

$$\left.c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,(p-i\,b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(p-i\,b\,(m-2\,k))}\right)\Bigg)\Bigg)$$

$$(p-i\,b\,(m-2\,k))^{-2\,(n+1)}+e^{\frac{i\,m\,\pi}{2}-\frac{c^2\,(v-2\,s)^2}{4\,(p-i\,b\,(m-2\,k))}}\Bigg(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(2\sqrt{z}\ (p-i\,b\,(m-2\,k))+c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\sqrt{z}\ (p-i\,b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{p-i\,b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(c\,(v-2\,s)\left(2\sqrt{z}\ (p-i\,b\,(m-2\,k))+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\right.\right.$$

$$\left.-\frac{\left(2\sqrt{z}\ (p-i\,b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{4\,(p-i\,b\,(m-2\,k))}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ (p-i\,b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{p-i\,b\,(m-2\,k)}}$$

$$\left.\left.(p-i\,b\,(m-2\,k))\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2\sqrt{z}\ (p-i\,b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{4\,(p-i\,b\,(m-2\,k))}\right)\right)\right)$$

$$(p-i\,b\,(m-2\,k))^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(b\,i\,(m-2\,k)+p)}-\frac{i\,m\,\pi}{2}}\,(b\,i\,(m-2\,k)+p)^{-2\,(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(2\,(b\,i\,(m-2\,k)+p)\sqrt{z}\ -c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\,(b\,i\,(m-2\,k)+p)\sqrt{z}\ -c\,(v-2\,s)\right)^2}{b\,i\,(m-2\,k)+p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(2\,(b\,i\,(m-2\,k)+p)\sqrt{-\frac{\left(2\,(b\,i\,(m-2\,k)+p)\sqrt{z}\ -c\,(v-2\,s)\right)^2}{b\,i\,(m-2\,k)+p}}\ \Gamma\left(\frac{1}{2}(h+i+2),\right.\right.$$

$$\left.-\frac{\left(2\,(b\,i\,(m-2\,k)+p)\sqrt{z}\ -c\,(v-2\,s)\right)^2}{4\,(b\,i\,(m-2\,k)+p)}\right)-c\,(v-2\,s)\left(2\,(b\,i\,(m-2\,k)+p)\sqrt{z}\ -c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2\,(b\,i\,(m-2\,k)+p)\sqrt{z}\ -c\,(v-2\,s)\right)^2}{4\,(b\,i\,(m-2\,k)+p)}\right)\right)+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(b\,i\,(m-2\,k)+p)}-\frac{i\,m\,\pi}{2}}$$

$$(b\,i\,(m-2\,k)+p)^{-2\,(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s))^{-h-i+2\,n}\left(2\sqrt{z}\ (b\,i\,(m-2\,k)+p)+c\,(v-2\,s)\right)^{h+i}$$

$$\left(-\frac{\left(2\sqrt{z}\ (b\,i\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{b\,i\,(m-2\,k)+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(c\,(v-2\,s)\left(2\sqrt{z}\ (b\,i\,(m-2\,k)+p)+\right.\right.$$

$$c\,(v-2\,s)\Big)\,\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,\sqrt{z}\;(b\,i\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{4\,(b\,i\,(m-2\,k)+p)}\right)+$$

$$2\sqrt{-\frac{\left(2\,\sqrt{z}\;(b\,i\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{b\,i\,(m-2\,k)+p}}\;(b\,i\,(m-2\,k)+p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\right.$$

$$\left.\left.-\frac{\left(2\,\sqrt{z}\;(b\,i\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{4\,(b\,i\,(m-2\,k)+p)}\right)\right)\Big/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sin^m(b\,z)\cosh^v\left(c\,z^r\right)$

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$$\int z^n\,e^{p\,z^2}\sin^m(b\,z)\cosh^v\left(c\,z^2\right)dz==$$

$$-2^{-m-v-1}\,z^{n+1}\left(-p\,z^2\right)^{\frac{1}{2}(-n-1)}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{n+1}{2},\,-p\,z^2\right)(1-m\bmod 2)\,(1-v\bmod 2)-2^{-m-v-1}\,z^{n+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left((-p-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-p-2\,c\,s+c\,v)\,z^2\right)+\left((-p-c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\left.\Gamma\left(\frac{n+1}{2},\,(-p-c\,(v-2\,s))\,z^2\right)\right)-i^{-m}\,2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{\frac{b^2\,(m-2\,k)^2}{4\,p}}\,p^{-n-1}$$

$$\binom{m}{k}\left((-1)^m\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{n-q}\,(2\,i\,b\,k-i\,b\,m+2\,p\,z)^{q+1}\left(-\frac{(2\,i\,b\,k-i\,b\,m+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,i\,b\,k-i\,b\,m+2\,p\,z)^2}{4\,p}\right)+\sum_{q=0}^{n}\left(i\,b\left(k-\frac{m}{2}\right)\right)^{n-q}(b\,i\,(m-2\,k)+2\,p\,z)^{q+1}$$

$$\left.\left(-\frac{(b\,i\,(m-2\,k)+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b\,i\,(m-2\,k)+2\,p\,z)^2}{4\,p}\right)\right)-i^{-m}\,2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k$$

$$e^{\frac{1}{4}\left(\frac{b^2\,(m-2\,k)^2}{p+2\,c\,s-c\,v}+\frac{b^2\,(m-2\,k)^2}{p+c\,(v-2\,s)}\right)}\binom{m}{k}\left(e^{-\frac{b^2\,(m-2\,k)^2}{4\,(p+2\,c\,s-c\,v)}}\sqrt{p+2\,c\,s-c\,v}\left(e^{i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{n-q}\,(p-2\,c\,s+c\,v)^{-n-\frac{1}{2}}\right.\right.$$

$$\left.\left.(2\,i\,b\,k-i\,b\,m+2\,(p-2\,c\,s+c\,v)\,z)^{q+1}\left(-\frac{(2\,i\,b\,k-i\,b\,m+2\,(p-2\,c\,s+c\,v)\,z)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(2\,i\,b\,k - i\,b\,m + 2\,(p - 2\,c\,s + c\,v)\,z)^2}{4\,(p - 2\,c\,s + c\,v)}\right) + \sum_{q=0}^{n}\left(i\,b\left(k - \frac{m}{2}\right)\right)^{n-q}(p - 2\,c\,s + c\,v)^{-n-\frac{1}{2}}$$

$$(b\,i\,(m - 2\,k) + 2\,(p - 2\,c\,s + c\,v)\,z)^{q+1}\left(-\frac{(b\,i\,(m - 2\,k) + 2\,(p - 2\,c\,s + c\,v)\,z)^2}{p - 2\,c\,s + c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(b\,i\,(m - 2\,k) + 2\,(p - 2\,c\,s + c\,v)\,z)^2}{4\,(p - 2\,c\,s + c\,v)}\right)\Bigg) +$$

$$e^{i\,m\,\pi - \frac{b^2\,(m-2\,k)^2}{4\,(p + c\,(v - 2\,s))}}\sqrt{p + c\,(v - 2\,s)}\sum_{q=0}^{n} 2^{q-n}\,(i\,b\,(m - 2\,k))^{n-q}\,(p + 2\,c\,s - c\,v)^{-n-\frac{1}{2}}$$

$$(2\,i\,b\,k - i\,b\,m + 2\,(p + 2\,c\,s - c\,v)\,z)^{q+1}\left(-\frac{(2\,i\,b\,k - i\,b\,m + 2\,(p + 2\,c\,s - c\,v)\,z)^2}{p + 2\,c\,s - c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(2\,i\,b\,k - i\,b\,m + 2\,(p + 2\,c\,s - c\,v)\,z)^2}{4\,(p + 2\,c\,s - c\,v)}\right) +$$

$$e^{-\frac{b^2\,(m-2\,k)^2}{4\,(p - 2\,c\,s + c\,v)}}\sqrt{p - 2\,c\,s + c\,v}\sum_{q=0}^{n}\left(i\,b\left(k - \frac{m}{2}\right)\right)^{n-q}(p + 2\,c\,s - c\,v)^{-n-\frac{1}{2}}$$

$$(b\,i\,(m - 2\,k) + 2\,(p + 2\,c\,s - c\,v)\,z)^{q+1}\left(-\frac{(b\,i\,(m - 2\,k) + 2\,(p + 2\,c\,s - c\,v)\,z)^2}{p + 2\,c\,s - c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(b\,i\,(m - 2\,k) + 2\,(p + 2\,c\,s - c\,v)\,z)^2}{4\,(p + 2\,c\,s - c\,v)}\right)\Bigg)\Bigg/$$

$$\left(\sqrt{p + 2\,c\,s - c\,v}\,\sqrt{p + c\,(v - 2\,s)}\right)/;\ m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

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$$\int z^n\,e^{p\sqrt{z}}\,\sin^m(b\,z)\cosh^v\left(c\,\sqrt{z}\right)dz == -2^{-m-v+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2\,(n+1),\,-p\,\sqrt{z}\right)(1 - m \bmod 2)\,(1 - v \bmod 2)\,p^{-2\,(n+1)} -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,(c\,(v - 2\,s) - p)\,\sqrt{z}\right)(c\,(v - 2\,s) - p)^{-2\,(n+1)} + (p + c\,(v - 2\,s))^{-2\,(n+1)}\right.$$

$$\left.\Gamma\left(2\,(n+1),\,(-p - c\,(v - 2\,s))\,\sqrt{z}\right)\right) + 2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}(i\,b\,(m - 2\,k))^{-2\,(n+1)}$$

$$\left(e^{\frac{i\,p^2}{4\,b\,(m-2\,k)} - \frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,p^{-h-i+2\,n}\left(2\,b\,i\,\sqrt{z}\,(m - 2\,k) + p\right)^{h+i}\left(\frac{i\left(2\,b\,i\,\sqrt{z}\,(m - 2\,k) + p\right)^2}{b\,(m - 2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left(p\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p\right)\Gamma\left(\frac{1}{2}(h+i+1),\,\frac{i\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p\right)^2}{4\,b\,(m-2\,k)}\right)+\right.$$

$$\left.2\,b\,i\,(m-2\,k)\sqrt{\frac{i\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p\right)^2}{b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+i+2),\,\frac{i\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p\right)^2}{4\,b\,(m-2\,k)}\right)\right)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{i\,p^2}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,p^{-h-i+2\,n}\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(-\frac{i\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(p\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{i\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)-\right.$$

$$\left.\left.2\,i\,b\,(m-2\,k)\sqrt{-\frac{i\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{i\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(i\,b\,(m-2\,k))^{-2\,(n+1)}\left(e^{\frac{i\,(p+c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p+c\,(v-2\,s))^{-h-i+2\,n}\right.$$

$$\left.\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p+c\,(v-2\,s)\right)^{h+i}\left(\frac{i\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left((p+c\,(v-2\,s))\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p+c\,(v-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),\,\frac{i\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)+$$

$$\left.2\,b\,i\,(m-2\,k)\sqrt{\frac{i\left(2\,b\,i\,\sqrt{z}\,(m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}\right)$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\ \frac{i\left(2\,b\,i\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,(p-c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c\,(v-2\,s))^{-h-i+2\,n}\left(2\,b\,i\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^{h+i}$$

$$\left(\frac{i\left(2\,b\,i\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg(\Bigg(p-c\,(v-2\,s)\Bigg)$$

$$\left(2\,b\,i\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\ \frac{i\left(2\,b\,i\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)+$$

$$2\,b\,i\,(m-2\,k)\sqrt{\frac{i\left(2\,b\,i\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\ \frac{i\left(2\,b\,i\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{i\,(p+c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p+c\,(v-2\,s))^{-h-i+2\,n}\left(-2\,i\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^{h+i}$$

$$\left(-\frac{i\left(-2\,i\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg(\Bigg((p+c\,(v-2\,s))\left(-2\,i\,b\,\sqrt{z}\right.$$

$$\left.(m-2\,k)+p+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\ -\frac{i\left(-2\,i\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)-$$

$$2\,i\,b\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+i+2),\right.$$

$$\left.-\frac{i\left(-2\,i\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{i\,(p-c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c\,(v-2\,s))^{-h-i+2\,n}\left(-2\,i\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^{h+i}$$

$$\left(-\frac{i\left(-2\,i\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((p-c\,(v-2\,s))\left(-2\,i\,b\,\sqrt{z}\right.\right.$$

$$\left.(m-2\,k)+p-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{i\left(-2\,i\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)-$$

$$2\,i\,b\,(m-2\,k)\sqrt{-\frac{i\left(-2\,i\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}\,\Gamma\left(\frac{1}{2}(h+i+2),\right.$$

$$\left.\left.-\frac{i\left(-2\,i\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sin^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

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$$\int z^n\,e^{p\,z}\sin^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz==$$

$$-2^{-m-v}\,(-p)^{-n-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(1-m\bmod 2)\,(1-v\bmod 2)-i^{-m}\,2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{1}{\sqrt{i\,b\,(2\,k-m)}}\left((-1)^m\,e^{\frac{p^2}{4\,i\,b\,m-8\,i\,b\,k}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(2\,k-m))^{-n-\frac{1}{2}}\,(-p)^{n-q}\,(p+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^{q+1}\right.\right.$$

$$\left.\left(\frac{i\,(p+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{i\,(p+4\,i\,b\,k\,z-2\,i\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)\right)+$$

$$\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\left(e^{\frac{p^2}{8\,i\,b\,k-4\,i\,b\,m}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{-n-\frac{1}{2}}\,(-p)^{n-q}\,(p+2\,b\,i\,(m-2\,k)\,z)^{q+1}\right.$$

$$\left.\left.\left(-\frac{i\,(p+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{i\,(p+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(8\,k-4\,m)}\right)\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{c\,(v-2\,s)}}\left(e^{\frac{p^2}{8\,c\,s-4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(c\,(v-2\,s))^{-n-\frac{1}{2}}\right.\right.$$

$$\left.(p+2\,c\,(v-2\,s)\,z)^{q+1}\left(-\frac{(p+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(p+2\,c\,(v-2\,s)\,z)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$\frac{1}{\sqrt{c\,(2\,s-v)}}\left(e^{\frac{p^2}{4\,c\,v-8\,c\,s}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(c\,(2\,s-v))^{-n-\frac{1}{2}}\,(p+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\right.$$

$$\left.\left(-\frac{(p+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(8\,s-4\,v)}\right)\right)\Bigg)-$$

$$i^{-m}\,2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(e^{\frac{p^2}{8\,i\,b\,k-4\,i\,b\,m-8\,c\,s+4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)^{-n-\frac{1}{2}}\right.\right.$$

$$(p+2\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z)^{q+1}\left(\frac{(p+2\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z)^2}{2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\Bigg($$

$$\left.\frac{q+1}{2},\frac{(p+2\,(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v)\,z)^2}{8\,i\,b\,k-4\,i\,b\,m-8\,c\,s+4\,c\,v}\right)\Bigg/\left(\sqrt{-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v}\right)+$$

$$\left(e^{\frac{p^2}{-8\,b\,i\,k+4\,i\,b\,m+8\,c\,s-4\,c\,v}+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^{-n-\frac{1}{2}}\right.$$

$$(p+2\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z)^{q+1}\left(-\frac{(p+2\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z)^2}{2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\Bigg($$

$$\left.\frac{q+1}{2},-\frac{(p+2\,(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)\,z)^2}{8\,i\,b\,k-4\,i\,b\,m-8\,c\,s+4\,c\,v}\right)\Bigg/\left(\sqrt{2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v}\right)+$$

$$\left(e^{\frac{p^2}{8\,i\,b\,k-4\,i\,b\,m+8\,c\,s-4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-n-\frac{1}{2}}\,(p+2\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z)^{q+1}\right.$$

$$\left(-\frac{(p+2\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z)^2}{-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\Bigg(\frac{q+1}{2},$$

$$\left.\frac{(p+2\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z)^2}{8\,i\,b\,k-4\,i\,b\,m+8\,c\,s-4\,c\,v}\right)\Bigg/\left(\sqrt{-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v}\right)+$$

$$\left(e^{\frac{p^2}{-8\,b\,i\,k+4\,i\,b\,m-8\,c\,s+4\,c\,v}+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)^{-n-\frac{1}{2}}\right.$$

$$(p+2(2ibk-ibm+2cs-cv)z)^{q+1}\left(-\frac{(p+2(2ibk-ibm+2cs-cv)z)^2}{2ibk-ibm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+2(2ibk-ibm+2cs-cv)z)^2}{8ibk-4ibm+8cs-4cv}\right)\Bigg/$$

$$\left(\sqrt{2ibk-ibm+2cs-cv}\right)\Bigg/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0\wedge n\in\mathbb{N}$$

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$$\int z^n e^{pz}\sin^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz==-2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,-pz)(1-m\bmod 2)(1-v\bmod 2)(-p)^{-n-1}+$$

$$2^{-m-2n-v-1}p^{-2(n+1)}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{\frac{b^2(m-2k)^2}{4p}+\frac{im\pi}{2}}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(-ib(m-2k))^{-h-i+2n}\left(2p\sqrt{z}-ib(m-2k)\right)^{h+i}\left(-\frac{\left(2p\sqrt{z}-ib(m-2k)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(2p\sqrt{-\frac{\left(2p\sqrt{z}-ib(m-2k)\right)^2}{p}}\ \Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2p\sqrt{z}-ib(m-2k)\right)^2}{4p}\right)-\right.$$

$$\left.ib(m-2k)\left(2p\sqrt{z}-ib(m-2k)\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2p\sqrt{z}-ib(m-2k)\right)^2}{4p}\right)\right)+e^{\frac{b^2(m-2k)^2}{4p}-\frac{im\pi}{2}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(ib(m-2k))^{-h-i+2n}\left(bi(m-2k)+2p\sqrt{z}\right)^{h+i}\left(-\frac{\left(bi(m-2k)+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(bi(m-2k)\left(bi(m-2k)+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(bi(m-2k)+2p\sqrt{z}\right)^2}{4p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(bi(m-2k)+2p\sqrt{z}\right)^2}{p}}\ p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(bi(m-2k)+2p\sqrt{z}\right)^2}{4p}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\, p^{-2(n+1)} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2 (v-2s)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h}\, 4^i\, (-c(v-2s))^{-h-i+2n} \right.$$

$$\left(2p\sqrt{z} - c(v-2s)\right)^{h+i} \left(-\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}\binom{n}{i}$$

$$\left(2p \sqrt{-\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{p}}\ \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{4p}\right) - \right.$$

$$\left. c(v-2s)\left(2p\sqrt{z} - c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{4p}\right)\right) +$$

$$e^{-\frac{c^2 (v-2s)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h}\, 4^i\, (c(v-2s))^{-h-i+2n} \left(2\sqrt{z}\ p + c(v-2s)\right)^{h+i} \left(-\frac{\left(2\sqrt{z}\ p + c(v-2s)\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i} \left(c(v-2s)\left(2\sqrt{z}\ p + c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2\sqrt{z}\ p + c(v-2s)\right)^2}{4p}\right) + \right.$$

$$\left. \left. 2\sqrt{-\frac{\left(2\sqrt{z}\ p + c(v-2s)\right)^2}{p}}\ p\,\Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2\sqrt{z}\ p + c(v-2s)\right)^2}{4p}\right)\right)\right) +$$

$$2^{-m-2n-v-1}\, p^{-2(n+1)} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{i m \pi}{2} - \frac{(c(v-2s) - i b (m-2k))^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h}\, 4^i\, (c(v-2s) - i b (m-2k))^{-h-i+2n} \right.$$

$$\left(-i b (m-2k) + c(v-2s) + 2p\sqrt{z}\right)^{h+i} \left(-\frac{\left(-i b (m-2k) + c(v-2s) + 2p\sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i} \left((c(v-2s) - i b (m-2k))\left(-i b (m-2k) + c(v-2s) + 2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1), \right.\right.$$

$$-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\Bigg)+2\sqrt{-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-i\,b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)+e^{-\frac{(b\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,p}-\frac{i\,m\,\pi}{2}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-i+2\,n}\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b\,i\,(m-2\,k)+c\,(v-2\,s))\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b\,i\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)+e^{\frac{i\,m\,\pi}{2}-\frac{(-i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,p}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-i+2\,n}\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((-i\,b\,(m-2\,k)-c\,(v-2\,s))\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.$$

$$\left.-\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$p\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(-i\,b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+e^{-\frac{(i\,b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,p}-\frac{i\,m\,\pi}{2}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(i\,b\,(m-2\,k)-c\,(v-2\,s))^{-h-i+2\,n}\left(b\,i\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((i\,b\,(m-2\,k)-c\,(v-2\,s))\left(b\,i\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\right.\right.$$

$$\left.-\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b\,i\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\,\sin^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3956.01

$$\int z^{\alpha-1}\, e^{p\, z^r} \sin^m(b\, z^r) \cosh^v(c\, z^r)\, dz ==$$

$$\frac{2^{-m-v}\, z^{\alpha}}{r}\left(-(-p\, z^r)^{-\frac{\alpha}{r}} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{\alpha}{r}, -p\, z^r\right) (m \bmod 2 - 1)\, (v \bmod 2 - 1) + i^{-m} \binom{v}{\frac{v}{2}} (v \bmod 2 - 1)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left((-1)^m\, \Gamma\left(\frac{\alpha}{r}, (-2\, b\, i\, k + i\, b\, m - p)\, z^r\right) ((-2\, b\, i\, k + i\, b\, m - p)\, z^r)^{-\frac{\alpha}{r}} + ((2\, i\, b\, k - i\, b\, m - p)\, z^r)^{-\frac{\alpha}{r}}\right.$$

$$\left.\Gamma\left(\frac{\alpha}{r}, (2\, i\, b\, k - i\, b\, m - p)\, z^r\right)\right) + \binom{m}{\frac{m}{2}} (m \bmod 2 - 1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(\Gamma\left(\frac{\alpha}{r}, (-p - 2\, c\, s + c\, v)\, z^r\right) ((-p - 2\, c\, s + c\, v)\, z^r)^{-\frac{\alpha}{r}} + ((-p - c\, (v - 2\, s))\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-p - c\, (v - 2\, s))\, z^r\right)\right) -$$

$$i^{-m} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(\Gamma\left(\frac{\alpha}{r}, (2\, i\, b\, k - i\, b\, m - p - 2\, c\, s + c\, v)\, z^r\right) ((2\, i\, b\, k - i\, b\, m - p - 2\, c\, s + c\, v)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$e^{i\, m\, \pi} \left(\Gamma\left(\frac{\alpha}{r}, (-2\, b\, i\, k + i\, b\, m - p - 2\, c\, s + c\, v)\, z^r\right) ((-2\, b\, i\, k + i\, b\, m - p - 2\, c\, s + c\, v)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$\left.((-2\, b\, i\, k + i\, b\, m - p + 2\, c\, s - c\, v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-2\, b\, i\, k + i\, b\, m - p + 2\, c\, s - c\, v)\, z^r\right)\right) +$$

$$\left.\left.((2\, i\, b\, k - i\, b\, m - p + 2\, c\, s - c\, v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (2\, i\, b\, k - i\, b\, m - p + 2\, c\, s - c\, v)\, z^r\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3957.01

$$\int z^n e^{p z^2} \sin^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == -2^{-m-v-1} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -p z^2\right) (1 - m \bmod 2) (1 - v \bmod 2) \left(-p z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-m-v-1} z^{n+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{1}{2} i m \pi} \Gamma\left(\frac{n+1}{2}, (-i b (m-2k) - p) z^2\right) \left((-i b (m-2k) - p) z^2\right)^{\frac{1}{2}(-n-1)} + e^{\frac{i m \pi}{2}} \left((i b (m-2k) - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (i b (m-2k) - p) z^2\right)\right) -$$

$$2^{-m-v-1} z^{n+1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\Gamma\left(\frac{n+1}{2}, (c (v-2s) - p) z^2\right) \left((c (v-2s) - p) z^2\right)^{\frac{1}{2}(-n-1)} + \left((-p - c (v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-p - c (v-2s)) z^2\right)\right) -$$

$$2^{-m-v-1} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{1}{2} i m \pi} \Gamma\left(\frac{n+1}{2}, (-i b (m-2k) - p + c (v-2s)) z^2\right) \left((-i b (m-2k) - p + c (v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} + e^{\frac{i m \pi}{2}} \left((b i (m-2k) - p + c (v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b i (m-2k) - p + c (v-2s)) z^2\right) + e^{-\frac{1}{2} i m \pi} \left((-i b (m-2k) - p - c (v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-i b (m-2k) - p - c (v-2s)) z^2\right) + e^{\frac{i m \pi}{2}} \left((b i (m-2k) - p - c (v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b i (m-2k) - p - c (v-2s)) z^2\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3958.01

$$\int z^n e^{p\sqrt{z}} \sin^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == -2^{-m-v+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2(n+1),\,-p\sqrt{z}\right)(1-m \bmod 2)(1-v \bmod 2)\,p^{-2(n+1)} -$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{1}{2}im\pi}\,\Gamma\left(2(n+1),\,(-ib(m-2k)-p)\sqrt{z}\right)(-ib(m-2k)-p)^{-2(n+1)} +\right.$$

$$\left. e^{\frac{im\pi}{2}}\,(ib(m-2k)-p)^{-2(n+1)}\,\Gamma\left(2(n+1),\,(ib(m-2k)-p)\sqrt{z}\right)\right) -$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(2(n+1),\,(c(v-2s)-p)\sqrt{z}\right)(c(v-2s)-p)^{-2(n+1)} +\right.$$

$$\left.(-p-c(v-2s))^{-2(n+1)}\,\Gamma\left(2(n+1),\,(-p-c(v-2s))\sqrt{z}\right)\right) -$$

$$2^{-m-v+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{1}{2}im\pi}\,\Gamma\left(2(n+1),\,(-ib(m-2k)-p+c(v-2s))\sqrt{z}\right)\right.$$

$$(-ib(m-2k)-p+c(v-2s))^{-2(n+1)} + e^{\frac{im\pi}{2}}\,(bi(m-2k)-p+c(v-2s))^{-2(n+1)}$$

$$\Gamma\left(2(n+1),\,(bi(m-2k)-p+c(v-2s))\sqrt{z}\right) + e^{-\frac{1}{2}im\pi}\,(-ib(m-2k)-p-c(v-2s))^{-2(n+1)}$$

$$\Gamma\left(2(n+1),\,(-ib(m-2k)-p-c(v-2s))\sqrt{z}\right) + e^{\frac{im\pi}{2}}\,(bi(m-2k)-p-c(v-2s))^{-2(n+1)}$$

$$\left.\Gamma\left(2(n+1),\,(bi(m-2k)-p-c(v-2s))\sqrt{z}\right)\right)/;\, m\in\mathbb{N}^+ \bigwedge v\in\mathbb{N}^+ \bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\sin^m\left(a\,z^r+q\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.3959.01

$$\int z^{\alpha-1}\, e^{b z^r+e} \sin^m(a z^r+q) \cosh^v(c z^r+g)\, dz ==$$

$$-\frac{2^{-m-v}\, z^{\alpha}}{r}\left(e^{e}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{\alpha}{r}, -b z^r\right)(1-m \bmod 2)(1-v \bmod 2)(-b z^r)^{-\frac{\alpha}{r}}+\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+2 i k q-i m q+\frac{i m \pi}{2}}\Gamma\left(\frac{\alpha}{r}, (-b-2 i a k+i a m) z^r\right)((-b-2 i a k+i a m) z^r)^{-\frac{\alpha}{r}}+e^{e-2 i k q+i m q-\frac{i m \pi}{2}}\right.$$

$$\left.\left.((-b+2 i a k-i a m) z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (-b+2 i a k-i a m) z^r\right)\right)+\right.$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e+2 g s-g v}\Gamma\left(\frac{\alpha}{r}, (-b-2 c s+c v) z^r\right)((-b-2 c s+c v) z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.e^{e-2 g s+g v}((-b+2 c s-c v) z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (-b+2 c s-c v) z^r\right)\right)+\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left(e^{e+2 i k q-i m q+2 g s-g v+\frac{i m \pi}{2}}\Gamma\left(\frac{\alpha}{r}, (-b-2 i a k+i a m-2 c s+c v) z^r\right)((-b-2 i a k+i a m-2 c s+c v) z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-2 i k q+i m q+2 g s-g v-\frac{i m \pi}{2}}((-b+2 i a k-i a m-2 c s+c v) z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (-b+2 i a k-i a m-2 c s+c v) z^r\right)+$$

$$e^{e+2 i k q-i m q-2 g s+g v+\frac{i m \pi}{2}}((-b-2 i a k+i a m+2 c s-c v) z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (-b-2 i a k+i a m+2 c s-c v) z^r\right)+$$

$$\left.\left.e^{e-2 i k q+i m q-2 g s+g v-\frac{i m \pi}{2}}((-b+2 i a k-i a m+2 c s-c v) z^r)^{-\frac{\alpha}{r}}\right.\right.$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r}, (-b+2 i a k-i a m+2 c s-c v) z^r\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.3960.01

$$\int z^n e^{b z^2+e} \sin^m\left(a z^2+q\right) \cosh^v\left(c z^2+g\right) dz ==$$

$$-2^{-m-v-1} e^e z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1-m \bmod 2) (1-v \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} - 2^{-m-v-1} z^{n+1} \binom{v}{\frac{v}{2}}$$

$$(1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{e-i (m-2 k) q+\frac{i m \pi}{2}} \Gamma\left(\frac{n+1}{2}, (i a (m-2 k)-b) z^2\right) \left((i a (m-2 k)-b) z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. e^{e+i (m-2 k) q-\frac{i m \pi}{2}} \left((-b-i a (m-2 k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-i a (m-2 k)) z^2\right) \right) -$$

$$2^{-m-v-1} z^{n+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-g (v-2 s)} \Gamma\left(\frac{n+1}{2}, (c (v-2 s)-b) z^2\right) \left((c (v-2 s)-b) z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. e^{e+g (v-2 s)} \left((-b-c (v-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-c (v-2 s)) z^2\right) \right) -$$

$$2^{-m-v-1} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-i (m-2 k) q-g (v-2 s)+\frac{i m \pi}{2}} \Gamma\left(\frac{n+1}{2}, (-b+a i (m-2 k)+c (v-2 s)) z^2\right) \right.$$

$$\left((-b+a i (m-2 k)+c (v-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} + e^{e+i (m-2 k) q-g (v-2 s)-\frac{i m \pi}{2}}$$

$$\left((-b-i a (m-2 k)+c (v-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-i a (m-2 k)+c (v-2 s)) z^2\right) +$$

$$e^{e-i (m-2 k) q+g (v-2 s)+\frac{i m \pi}{2}} \left((-b+a i (m-2 k)-c (v-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, \right.$$

$$\left. (-b+a i (m-2 k)-c (v-2 s)) z^2\right) + e^{e+i (m-2 k) q+g (v-2 s)-\frac{i m \pi}{2}} \left((-b-i a (m-2 k)-c (v-2 s)) z^2\right)^{\frac{1}{2}(-n-1)}$$

$$\left. \Gamma\left(\frac{n+1}{2}, (-b-i a (m-2 k)-c (v-2 s)) z^2\right) \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3961.01

$$\int z^n e^{\sqrt{z}\,b+e} \sin^m\left(\sqrt{z}\,a+q\right) \cosh^v\left(\sqrt{z}\,c+g\right) dz ==$$

$$-2^{-m-v+1} e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(2(n+1), -b\sqrt{z}\right) (1-m \bmod 2)(1-v \bmod 2)\, b^{-2(n+1)} -$$

$$2^{-m-v+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{e-i(m-2k)q+\frac{i m \pi}{2}} \Gamma\left(2(n+1), (i a (m-2k)-b)\sqrt{z}\right) (i a (m-2k)-b)^{-2(n+1)} + \right.$$

$$\left. e^{e+i(m-2k)q-\frac{i m \pi}{2}} (-b-i a (m-2k))^{-2(n+1)} \Gamma\left(2(n+1), (-b-i a (m-2k))\sqrt{z}\right) \right) -$$

$$2^{-m-v+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-g(v-2s)} \Gamma\left(2(n+1), (c(v-2s)-b)\sqrt{z}\right) (c(v-2s)-b)^{-2(n+1)} + \right.$$

$$\left. e^{e+g(v-2s)} (-b-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-b-c(v-2s))\sqrt{z}\right) \right) -$$

$$2^{-m-v+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-i(m-2k)q-g(v-2s)+\frac{i m \pi}{2}} \Gamma\left(2(n+1), (-b+a i (m-2k)+c(v-2s))\sqrt{z}\right) \right.$$

$$(-b+a i (m-2k)+c(v-2s))^{-2(n+1)} + e^{e+i(m-2k)q-g(v-2s)-\frac{i m \pi}{2}} (-b-i a (m-2k)+c(v-2s))^{-2(n+1)}$$

$$\Gamma\left(2(n+1), (-b-i a (m-2k)+c(v-2s))\sqrt{z}\right) + e^{e-i(m-2k)q+g(v-2s)+\frac{i m \pi}{2}}$$

$$(-b+a i (m-2k)-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-b+a i (m-2k)-c(v-2s))\sqrt{z}\right) +$$

$$\left. e^{e+i(m-2k)q+g(v-2s)-\frac{i m \pi}{2}} (-b-i a (m-2k)-c(v-2s))^{-2(n+1)} \right.$$

$$\left. \Gamma\left(2(n+1), (-b-i a (m-2k)-c(v-2s))\sqrt{z}\right) \right) /;\ m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^n\, e^{b z^2+d z+e} \sin^m\left(a z^2+p z+q\right) \cosh^v\left(c z^2+f z+g\right)$

01.20.21.3962.01

$$\int z^n e^{b z^2+d z+e} \sin^m\left(a z^2+p z+q\right) \cosh^v\left(c z^2+f z+g\right) dz == -2^{-m-v-1} e^{e-\frac{d^2}{4b}} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)(1-v \bmod 2)$$

$$b^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d)^{n-j} (d+2bz)^{j+1} \left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+2bz)^2}{4b}\right) - 2^{-m-v-1} \binom{v}{\frac{v}{2}}$$

$$(1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{(d+i(2k-m)p)^2}{4(b+a i (2k-m))}+e+i(2k-m)q+\frac{i m \pi}{2}} (b+a i (2k-m))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d-i(2k-m)p)^{n-j} \right.$$

$$(d+i(2k-m)p+2(b+a i (2k-m))z)^{j+1} \left(-\frac{(d+i(2k-m)p+2(b+a i (2k-m))z)^2}{b+a i (2k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+i(2k-m)p+2(b+a i (2k-m))z)^2}{4(b+a i (2k-m))}\right) + \right.$$

$$e^{-\frac{(d+i(m-2k)p)^2}{4(b+ai(m-2k))}+e+i(m-2k)q-\frac{im\pi}{2}}(b+ai(m-2k))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-i(m-2k)p)^{n-j}$$

$$(d+i(m-2k)p+2(b+ai(m-2k))z)^{j+1}\left(-\frac{(d+i(m-2k)p+2(b+ai(m-2k))z)^2}{b+ai(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+i(m-2k)p+2(b+ai(m-2k))z)^2}{4(b+ai(m-2k))}\right)\Bigg)-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d+f(2s-v))^2}{4(b+c(2s-v))}+e+g(2s-v)}(b+c(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-f(2s-v))^{n-j}(d+f(2s-v)+2(b+c(2s-v))z)^{j+1}$$

$$\left(-\frac{(d+f(2s-v)+2(b+c(2s-v))z)^2}{b+c(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f(2s-v)+2(b+c(2s-v))z)^2}{4(b+c(2s-v))}\right)+$$

$$e^{-\frac{(d+f(v-2s))^2}{4(b+c(v-2s))}+e+g(v-2s)}(b+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-f(v-2s))^{n-j}(d+f(v-2s)+2(b+c(v-2s))z)^{j+1}$$

$$\left(-\frac{(d+f(v-2s)+2(b+c(v-2s))z)^2}{b+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f(v-2s)+2(b+c(v-2s))z)^2}{4(b+c(v-2s))}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d+i(2k-m)p+f(2s-v))^2}{4(b+ai(2k-m)+c(2s-v))}+e+i(2k-m)q+g(2s-v)+\frac{im\pi}{2}}(b+ai(2k-m)+c(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-d-i(2k-m)p-f(2s-v))^{n-j}(d+i(2k-m)p+f(2s-v)+2(b+ai(2k-m)+c(2s-v))z)^{j+1}$$
$$\left(-(d+i(2k-m)p+f(2s-v)+2(b+ai(2k-m)+c(2s-v))z)^2\Big/\right.$$
$$\left.(b+ai(2k-m)+c(2s-v))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-(d+i(2k-m)p+f(2s-v)+\right.$$
$$\left.2(b+ai(2k-m)+c(2s-v))z)^2\Big/(4(b+ai(2k-m)+c(2s-v)))\right)+$$

$$e^{-\frac{(d+i(m-2k)p+f(2s-v))^2}{4(b+ai(m-2k)+c(2s-v))}+e+i(m-2k)q+g(2s-v)-\frac{im\pi}{2}}(b+ai(m-2k)+c(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-d-i(m-2k)p-f(2s-v))^{n-j}(d+i(m-2k)p+f(2s-v)+2(b+ai(m-2k)+c(2s-v))z)^{j+1}$$
$$\left(-(d+i(m-2k)p+f(2s-v)+2(b+ai(m-2k)+c(2s-v))z)^2\Big/\right.$$
$$\left.(b+ai(m-2k)+c(2s-v))\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-(d+i(m-2k)p+f(2s-v)+\right.$$
$$\left.2(b+ai(m-2k)+c(2s-v))z)^2\Big/(4(b+ai(m-2k)+c(2s-v)))\right)+$$

$$e^{-\frac{(d+i(2k-m)p+f(v-2s))^2}{4(b+ai(2k-m)+c(v-2s))}+e+i(2k-m)q+g(v-2s)+\frac{im\pi}{2}}(b+ai(2k-m)+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-d-i(2k-m)p-f(v-2s))^{n-j}(d+i(2k-m)p+f(v-2s)+2(b+ai(2k-m)+c(v-2s))z)^{j+1}$$
$$\left(-(d+i(2k-m)p+f(v-2s)+2(b+ai(2k-m)+c(v-2s))z)^2\Big/\right.$$

$$(b+a\,i\,(2\,k-m)+c\,(v-2\,s))^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-(d+i\,(2\,k-m)\,p+f\,(v-2\,s)+\right.$$

$$\left.2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,s))\,z)^2\Big/(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,s)))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,k)\,p+f\,(v-2\,s))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))}+e+i\,(m-2\,k)\,q+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-d-i\,(m-2\,k)\,p-f\,(v-2\,s))^{n-j}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-(d+i\,(m-2\,k)\,p+f\,(v-2\,s)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2\Big/\right.$$

$$(b+a\,i\,(m-2\,k)+c\,(v-2\,s)))^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\left.\Gamma\left(\frac{j+1}{2},\,-(d+i\,(m-2\,k)\,p+f\,(v-2\,s)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))\,z)^2\Big/\right.\right.$$

$$\left.\left.(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s)))\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\,e^{\sqrt{z}\,b+d\,z+e}\sin^m\left(\sqrt{z}\,a+p\,z+q\right)\cosh^v\left(\sqrt{z}\,c+f\,z+g\right)dz==2^{-m-2\,n-v-1}\,e^{e-\frac{b^2}{4\,d}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)$$

$$(1-v\bmod 2)\,d^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,b^{-h-i+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(b+a\,i\,(2\,k-m))^2}{4\,(d+i\,(2\,k-m)\,p)}+e+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p)^{-2\,n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(2\,k-m))^{-h-i+2\,n}\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+a\,i\,(2\,k-m))\left(b+a\,i\,(2\,k-m)+\right.\right.$$

$$\left.\left.2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\;(d+i\,(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\;-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k))^2}{4\,(d+i\,(m-2\,k)\,p)}+e+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(m-2\,k))^{-h-i+2\,n}$$

$$\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b+a\,i\,(m-2\,k))\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\;-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)+$$

$$2\,(d+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\;-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\Bigg)\Bigg)+2^{-m-2\,n-\nu-1}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{(b+c\,(2\,s-\nu))^2}{4\,(d+f\,(2\,s-\nu))}+e+g\,(2\,s-\nu)}\,(d+f\,(2\,s-\nu))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c\,(2\,s-\nu))^{-h-i+2\,n}\right.$$

$$\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)^2}{d+f\,(2\,s-\nu)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b+c\,(2\,s-\nu))\left(b+c\,(2\,s-\nu)+2\,(d+f\,(2\,s-\nu))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.\right.$$

$$-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\Bigg)+2\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}}$$

$$(d+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)\Bigg)+$$

$$e^{-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}+e+g\,(v-2\,s)}\,(d+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\Bigg((b+c\,(v-2\,s))\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}$$

$$(d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,s-v))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))}+e+i\,(2\,k-m)\,q+g\,(2\,s-v)+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(2\,s-v))^{-h-i+2\,n}$$

$$\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg((b+a\,i\,(2\,k-m)+c\,(2\,s-v))$$

$$\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)$$

$$\Gamma\Bigg(\frac{1}{2}\,(h+i+1),\,-\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/$$

$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v)))\right)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(b+a\,i\,(2k-m)+c\,(2s-v)+2\,(d+i\,(2k-m)\,p+f\,(2s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2k-m)\,p+f\,(2s-v)))\right)\sqrt{\left(-\left(b+a\,i\,(2k-m)+c\,(2s-v)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(2k-m)\,p+f\,(2s-v))\,\sqrt{z}\right)^2\Big/(d+i\,(2k-m)\,p+f\,(2s-v))\right)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2k)+c\,(2s-v))^2}{4\,(d+i\,(m-2k)\,p+f\,(2s-v))}+e+i\,(m-2k)\,q+g\,(2s-v)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2k)\,p+f\,(2s-v))^{-2n-2}$$
$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(m-2k)+c\,(2s-v))^{-h-i+2n}$$
$$\left(b+a\,i\,(m-2k)+c\,(2s-v)+2\,(d+i\,(m-2k)\,p+f\,(2s-v))\,\sqrt{z}\right)^{h+i}$$
$$\left(-\left(b+a\,i\,(m-2k)+c\,(2s-v)+2\,(d+i\,(m-2k)\,p+f\,(2s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(m-2k)\,p+f\,(2s-v))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$
$$\left((b+a\,i\,(m-2k)+c\,(2s-v))\left(b+a\,i\,(m-2k)+c\,(2s-v)+2\,(d+i\,(m-2k)\,p+f\,(2s-v))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\left(b+a\,i\,(m-2k)+c\,(2s-v)+2\,(d+i\,(m-2k)\,p+f\,(2s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2k)\,p+f\,(2s-v)))\right)+2\,(d+i\,(m-2k)\,p+f\,(2s-v))$$
$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(b+a\,i\,(m-2k)+c\,(2s-v)+2\,(d+i\,(m-2k)\,p+f\,(2s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2k)\,p+f\,(2s-v)))\right)\sqrt{\left(-\left(b+a\,i\,(m-2k)+c\,(2s-v)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(m-2k)\,p+f\,(2s-v))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2k)\,p+f\,(2s-v))\right)\Big)+$$

$$e^{-\frac{(b+a\,i\,(2k-m)+c\,(v-2s))^2}{4\,(d+i\,(2k-m)\,p+f\,(v-2s))}+e+i\,(2k-m)\,q+g\,(v-2s)+\frac{i\,m\,\pi}{2}}\,(d+i\,(2k-m)\,p+f\,(v-2s))^{-2n-2}$$
$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(2k-m)+c\,(v-2s))^{-h-i+2n}$$
$$\left(b+a\,i\,(2k-m)+c\,(v-2s)+2\,(d+i\,(2k-m)\,p+f\,(v-2s))\,\sqrt{z}\right)^{h+i}$$
$$\left(-\left(b+a\,i\,(2k-m)+c\,(v-2s)+2\,(d+i\,(2k-m)\,p+f\,(v-2s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(2k-m)\,p+f\,(v-2s))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$
$$\left((b+a\,i\,(2k-m)+c\,(v-2s))\left(b+a\,i\,(2k-m)+c\,(v-2s)+2\,(d+i\,(2k-m)\,p+f\,(v-2s))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\left(b+a\,i\,(2k-m)+c\,(v-2s)+2\,(d+i\,(2k-m)\,p+f\,(v-2s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2k-m)\,p+f\,(v-2s)))\right)+2\,(d+i\,(2k-m)\,p+f\,(v-2s))$$
$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(b+a\,i\,(2k-m)+c\,(v-2s)+2\,(d+i\,(2k-m)\,p+f\,(v-2s))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s)))\Big)\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\Big)}+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))}+e+i\,(m-2\,k)\,q+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\big)^{h+i}$$

$$\Big(-\big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$

$$(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\Big)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Big((b+a\,i\,(m-2\,k)+c\,(v-2\,s))\big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}(h+i+1),\,-\big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s)))\Big)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))$$

$$\Gamma\Big(\frac{1}{2}(h+i+2),\,-\big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s)))\Big)$$

$$\sqrt{\Big(-\big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$

$$(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\Big)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving cos, exp and power

Involving $z^{\alpha-1}\,e^{p\,z}\cos(c\,z)\cosh^{\nu}(a\,z)$

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$$\int z^{\alpha-1}\,e^{p\,z}\cos(c\,z)\cosh^{\nu}(a\,z)\,dz==$$

$$2^{-\nu-1}\,z^{\alpha}\Bigg(\binom{\nu}{\frac{\nu}{2}}(E_{1-\alpha}((i\,c-p)\,z)+E_{1-\alpha}((-p-i\,c)\,z))\,(\nu\bmod 2-1)-\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}((-p+i\,c-2\,a\,s+a\,\nu)\,z)+$$

$$E_{1-\alpha}((-p-i\,c-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-p+i\,c+2\,a\,s-a\,\nu)\,z)+E_{1-\alpha}((-p-i\,c+2\,a\,s-a\,\nu)\,z))\Bigg)/;\,\nu\in\mathbb{N}^+$$

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$$\int z^n e^{p z} \cos(c z) \cosh^{\nu}(a z)\, dz ==$$

$$\frac{1}{2} n!\, e^{p z} \cosh^{\nu}(a z) \left(1 + e^{2 a z}\right)^{-\nu} \left(e^{-i c z} \sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p - i c - a \nu)^{j+1}}\, {}_{j+2}F_{j+1}\left(\frac{-i c + p - a \nu}{2 a}, \ldots, \frac{-i c + p - a \nu}{2 a}, \right.\right.$$

$$\left. -\nu; \frac{-i c + p - a \nu}{2 a} + 1, \ldots, \frac{-i c + p - a \nu}{2 a} + 1; -e^{2 a z} \right) + e^{i c z} \sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p + i c - a \nu)^{j+1}}$$

$$\left. {}_{j+2}F_{j+1}\left(\frac{i c + p - a \nu}{2 a}, \ldots, \frac{i c + p - a \nu}{2 a}, -\nu; \frac{i c + p - a \nu}{2 a} + 1, \ldots, \frac{i c + p - a \nu}{2 a} + 1; -e^{2 a z} \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z} \cos(c z + d) \cosh^{\nu}(a z)$

01.20.21.3966.01

$$\int z^{\alpha-1} e^{p z} \cos(d + c z) \cosh^{\nu}(a z)\, dz ==$$

$$-2^{-\nu-1} e^{-i d} z^{\alpha} \binom{\nu}{\frac{\nu}{2}} \left(e^{2 i d}\, \Gamma(\alpha, (-i c - p) z)\, ((-i c - p) z)^{-\alpha} + ((i c - p) z)^{-\alpha}\, \Gamma(\alpha, (i c - p) z) \right) (1 - \nu \bmod 2) -$$

$$2^{-\nu-1} z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-i d} \binom{\nu}{k} \left(e^{2 i d}\, \Gamma(\alpha, (-i c - 2 a k - p + a \nu) z)\, ((-i c - 2 a k - p + a \nu) z)^{-\alpha} + \right.$$

$$((i c - 2 a k - p + a \nu) z)^{-\alpha}\, \Gamma(\alpha, (i c - 2 a k - p + a \nu) z) + e^{2 i d}\, ((-i c + 2 a k - p - a \nu) z)^{-\alpha}$$

$$\left. \Gamma(\alpha, (-i c + 2 a k - p - a \nu) z) + ((i c + 2 a k - p - a \nu) z)^{-\alpha}\, \Gamma(\alpha, (i c + 2 a k - p - a \nu) z) \right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.3967.01

$$\int z^n e^{p z} \cos(d + c z) \cosh^{\nu}(a z)\, dz ==$$

$$\frac{1}{2} n! \cosh^{\nu}(a z) \left(1 + e^{2 a z}\right)^{-\nu} \left(e^{-i d + (p - i c) z} \sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p - i c - a \nu)^{j+1}}\, {}_{j+2}F_{j+1}\left(\frac{-i c + p - a \nu}{2 a}, \ldots, \frac{-i c + p - a \nu}{2 a}, -\nu; \right.\right.$$

$$\left. \frac{-i c + p - a \nu}{2 a} + 1, \ldots, \frac{-i c + p - a \nu}{2 a} + 1; -e^{2 a z} \right) + e^{i d + (p + i c) z} \sum_{j=0}^{n} \frac{\left((-1)^j z^{n-j}\right)}{(n-j)!\,(p + i c - a \nu)^{j+1}}$$

$$\left. {}_{j+2}F_{j+1}\left(\frac{i c + p - a \nu}{2 a}, \ldots, \frac{i c + p - a \nu}{2 a}, -\nu; \frac{i c + p - a \nu}{2 a} + 1, \ldots, \frac{i c + p - a \nu}{2 a} + 1; -e^{2 a z} \right) \right) /;\ n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z} \cos(c z) \cosh^{\nu}(a z + b)$

01.20.21.3968.01

$$\int z^{\alpha-1}\, e^{p\,z} \cos(c\,z) \cosh^{\nu}(b+a\,z)\, dz ==$$

$$-2^{-\nu-1}\, z^{\alpha} \binom{\nu}{\frac{\nu}{2}} (\Gamma(\alpha, (-i\,c-p)\,z)\,((-i\,c-p)\,z)^{-\alpha} + ((i\,c-p)\,z)^{-\alpha}\,\Gamma(\alpha, (i\,c-p)\,z))\,(1-\nu \bmod 2) -$$

$$2^{-\nu-1}\, z^{\alpha} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2\,b\,k-b\,\nu} \binom{\nu}{k} \left(e^{4\,b\,k}\,\Gamma(\alpha, (-i\,c-2\,a\,k-p+a\,\nu)\,z)\,((-i\,c-2\,a\,k-p+a\,\nu)\,z)^{-\alpha} + \right.$$

$$e^{4\,b\,k}\,((i\,c-2\,a\,k-p+a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha, (i\,c-2\,a\,k-p+a\,\nu)\,z) + e^{2\,b\,\nu} \left(\Gamma(\alpha, (-i\,c+2\,a\,k-p-a\,\nu)\,z)\right.$$

$$\left.\left.((-i\,c+2\,a\,k-p-a\,\nu)\,z)^{-\alpha} + ((i\,c+2\,a\,k-p-a\,\nu)\,z)^{-\alpha}\,\Gamma(\alpha, (i\,c+2\,a\,k-p-a\,\nu)\,z)\right)\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.3969.01

$$\int z^{n}\, e^{p\,z} \cos(d+c\,z) \cosh^{\nu}(b+a\,z)\, dz == \frac{1}{2}\left(1+e^{2\,(b+a\,z)}\right)^{-\nu} n!\, \cosh^{\nu}(b+a\,z)$$

$$\left(e^{-i\,d+(-i\,c+p)\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (-i\,c+p-a\,\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{-i\,c+p-a\,\nu}{2\,a}, \ldots, \frac{-i\,c+p-a\,\nu}{2\,a}, -\nu;\right.\right.$$

$$\left. \frac{-i\,c+p-a\,\nu}{2\,a}+1, \ldots, \frac{-i\,c+p-a\,\nu}{2\,a}+1; -e^{2\,(b+a\,z)}\right) + e^{i\,d+(i\,c+p)\,z} \sum_{j=0}^{n} \frac{(-1)^{j}\, z^{n-j}\, (i\,c+p-a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left.\left. {}_{j+2}F_{j+1}\left(\frac{i\,c+p-a\,\nu}{2\,a}, \ldots, \frac{i\,c+p-a\,\nu}{2\,a}, -\nu; \frac{i\,c+p-a\,\nu}{2\,a}+1, \ldots, \frac{i\,c+p-a\,\nu}{2\,a}+1; -e^{2\,(b+a\,z)}\right)\right) /;\ n \in \mathbb{N}\right.$$

Involving $z^{\alpha-1}\, e^{p\,z} \cos(c\,z+d) \cosh^{\nu}(a\,z+b)$

01.20.21.3970.01

$$\int z^{\alpha-1}\, e^{p\,z} \cos(c\,z+d) \cosh^{\nu}(a\,z+b)\, dz == 2^{-\nu-1}\, z^{\alpha} \left(e^{-i\,d} \binom{\nu}{\frac{\nu}{2}} \left(e^{2\,i\,d}\, E_{1-\alpha}((-i\,c-p)\,z) + E_{1-\alpha}((i\,c-p)\,z)\right) (\nu \bmod 2 - 1) - \right.$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-i\,d-b\,(2\,s+\nu)} \binom{\nu}{s} \left(e^{2\,i\,d} \left(e^{4\,b\,s}\, E_{1-\alpha}((-i\,c-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((-i\,c-p+2\,a\,s-a\,\nu)\,z)\right) + \right.$$

$$\left.\left. e^{4\,b\,s}\, E_{1-\alpha}((i\,c-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((i\,c-p+2\,a\,s-a\,\nu)\,z)\right)\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.3971.01

$$\int z^n e^{p z} \cos(d + c z) \cosh^{\nu}(b + a z)\, dz == \frac{1}{2}\left(1 + e^{2(b+a z)}\right)^{-\nu} n!\, \cosh^{\nu}(b + a z)$$
$$\left(e^{-i d+(-i c+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-i c + p - a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{-i c + p - a \nu}{2 a}, \ldots, \frac{-i c + p - a \nu}{2 a}, -\nu;\right.\right.$$
$$\left.\frac{-i c + p - a \nu}{2 a} + 1, \ldots, \frac{-i c + p - a \nu}{2 a} + 1; -e^{2(b+a z)}\right) + e^{i d+(i c+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (i c + p - a \nu)^{-j-1}}{(n-j)!}$$
$$\left.{}_{j+2}F_{j+1}\left(\frac{i c + p - a \nu}{2 a}, \ldots, \frac{i c + p - a \nu}{2 a}, -\nu; \frac{i c + p - a \nu}{2 a} + 1, \ldots, \frac{i c + p - a \nu}{2 a} + 1; -e^{2(b+a z)}\right)\right) /; n \in \mathbb{N}$$

Involving $z^n e^{p z^r} \cos\left(b z^r\right) \cosh^{\nu}(c z)$

01.20.21.3972.01

$$\int z^n e^{p z^2} \cos\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(z^{n+1}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2}, (-i b-p) z^2\right)\left((-i b-p) z^2\right)^{\frac{1}{2}(-n-1)}+\left((i b-p) z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2}, (i b-p) z^2\right)\right)(\nu \bmod 2-1)-\right.$$

$$\frac{1}{\sqrt{-i b+p}\ \sqrt{i b+p}}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-\frac{c^2 p (\nu-2 s)^2}{2\left(b^2+p^2\right)}}\binom{\nu}{s}\left(e^{\frac{c^2 (\nu-2 s)^2}{4 (i b+p)}}\sqrt{i b+p}\sum_{q=0}^{n} 2^{q-n}(-i b+p)^{-n-\frac{1}{2}}(c(\nu-2 s))^{n-q}(c(2 s-\nu)+2(-i b+p) z)^{q+1}\right.$$

$$\left(-\frac{(c(2 s-\nu)+2(-i b+p) z)^2}{-i b+p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(2 s-\nu)+2(-i b+p) z)^2}{4(-i b+p)}\right)+$$

$$e^{\frac{c^2 (\nu-2 s)^2}{4 (i b+p)}}\sqrt{i b+p}\sum_{q=0}^{n}(-i b+p)^{-n-\frac{1}{2}}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(c(\nu-2 s)+2(-i b+p) z)^{q+1}$$

$$\left(-\frac{(c(\nu-2 s)+2(-i b+p) z)^2}{-i b+p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(\nu-2 s)+2(-i b+p) z)^2}{4(-i b+p)}\right)+$$

$$e^{\frac{c^2 (\nu-2 s)^2}{4 (-i b+p)}}\sqrt{-i b+p}\left(\sum_{q=0}^{n} 2^{q-n}(i b+p)^{-n-\frac{1}{2}}(c(\nu-2 s))^{n-q}(c(2 s-\nu)+2(i b+p) z)^{q+1}\right.$$

$$\left(-\frac{(c(2 s-\nu)+2(i b+p) z)^2}{i b+p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(2 s-\nu)+2(i b+p) z)^2}{4(i b+p)}\right)+$$

$$\sum_{q=0}^{n}(i b+p)^{-n-\frac{1}{2}}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(c(\nu-2 s)+2(i b+p) z)^{q+1}\left(-\frac{(c(\nu-2 s)+2(i b+p) z)^2}{i b+p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(c(\nu-2 s)+2(i b+p) z)^2}{4(i b+p)}\right)\right)\right)\right)\Big/; \nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

01.20.21.3973.01

$$\int z^n e^{p\sqrt{z}} \cos\left(b\sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(4\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2(n+1), (-i b-p)\sqrt{z}\right)(-i b-p)^{-2(n+1)}+(i b-p)^{-2(n+1)}\Gamma\left(2(n+1), (i b-p)\sqrt{z}\right)\right)(\nu \bmod 2-1)+\right.$$

$$4^{-n}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(c\,(2\,s-v))^{-2\,n}\,(c\,(v-2\,s))^{-2\,(n+1)}\binom{v}{s}\left(e^{\frac{(b+i\,p)^2}{c\,(8\,s-4\,v)}}\,(c\,(v-2\,s))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b+p)^{-h-k+2\,n}\right.$$

$$\left(\frac{\left(b+i\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\left(-i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left((-i\,b+p)\left(-i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b+i\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$\left.2\,c\,(2\,s-v)\,\sqrt{\frac{\left(b+i\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\right)^2}{c\,(2\,s-v)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b+i\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{(i\,b+p)^2}{c\,(8\,s-4\,v)}}\left((c\,(2\,s-v))^{2\,n}\left(e^{-\frac{i\,b\,p}{c\,(2\,s-v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b+p)^{-h-k+2\,n}\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((-i\,b+p)\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$\left.2\,c\,(v-2\,s)\,\sqrt{-\frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(-i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+\right.$$

$$\left.\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b+p)^{-h-k+2\,n}\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\right)$$

$$\left(-\frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((i\,b+p)\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\,(v-2\,s)$$

$$\left.\sqrt{-\frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(i\,b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{(b-i\,p)^2}{4\,c\,s-2\,c\,v}}\,(c\,(v-2\,s))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b+p)^{-h-k+2\,n}\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((i\,b+p)\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$2\,c\,(2\,s-v)\sqrt{-\frac{\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(i\,b+p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\right)\Big/;\ v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\cos(b\,z)\cosh^v(c\,z)$

01.20.21.3974.01

$$\int z^n e^{p z^2} \cos(b z) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(e^{\frac{b^2}{4p}} p^{-n-1}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(\sum_{q=0}^{n} 2^{q-n}(i b)^{n-q}\left(\frac{(b+2 i p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}(-i b+2 p z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b+2 i p z)^2}{4 p}\right)+\right.\right.$$

$$\left.\sum_{q=0}^{n} 2^{q-n}(-i b)^{n-q}\left(\frac{(b-2 i p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}(i b+2 p z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b-2 i p z)^2}{4 p}\right)\right)-$$

$$p^{-n-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{\frac{b^2-c^2(\nu-2s)^2}{2p}}\binom{\nu}{s}\left(e^{\frac{(i b-2 c s+c \nu)^2}{4 p}}\sum_{q=0}^{n}\left(\frac{i b}{2}+c s-\frac{c \nu}{2}\right)^{n-q}(-i b-2 c s+c \nu+2 p z)^{q+1}\right.$$

$$\left(-\frac{(-i b-2 c s+c \nu+2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-i b-2 c s+c \nu+2 p z)^2}{4 p}\right)+$$

$$e^{\frac{(-i b-2 c s+c \nu)^2}{4 p}}\sum_{q=0}^{n}\left(c\left(s-\frac{\nu}{2}\right)-\frac{i b}{2}\right)^{n-q}(i b-2 c s+c \nu+2 p z)^{q+1}\left(-\frac{(i b-2 c s+c \nu+2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(i b-2 c s+c \nu+2 p z)^2}{4 p}\right)+$$

$$e^{\frac{(i b-2 c s+c \nu)^2}{4 p}}\sum_{q=0}^{n} 2^{q-n}(-i b+c(\nu-2 s))^{n-q}\left(-\frac{(-i b-2 c s+c \nu-2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$(i b+2 c s-c \nu+2 p z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-i b-2 c s+c \nu-2 p z)^2}{4 p}\right)+$$

$$e^{\frac{(-i b-2 c s+c \nu)^2}{4 p}}\sum_{q=0}^{n} 2^{q-n}(i b+c(\nu-2 s))^{n-q}\left(-\frac{(i b-2 c s+c \nu-2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(-i b+2 c s-c \nu+2 p z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(i b-2 c s+c \nu-2 p z)^2}{4 p}\right)\right)\right) /;\ \nu\in\mathbb{Z}\wedge\nu>0\wedge n\in\mathbb{N}$$

01.20.21.3975.01

$$\int z^n e^{p\sqrt{z}} \cos(b z) \cosh^{\nu}(c z)\, dz == 2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(e^{\frac{p^2}{4 i b+8 c s-4 c \nu}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2(-i b-2 c s+c \nu)\sqrt{z}\right)^{h+k}\left(\frac{\left(p+2(-i b-2 c s+c \nu)\sqrt{z}\right)^2}{i b+2 c s-c \nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(-i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+k+1\right),\ \frac{\left(p+2\left(-i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\,i\,b+8\,c\,s-4\,c\,v}\right)+2\right.$$

$$\left(-i\,b-2\,c\,s+c\,v\right)\sqrt{\frac{\left(p+2\left(-i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b+2\,c\,s-c\,v}}$$

$$\left.\Gamma\left(\frac{1}{2}\left(h+k+2\right),\ \frac{\left(p+2\left(-i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\,i\,b+8\,c\,s-4\,c\,v}\right)\right)\left(-i\,b-2\,c\,s+c\,v\right)^{-2\left(n+1\right)}+$$

$$e^{\frac{p^2}{4\,i\,b-8\,c\,s+4\,c\,v}}\left(-i\,b+2\,c\,s-c\,v\right)^{-2\left(n+1\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}\left(-1\right)^{k-h}4^k\,p^{-h-k+2\,n}\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,v}\right)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+k+1\right),\ \frac{\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b-2\,c\,s+c\,v\right)}\right)-2\left(i\,b-2\,c\,s+c\,v\right)\right.$$

$$\left.\sqrt{\frac{\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,v}}\ \Gamma\left(\frac{1}{2}\left(h+k+2\right),\ \frac{\left(p-2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b-2\,c\,s+c\,v\right)}\right)\right)+$$

$$e^{\frac{p^2}{-4\,i\,b+8\,c\,s-4\,c\,v}}\left(i\,b-2\,c\,s+c\,v\right)^{-2\left(n+1\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}\left(-1\right)^{k-h}4^k\,p^{-h-k+2\,n}\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,v}\right)^{\frac{1}{2}\left(-h-k-1\right)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\left(h+k+1\right),\ -\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b-2\,c\,s+c\,v\right)}\right)+2\sqrt{-\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{i\,b-2\,c\,s+c\,v}}$$

$$\left(i\,b-2\,c\,s+c\,v\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),\ -\frac{\left(p+2\left(i\,b-2\,c\,s+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b-2\,c\,s+c\,v\right)}\right)\Bigg)+$$

$$e^{\frac{p^2}{-4ib-8cs+4cv}}(ib+2cs-cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p+2(ib+2cs-cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2(ib+2cs-cv)\sqrt{z}\right)^2}{ib+2cs-cv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2(ib+2cs-cv)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),-\frac{\left(p+2(ib+2cs-cv)\sqrt{z}\right)^2}{4ib+8cs-4cv}\right)+2\sqrt{-\frac{\left(p+2(ib+2cs-cv)\sqrt{z}\right)^2}{ib+2cs-cv}}$$

$$(ib+2cs-cv)\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(p+2(ib+2cs-cv)\sqrt{z}\right)^2}{4ib+8cs-4cv}\right)\Bigg)\Bigg)-$$

$$\frac{1}{b^2}\left(2^{-2n-v-2}e^{\frac{ip^2}{4b}}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(e^{-\frac{ip^2}{2b}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p-2ib\sqrt{z}\right)^{h+k}\right.\right.\right.$$

$$\left(-\frac{i\left(p-2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p-2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{i\left(p-2ib\sqrt{z}\right)^2}{4b}\right)-2\right.$$

$$\left.\left.\left.ib\sqrt{-\frac{i\left(p-2ib\sqrt{z}\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+k+2),-\frac{i\left(p-2ib\sqrt{z}\right)^2}{4b}\right)\right)\right)(-ib)^{-2n}+$$

$$(ib)^{-2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p+2ib\sqrt{z}\right)^{h+k}\left(\frac{i\left(p+2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p+2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{i\left(p+2ib\sqrt{z}\right)^2}{4b}\right)+\right.$$

$$\left.\left.\left.2\sqrt{\frac{i\left(p+2ib\sqrt{z}\right)^2}{b}}\ bi\Gamma\left(\frac{1}{2}(h+k+2),\frac{i\left(p+2ib\sqrt{z}\right)^2}{4b}\right)\right)\right)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\, e^{p\,z}\cos\left(b\,z^r\right)\cosh^v(c\,z)$

01.20.21.3976.01

$$\int z^n e^{p z} \cos\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(\frac{1}{\sqrt{b^2}}\left(e^{\frac{i p^2}{4 b}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(\sqrt{-i b}\sum_{q=0}^{n} 2^{q-n}(i b)^{-n-\frac{1}{2}}(-p)^{n-q}(p+2 i b z)^{q+1}\left(\frac{i(p+2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\right.\right.\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{i(p+2 i b z)^2}{4 b}\right)+\sqrt{i b}\; e^{-\frac{i p^2}{2 b}}\right.$$

$$\left.\left.\left.\sum_{q=0}^{n} 2^{q-n}(-i b)^{-n-\frac{1}{2}}(-p)^{n-q}(p-2 i b z)^{q+1}\left(-\frac{i(p-2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{i(p-2 i b z)^2}{4 b}\right)\right)\right)+$$

$$\frac{1}{(-i b)^{3/2}}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-\frac{i(p+c(\nu-2 s))^2}{4 b}}\binom{\nu}{s}\left(\sqrt{-i b}\;\sqrt{i b}\; e^{\frac{i\left(p^2+c^2(\nu-2 s)^2\right)}{2 b}}\left(e^{-\frac{i c p(2 s-\nu)}{b}}\sum_{q=0}^{n} 2^{q-n}(i b)^{-n-\frac{1}{2}}(-p+2 c s-c \nu)^{n-q}\right.\right.\right.$$

$$(p+c(\nu-2 s)+2 i b z)^{q+1}\left(\frac{i(p+c(\nu-2 s)+2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\left.\frac{i(p-2 c s+c \nu+2 i b z)^2}{4 b}\right)+\sum_{q=0}^{n} 2^{q-n}(i b)^{-n-\frac{1}{2}}(c(\nu-2 s)-p)^{n-q}(p+2 c s-c \nu+2 i b z)^{q+1}\right.$$

$$\left.\left.\left(\frac{i(p+2 c s-c \nu+2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{i(p+2 c s-c \nu+2 i b z)^2}{4 b}\right)\right)+\right.$$

$$b e^{\frac{i c p(\nu-2 s)}{b}} i\sum_{q=0}^{n} 2^{q-n}(-i b)^{-n-\frac{1}{2}}(c(\nu-2 s)-p)^{n-q}(p+c(2 s-\nu)-2 i b z)^{q+1}$$

$$\left(-\frac{i(p+c(2 s-\nu)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{i(p+c(2 s-\nu)-2 i b z)^2}{4 b}\right)+$$

$$b i\sum_{q=0}^{n} 2^{q-n}(-i b)^{-n-\frac{1}{2}}(-p+2 c s-c \nu)^{n-q}(p+c(\nu-2 s)-2 i b z)^{q+1}\left(-\frac{i(p+c(\nu-2 s)-2 i b z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{i(p+c(\nu-2 s)-2 i b z)^2}{4 b}\right)\right)\right)\right)\Big/; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3977.01

$$\int z^n e^{p z} \cos\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(4^{-n}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{b^2}{4(p-2 c s+c \nu)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k(-i b)^{-h-k+2 n}\left(\frac{\left(b+2 i(p-2 c s+c \nu)\sqrt{z}\right)^2}{p-2 c s+c \nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.\right.$$

$$\left(-i\,b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(2\,(p-2\,c\,s+c\,v)\right.$$

$$\sqrt{\frac{\left(b+2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)-$$

$$\left.i\,b\left(-i\,b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b+2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b)^{-h-k+2\,n}\left(\frac{\left(b-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(i\,b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,i\left(i\,b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)+2\sqrt{\frac{\left(b-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}$$

$$\left.\left.(p-2\,c\,s+c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\right)\right)(p-2\,c\,s+c\,v)^{-2\,(n+1)}+$$

$$e^{\frac{b^2}{4\,(p+2\,c\,s-c\,v)}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b)^{-h-k+2\,n}\left(\frac{\left(b+2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(-i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(2\,(p+2\,c\,s-c\,v)\right.$$

$$\sqrt{\frac{\left(b+2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)-$$

$$i\,b\left(-i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b+2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)+$$

$$e^{\frac{b^2}{4\,(p+2\,c\,s-c\,v)}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b)^{-h-k+2\,n}\left(\frac{\left(b-2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,i\left(i\,b+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b-2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)+2\,\sqrt{\frac{\left(b-2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}$$

$$\left.(p+2\,c\,s-c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b-2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)\right)\Bigg)-$$

$$4^{-n}\,e^{\frac{b^2}{4\,p}}\,p^{-2\,(n+1)}\binom{v}{\frac{v}{2}}(v\bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}-(-1)^{k-h}\,4^k\,(-i\,b)^{-h-k+2\,n}\left(\frac{\left(b+2\,i\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(-i\,b+2\,p\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,i\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b+2\,i\,p\,\sqrt{z}\right)^2}{4\,p}\right)-\right.$$

$$\left.2\,p\,\sqrt{\frac{\left(b+2\,i\,p\,\sqrt{z}\right)^2}{p}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b+2\,i\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}-(-1)^{k-h}\,4^k\,(i\,b)^{-h-k+2\,n}\left(\frac{\left(b-2\,i\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\left(i\,b+2\,p\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b-2\,i\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b-2\,i\,p\,\sqrt{z}\right)^2}{4\,p}\right)-\right.$$

$$\left.\sqrt{\left(b-2\,i\,p\,\sqrt{z}\right)^2}\ \left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b-2\,i\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\Bigg)\Bigg)\Bigg)$$

Involving $z^n e^{p z} \cos(b z) \cosh^{\nu}(c z^r)$

01.20.21.3978.01

$$\int z^n e^{p z} \cos(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$2^{-\nu-2}\left(2\binom{\nu}{\frac{\nu}{2}}\left(E_{-n}((-i b-p) z)+E_{-n}((i b-p) z)\right)(\nu \bmod 2-1) z^{n+1}+\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{(c(2 k-\nu))^{3/2}} e^{-\frac{(i b+p)^2}{c(8 k-4 \nu)}}\binom{\nu}{k}\right.$$

$$\left(\sqrt{c(2 k-\nu)}\ \sqrt{c(\nu-2 k)}\left(e^{\frac{p^2-b^2}{c(4 k-2 \nu)}}\sum_{q=0}^{n} 2^{q-n}(i b-p)^{n-q}(c(\nu-2 k))^{-n-\frac{1}{2}}(-i b+p+2 c(\nu-2 k) z)^{q+1}\right.\right.$$

$$\left(\frac{(-i b+p+2 c(\nu-2 k) z)^2}{c(2 k-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(-i b+p+2 c(\nu-2 k) z)^2}{c(8 k-4 \nu)}\right)+$$

$$e^{\frac{(i b+p)^2}{c(4 k-2 \nu)}}\sum_{q=0}^{n} 2^{q-n}(-i b-p)^{n-q}(c(\nu-2 k))^{-n-\frac{1}{2}}(i b+p+2 c(\nu-2 k) z)^{q+1}$$

$$\left.\left(-\frac{(i b+p+2 c(\nu-2 k) z)^2}{c(\nu-2 k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(i b+p+2 c(\nu-2 k) z)^2}{c(8 k-4 \nu)}\right)\right)-$$

$$c e^{\frac{i b p}{c(2 k-\nu)}}(2 k-\nu)\sum_{q=0}^{n} 2^{q-n}(i b-p)^{n-q}(c(2 k-\nu))^{-n-\frac{1}{2}}(-i b+p+4 c k z-2 c \nu z)^{q+1}$$

$$\left(-\frac{(-i b+p+4 c k z-2 c \nu z)^2}{2 c k-c \nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b+i(p+4 c k z-2 c \nu z))^2}{c(8 k-4 \nu)}\right)+$$

$$c(\nu-2 k)\sum_{q=0}^{n} 2^{q-n}(-i b-p)^{n-q}(c(2 k-\nu))^{-n-\frac{1}{2}}(i b+p+4 c k z-2 c \nu z)^{q+1}$$

$$\left.\left.\left.\left(-\frac{(i b+p+4 c k z-2 c \nu z)^2}{c(2 k-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(i b+p+4 c k z-2 c \nu z)^2}{c(8 k-4 \nu)}\right)\right)\right)\right/; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3979.01

$$\int z^n e^{p z} \cos(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-2}\left(2\binom{\nu}{\frac{\nu}{2}}\left(\Gamma(n+1, (-i b-p) z)(-i b-p)^{-n-1}+(i b-p)^{-n-1}\Gamma(n+1, (i b-p) z)\right)(\nu \bmod 2-1)+\right.$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{u}\left(e^{-\frac{c^2(\nu-2 u)^2}{4(-i b+p)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h} 4^k (c(\nu-2 u))^{-h-k+2 n}\left(\frac{\left(2\sqrt{z}\ (b+i p)+c i(\nu-2 u)\right)^2}{-i b+p}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,u)\left(2\sqrt{z}\ (-i\,b+p)+c\,(v-2\,u)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2\sqrt{z}\ (b+i\,p)+c\,i\,(v-2\,u)\right)^2}{4\,(-i\,b+p)}\right)+2\sqrt{\frac{\left(2\sqrt{z}\ (b+i\,p)+c\,i\,(v-2\,u)\right)^2}{-i\,b+p}}$$

$$\left.\left.(-i\,b+p)\,\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2\sqrt{z}\ (b+i\,p)+c\,i\,(v-2\,u)\right)^2}{4\,(-i\,b+p)}\right)\right)\right)(-i\,b+p)^{-2\,(n+1)}+$$

$$e^{-\frac{c^2\,(v-2\,u)^2}{4\,(-i\,b+p)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c\,(v-2\,u))^{-h-k+2\,n}\left(\frac{\left(2\sqrt{z}\ (-b-i\,p)+c\,i\,(v-2\,u)\right)^2}{-i\,b+p}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2\,(-i\,b+p)\sqrt{z}\ -c\,(v-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(2\,(-i\,b+p)\sqrt{\frac{\left(2\sqrt{z}\ (-b-i\,p)+c\,i\,(v-2\,u)\right)^2}{-i\,b+p}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2\sqrt{z}\ (-b-i\,p)+c\,i\,(v-2\,u)\right)^2}{4\,(-i\,b+p)}\right)-c\,(v-2\,u)$$

$$\left.\left.\left(2\,(-i\,b+p)\sqrt{z}\ -c\,(v-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2\sqrt{z}\ (-b-i\,p)+c\,i\,(v-2\,u)\right)^2}{4\,(-i\,b+p)}\right)\right)\right)$$

$$(-i\,b+p)^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,u)^2}{4\,(i\,b+p)}}\,(i\,b+p)^{-2\,(n+1)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,u))^{-h-k+2\,n}\right.$$

$$\left(\frac{\left(2\sqrt{z}\ (i\,p-b)+c\,i\,(v-2\,u)\right)^2}{i\,b+p}\right)^{\frac{1}{2}(-h-k-1)}\left(2\sqrt{z}\ (i\,b+p)+c\,(v-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(2\,(i\,b+p)\right.$$

$$\left.\sqrt{\frac{\left(2\sqrt{z}\ (i\,p-b)+c\,i\,(v-2\,u)\right)^2}{i\,b+p}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2\sqrt{z}\ (i\,p-b)+c\,i\,(v-2\,u)\right)^2}{4\,(i\,b+p)}\right)-i\,c\right.$$

$$(v-2u)\left(2\sqrt{z}\ (i\,p-b)+c\,i\,(v-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2\sqrt{z}\ (i\,p-b)+c\,i\,(v-2u)\right)^2}{4\,(i\,b+p)}\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c\,(v-2u))^{-h-k+2n}\left(\frac{\left(2\sqrt{z}\ (b-i\,p)+c\,i\,(v-2u)\right)^2}{i\,b+p}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(i\,b+p)\sqrt{z}\ -c\,(v-2u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(2\,(i\,b+p)\sqrt{\frac{\left(2\sqrt{z}\ (b-i\,p)+c\,i\,(v-2u)\right)^2}{i\,b+p}}\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2\sqrt{z}\ (b-i\,p)+c\,i\,(v-2u)\right)^2}{4\,(i\,b+p)}\right)-c\,(v-2u)\left(2\,(i\,b+p)\sqrt{z}\ -c\,(v-2u)\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2\sqrt{z}\ (b-i\,p)+c\,i\,(v-2u)\right)^2}{4\,(i\,b+p)}\right)\right)\right)\Big/;\ v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\cos(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.3980.01

$$\int z^n e^{p z^2} \cos(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$2^{-\nu-2}\left(e^{\frac{b^2}{4 p}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(\sum_{q=0}^{n} 2^{q-n}(i b)^{n-q}\left(\frac{(b+2 i p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}(-i b+2 p z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b+2 i p z)^2}{4 p}\right)+\right.\right.$$

$$\left.\sum_{q=0}^{n} 2^{q-n}(-i b)^{n-q}\left(\frac{(b-2 i p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}(i b+2 p z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b-2 i p z)^2}{4 p}\right)\right) p^{-n-1}+$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{k}\left(-e^{\frac{b^2}{4(-2 c k+p+c \nu)}}\sqrt{2 c k+p-c \nu}\left(\sum_{q=0}^{n} 2^{q-n}(-i b)^{n-q}(-2 c k+p+c \nu)^{-n-\frac{1}{2}}(i b+2(-2 c k+p+c \nu) z)^{q+1}\right.\right.\right.$$

$$\left(-\frac{(i b+2(-2 c k+p+c \nu) z)^2}{-2 c k+p+c \nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(i b+2(-2 c k+p+c \nu) z)^2}{4(-2 c k+p+c \nu)}\right)+$$

$$\sum_{q=0}^{n} 2^{q-n}(i b)^{n-q}(-2 c k+p+c \nu)^{-n-\frac{1}{2}}\left(-\frac{(i b-2(-2 c k+p+c \nu) z)^2}{-2 c k+p+c \nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.(-i b+2(-2 c k+p+c \nu) z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(i b-2(-2 c k+p+c \nu) z)^2}{4(-2 c k+p+c \nu)}\right)\right)-$$

$$e^{\frac{b^2}{4(2 c k+p-c \nu)}}\sqrt{-2 c k+p+c \nu}\sum_{q=0}^{n} 2^{q-n}(i b)^{n-q}(2 c k+p-c \nu)^{-n-\frac{1}{2}}\left(\frac{(b+2 i(2 c k+p-c \nu) z)^2}{2 c k+p-c \nu}\right)^{\frac{1}{2}(-q-1)}$$

$$(-i b+2(2 c k+p-c \nu) z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b+2 i(2 c k+p-c \nu) z)^2}{4(2 c k+p-c \nu)}\right)-$$

$$e^{\frac{b^2}{4(2 c k+p-c \nu)}}\sqrt{p+c(\nu-2 k)}\sum_{q=0}^{n} 2^{q-n}(-i b)^{n-q}(2 c k+p-c \nu)^{-n-\frac{1}{2}}\left(\frac{(b-2 i(2 c k+p-c \nu) z)^2}{2 c k+p-c \nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.(i b+2(2 c k+p-c \nu) z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(b-2 i(2 c k+p-c \nu) z)^2}{4(2 c k+p-c \nu)}\right)\right)\right)\Big/$$

$$\left.\left(\sqrt{2 c k+p-c \nu}\sqrt{p+c(\nu-2 k)}\right)\right)\Big/; \nu \in \mathbb{Z} \wedge \nu>0 \wedge n \in \mathbb{N}$$

01.20.21.3981.01

$$\int z^n e^{p\sqrt{z}} \cos(b z) \cosh^{\nu}\left(c\sqrt{z}\right) dz ==$$

$$2^{-2n-\nu-2}(-1)^n b^{-2n-2}\left(e^{\frac{i p^2}{4b}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p+2ib\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(\frac{i\left(p+2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{i\left(p+2ib\sqrt{z}\right)^2}{4b}\right)+\right.$$

$$\left.2\sqrt{\frac{i\left(p+2ib\sqrt{z}\right)^2}{b}}\,bi\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{i\left(p+2ib\sqrt{z}\right)^2}{4b}\right)\right)+$$

$$e^{-\frac{ip^2}{2b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p-2ib\sqrt{z}\right)^{h+k}\left(-\frac{i\left(p-2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p-2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{i\left(p-2ib\sqrt{z}\right)^2}{4b}\right)-\right.$$

$$\left.\left.2ib\sqrt{-\frac{i\left(p-2ib\sqrt{z}\right)^2}{b}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{i\left(p-2ib\sqrt{z}\right)^2}{4b}\right)\right)\right)-$$

$$\sum_{u=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{u}\left(e^{-\frac{i(p-c(\nu-2u))^2}{4b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(p-c(\nu-2u))^{-h-k+2n}\left(p-c(\nu-2u)-2ib\sqrt{z}\right)^{h+k}\right.$$

$$\left(-\frac{i\left(p-c(\nu-2u)-2ib\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left.\left((p-c(\nu-2u))\left(p-c(\nu-2u)-2ib\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{i\left(p-c(\nu-2u)-2ib\sqrt{z}\right)^2}{4b}\right)-2\right.\right.$$

$$i\,b\sqrt{-\frac{i\left(p-c\,(v-2\,u)-2\,i\,b\,\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{i\left(p-c\,(v-2\,u)-2\,i\,b\,\sqrt{z}\right)^2}{4\,b}\right)\Bigg)+$$

$$e^{\frac{i\,(p+2\,c\,u-c\,v)^2}{4\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p-c\,(v-2\,u))^{-h-k+2\,n}\left(p-c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{i\left(p-c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((p-c\,(v-2\,u))\left(p-c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{i\left(2\,\sqrt{z}\;b-i\,p+c\,i\,(v-2\,u)\right)^2}{4\,b}\right)+2$$

$$b\,i\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{i\left(2\,\sqrt{z}\;b-i\,p+c\,i\,(v-2\,u)\right)^2}{4\,b}\right)\sqrt{\frac{i\left(p-c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)^2}{b}}\Bigg)+$$

$$e^{-\frac{i\,(p+c\,(v-2\,u))^2}{4\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p+c\,(v-2\,u))^{-h-k+2\,n}\left(p+c\,(v-2\,u)-2\,i\,b\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{i\left(2\,\sqrt{z}\;b+i\,p+c\,i\,(v-2\,u)\right)^2}{b}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((p+c\,(v-2\,u))\left(p+c\,(v-2\,u)-2\,i\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{i\left(2\,\sqrt{z}\;b+i\,p+c\,i\,(v-2\,u)\right)^2}{4\,b}\right)-2$$

$$i\,b\sqrt{\frac{i\left(2\,\sqrt{z}\;b+i\,p+c\,i\,(v-2\,u)\right)^2}{b}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{i\left(2\,\sqrt{z}\;b+i\,p+c\,i\,(v-2\,u)\right)^2}{4\,b}\right)\Bigg)+$$

$$e^{\frac{i\,(p-2\,c\,u+c\,v)^2}{4\,b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p+c\,(v-2\,u))^{-h-k+2\,n}\left(p+c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{i\left(p+c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((p+c\,(v-2\,u))\left(p+c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{i\left(-2\,\sqrt{z}\;b+i\,p+c\,i\,(v-2\,u)\right)^2}{4\,b}\right)+2\,b\,i\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.-\frac{i\left(-2\,\sqrt{z}\;b+i\,p+c\,i\,(v-2\,u)\right)^2}{4\,b}\right)\sqrt{\frac{i\left(p+c\,(v-2\,u)+2\,i\,b\,\sqrt{z}\right)^2}{b}}\right)\right)\Big/;\,v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cos\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.3982.01

$$\int z^n e^{p z} \cos\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$-2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{\sqrt{-i b-2 c s+c \nu}} e^{\frac{p^2}{4 i b+8 c s-4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-i b-2 c s+c \nu)^{-n-\frac{1}{2}} (p+2 (-i b-2 c s+c \nu) z)^{q+1} \right.$$

$$\left(-\frac{(p+2 (-i b-2 c s+c \nu) z)^2}{-i b-2 c s+c \nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 (-i b-2 c s+c \nu) z)^2}{-4 i b-8 c s+4 c \nu} \right) +$$

$$\frac{1}{\sqrt{i b-2 c s+c \nu}} e^{\frac{p^2}{-4 i b+8 c s-4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (i b-2 c s+c \nu)^{-n-\frac{1}{2}} (p+2 (i b-2 c s+c \nu) z)^{q+1}$$

$$\left(-\frac{(p+2 (i b-2 c s+c \nu) z)^2}{i b-2 c s+c \nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2 (i b-2 c s+c \nu) z)^2}{-4 i b+8 c s-4 c \nu} \right) +$$

$$\frac{1}{\sqrt{-i b+2 c s-c \nu}} e^{\frac{p^2}{4 i b-8 c s+4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-i b+2 c s-c \nu)^{-n-\frac{1}{2}} (p+2 (-i b+2 c s-c \nu) z)^{q+1}$$

$$\left(-\frac{(p+2 (-i b+2 c s-c \nu) z)^2}{-i b+2 c s-c \nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 (-i b+2 c s-c \nu) z)^2}{-4 i b+8 c s-4 c \nu} \right) +$$

$$\frac{1}{\sqrt{i b+2 c s-c \nu}} e^{\frac{p^2}{-4 i b-8 c s+4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (i b+2 c s-c \nu)^{-n-\frac{1}{2}} (p+2 (i b+2 c s-c \nu) z)^{q+1}$$

$$\left(\frac{(p+2 (i b+2 c s-c \nu) z)^2}{-i b-2 c s+c \nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2 (i b+2 c s-c \nu) z)^2}{-4 i b-8 c s+4 c \nu} \right) \Bigg) - \frac{1}{\sqrt{b^2}} 2^{-\nu-2} e^{\frac{i p^2}{4 b}} \binom{\nu}{\frac{\nu}{2}}$$

$$(1-\nu \bmod 2) \left(\sqrt{-i b} \sum_{q=0}^{n} 2^{q-n} (i b)^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 i b z)^{q+1} \left(\frac{i (p+2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{i (p+2 i b z)^2}{4 b} \right) + \right.$$

$$\sqrt{i b}\ e^{-\frac{i p^2}{2 b}} \sum_{q=0}^{n} 2^{q-n} (-i b)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2 i b z)^{q+1}$$

$$\left. \left(-\frac{i (p-2 i b z)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{i (p-2 i b z)^2}{4 b} \right) \right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3983.01

$$\int z^n e^{p z} \cos\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-2 n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(e^{\frac{b^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-i b)^{-h-i+2 n} \left(-i b+2 p \sqrt{z}\right)^{h+i} \left(-\frac{\left(-i b+2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \right.$$

$$\binom{i}{h}\binom{n}{i}\left(2\,p\sqrt{-\frac{\left(-i\,b+2\,p\sqrt{z}\right)^2}{p}}\;\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(-i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right)-\right.$$

$$\left.i\,b\left(-i\,b+2\,p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(-i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{\frac{b^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(i\,b)^{-h-i+2n}\left(i\,b+2\,p\sqrt{z}\right)^{h+i}\left(-\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(b\,i\left(i\,b+2\,p\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(i\,b+2\,p\sqrt{z}\right)^2}{4\,p}\right)\right)$$

$$p^{-2(n+1)}+2^{-2n-\nu-2}\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{-\frac{(-i\,b+c(\nu-2k))^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-i\,b+c\,(\nu-2\,k))^{-h-i+2n}\right.\right.$$

$$\left(-i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)^{h+i}\left(-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-i\,b+c\,(\nu-2\,k))\left(-i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\left.\sqrt{-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(-i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)^2}{4\,p}\right)\right)+\right.$$

$$e^{-\frac{(i\,b+c(\nu-2k))^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(i\,b+c\,(\nu-2\,k))^{-h-i+2n}\left(i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)^{h+i}$$

$$\left.\left.\left(-\frac{\left(i\,b+c\,(\nu-2\,k)+2\,p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\right)\right)$$

$$\left((i\,b+c\,(v-2\,k))\left(i\,b+c\,(v-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(i\,b+c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(i\,b+c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(-i\,b-c\,(v-2\,k))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-i\,b-c\,(v-2\,k))^{-h-i+2\,n}\left(-i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-i\,b-c\,(v-2\,k))\left(-i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(-i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(-i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{(i\,b-c\,(v-2\,k))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(i\,b-c\,(v-2\,k))^{-h-i+2\,n}\left(i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((i\,b-c\,(v-2\,k))\left(i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.\left.p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(i\,b-c\,(v-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right)\Bigg)\,p^{-2\,(n+1)}\;/;\;v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\cos\left(b\,z^r\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.3984.01

$$\int z^{\alpha-1}\, e^{p\,z^r} \cos(b\,z^r)\cosh^{\nu}(c\,z^r)\,dz ==$$

$$-\frac{2^{-\nu-1}\,z^{\alpha}}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{\alpha}{r},\,(-i\,b-p)\,z^r\right)((-i\,b-p)\,z^r)^{-\frac{\alpha}{r}}+((i\,b-p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(i\,b-p)\,z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{\alpha}{r},\,(-i\,b-p-2\,c\,s+c\,\nu)\,z^r\right)((-i\,b-p-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$((i\,b-p-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(i\,b-p-2\,c\,s+c\,\nu)\,z^r\right)+((-i\,b-p+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},\,(-i\,b-p+2\,c\,s-c\,\nu)\,z^r\right)+((i\,b-p+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(i\,b-p+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.3985.01

$$\int z^n\, e^{p\,z^2}\cos\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(\frac{n+1}{2},\,(-i\,b-p)\,z^2\right)\left((-i\,b-p)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((i\,b-p)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(i\,b-p)\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\Gamma\left(\frac{n+1}{2},\,(-i\,b-p+c\,(\nu-2\,k))\,z^2\right)\left((-i\,b-p+c\,(\nu-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}+\left((i\,b-p+c\,(\nu-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}\right.\right.$$

$$\Gamma\left(\frac{n+1}{2},\,(i\,b-p+c\,(\nu-2\,k))\,z^2\right)+\left((-i\,b-p-c\,(\nu-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(-i\,b-p-c\,(\nu-2\,k))\,z^2\right)+$$

$$\left.\left.\left((i\,b-p-c\,(\nu-2\,k))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(i\,b-p-c\,(\nu-2\,k))\,z^2\right)\right)\right)z^{n+1}\,/;\,\nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

01.20.21.3986.01

$$\int z^n\, e^{p\sqrt{z}}\cos\left(b\sqrt{z}\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz ==$$

$$-2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\Gamma\left(2\,(n+1),\,(-i\,b-p+c\,(\nu-2\,k))\,\sqrt{z}\right)(-i\,b-p+c\,(\nu-2\,k))^{-2\,(n+1)}+\right.$$

$$(i\,b-p+c\,(\nu-2\,k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(i\,b-p+c\,(\nu-2\,k))\,\sqrt{z}\right)+(-i\,b-p-c\,(\nu-2\,k))^{-2\,(n+1)}$$

$$\left.\Gamma\left(2\,(n+1),\,(-i\,b-p-c\,(\nu-2\,k))\,\sqrt{z}\right)+(i\,b-p-c\,(\nu-2\,k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(i\,b-p-c\,(\nu-2\,k))\,\sqrt{z}\right)\right)-$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2\,(n+1),\,(-i\,b-p)\,\sqrt{z}\right)(-i\,b-p)^{-2\,(n+1)}+(i\,b-p)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(i\,b-p)\,\sqrt{z}\right)\right)$$

$$(1-\nu \bmod 2)\,/;\,\nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{b\,z^r+e}\cos\left(a\,z^r+q\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.3987.01

$$\int z^{\alpha-1}\, e^{b z^r+e} \cos(a z^r+q) \cosh^{\nu}(c z^r+g)\, dz ==$$

$$-\frac{2^{-\nu-1} z^{\alpha}}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e+i q}\, \Gamma\left(\frac{\alpha}{r}, (-b-i a) z^r\right)((-b-i a) z^r)^{-\frac{\alpha}{r}}+e^{e-i q}((i a-b) z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (i a-b) z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+i q+2 g s-g \nu}\, \Gamma\left(\frac{\alpha}{r}, (-b-i a-2 c s+c \nu) z^r\right)((-b-i a-2 c s+c \nu) z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{e-i q+2 g s-g \nu}((-b+i a-2 c s+c \nu) z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+i a-2 c s+c \nu) z^r\right)+$$

$$e^{e+i q-2 g s+g \nu}((-b-i a+2 c s-c \nu) z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-i a+2 c s-c \nu) z^r\right)+$$

$$\left.\left.e^{e-i q-2 g s+g \nu}((-b+i a+2 c s-c \nu) z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+i a+2 c s-c \nu) z^r\right)\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.3988.01

$$\int z^n\, e^{b z^2+e} \cos\left(a z^2+q\right) \cosh^{\nu}\left(c z^2+g\right) dz == -2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}$$

$$\left(e^{e+i q}\, \Gamma\left(\frac{n+1}{2}, (-b-i a) z^2\right)\left((-b-i a) z^2\right)^{\frac{1}{2}(-n-1)}+e^{e-i q}\left((i a-b) z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (i a-b) z^2\right)\right)(1-\nu \bmod 2)\, z^{n+1}-$$

$$2^{-\nu-2} z^{n+1} \sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{e+i q-g(\nu-2 k)}\, \Gamma\left(\frac{n+1}{2}, (-b-i a+c(\nu-2 k)) z^2\right)\left((-b-i a+c(\nu-2 k)) z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$e^{e-i q-g(\nu-2 k)}\left((-b+i a+c(\nu-2 k)) z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-b+i a+c(\nu-2 k)) z^2\right)+$$

$$e^{e+i q+g(\nu-2 k)}\left((-b-i a-c(\nu-2 k)) z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-b-i a-c(\nu-2 k)) z^2\right)+$$

$$\left.e^{e-i q+g(\nu-2 k)}\left((-b+i a-c(\nu-2 k)) z^2\right)^{\frac{1}{2}(-n-1)}\, \Gamma\left(\frac{n+1}{2}, (-b+i a-c(\nu-2 k)) z^2\right)\right) /;\ \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.3989.01

$$\int z^n\, e^{\sqrt{z}\, b+e} \cos\left(\sqrt{z}\, a+q\right) \cosh^{\nu}\left(\sqrt{z}\, c+g\right) dz ==$$

$$-2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left(e^{e+i q}\, \Gamma\left(2(n+1), (-b-i a)\sqrt{z}\right)(-b-i a)^{-2(n+1)}+(i a-b)^{-2(n+1)}\, e^{e-i q}\, \Gamma\left(2(n+1), (i a-b)\sqrt{z}\right)\right)$$

$$(1-\nu \bmod 2)-2^{-\nu}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(e^{e+i q-g(\nu-2 k)}\, \Gamma\left(2(n+1), (-b-i a+c(\nu-2 k))\sqrt{z}\right)(-b-i a+c(\nu-2 k))^{-2(n+1)}+\right.$$

$$e^{e-i q-g(\nu-2 k)}(-b+i a+c(\nu-2 k))^{-2(n+1)}\, \Gamma\left(2(n+1), (-b+i a+c(\nu-2 k))\sqrt{z}\right)+$$

$$e^{e+i q+g(\nu-2 k)}(-b-i a-c(\nu-2 k))^{-2(n+1)}\, \Gamma\left(2(n+1), (-b-i a-c(\nu-2 k))\sqrt{z}\right)+$$

$$\left.e^{e-i q+g(\nu-2 k)}(-b+i a-c(\nu-2 k))^{-2(n+1)}\, \Gamma\left(2(n+1), (-b+i a-c(\nu-2 k))\sqrt{z}\right)\right) /;\ \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^n e^{b z^r+d z+e} \cos(a z^r+p z+q) \cosh^v(c z^r+f z+g)$

01.20.21.3990.01

$$\int z^n e^{b z^2+d z+e} \cos(a z^2+p z+q) \cosh^v(c z^2+f z+g)\, dz ==$$

$$-2^{-v-2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(e^{-\frac{(d-i p)^2}{4(b-i a)}+e-i q}(b-i a)^{-n-1}\sum_{j=0}^{n}2^{j-n}(i p-d)^{n-j}(d-i p+2(b-i a) z)^{j+1}\right.$$

$$\left(-\frac{(d-i p+2(b-i a) z)^2}{b-i a}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d-i p+2(b-i a) z)^2}{4(b-i a)}\right)+$$

$$(b+i a)^{-n-1} e^{-\frac{(d+i p)^2}{4(b+i a)}+e+i q}\sum_{j=0}^{n}2^{j-n}(-d-i p)^{n-j}(d+i p+2(b+i a) z)^{j+1}$$

$$\left.\left(-\frac{(d+i p+2(b+i a) z)^2}{b+i a}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+i p+2(b+i a) z)^2}{4(b+i a)}\right)\right)-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d-i p+f(2s-v))^2}{4(b-i a+c(2s-v))}+e-i q+g(2s-v)}(b-i a+c(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d+i p-f(2s-v))^{n-j}(d-i p+\right.$$

$$f(2s-v)+2(b-i a+c(2s-v)) z)^{j+1}\left(-\frac{(d-i p+f(2s-v)+2(b-i a+c(2s-v)) z)^2}{b-i a+c(2s-v)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d-i p+f(2s-v)+2(b-i a+c(2s-v)) z)^2}{4(b-i a+c(2s-v))}\right)+e^{-\frac{(d+i p+f(2s-v))^2}{4(b+i a+c(2s-v))}+e+i q+g(2s-v)}$$

$$(b+i a+c(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d-i p-f(2s-v))^{n-j}(d+i p+f(2s-v)+2(b+i a+c(2s-v)) z)^{j+1}$$

$$\left(-\frac{(d+i p+f(2s-v)+2(b+i a+c(2s-v)) z)^2}{b+i a+c(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d+i p+f(2s-v)+2(b+i a+c(2s-v)) z)^2}{4(b+i a+c(2s-v))}\right)+e^{-\frac{(d-i p+f(v-2s))^2}{4(b-i a+c(v-2s))}+e-i q+g(v-2s)}$$

$$(b-i a+c(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}(-d+i p-f(v-2s))^{n-j}(d-i p+f(v-2s)+2(b-i a+c(v-2s)) z)^{j+1}$$

$$\left(-\frac{(d-i p+f(v-2s)+2(b-i a+c(v-2s)) z)^2}{b-i a+c(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d-i p+f(v-2s)+2(b-i a+c(v-2s)) z)^2}{4(b-i a+c(v-2s))}\right)+e^{-\frac{(d+i p+f(v-2s))^2}{4(b+i a+c(v-2s))}+e+i q+g(v-2s)}$$

$$(b+i\,a+c\,(v-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-i\,p-f\,(v-2\,s))^{n-j}\,(d+i\,p+f\,(v-2\,s)+2\,(b+i\,a+c\,(v-2\,s))\,z)^{j+1}$$

$$\left(-\frac{(d+i\,p+f\,(v-2\,s)+2\,(b+i\,a+c\,(v-2\,s))\,z)^2}{b+i\,a+c\,(v-2\,s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$

$$\Gamma\left(\frac{j+1}{2},-\frac{(d+i\,p+f\,(v-2\,s)+2\,(b+i\,a+c\,(v-2\,s))\,z)^2}{4\,(b+i\,a+c\,(v-2\,s))}\right)\Bigg)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.3991.01

$$\int z^n\,e^{\sqrt{z}\,b+d\,z+e}\cos\left(\sqrt{z}\,a+p\,z+q\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z+g\right)dz==$$

$$2^{-2\,n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{-\frac{(b+i\,a)^2}{4\,(d+i\,p)}+e+i\,q}\,(d+i\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+i\,a)^{-h-i+2\,n}\left(b+i\,a+2\,(d+i\,p)\,\sqrt{z}\right)^{h+i}\right.$$

$$\left(-\frac{\left(b+i\,a+2\,(d+i\,p)\,\sqrt{z}\right)^2}{d+i\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+i\,a)\left(b+i\,a+2\,(d+i\,p)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+i\,a+2\,(d+i\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,p)}\right)+2\sqrt{-\frac{\left(b+i\,a+2\,(d+i\,p)\,\sqrt{z}\right)^2}{d+i\,p}}$$

$$\left.\left.(d+i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+i\,a+2\,(d+i\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,p)}\right)\right)+e^{-\frac{(b-i\,a)^2}{4\,(d-i\,p)}+e-i\,q}\,(d-i\,p)^{-2\,n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-i\,a)^{-h-i+2\,n}\left(b-i\,a+2\,(d-i\,p)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b-i\,a+2\,(d-i\,p)\,\sqrt{z}\right)^2}{d-i\,p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b-i\,a)\left(b-i\,a+2\,(d-i\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b-i\,a+2\,(d-i\,p)\,\sqrt{z}\right)^2}{4\,(d-i\,p)}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{\left(b-i\,a+2\,(d-i\,p)\,\sqrt{z}\right)^2}{d-i\,p}}\;(d-i\,p)\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b-i\,a+2\,(d-i\,p)\,\sqrt{z}\right)^2}{4\,(d-i\,p)}\right)\right)\right)+$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(e^{-\frac{(b+ia+c(2s-\nu))^2}{4(d+ip+f(2s-\nu))}+e+iq+g(2s-\nu)}(d+ip+f(2s-\nu))^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b+ia+c(2s-\nu))^{-h-i+2n}\left(b+ia+c(2s-\nu)+2(d+ip+f(2s-\nu))\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+ia+c(2s-\nu)+2(d+ip+f(2s-\nu))\sqrt{z}\right)^2}{d+ip+f(2s-\nu)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b+ia+c(2s-\nu))\left(b+ia+c(2s-\nu)+2(d+ip+f(2s-\nu))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+1),-\frac{\left(b+ia+c(2s-\nu)+2(d+ip+f(2s-\nu))\sqrt{z}\right)^2}{4(d+ip+f(2s-\nu))}\Bigg)+$$

$$2(d+ip+f(2s-\nu))\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+ia+c(2s-\nu)+2(d+ip+f(2s-\nu))\sqrt{z}\right)^2}{4(d+ip+f(2s-\nu))}\right)$$

$$\sqrt{-\frac{\left(b+ia+c(2s-\nu)+2(d+ip+f(2s-\nu))\sqrt{z}\right)^2}{d+ip+f(2s-\nu)}}\Bigg)+$$

$$e^{-\frac{(b-ia+c(2s-\nu))^2}{4(d-ip+f(2s-\nu))}+e-iq+g(2s-\nu)}(d-ip+f(2s-\nu))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b-ia+c(2s-\nu))^{-h-i+2n}$$

$$\left(b-ia+c(2s-\nu)+2(d-ip+f(2s-\nu))\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-ia+c(2s-\nu)+2(d-ip+f(2s-\nu))\sqrt{z}\right)^2}{d-ip+f(2s-\nu)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b-ia+c(2s-\nu))\left(b-ia+c(2s-\nu)+2(d-ip+f(2s-\nu))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+1),-\frac{\left(b-ia+c(2s-\nu)+2(d-ip+f(2s-\nu))\sqrt{z}\right)^2}{4(d-ip+f(2s-\nu))}\Bigg)+$$

$$2\,(d-i\,p+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b-i\,a\,+c\,(2\,s-v)+2\,(d-i\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p+f\,(2\,s-v))}\right)$$

$$\sqrt{-\frac{\left(b-i\,a\,+c\,(2\,s-v)+2\,(d-i\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d-i\,p+f\,(2\,s-v)}}\Bigg)+$$

$$e^{-\frac{(b+i\,a+c\,(v-2\,s))^2}{4\,(d+i\,p+f\,(v-2\,s))}+e+i\,q+g\,(v-2\,s)}\,(d+i\,p+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+i\,a\,+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(b+i\,a\,+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+i\,a\,+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+i\,p+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b+i\,a\,+c\,(v-2\,s))\left(b+i\,a\,+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+i+1),\,-\frac{\left(b+i\,a\,+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+i\,p+f\,(v-2\,s))}\Bigg)+$$

$$2\,(d+i\,p+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+i\,a\,+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+i\,p+f\,(v-2\,s))}\right)$$

$$\sqrt{-\frac{\left(b+i\,a\,+c\,(v-2\,s)+2\,(d+i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+i\,p+f\,(v-2\,s)}}\Bigg)+$$

$$e^{-\frac{(b-i\,a+c\,(v-2\,s))^2}{4\,(d-i\,p+f\,(v-2\,s))}+e-i\,q+g\,(v-2\,s)}\,(d-i\,p+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b-i\,a\,+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(b-i\,a\,+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-i\,a\,+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d-i\,p+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b-i\,a\,+c\,(v-2\,s))\left(b-i\,a\,+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+i+1),\ -\frac{\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d-i\,p+f\,(v-2\,s))}\Bigg)+$$

$$2\,(d-i\,p+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d-i\,p+f\,(v-2\,s))}\right)$$

$$\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,s)+2\,(d-i\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d-i\,p+f\,(v-2\,s)}}\Bigg)\Bigg)\ /;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving powers of cos, exp and power

Involving $z^{\alpha-1}\,e^{p\,z}\cos^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.3992.01

$$\int z^{\alpha-1}\,e^{b\,z}\cos^m(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-m-\nu}\,z^{\alpha}\left(-\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}E_{1-\alpha}(-b\,z)\,(m \bmod 2-1)\,(\nu \bmod 2-1)+\right.$$

$$\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(E_{1-\alpha}((i\,c\,(m-2\,s)-b)\,z)+E_{1-\alpha}(-(b+c\,i\,(m-2\,s))\,z))+$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}(-(b+2\,a\,s-a\,\nu)\,z)+E_{1-\alpha}(-(b+a\,(\nu-2\,s))\,z))-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}(-(b-2\,i\,c\,k+i\,c\,m-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}(-(b+2\,i\,c\,k-i\,c\,m-2\,a\,s+a\,\nu)\,z)+$$

$$\left.E_{1-\alpha}((-b+c\,i\,(m-2\,k)-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}(-(b-2\,i\,c\,k+i\,c\,m+2\,a\,s-a\,\nu)\,z)\right)\Bigg)\ /;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.3993.01

$$\int z^n e^{p z} \cos^{\mu}(c z) \cosh^{\nu}(a z)\, dz == 2^{-\nu} e^{p z} \binom{\nu}{\frac{\nu}{2}} \cos^{\mu}(c z)\, n!\, (1 - \nu \bmod 2)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + c \mu}{2 c}, \ldots, -\frac{i p + c \mu}{2 c}, -\mu; 1 - \frac{i p + c \mu}{2 c}, \ldots, 1 - \frac{i p + c \mu}{2 c}; -e^{2 i c z}\right)\right)$$

$$\left(1 + e^{2 i c z}\right)^{-\mu} +$$

$$2^{-\nu} \cos^{\mu}(c z)\, n! \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{(p - a(\nu - 2s)) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a(\nu - 2s) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p - i a(\nu - 2s) + c \mu}{2 c}, \ldots, -\frac{i p - i a(\nu - 2s) + c \mu}{2 c}, -\mu; 1 - \frac{i p - i a(\nu - 2s) + c \mu}{2 c}, \ldots, 1 - \frac{i p - i a(\nu - 2s) + c \mu}{2 c}; -e^{2 i c z}\right) + e^{(p + a(\nu - 2s)) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a(\nu - 2s) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + i a(\nu - 2s) + c \mu}{2 c}, \ldots, -\frac{i p + i a(\nu - 2s) + c \mu}{2 c}, -\mu; 1 - \frac{i p + i a(\nu - 2s) + c \mu}{2 c}, \ldots, 1 - \frac{i p + i a(\nu - 2s) + c \mu}{2 c}; -e^{2 i c z}\right)\right)\left(1 + e^{2 i c z}\right)^{-\mu} /; n \in \mathbb{N} \wedge \nu \in \mathbb{N}^+$$

01.20.21.3994.01

$$\int z^n e^{b z} \cos^{m}(c z) \cosh^{\nu}(a z)\, dz == 2^{-m}\, n! \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\, e^{b z} \cosh^{\nu}(a z) \left(1 + e^{2 a z}\right)^{-\nu}$$

$$\sum_{p=0}^{n} \frac{(-1)^p z^{n-p}}{(n-p)!\, (b - a \nu)^{p+1}}\, {}_{p+2}F_{p+1}\left(\frac{b - a \nu}{2 a}, \ldots, \frac{b - a \nu}{2 a}, -\nu; 1 + \frac{b - a \nu}{2 a}, \ldots, 1 + \frac{b - a \nu}{2 a}; -e^{2 a z}\right) + 2^{-m}$$

$$n!\, e^{b z} \cosh^{\nu}(a z) \left(1 + e^{2 a z}\right)^{-\nu}$$

$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{i c (m-2s) z} \sum_{p=0}^{n} \frac{(-1)^p z^{n-p}}{(n-p)!\, (b + i c (m-2s) - a \nu)^{p+1}}\, {}_{p+2}F_{p+1}\left(\frac{b + i c (m-2s) - a \nu}{2 a}, \ldots, \frac{b + i c (m-2s) - a \nu}{2 a}, -\nu; 1 + \frac{b + i c (m-2s) - a \nu}{2 a}, \ldots, 1 + \frac{b + i c (m-2s) - a \nu}{2 a}; -e^{2 a z}\right) + e^{-i c (m-2s) z} \sum_{p=0}^{n} \frac{(-1)^p z^{n-p}}{(n-p)!\, (b - i c (m-2s) - a \nu)^{p+1}}\, {}_{p+2}F_{p+1}\left(\frac{b - i c (m-2s) - a \nu}{2 a}, \ldots, \frac{b - i c (m-2s) - a \nu}{2 a}, -\nu; 1 + \frac{b - i c (m-2s) - a \nu}{2 a}, \ldots, 1 + \frac{b - i c (m-2s) - a \nu}{2 a}; -e^{2 a z}\right)\right) /; m \in \mathbb{N} \wedge n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p z}\, \cos^{\mu}(c z + d) \cosh^{\nu}(a z)$

01.20.21.3995.01

$$\int z^{\alpha-1}\, e^{p\,z} \cos^m(d+c\,z) \cosh^\nu(a\,z)\, dz == -2^{-m-\nu}\, z^\alpha \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} \Gamma(\alpha, -p\,z)\, (1-m \bmod 2)\, (1-\nu \bmod 2)\, (-p\,z)^{-\alpha} -$$

$$2^{-m-\nu}\, z^\alpha \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-i\,d\,(m-2\,s)} \binom{m}{s} \left(\Gamma(\alpha, (i\,c\,m-p-2\,i\,c\,s)\,z)\, ((i\,c\,m-p-2\,i\,c\,s)\,z)^{-\alpha} +\right.$$

$$\left. e^{2\,i\,d\,(m-2\,s)}\, ((-p-i\,c\,(m-2\,s))\,z)^{-\alpha}\, \Gamma(\alpha, (-p-i\,c\,(m-2\,s))\,z)\right) - 2^{-m-\nu}\, z^\alpha \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k} \left(\Gamma(\alpha, (-2\,a\,k-p+a\,\nu)\,z)\, ((-2\,a\,k-p+a\,\nu)\,z)^{-\alpha} + ((-p-a\,(\nu-2\,k))\,z)^{-\alpha}\, \Gamma(\alpha, (-p-a\,(\nu-2\,k))\,z)\right) - 2^{-m-\nu}\, z^\alpha$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k} \sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{-i\,d\,m-2\,i\,d\,s} \binom{m}{s} \left(e^{2\,i\,d\,m}\, \Gamma(\alpha, (-2\,a\,k-i\,c\,m-p+2\,i\,c\,s+a\,\nu)\,z)\, ((-2\,a\,k-i\,c\,m-p+2\,i\,c\,s+a\,\nu)\,z)^{-\alpha} +\right.$$

$$e^{4\,i\,d\,s}\, ((-2\,a\,k+i\,c\,m-p-2\,i\,c\,s+a\,\nu)\,z)^{-\alpha}\, \Gamma(\alpha, (-2\,a\,k+i\,c\,m-p-2\,i\,c\,s+a\,\nu)\,z) +$$

$$\left(e^{2\,i\,d\,m}\, \Gamma(\alpha, (2\,a\,k-i\,c\,m-p+2\,i\,c\,s-a\,\nu)\,z)\, ((2\,a\,k-i\,c\,m-p+2\,i\,c\,s-a\,\nu)\,z)^{-\alpha} +\right.$$

$$\left.\left. e^{4\,i\,d\,s}\, ((2\,a\,k+i\,c\,m-p-2\,i\,c\,s-a\,\nu)\,z)^{-\alpha}\, \Gamma(\alpha, (2\,a\,k+i\,c\,m-p-2\,i\,c\,s-a\,\nu)\,z)\right)\right) /;\, m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3996.01

$$\int z^n\, e^{p\,z} \cos^\mu(d+c\,z) \cosh^\nu(a\,z)\, dz == 2^{-\nu}\, e^{p\,z} \binom{\nu}{\frac{\nu}{2}} \cos^\mu(d+c\,z)\, n!\, (1-\nu \bmod 2)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p-i\,c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i\,p+c\,\mu}{2\,c}, \ldots, -\frac{i\,p+c\,\mu}{2\,c}, -\mu; 1-\frac{i\,p+c\,\mu}{2\,c}, \ldots, 1-\frac{i\,p+c\,\mu}{2\,c}; -e^{2\,i\,(d+c\,z)}\right)\right)$$

$$\left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu} + 2^{-\nu} \cos^\mu(d+c\,z)\, n!$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} \left(e^{(p-a\,(\nu-2\,s))\,z} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p-a\,(\nu-2\,s)-i\,c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i\,p-i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}, \ldots,\right.\right.\right.$$

$$\left.\left.\left. -\frac{i\,p-i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}, -\mu; 1-\frac{i\,p-i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}, \ldots, 1-\frac{i\,p-i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}; \right.\right.\right.$$

$$\left.\left.\left. -e^{2\,i\,(d+c\,z)}\right) + e^{(p+a\,(\nu-2\,s))\,z} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+a\,(\nu-2\,s)-i\,c\,\mu)^{-j-1}}{(n-j)!}\right.\right.\right.$$

$$\left.\left.\left. {}_{j+2}F_{j+1}\left(-\frac{i\,p+i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}, \ldots, -\frac{i\,p+i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}, -\mu; 1-\frac{i\,p+i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}, \right.\right.\right.\right.$$

$$\left.\left.\left.\left. \ldots, 1-\frac{i\,p+i\,a\,(\nu-2\,s)+c\,\mu}{2\,c}; -e^{2\,i\,(d+c\,z)}\right)\right)\right) \left(1+e^{2\,i\,(d+c\,z)}\right)^{-\mu} /;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3997.01

$$\int z^n e^{p z} \cos^m(d + c z) \cosh^\nu(a z)\, dz == 2^{-m} e^{p z} \binom{m}{\frac{m}{2}} n! (1 - m \bmod 2) \cosh^\nu(a z) \left(1 + e^{2 a z}\right)^{-\nu}$$
$$\left(\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p - a \nu}{2 a}, \ldots, \frac{p - a \nu}{2 a}, -\nu; \frac{p - a \nu}{2 a} + 1, \ldots, \frac{p - a \nu}{2 a} + 1; -e^{2 a z}\right)\right) +$$
$$2^{-m} n! \cosh^\nu(a z) \left(1 + e^{2 a z}\right)^{-\nu} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{(p - i c (m-2 s)) z - i d (m-2 s)} \right.$$
$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - i c (m-2 s) - a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p - i c (m-2 s) - a \nu}{2 a}, \ldots, \frac{p - i c (m-2 s) - a \nu}{2 a},\right.$$
$$\left. -\nu; \frac{p - i c (m-2 s) - a \nu}{2 a} + 1, \ldots, \frac{p - i c (m-2 s) - a \nu}{2 a} + 1; -e^{2 a z}\right) + e^{d i (m-2 s) + (p + c i (m-2 s)) z}$$
$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + c i (m-2 s) - a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p + i c (m-2 s) - a \nu}{2 a}, \ldots, \frac{p + i c (m-2 s) - a \nu}{2 a},\right.$$
$$\left.\left. -\nu; \frac{p + i c (m-2 s) - a \nu}{2 a} + 1, \ldots, \frac{p + i c (m-2 s) - a \nu}{2 a} + 1; -e^{2 a z}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1}\, e^{p z} \cos^\mu(c z) \cosh^\nu(a z + b)$

01.20.21.3998.01

$$\int z^{\alpha-1} e^{p z} \cos^m(c z) \cosh^\nu(b + a z)\, dz ==$$
$$-2^{-m-\nu} z^\alpha \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} \Gamma(\alpha, -p z) (1 - m \bmod 2) (1 - \nu \bmod 2) (-p z)^{-\alpha} - 2^{-m-\nu} z^\alpha \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$
$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} (\Gamma(\alpha, (i c m - p - 2 i c s) z) ((i c m - p - 2 i c s) z)^{-\alpha} + ((-p - i c (m-2 s)) z)^{-\alpha} \Gamma(\alpha, (-p - i c (m-2 s)) z)) -$$
$$2^{-m-\nu} z^\alpha \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2 b k - b \nu} \binom{\nu}{k} \left(e^{4 b k} \Gamma(\alpha, (-2 a k - p + a \nu) z) ((-2 a k - p + a \nu) z)^{-\alpha} + \right.$$
$$\left. e^{2 b \nu} ((-p - a (\nu - 2 k)) z)^{-\alpha} \Gamma(\alpha, (-p - a (\nu - 2 k)) z) \right) - 2^{-m-\nu} z^\alpha$$
$$\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{-2 b k - b \nu} \binom{m}{s} \left(e^{4 b k} \Gamma(\alpha, (-2 a k - i c m - p + 2 i c s + a \nu) z) ((-2 a k - i c m - p + 2 i c s + a \nu) z)^{-\alpha} + \right.$$
$$e^{4 b k} ((-2 a k + i c m - p - 2 i c s + a \nu) z)^{-\alpha} \Gamma(\alpha, (-2 a k + i c m - p - 2 i c s + a \nu) z) +$$
$$\left. e^{2 b \nu} \left(\Gamma(\alpha, (2 a k - i c m - p + 2 i c s - a \nu) z) ((2 a k - i c m - p + 2 i c s - a \nu) z)^{-\alpha} + \right.\right.$$
$$\left.\left. ((2 a k + i c m - p - 2 i c s - a \nu) z)^{-\alpha} \Gamma(\alpha, (2 a k + i c m - p - 2 i c s - a \nu) z) \right) \right) /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.3999.01

$$\int z^n e^{p z} \cos^{\mu}(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-\nu} e^{p z} \binom{\nu}{\frac{\nu}{2}} \cos^{\mu}(c z)\, n!\, (1 - \nu \bmod 2)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + c \mu}{2 c}, \ldots, -\frac{i p + c \mu}{2 c}, -\mu; 1 - \frac{i p + c \mu}{2 c}, \ldots, 1 - \frac{i p + c \mu}{2 c}; -e^{2 i c z}\right)\right)$$

$$\left(1 + e^{2 i c z}\right)^{-\mu} + 2^{-\nu} \cos^{\mu}(c z)\, n!$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{(p - a(\nu-2s)) z - b(\nu-2s)} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a(\nu-2s) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p - i a(\nu-2s) + c \mu}{2 c}, \ldots, -\frac{i p - i a(\nu-2s) + c \mu}{2 c}, -\mu; 1 - \frac{i p - i a(\nu-2s) + c \mu}{2 c}, \ldots, 1 - \frac{i p - i a(\nu-2s) + c \mu}{2 c}; -e^{2 i c z}\right) + e^{b(\nu-2s) + (p + a(\nu-2s)) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a(\nu-2s) - i c \mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{i p + i a(\nu-2s) + c \mu}{2 c}, \ldots, -\frac{i p + i a(\nu-2s) + c \mu}{2 c}, -\mu; 1 - \frac{i p + i a(\nu-2s) + c \mu}{2 c}, \ldots, 1 - \frac{i p + i a(\nu-2s) + c \mu}{2 c}; -e^{2 i c z}\right)\right)\right) \left(1 + e^{2 i c z}\right)^{-\mu} /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4000.01

$$\int z^n e^{p z} \cos^{m}(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-m} e^{p z} \binom{m}{\frac{m}{2}} n!\, (1 - m \bmod 2) \cosh^{\nu}(b + a z)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p - a \nu}{2 a}, \ldots, \frac{p - a \nu}{2 a}, -\nu; \frac{p - a \nu}{2 a} + 1, \ldots, \frac{p - a \nu}{2 a} + 1; -e^{2(b + a z)}\right)\right)$$

$$\left(1 + e^{2(b + a z)}\right)^{-\nu} + 2^{-m} n! \cosh^{\nu}(b + a z) \left(1 + e^{2(b + a z)}\right)^{-\nu}$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{(p - i c(m-2s)) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p - i c(m-2s) - a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p - i c(m-2s) - a \nu}{2 a}, \ldots, \frac{p - i c(m-2s) - a \nu}{2 a}, -\nu; \frac{p - i c(m-2s) - a \nu}{2 a} + 1, \ldots, \frac{p - i c(m-2s) - a \nu}{2 a} + 1; -e^{2(b + a z)}\right) + e^{(p + c i(m-2s)) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + c i(m-2s) - a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p + i c(m-2s) - a \nu}{2 a}, \ldots, \frac{p + i c(m-2s) - a \nu}{2 a}, -\nu; \frac{p + i c(m-2s) - a \nu}{2 a} + 1, \ldots, \frac{p + i c(m-2s) - a \nu}{2 a} + 1; -e^{2(b + a z)}\right)\right) /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1} e^{p z} \cos^{\mu}(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.4001.01

$$\int z^{\alpha-1}\, e^{p z} \cos^m(d+c z) \cosh^\nu(b+a z)\, dz == 2^{-m-\nu}\, z^\alpha \left(-\binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} E_{1-\alpha}(-p z)\, (m \bmod 2 - 1)\, (\nu \bmod 2 - 1) + \right.$$

$$\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{-i d (m-2 s)} \binom{m}{s} \left(E_{1-\alpha}((i c (m-2 s) - p) z) + e^{2 i d (m-2 s)}\, E_{1-\alpha}(-(p + c i (m-2 s)) z) \right) +$$

$$\binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (2 s+\nu)} \binom{\nu}{s} \left(e^{4 b s}\, E_{1-\alpha}(-(p + 2 a s - a \nu) z) + e^{2 b \nu}\, E_{1-\alpha}(-(p + a (\nu - 2 s)) z) \right) -$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-i d (2 k+m)-b (2 s+\nu)} \binom{\nu}{s} \left(e^{2 i d m} \left(e^{4 b s}\, E_{1-\alpha}((c i (2 k-m) - p - 2 a s + a \nu) z) + \right. \right.$$

$$e^{2 b \nu}\, E_{1-\alpha}((c i (2 k-m) - p + 2 a s - a \nu) z) \Big) + e^{4 i d k} \left(e^{4 b s}\, E_{1-\alpha}((c i (m-2 k) - p - 2 a s + a \nu) z) + \right.$$

$$\left. \left. \left. e^{2 b \nu}\, E_{1-\alpha}((-2 c i k + i c m - p + 2 a s - a \nu) z) \right) \right) \right) /;\ m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4002.01

$$\int z^n\, e^{p z} \cos^\mu(d+c z) \cosh^\nu(b+a z)\, dz == 2^{-\nu}\, e^{p z} \binom{\nu}{\frac{\nu}{2}} \cos^\mu(d+c z)\, n!\, (1 - \nu \bmod 2)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p - i c \mu)^{-j-1}}{(n-j)!}\ {}_{j+2}F_{j+1}\left(-\frac{i p + c \mu}{2 c}, \ldots, -\frac{i p + c \mu}{2 c}, -\mu; 1 - \frac{i p + c \mu}{2 c}, \ldots, 1 - \frac{i p + c \mu}{2 c}; -e^{2 i (d+c z)} \right) \right)$$

$$\left(1 + e^{2 i (d+c z)}\right)^{-\mu} + 2^{-\nu} \cos^\mu(d+c z)\, n!$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{(p - a (\nu-2 s)) z - b (\nu-2 s)} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p - a (\nu-2 s) - i c \mu)^{-j-1}}{(n-j)!}\ {}_{j+2}F_{j+1}\left(-\frac{i p - i a (\nu-2 s) + c \mu}{2 c}, \ldots, \right. \right. \right.$$

$$\left. -\frac{i p - i a (\nu-2 s) + c \mu}{2 c}, -\mu; 1 - \frac{i p - i a (\nu-2 s) + c \mu}{2 c}, \ldots, 1 - \frac{i p - i a (\nu-2 s) + c \mu}{2 c}; \right.$$

$$\left. -e^{2 i (d+c z)} \right) + e^{b (\nu-2 s) + (p + a (\nu-2 s)) z} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p + a (\nu-2 s) - i c \mu)^{-j-1}}{(n-j)!}$$

$${}_{j+2}F_{j+1}\left(-\frac{i p + i a (\nu-2 s) + c \mu}{2 c}, \ldots, -\frac{i p + i a (\nu-2 s) + c \mu}{2 c}, -\mu; 1 - \frac{i p + i a (\nu-2 s) + c \mu}{2 c}, \right.$$

$$\left. \left. \left. \ldots, 1 - \frac{i p + i a (\nu-2 s) + c \mu}{2 c}; -e^{2 i (d+c z)} \right) \right) \right) \left(1 + e^{2 i (d+c z)}\right)^{-\mu} /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4003.01

$$\int z^n e^{p z} \cos^m(d+c z) \cosh^\nu(b+a z)\, dz == 2^{-m} e^{p z} \binom{m}{\frac{m}{2}} n! (1-m \bmod 2) \cosh^\nu(b+a z)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p-a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p-a\nu}{2a}, \ldots, \frac{p-a\nu}{2a}, -\nu; \frac{p-a\nu}{2a}+1, \ldots, \frac{p-a\nu}{2a}+1; -e^{2(b+a z)}\right)\right)$$

$$\left(1+e^{2(b+a z)}\right)^{-\nu} + 2^{-m} n! \cosh^\nu(b+a z) \left(1+e^{2(b+a z)}\right)^{-\nu} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{(p-i c (m-2 s)) z - i d (m-2 s)} \right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p-i c (m-2 s)-a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p-i c (m-2 s)-a\nu}{2a}, \ldots, \frac{p-i c (m-2 s)-a\nu}{2a}, -\nu;\right.$$

$$\left.\frac{p-i c (m-2 s)-a\nu}{2a}+1, \ldots, \frac{p-i c (m-2 s)-a\nu}{2a}+1; -e^{2(b+a z)}\right) + e^{d i (m-2 s)+(p+c i (m-2 s)) z}$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p+c i (m-2 s)-a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(\frac{p+i c (m-2 s)-a\nu}{2a}, \ldots, \frac{p+i c (m-2 s)-a\nu}{2a},\right.$$

$$\left. \left. -\nu; \frac{p+i c (m-2 s)-a\nu}{2a}+1, \ldots, \frac{p+i c (m-2 s)-a\nu}{2a}+1; -e^{2(b+a z)}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n e^{p z^r} \cos^m(b z^r) \cosh^\nu(c z)$

01.20.21.4004.01

$$\int z^n e^{p z^2} \cos^m\left(b z^2\right) \cosh^\nu(c z)\, dz ==$$

$$2^{-m-\nu-1} \left(p^{-n-1} \binom{m}{\frac{m}{2}} (m \bmod 2 - 1) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{c^2 (\nu-2 s)^2}{4 p}} \binom{\nu}{s} \left(\sum_{q=0}^{n} 2^{q-n} (c(\nu-2 s))^{n-q} (2 c s - c \nu + 2 p z)^{q+1} \right.\right.$$

$$\left(-\frac{(2 c s - c \nu + 2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2 c s - c \nu + 2 p z)^2}{4 p}\right) + \sum_{q=0}^{n} \left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}$$

$$\left. (c(\nu-2 s) + 2 p z)^{q+1} \left(-\frac{(c(\nu-2 s) + 2 p z)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c(\nu-2 s) + 2 p z)^2}{4 p}\right) \right) -$$

$$z^{n+1} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} E_{\frac{1}{2}-\frac{n}{2}}\left(-p z^2\right) (m \bmod 2 - 1) (\nu \bmod 2 - 1) + z^{n+1} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1)$$

$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\left(-(p + b i (m-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -(p + b i (m-2 s)) z^2\right) + \right.$$

$$\left. \left(-(p - i b (m-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -(p - i b (m-2 s)) z^2\right) \right) -$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{c^2 p (\nu-2 s)^2}{2\left(b^2 (m-2 k)^2 + p^2\right)}} \binom{\nu}{s} \left(e^{\frac{c^2 (\nu-2 s)^2}{4 (b i (m-2 k) + p)}} \sqrt{b i (m-2 k) + p} \sum_{q=0}^{n} 2^{q-n} (b i (2 k - m) + p)^{-n-\frac{1}{2}} \right.$$

$$(c\,(v-2\,s))^{n-q}\,(c\,(2\,s-v)+2\,(b\,i\,(2\,k-m)+p)\,z)^{q+1}\left(-(c\,(2\,s-v)+2\,(b\,i\,(2\,k-m)+p)\,z)^2\Big/\right.$$
$$\left.(b\,i\,(2\,k-m)+p)\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c\,(2\,s-v)+2\,(b\,i\,(2\,k-m)+p)\,z)^2}{4\,(b\,i\,(2\,k-m)+p)}\right)+$$
$$e^{\frac{c^2\,(v-2\,s)^2}{4\,(b\,i\,(m-2\,k)+p)}}\sqrt{-2\,b\,i\,k+i\,b\,m+p}\sum_{q=0}^{n}(b\,i\,(2\,k-m)+p)^{-n-\frac{1}{2}}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}(c\,(v-2\,s)+$$
$$2\,(b\,i\,(2\,k-m)+p)\,z)^{q+1}\left(-(c\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+p)\,z)^2\Big/(b\,i\,(2\,k-m)+p)\right)^{\frac{1}{2}(-q-1)}$$
$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c\,(v-2\,s)+2\,(b\,i\,(2\,k-m)+p)\,z)^2}{4\,(b\,i\,(2\,k-m)+p)}\right)+e^{\frac{c^2\,(v-2\,s)^2}{4\,(b\,i\,(2\,k-m)+p)}}\sqrt{b\,i\,(2\,k-m)+p}$$
$$\left(\sum_{q=0}^{n}2^{q-n}\,(-2\,b\,i\,k+i\,b\,m+p)^{-n-\frac{1}{2}}\,(c\,(v-2\,s))^{n-q}\,(c\,(2\,s-v)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^{q+1}\right.$$
$$\left(-(c\,(2\,s-v)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2\Big/(-2\,b\,i\,k+i\,b\,m+p)\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\Gamma\left(\frac{q+1}{2},-(c\,(2\,s-v)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2\Big/(4\,(-2\,b\,i\,k+i\,b\,m+p))\right)+$$
$$\sum_{q=0}^{n}(-2\,b\,i\,k+i\,b\,m+p)^{-n-\frac{1}{2}}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}(c\,(v-2\,s)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^{q+1}$$
$$\left(-(c\,(v-2\,s)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2\Big/(-2\,b\,i\,k+i\,b\,m+p)\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\left.\left.\Gamma\left(\frac{q+1}{2},-(c\,(v-2\,s)+2\,(-2\,b\,i\,k+i\,b\,m+p)\,z)^2\Big/(4\,(-2\,b\,i\,k+i\,b\,m+p))\right)\right)\Big/$$
$$\left.\left(\sqrt{b\,i\,(2\,k-m)+p}\;\sqrt{b\,i\,(m-2\,k)+p}\right)\right/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

01.20.21.4005.01

$$\int z^n\,e^{p\sqrt{z}}\,\cos^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz==$$
$$2^{-m-v-1}\left(-4\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2\,(n+1),-p\sqrt{z}\right)(m\bmod 2-1)\,(v\bmod 2-1)\,p^{-2\,(n+1)}+4\binom{v}{\frac{v}{2}}(v\bmod 2-1)\right.$$
$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(\Gamma\left(2\,(n+1),(i\,b\,(m-2\,s)-p)\sqrt{z}\right)(i\,b\,(m-2\,s)-p)^{-2\,(n+1)}+(-p-i\,b\,(m-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\right.\right.$$
$$\left.\left.-(p+b\,i\,(m-2\,s))\sqrt{z}\right)\right)-4^{-n}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{p^2}{4\,c\,v-8\,c\,s}}\,(c\,(2\,s-v))^{-2\,n}\,(c\,(v-2\,s))^{-2\,(n+1)}\binom{v}{s}$$

$$\left(e^{\frac{p^2}{4cs-2cv}}(c(2s-v))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p+2c(v-2s)\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)+\right.$$

$$\left.\left.2c\sqrt{\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}}\,(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)+\right.$$

$$(c(v-2s))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k p^{-h-k+2n}\left(p+2c(2s-v)\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2c(2s-v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)+\right.$$

$$\left.\left.2c(2s-v)\sqrt{-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(p+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)\right)+$$

$$4^{-n}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(c(2s-v))^{-2n}(c(v-2s))^{-2(n+1)}\binom{m}{u}\left(e^{\frac{(ip+b(m-2u))^2}{c(8s-4v)}}(c(v-2s))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k\right.$$

$$(p-ib(m-2u))^{-h-k+2n}\left(\left(b(m-2u)+i\left(p+2c(2s-v)\sqrt{z}\right)\right)^2\Big/(c(2s-v))\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(p-ib(m-2u)+2c(2s-v)\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((p-ib(m-2u))\left(p-ib(m-2u)+2c(2s-\right.\right.$$

$$\left.\left.v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\left(b(m-2u)+i\left(p+2c(2s-v)\sqrt{z}\right)\right)^2\Big/(c(8s-4v))\right)+\right.$$

$$2c(2s-v)\,\Gamma\left(\frac{1}{2}(h+k+2),\left(b(m-2u)+i\left(p+2c(2s-v)\sqrt{z}\right)\right)^2\Big/(c(8s-4v))\right)$$

$$\left.\sqrt{\left(\left(b(m-2u)+i\left(p+2c(2s-v)\sqrt{z}\right)\right)^2\Big/(c(2s-v))\right)}+e^{\frac{(p+bi(m-2u))^2}{c(8s-4v)}}\right.$$

$$\left((c(2s-v))^{2n}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(p+bi(m-2u))^{-h-k+2n}\left(p+bi(m-2u)+2c(v-2s)\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left.\left.\left(-\left(p+bi(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(v-2s))\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left((p+b\,i\,(m-2u))\left(p+b\,i\,(m-2u)+2c(v-2s)\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(h+k+1),\left(p+b\,i\,(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(8s-4v))\right)+$$
$$2c(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\left(p+b\,i\,(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(8s-4v))\right)$$
$$\left.\sqrt{\left(-\left(p+b\,i\,(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(v-2s))\right)}\right)+e^{-\frac{i\,b\,p\,(m-2u)}{c(2s-v)}}$$
$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p-i\,b\,(m-2u))^{-h-k+2n}\left(p-i\,b\,(m-2u)+2c(v-2s)\sqrt{z}\right)^{h+k}$$
$$\left(-\left(p-i\,b\,(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(v-2s))\right)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\left((p-i\,b\,(m-2u))\left(p-i\,b\,(m-2u)+2c(v-2s)\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(h+k+1),\left(p-i\,b\,(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(8s-4v))\right)+$$
$$2c(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\left(p-i\,b\,(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(8s-4v))\right)$$
$$\left.\left.\sqrt{\left(-\left(p-i\,b\,(m-2u)+2c(v-2s)\sqrt{z}\right)^2\Big/(c(v-2s))\right)}\right)\right)+e^{\frac{(b\,m-i\,p-2\,b\,u)^2}{4cs-2cv}}$$
$$(c(v-2s))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(p+b\,i\,(m-2u))^{-h-k+2n}\left(p+b\,i\,(m-2u)+\right.$$
$$\left.2c(2s-v)\sqrt{z}\right)^{h+k}\left(-\left(p+b\,i\,(m-2u)+2c(2s-v)\sqrt{z}\right)^2\Big/(c(2s-v))\right)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\left((p+b\,i\,(m-2u))\left(p+b\,i\,(m-2u)+2c(2s-v)\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(h+k+1),-\left(p+b\,i\,(m-2u)+2c(2s-v)\sqrt{z}\right)^2\Big/(c(8s-4v))\right)+$$
$$2c(2s-v)\,\Gamma\left(\frac{1}{2}(h+k+2),-\left(p+b\,i\,(m-2u)+2c(2s-v)\sqrt{z}\right)^2\Big/\right.$$
$$(c(8s-4v))\Big)\sqrt{\left(-\left(p+b\,i\,(m-2u)+2c(2s-v)\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.\left.\left.(c(2s-v))\right)\right)\right)\right)\Bigg/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\cos^m(b\,z)\cosh^v(c\,z)$

01.20.21.4006.01

$$\int z^n e^{p z^2} \cos^m(b z) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1}\left(\binom{v}{\frac{v}{2}}(v \bmod 2-1)\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{\frac{b^2 (m-2 s)^2}{4 p}}\binom{m}{s}\left(\sum_{q=0}^{n} 2^{q-n}\,(i\,b\,(m-2 s))^{n-q}\left(\frac{(b\,(m-2 s)+2\,i\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\right.\right.\right.$$

$$(2\,p\,z-i\,b\,(m-2 s))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b\,(m-2 s)+2\,i\,p\,z)^2}{4 p}\right)+\sum_{q=0}^{n}\left(i\,b\left(s-\frac{m}{2}\right)\right)^{n-q}$$

$$\left.\left.\left.\left(\frac{(b\,(m-2 s)-2\,i\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}(b\,i\,(m-2 s)+2\,p\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b\,(m-2 s)-2\,i\,p\,z)^2}{4 p}\right)\right)\right)p^{-n-1}+$$

$$\binom{m}{\frac{m}{2}}(m \bmod 2-1)\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-\frac{c^2 (v-2 s)^2}{4 p}}\binom{v}{s}\left(\sum_{q=0}^{n} 2^{q-n}\,(c\,(v-2 s))^{n-q}\,(2\,c\,s-c\,v+2\,p\,z)^{q+1}\right.\right.$$

$$\left(-\frac{(2\,c\,s-c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,c\,s-c\,v+2\,p\,z)^2}{4 p}\right)+\sum_{q=0}^{n}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}$$

$$\left.\left.(c\,(v-2 s)+2\,p\,z)^{q+1}\left(-\frac{(c\,(v-2 s)+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(c\,(v-2 s)+2\,p\,z)^2}{4 p}\right)\right)\right)p^{-n-1}-$$

$$\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} e^{\frac{b^2 (m-2 k)^2-c^2 (v-2 s)^2}{2 p}}\binom{m}{k}\left(e^{\frac{(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v)^2}{4 p}}\sum_{q=0}^{n}\left(\left(s-\frac{v}{2}\right)c+\left(k-\frac{m}{2}\right)b\,i\right)^{n-q}(-2\,b\,i\,k+i\,b\,m-\right.\right.$$

$$2\,c\,s+c\,v+2\,p\,z)^{q+1}\left(-\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.-\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{4 p}\right)+e^{\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^2}{4 p}}\sum_{q=0}^{n}\left(-i\,b\,k+\frac{i\,b\,m}{2}+c\,s-\frac{c\,v}{2}\right)^{n-q}$$

$$(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^{q+1}\left(-\frac{(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,i\,b\,k-i\,b\,m-2\,c\,s+c\,v+2\,p\,z)^2}{4 p}\right)+$$

$$e^{\frac{(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^2}{4 p}}\sum_{q=0}^{n}2^{q-n}\,(b\,i\,(2\,k-m)+c\,(v-2 s))^{n-q}\left(-\frac{(b\,i\,(2\,k-m)-2\,c\,s+c\,v-2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$(-2\,b\,i\,k+i\,b\,m+2\,c\,s-c\,v+2\,p\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b\,i\,(2\,k-m)-2\,c\,s+c\,v-2\,p\,z)^2}{4 p}\right)+$$

$$e^{\frac{(2 i b k - i b m - 2 c s + c v)^2}{4 p}} \sum_{q=0}^{n} 2^{q-n} (b i (m-2k) + c (v-2s))^{n-q} \left(-\frac{(b i (m-2k) - 2 c s + c v - 2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)}$$

$$(2 i b k - i b m + 2 c s - c v + 2 p z)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b i (m-2k) - 2 c s + c v - 2 p z)^2}{4 p}\right)\Bigg)\Bigg)$$

$$p^{-n-1} - z^{n+1} \left(-p z^2\right)^{\frac{1}{2}(-n-1)} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -p z^2\right) (m \bmod 2 - 1) (v \bmod 2 - 1)\Bigg) /; m \in$$

$\mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0 \wedge n \in$
$\mathbb{N}$

01.20.21.4007.01

$$\int z^n e^{p \sqrt{z}} \cos^m(b z) \cosh^v(c z)\, dz ==$$

$$-2^{-m-v+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(2 (n+1), -p \sqrt{z}\right) (1 - m \bmod 2) (1 - v \bmod 2)\, p^{-2n-2} - \frac{1}{b^2}\Bigg(2^{-m-2n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{(m-2s)^2}\Bigg(e^{\frac{p^2}{8 i b s - 4 i b m}} \binom{m}{s}\Bigg(e^{\frac{p^2}{2 i b m - 4 i b s}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p - 2 i b (m-2s) \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{i \left(p - 2 i b (m-2s) \sqrt{z}\right)^2}{b (m-2s)}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}\Bigg(p \left(p - 2 i b (m-2s) \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),$$

$$-\frac{i \left(p - 2 i b (m-2s) \sqrt{z}\right)^2}{4 b (m-2s)}\right) - 2 i b (m-2s) \sqrt{-\frac{i \left(p - 2 i b (m-2s) \sqrt{z}\right)^2}{b (m-2s)}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2), -\frac{i \left(p - 2 i b (m-2s) \sqrt{z}\right)^2}{4 b (m-2s)}\right)\Bigg)\Bigg) (-i b (m-2s))^{-2n} + (i b (m-2s))^{-2n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(p + 2 b i (m-2s) \sqrt{z}\right)^{h+k} \left(\frac{i \left(p + 2 b i (m-2s) \sqrt{z}\right)^2}{b (m-2s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{i\left(p+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)+2\,b\,i\right.$$

$$\left.(m-2\,s)\,\sqrt{\frac{i\left(p+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{i\left(p+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)\right)\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{\frac{p^2}{4\,c\,v-8\,c\,s}}\,(c\,(2\,s-v))^{-2\,n}\,(c\,(v-2\,s))^{-2\,(n+1)}\binom{v}{s}$$

$$\left(e^{\frac{p^2}{4\,c\,s-2\,c\,v}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\right.$$

$$\left.\left.\left.\sqrt{\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ (v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\right)(c\,(2\,s-v))^{2\,n}+$$

$$(c\,(v-2\,s))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$\left.\left.2\,c\,(2\,s-v)\,\sqrt{-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{u}\left(e^{\frac{p^2}{4\,i\,b\,m+8\,c\,s-8\,i\,b\,u-4\,c\,v}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(\frac{\left(p+2\left(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(-i\,b\,m-2\,c\,s+\right.\right.\right.$$

$$\left.\left.\left.2\,i\,b\,u+c\,v\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(p+2\left(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\,i\,b\,m+8\,c\,s-8\,i\,b\,u-4\,c\,v}\right)+\right.$$

$$2\left(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v\right)\sqrt{\frac{\left(p+2\left(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(p+2\left(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\,i\,b\,m+8\,c\,s-8\,i\,b\,u-4\,c\,v}\right)\right)\Bigg)$$

$$\left(-i\,b\,m-2\,c\,s+2\,i\,b\,u+c\,v\right)^{-2(n+1)}+e^{\frac{p^2}{4\,i\,b\,m-8\,c\,s-8\,i\,b\,u+4\,c\,v}}\left(-i\,b\,m+2\,c\,s+2\,i\,b\,u-c\,v\right)^{-2(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\right.\right.$$

$$\left.\left.\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)}\right)-\right.$$

$$2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{\frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(p-2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)}\right)\right)+e^{\frac{p^2}{-4\,b\,i\,m+8\,c\,s+8\,i\,b\,u-4\,c\,v}}$$

$$\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v\right)\right.\right.$$

$$\sqrt{z}\,\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(p+2(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v)\sqrt{z}\right)^2}{4(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v)}\right)+$$

$$2\sqrt{-\frac{\left(p+2(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v)\sqrt{z}\right)^2}{i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v}}\,(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v)$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(p+2(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v)\sqrt{z}\right)^2}{4(i\,b\,m-2\,c\,s-2\,i\,b\,u+c\,v)}\right)\Bigg)+e^{\frac{p^2}{-4\,b\,i\,m-8\,c\,s+8\,i\,b\,u+4\,c\,v}}$$

$$(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\right.$$

$$\sqrt{z}\,\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(p+2(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\sqrt{z}\right)^2}{8\,c\,s+4\,b\,i\,(m-2\,u)-4\,c\,v}\right)+$$

$$2\sqrt{-\frac{\left(p+2(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\sqrt{z}\right)^2}{i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v}}\,(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(p+2(i\,b\,m+2\,c\,s-2\,i\,b\,u-c\,v)\sqrt{z}\right)^2}{8\,c\,s+4\,b\,i\,(m-2\,u)-4\,c\,v}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cos^m(b\,z^r)\cosh^v(c\,z)$

01.20.21.4008.01

$$\int z^n\,e^{p\,z}\cos^m\left(b\,z^2\right)\cosh^v(c\,z)\,dz == 2^{-m-v-1}\left(\frac{2\,z^n\,(-p\,z)^{-n}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(m\bmod 2-1)\,(v\bmod 2-1)}{p}+\right.$$

$$2\,z^{n+1}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(E_{-n}(-(p+2\,c\,s-c\,v)\,z)+E_{-n}(-(p+c\,(v-2\,s))\,z))+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,b\,(2\,k-m))^{3/2}}\left(e^{\frac{i\,(p+c\,(v-2\,s))^2}{b\,(8\,k-4\,m)}}\binom{v}{s}\left(-i\,b\,e^{-\frac{i\,c\,p\,(v-2\,s)}{b\,(2\,k-m)}}\,(2\,k-m)\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(2\,k-m))^{-n-\frac{1}{2}}\,(c\,(v-2\,s)-p)^{n-q}\right.\right.$$

$$(p+c\,(2\,s-v)+2\,b\,i\,(2\,k-m)\,z)^{q+1}\left(\frac{i\,(p+c\,(2\,s-v)+2\,b\,i\,(2\,k-m)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{i\,(p+c\,(2\,s-v)+2\,b\,i\,(2\,k-m)\,z)^2}{b\,(8\,k-4\,m)}\right)+$$

$$b\,i\,(m-2\,k)\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(2\,k-m))^{-n-\frac{1}{2}}\,(-p+2\,c\,s-c\,v)^{n-q}\,(p+c\,(v-2\,s)+2\,b\,i\,(2\,k-m)\,z)^{q+1}$$

$$\left(\frac{i\,(p+c\,(v-2\,s)+2\,b\,i\,(2\,k-m)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\ \frac{i\,(p+c\,(v-2\,s)+2\,b\,i\,(2\,k-m)\,z)^2}{b\,(8\,k-4\,m)}\right)+e^{-\frac{i\left(p^2+c^2\,(v-2\,s)^2\right)}{b\,(4\,k-2\,m)}}\sqrt{i\,b\,(2\,k-m)}\ \sqrt{i\,b\,(m-2\,k)}$$

$$\left(e^{\frac{i\,c\,p\,(2\,s-v)}{b\,(2\,k-m)}}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{-n-\frac{1}{2}}\,(-p+2\,c\,s-c\,v)^{n-q}\,(p+c\,(v-2\,s)+2\,b\,i\,(m-2\,k)\,z)^{q+1}\right.$$

$$\left(\frac{i\,(p+c\,(v-2\,s)+2\,b\,i\,(m-2\,k)\,z)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\frac{(p-2\,c\,s+c\,v-4\,i\,b\,k\,z+2\,i\,b\,m\,z)^2}{8\,i\,b\,k-4\,i\,b\,m}\right)+\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,k))^{-n-\frac{1}{2}}\,(c\,(v-2\,s)-p)^{n-q}$$

$$(p+2\,c\,s-c\,v-4\,i\,b\,k\,z+2\,i\,b\,m\,z)^{q+1}\left(\frac{i\,(p+2\,c\,s-c\,v-4\,i\,b\,k\,z+2\,i\,b\,m\,z)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{(p+2\,c\,s-c\,v-4\,i\,b\,k\,z+2\,i\,b\,m\,z)^2}{8\,i\,b\,k-4\,i\,b\,m}\right)\right)\right)+\binom{v}{\frac{v}{2}}(v\bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b^2\,(m-2\,s)^2}}\left(e^{\frac{i\,p^2}{4\,b\,m-8\,b\,s}}\binom{m}{s}\left(\sqrt{-i\,b\,(m-2\,s)}\ \sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(i\,b\,(m-2\,s))^{-n-\frac{1}{2}}\,(p+2\,b\,i\,(m-2\,s)\,z)^{q+1}\right.\right.$$

$$\left(\frac{i\,(p+2\,b\,i\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{i\,(p+2\,b\,i\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)+e^{\frac{i\,p^2}{4\,b\,s-2\,b\,m}}\sqrt{i\,b\,(m-2\,s)}$$

$$\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(-i\,b\,(m-2\,s))^{-n-\frac{1}{2}}\,(p-2\,i\,b\,(m-2\,s)\,z)^{q+1}\left(-\frac{i\,(p-2\,i\,b\,(m-2\,s)\,z)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{i\,(p-2\,i\,b\,(m-2\,s)\,z)^2}{4\,b\,(m-2\,s)}\right)\right)\right)\right);\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0\wedge n\in\mathbb{N}$$

01.20.21.4009.01

$$\int z^n e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1}\left(\frac{2 (-p)^{-n} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma(n+1, -p z) (m \bmod 2 - 1) (v \bmod 2 - 1)}{p} + 2 \binom{m}{\frac{m}{2}} (m \bmod 2 - 1)\right.$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\Gamma(n+1, -(p + c (v-2 s)) z) (-p + 2 c s - c v)^{-n-1} + (c (v-2 s) - p)^{-n-1} \Gamma(n+1, -(p + 2 c s - c v) z)\right) -$$

$$4^{-n} p^{-2 (n+1)} \binom{v}{\frac{v}{2}} (v \bmod 2 - 1) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} e^{\frac{b^2 (m-2 s)^2}{4 p}} \binom{m}{s}$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} -(-1)^{k-h} 4^k (-i b (m-2 s))^{-h-k+2 n} \left(\frac{\left(2 i \sqrt{z}\ p + b (m-2 s)\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)} \left(2 p \sqrt{z} - i b (m-2 s)\right)^{h+k}\right.$$

$$\binom{k}{h} \binom{n}{k} \left(b (m-2 s) \left(2 i \sqrt{z}\ p + b (m-2 s)\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(2 i \sqrt{z}\ p + b (m-2 s)\right)^2}{4 p}\right) - 2\right.$$

$$\left.\left. p \sqrt{\frac{\left(2 i \sqrt{z}\ p + b (m-2 s)\right)^2}{p}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(2 i \sqrt{z}\ p + b (m-2 s)\right)^2}{4 p}\right)\right) +$$

$$\sum_{k=0}^{n} \sum_{h=0}^{k} -(-1)^{k-h} 4^k (i b (m-2 s))^{-h-k+2 n} \left(\frac{\left(b (m-2 s) - 2 i p \sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)} \left(2 \sqrt{z}\ p + b i (m-2 s)\right)^{h+k}$$

$$\binom{k}{h} \binom{n}{k} \left(b (m-2 s) \left(b (m-2 s) - 2 i p \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b (m-2 s) - 2 i p \sqrt{z}\right)^2}{4 p}\right) - 2\right.$$

$$\left.\left.\left. p \sqrt{\frac{\left(b (m-2 s) - 2 i p \sqrt{z}\right)^2}{p}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b (m-2 s) - 2 i p \sqrt{z}\right)^2}{4 p}\right)\right)\right) +$$

$$4^{-n} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{u} \left(e^{\frac{b^2 (m-2 u)^2}{4 (p-2 c s+c v)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-i b (m-2 u))^{-h-k+2 n}\right.\right.$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\left(2\,(p-2\,c\,s+c\,v)\,\sqrt{z}-i\,b\,(m-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(p-2\,c\,s+c\,v)\sqrt{\frac{\left(b\,(m-2\,u)+2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.\frac{\left(b\,(m-2\,u)+2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)-i\,b\,(m-2\,u)\left(2\,(p-2\,c\,s+c\,v)\,\sqrt{z}-\right.$$

$$\left.\left.i\,b\,(m-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b\,(m-2\,u)+2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(i\,b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(b\,i\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,i\,(m-2\,u)\left(b\,i\,(m-2\,u)+\right.\right.$$

$$\left.2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b\,(m-2\,u)-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)+$$

$$2\,(p-2\,c\,s+c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b\,(m-2\,u)-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)$$

$$\left.\left.\sqrt{\frac{\left(b\,(m-2\,u)-2\,i\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}\right)\right)(p-2\,c\,s+c\,v)^{-2\,(n+1)}+$$

$$e^{\frac{b^2\,(m-2\,u)^2}{4\,(p+2\,c\,s-c\,v)}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-i\,b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,i\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\left(2\,(p+2\,c\,s-c\,v)\,\sqrt{z}-i\,b\,(m-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left(2(p+2cs-cv)\sqrt{\frac{\left(b(m-2u)+2i(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}}\;\Gamma\left(\frac{1}{2}(h+k+2),\right.\right.$$

$$\left.\frac{\left(b(m-2u)+2i(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)-ib(m-2u)\left(2(p+2cs-cv)\sqrt{z}\;-\right.$$

$$\left.ib(m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(b(m-2u)+2i(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)+$$

$$e^{\frac{b^2(m-2u)^2}{4(p+2cs-cv)}}(p+2cs-cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(ib(m-2u))^{-h-k+2n}$$

$$\left(\frac{\left(b(m-2u)-2i(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}\right)^{\frac{1}{2}(-h-k-1)}\left(bi(m-2u)+2(p+2cs-cv)\sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left(bi(m-2u)\left(bi(m-2u)+2(p+2cs-cv)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\;\frac{\left(b(m-2u)-2i(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)+$$

$$2(p+2cs-cv)\,\Gamma\left(\frac{1}{2}(h+k+2),\;\frac{\left(b(m-2u)-2i(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)$$

$$\left.\left.\sqrt{\frac{\left(b(m-2u)-2i(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}}\right)\right)/;\;m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\cos^m(b\,z)\cosh^v(c\,z^r)$

01.20.21.4010.01

$$\int z^n e^{p z} \cos^m(b z) \cosh^v\left(c z^2\right) dz ==$$

$$2^{-m-v-1}\left(\frac{2 (-p)^{-n}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,-p z)(m \bmod 2-1)(v \bmod 2-1)}{p}+\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{-c^2 (v-2 s)^2}}\left(e^{\frac{p^2}{4 c v-8 c s}}\binom{v}{s}\left(\sqrt{c (v-2 s)}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(c (2 s-v))^{-n-\frac{1}{2}}(p+4 c s z-2 c v z)^{q+1}\right.\right.$$

$$\left(\frac{(p+4 c s z-2 c v z)^2}{c (v-2 s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+4 c s z-2 c v z)^2}{4 c (v-2 s)}\right)+$$

$$e^{\frac{p^2}{4 c s-2 c v}}\sqrt{c (2 s-v)}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(c (v-2 s))^{-n-\frac{1}{2}}(p+2 c (v-2 s) z)^{q+1}$$

$$\left.\left.\left(-\frac{(p+2 c (v-2 s) z)^2}{c (v-2 s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+2 c (v-2 s) z)^2}{c (8 s-4 v)}\right)\right)\right)+$$

$$2 z^{n+1}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}(E_{-n}(-(p+b i (m-2 s)) z)+E_{-n}(-(p-i b (m-2 s)) z))+$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(c (2 k-v))^{3/2}}$$

$$\left(e^{-\frac{(p+b i (m-2 s))^2}{c (8 k-4 v)}}\binom{m}{s}\left(\sqrt{c (2 k-v)}\ \sqrt{c (v-2 k)}\left(e^{\frac{(p+b i (m-2 s))^2}{c (4 k-2 v)}}\sum_{q=0}^{n}2^{q-n}(-p-i b (m-2 s))^{n-q}(c (v-2 k))^{-n-\frac{1}{2}}\right.\right.\right.$$

$$(p+b i (m-2 s)+2 c (v-2 k) z)^{q+1}\left(-\frac{(p+b i (m-2 s)+2 c (v-2 k) z)^2}{c (v-2 k)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+b i (m-2 s)+2 c (v-2 k) z)^2}{c (8 k-4 v)}\right)+e^{\frac{p^2-b^2 (m-2 s)^2}{c (4 k-2 v)}}$$

$$\sum_{q=0}^{n}2^{q-n}(i b (m-2 s)-p)^{n-q}(c (v-2 k))^{-n-\frac{1}{2}}(p-i b (m-2 s)+2 c (v-2 k) z)^{q+1}$$

$$\left(\frac{(p-i b (m-2 s)+2 c (v-2 k) z)^2}{c (2 k-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(p-i b (m-2 s)+2 c (v-2 k) z)^2}{c (8 k-4 v)}\right)\right)-c e^{\frac{i b p (m-2 s)}{c (2 k-v)}}(2 k-v)\right)\right.$$

$$\sum_{q=0}^{n} 2^{q-n} (i\,b\,(m-2\,s)-p)^{n-q} (c\,(2\,k-\nu))^{-n-\frac{1}{2}} (p-i\,b\,(m-2\,s)+4\,c\,k\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left(-\frac{(-i\,b\,m+p+2\,i\,b\,s+4\,c\,k\,z-2\,c\,\nu\,z)^2}{2\,c\,k-c\,\nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(b\,(m-2\,s)+i\,(p+4\,c\,k\,z-2\,c\,\nu\,z))^2}{c\,(8\,k-4\,\nu)}\right)+$$

$$c\,(\nu-2\,k)\sum_{q=0}^{n} 2^{q-n} (-p-i\,b\,(m-2\,s))^{n-q} (c\,(2\,k-\nu))^{-n-\frac{1}{2}} (p+b\,i\,(m-2\,s)+4\,c\,k\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left(-\frac{(p+b\,i\,(m-2\,s)+4\,c\,k\,z-2\,c\,\nu\,z)^2}{c\,(2\,k-\nu)}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(p+b\,i\,(m-2\,s)+4\,c\,k\,z-2\,c\,\nu\,z)^2}{c\,(8\,k-4\,\nu)}\right)\right)\right) /;\ m\in\mathbb{Z}\wedge m>0\wedge \nu\in\mathbb{Z}\wedge \nu>0\wedge n\in\mathbb{N}$$

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$$\int z^n e^{p\,z} \cos^m(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right) dz == 2^{-m-\nu-1}\left(\frac{2\,(-p)^{-n}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\Gamma(n+1,\,-p\,z)\,(m \bmod 2-1)\,(\nu \bmod 2-1)}{p}-\right.$$

$$2\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(-\Gamma(n+1,\,(-p-i\,b\,(2\,s-m))\,z)\,(i\,b\,m-p-2\,i\,b\,s)^{-n-1}-\right.$$

$$\left.(i\,b\,(2\,s-m)-p)^{-n-1}\,\Gamma(n+1,\,(-i\,b\,m-p+2\,i\,b\,s)\,z)\right)+4^{-n}\,p^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{u=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-\frac{c^2\,(\nu-2\,u)^2}{4\,p}}\binom{\nu}{u}$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,u))^{-h-k+2\,n}\left(\frac{\left(2\,i\,\sqrt{z}\;p+c\,i\,(\nu-2\,u)\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\left(2\,\sqrt{z}\;p+c\,(\nu-2\,u)\right)^{h+k}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(i\,c\,(\nu-2\,u)\left(2\,i\,\sqrt{z}\;p+c\,i\,(\nu-2\,u)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,i\,\sqrt{z}\;p+c\,i\,(\nu-2\,u)\right)^2}{4\,p}\right)-2\right.$$

$$\left.\left.p\sqrt{\frac{\left(2\,i\,\sqrt{z}\;p+c\,i\,(\nu-2\,u)\right)^2}{p}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,i\,\sqrt{z}\;p+c\,i\,(\nu-2\,u)\right)^2}{4\,p}\right)\right)+\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(-c\,(v-2\,u))^{-h-k+2\,n}\left(\frac{\left(i\,c\,(v-2\,u)-2\,i\,p\,\sqrt{z}\right)^{2}}{p}\right)^{\frac{1}{2}(-h-k-1)}\left(2\,p\,\sqrt{z}\,-c\,(v-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left(i\,c\,(v-2\,u)\left(i\,c\,(v-2\,u)-2\,i\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(i\,c\,(v-2\,u)-2\,i\,p\,\sqrt{z}\right)^{2}}{4\,p}\right)-2\right.$$

$$\left.p\,\sqrt{\frac{\left(i\,c\,(v-2\,u)-2\,i\,p\,\sqrt{z}\right)^{2}}{p}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(i\,c\,(v-2\,u)-2\,i\,p\,\sqrt{z}\right)^{2}}{4\,p}\right)\right)\Bigg)+$$

$$4^{-n}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\sum_{u=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{u}\left(e^{-\frac{c^{2}\,(v-2\,u)^{2}}{4\,(i\,b\,m+p-2\,i\,b\,s)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(v-2\,u))^{-h-k+2\,n}\left(2\,\sqrt{z}\ (i\,b\,m+p-2\,i\,b\,s)+c\,(v-2\,u)\right)^{h+k}\right.\right.$$

$$\left(\frac{\left(2\,\sqrt{z}\ (-b\,m+i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^{2}}{i\,b\,m+p-2\,i\,b\,s}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(2\,(i\,b\,m+p-2\,i\,b\,s)\,\sqrt{\frac{\left(2\,\sqrt{z}\ (-b\,m+i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^{2}}{i\,b\,m+p-2\,i\,b\,s}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.\frac{\left(2\,\sqrt{z}\ (-b\,m+i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^{2}}{4\,(i\,b\,m+p-2\,i\,b\,s)}\right)-i\,c\,(v-2\,u)\left(2\,\sqrt{z}\ (-b\,m+i\,p+2\,b\,s)+\right.$$

$$\left.\left.c\,i\,(v-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(2\,\sqrt{z}\ (-b\,m+i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^{2}}{4\,(i\,b\,m+p-2\,i\,b\,s)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(-c\,(v-2\,u))^{-h-k+2\,n}\left(\frac{\left(2\,\sqrt{z}\ (b\,m-i\,p-2\,b\,s)+c\,i\,(v-2\,u)\right)^{2}}{i\,b\,m+p-2\,i\,b\,s}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(i\,b\,m+p-2\,i\,b\,s)\,\sqrt{z}\,-c\,(v-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(2\,(i\,b\,m+p-2\,i\,b\,s)\,\sqrt{\frac{\left(2\,\sqrt{z}\ (b\,m-i\,p-2\,b\,s)+c\,i\,(v-2\,u)\right)^{2}}{i\,b\,m+p-2\,i\,b\,s}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\frac{\left(2\sqrt{z}\ (b\,m-i\,p-2\,b\,s)+c\,i\,(v-2\,u)\right)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}\Bigg)-c\,(v-2\,u)\left(2\,(i\,b\,m+p-2\,i\,b\,s)\sqrt{z}\ -\right.$$

$$\left.c\,(v-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(2\sqrt{z}\ (b\,m-i\,p-2\,b\,s)+c\,i\,(v-2\,u)\right)^2}{4\,(i\,b\,m+p-2\,i\,b\,s)}\right)\Bigg)\Bigg)$$

$$(i\,b\,m+p-2\,i\,b\,s)^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,u)^2}{4\,(p+b\,i\,(2\,s-m))}}\,(p+b\,i\,(2\,s-m))^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c\,(v-2\,u))^{-h-k+2\,n}$$

$$\left(\frac{\left(2\sqrt{z}\ (-b\,m-i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^2}{p+b\,i\,(2\,s-m)}\right)^{\frac{1}{2}\,(-h-k-1)}\left(2\,(p+b\,i\,(2\,s-m))\sqrt{z}\ -c\,(v-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(2\,(p+b\,i\,(2\,s-m))\sqrt{\frac{\left(2\sqrt{z}\ (-b\,m-i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^2}{p+b\,i\,(2\,s-m)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\frac{\left(2\sqrt{z}\ (-b\,m-i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)-c\,(v-2\,u)\left(2\,(p+b\,i\,(2\,s-m))\sqrt{z}\ -\right.$$

$$\left.c\,(v-2\,u)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(2\sqrt{z}\ (-b\,m-i\,p+2\,b\,s)+c\,i\,(v-2\,u)\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)\Bigg)+$$

$$e^{-\frac{c^2\,(v-2\,u)^2}{4\,(p+b\,i\,(2\,s-m))}}\,(p+b\,i\,(2\,s-m))^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,u))^{-h-k+2\,n}$$

$$\left(\frac{\left(2\sqrt{z}\ (i\,p+b\,(m-2\,s))+c\,i\,(v-2\,u)\right)^2}{p+b\,i\,(2\,s-m)}\right)^{\frac{1}{2}\,(-h-k-1)}\left(2\sqrt{z}\ (p+b\,i\,(2\,s-m))+c\,(v-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(v-2\,u)\left(2\sqrt{z}\ (p+b\,i\,(2\,s-m))+c\,(v-2\,u)\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2\sqrt{z}\ (i\,p+b\,(m-2\,s))+c\,i\,(v-2\,u)\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)+$$

$$2\,(p+b\,i\,(2\,s-m))\,\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2\sqrt{z}\ (i\,p+b\,(m-2\,s))+c\,i\,(v-2\,u)\right)^2}{4\,(p+b\,i\,(2\,s-m))}\right)$$

$$\sqrt{\frac{\left(2\sqrt{z}\ (i\,p+b\,(m-2\,s))+c\,i\,(v-2\,u)\right)^2}{p+b\,i\,(2\,s-m)}}\Bigg)\Bigg)\Bigg)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\cos^m(b\,z)\cosh^v\left(c\,z^r\right)$

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$$\int z^n\,e^{p\,z^2}\cos^m(b\,z)\cosh^v\left(c\,z^2\right)dz==$$

$$2^{-m-v-1}\left(\binom{v}{\frac{v}{2}}(v\bmod 2-1)\left(\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}e^{\frac{b^2\,(m-2\,s)^2}{4\,p}}\binom{m}{s}\left(\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,s))^{n-q}\left(\frac{(b\,(m-2\,s)+2\,i\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\right.\right.\right.$$

$$(2\,p\,z-i\,b\,(m-2\,s))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{(b\,(m-2\,s)+2\,i\,p\,z)^2}{4\,p}\right)+\sum_{q=0}^{n}2^{q-n}\,(-i\,b\,(m-2\,s))^{n-q}$$

$$\left.\left.\left.\left(\frac{(b\,(m-2\,s)-2\,i\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}(b\,i\,(m-2\,s)+2\,p\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{(b\,(m-2\,s)-2\,i\,p\,z)^2}{4\,p}\right)\right)\right)p^{-n-1}-\right.$$

$$z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}E_{\frac{1}{2}-\frac{n}{2}}\left(-p\,z^2\right)(m\bmod 2-1)\,(v\bmod 2-1)-z^{n+1}\binom{m}{\frac{m}{2}}(m\bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\left(-(p+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\ -(p+2\,c\,s-c\,v)\,z^2\right)-\right.$$

$$\left.\left(-(p+c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\ -(p+c\,(v-2\,s))\,z^2\right)\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}-\left(\binom{m}{s}\left(e^{\frac{b^2\,(m-2\,s)^2}{4\,(-2\,c\,k+p+c\,v)}}\sqrt{2\,c\,k+p-c\,v}\left(\sum_{q=0}^{n}\left(i\,b\left(s-\frac{m}{2}\right)\right)^{n-q}(-2\,c\,k+p+c\,v)^{-n-\frac{1}{2}}\right.\right.\right.$$

$$(b\,i\,(m-2\,s)+2\,(-2\,c\,k+p+c\,v)\,z)^{q+1}\left(-\frac{(b\,i\,(m-2\,s)+2\,(-2\,c\,k+p+c\,v)\,z)^2}{-2\,c\,k+p+c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{(b\,i\,(m-2\,s)+2\,(-2\,c\,k+p+c\,v)\,z)^2}{4\,(-2\,c\,k+p+c\,v)}\right)+\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,s))^{n-q}\right.\right.\right.$$

$$(-2\,c\,k+p+c\,v)^{-n-\frac{1}{2}}\left(-\frac{(i\,b\,(m-2\,s)-2\,(-2\,c\,k+p+c\,v)\,z)^2}{-2\,c\,k+p+c\,v}\right)^{\frac{1}{2}(-q-1)}(2\,(-2\,c\,k+p+c\,v)$$

$$z-i\,b\,(m-2\,s))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(i\,b\,(m-2\,s)-2\,(-2\,c\,k+p+c\,v)\,z)^2}{4\,(-2\,c\,k+p+c\,v)}\right)\Bigg)+$$

$$e^{\frac{b^2\,(m-2\,s)^2}{4\,(2\,c\,k+p-c\,v)}}\sqrt{-2\,c\,k+p+c\,v}\sum_{q=0}^{n}2^{q-n}\,(i\,b\,(m-2\,s))^{n-q}\,(2\,c\,k+p-c\,v)^{-n-\frac{1}{2}}$$

$$\left(\frac{(b\,(m-2\,s)+2\,i\,(2\,c\,k+p-c\,v)\,z)^2}{2\,c\,k+p-c\,v}\right)^{\frac{1}{2}(-q-1)}(2\,(2\,c\,k+p-c\,v)\,z-i\,b\,(m-2\,s))^{q+1}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b\,(m-2\,s)+2\,i\,(2\,c\,k+p-c\,v)\,z)^2}{4\,(2\,c\,k+p-c\,v)}\right)+e^{\frac{b^2\,(m-2\,s)^2}{4\,(2\,c\,k+p-c\,v)}}\sqrt{p+c\,(v-2\,k)}$$

$$\sum_{q=0}^{n}\left(i\,b\left(s-\frac{m}{2}\right)\right)^{n-q}(2\,c\,k+p-c\,v)^{-n-\frac{1}{2}}\left(\frac{(b\,(m-2\,s)-2\,i\,(2\,c\,k+p-c\,v)\,z)^2}{2\,c\,k+p-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$(b\,i\,(m-2\,s)+2\,(2\,c\,k+p-c\,v)\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b\,(m-2\,s)-2\,i\,(2\,c\,k+p-c\,v)\,z)^2}{4\,(2\,c\,k+p-c\,v)}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(\sqrt{2\,c\,k+p-c\,v}\ \sqrt{p+c\,(v-2\,k)}\right)\Bigg)/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0\wedge n\in\mathbb{N}$$

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$$\int z^n\,e^{p\sqrt{z}}\cos^m(b\,z)\cosh^v\left(c\,\sqrt{z}\right)dz==-2^{-m-v+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2\,(n+1),-p\,\sqrt{z}\right)(1-m\bmod 2)\,(1-v\bmod 2)\,p^{-2\,(n+1)}-$$

$$2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\left(\Gamma\left(2\,(n+1),(-2\,c\,k-p+c\,v)\,\sqrt{z}\right)(-2\,c\,k-p+c\,v)^{-2\,(n+1)}+\right.$$

$$\left.(p+c\,(v-2\,k))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-p-c\,(v-2\,k))\,\sqrt{z}\right)\right)+2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{i\,p^2}{4\,b\,(m-2\,k)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,p^{-h-j+2\,n}\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+j}\left(-\frac{i\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-j-1)}\right.\right.$$

$$\left.\left.\binom{j}{h}\binom{n}{j}\left(p\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),-\frac{i\left(p-2\,i\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)-2\,i\,b\right.\right.\right.$$

$$(m-2k)\sqrt{-\frac{i\left(p-2ib(m-2k)\sqrt{z}\right)^2}{b(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),-\frac{i\left(p-2ib(m-2k)\sqrt{z}\right)^2}{4b(m-2k)}\right)\Bigg)\Bigg)$$

$$(-ib(m-2k))^{-2n-2}+e^{\frac{ip^2}{4b(m-2k)}}(ib(m-2k))^{-2n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j\,p^{-h-j+2n}$$

$$\left(2bi\sqrt{z}\,(m-2k)+p\right)^{h+j}\left(\frac{i\left(2bi\sqrt{z}\,(m-2k)+p\right)^2}{b(m-2k)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}$$

$$\Bigg(p\left(2bi\sqrt{z}\,(m-2k)+p\right)\Gamma\left(\frac{1}{2}(h+j+1),\frac{i\left(2bi\sqrt{z}\,(m-2k)+p\right)^2}{4b(m-2k)}\right)+2bi(m-2k)$$

$$\sqrt{\frac{i\left(2bi\sqrt{z}\,(m-2k)+p\right)^2}{b(m-2k)}}\;\Gamma\left(\frac{1}{2}(h+j+2),\frac{i\left(2bi\sqrt{z}\,(m-2k)+p\right)^2}{4b(m-2k)}\right)\Bigg)\Bigg)+2^{-m-2n-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{-\frac{i(p+c(v-2k))^2}{4b(m-2s)}}\Bigg(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}4^j\,(p+c(v-2k))^{-h-j+2n}\left(p+c(v-2k)-2ib(m-2s)\sqrt{z}\right)^{h+j}$$

$$\left(-\frac{i\left(p+c(v-2k)-2ib(m-2s)\sqrt{z}\right)^2}{b(m-2s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\Bigg((p+c(v-2k))\left(p+c(v-2k)-\right.$$

$$\left.2ib(m-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+j+1),-\frac{i\left(p+c(v-2k)-2ib(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\right)-$$

$$2ib(m-2s)\sqrt{-\frac{i\left(p+c(v-2k)-2ib(m-2s)\sqrt{z}\right)^2}{b(m-2s)}}\;\Gamma\Bigg(\frac{1}{2}(h+j+2),$$

$$-\frac{i\left(p+c(v-2k)-2ib(m-2s)\sqrt{z}\right)^2}{4b(m-2s)}\Bigg)\Bigg)\Bigg)(-ib(m-2s))^{-2n-2}+$$

$$e^{-\frac{i\,(p-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}}\left(\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p-c\,(v-2\,k))^{-h-j+2\,n}\left(p-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,\sqrt{z}\right)^{h+j}\right.$$

$$\left(-\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((p-c\,(v-2\,k))\left(p-c\,(v-2\,k)-\right.\right.$$

$$2\,i\,b\,(m-2\,s)\,\sqrt{z}\Big)\Gamma\left(\frac{1}{2}\,(h+j+1),\,-\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)-$$

$$2\,i\,b\,(m-2\,s)\sqrt{-\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\left.-\frac{i\left(p-c\,(v-2\,k)-2\,i\,b\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)\right)\right)(-i\,b\,(m-2\,s))^{-2\,n-2}+e^{\frac{i\,(p+c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}}$$

$$(i\,b\,(m-2\,s))^{-2\,n-2}\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p+c\,(v-2\,k))^{-h-j+2\,n}\left(p+c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(p+c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((p+c\,(v-2\,k))\right.$$

$$\left(p+c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\,\frac{i\left(p+c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)+$$

$$2\,b\,i\,(m-2\,s)\sqrt{\frac{i\left(p+c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\frac{i\left(p+c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)\right)+e^{\frac{i\,(p-c\,(v-2\,k))^2}{4\,b\,(m-2\,s)}}\,(i\,b\,(m-2\,s))^{-2\,n-2}$$

$$\sum_{j=0}^{n}\sum_{h=0}^{j}(-1)^{j-h}\,4^j\,(p-c\,(v-2\,k))^{-h-j+2\,n}\left(p-c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^{h+j}$$

$$\left(\frac{i\left(p-c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}\right)^{\frac{1}{2}(-h-j-1)}\binom{j}{h}\binom{n}{j}\left((p-c\,(v-2\,k))\right.$$

$$\left(p-c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+j+1),\ \frac{i\left(p-c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)+$$

$$2\,b\,i\,(m-2\,s)\sqrt{\frac{i\left(p-c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{b\,(m-2\,s)}}\ \Gamma\left(\frac{1}{2}\,(h+j+2),\right.$$

$$\left.\left.\left.\frac{i\left(p-c\,(v-2\,k)+2\,b\,i\,(m-2\,s)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,s)}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{p\,z}\cos^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

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$$\int z^n\,e^{p\,z}\cos^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz==-2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,\,-p\,z)\,(1-m\bmod 2)\,(1-v\bmod 2)\,(-p)^{-n-1}+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(-\left(e^{\frac{p^2}{-8\,b\,i\,k+4\,i\,b\,m-8\,c\,s+4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)^{-n-\frac{1}{2}}\right.\right.$$

$$(p+2\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z)^{q+1}\left(-\frac{(p+2\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z)^2}{2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(p+2\,(2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v)\,z)^2}{8\,i\,b\,k-4\,i\,b\,m+8\,c\,s-4\,c\,v}\right)\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,c\,s-c\,v}\right)-$$

$$\left(e^{\frac{p^2}{8\,i\,b\,k-4\,i\,b\,m+8\,c\,s-4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)^{-n-\frac{1}{2}}\,(p+2\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z)^{q+1}\right.$$

$$\left(-\frac{(p+2\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z)^2}{-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\left.\frac{(p+2\,(-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v)\,z)^2}{8\,i\,b\,k-4\,i\,b\,m+8\,c\,s-4\,c\,v}\right)\right)\Big/\left(\sqrt{-2\,b\,i\,k+i\,b\,m-2\,c\,s+c\,v}\right)-$$

$$\left(e^{\frac{p^2}{-8ibik+4ibm+8cs-4cv}}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(2ibk-ibm-2cs+cv)^{-n-\frac{1}{2}}(p+2(2ibk-ibm-2cs+cv)z)^{q+1}\right.$$

$$\left(-\frac{(p+2(2ibk-ibm-2cs+cv)z)^2}{2ibk-ibm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\left.-\frac{(p+2(2ibk-ibm-2cs+cv)z)^2}{8ibk-4ibm-8cs+4cv}\right)\right)\Big/\left(\sqrt{2ibk-ibm-2cs+cv}\right)-$$

$$\left(e^{\frac{p^2}{8ibk-4ibm-8cs+4cv}}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(-2bik+ibm+2cs-cv)^{-n-\frac{1}{2}}(p+2(-2bik+ibm+2cs-cv)z)^{q+1}\right.$$

$$\left(\frac{(p+2(-2bik+ibm+2cs-cv)z)^2}{2ibk-ibm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\left.\frac{(p+2(-2bik+ibm+2cs-cv)z)^2}{8ibk-4ibm-8cs+4cv}\right)\right)\Big/\left(\sqrt{-2bik+ibm+2cs-cv}\right)\Bigg)-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{b^2(m-2s)^2}}\left(e^{\frac{p^2}{8ibs-4ibm}}\binom{m}{s}\left(\sqrt{-ib(m-2s)}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(ib(m-2s))^{-n-\frac{1}{2}}\right.\right.$$

$$(p+2bi(m-2s)z)^{q+1}\left(\frac{i(p+2bi(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{i(p+2bi(m-2s)z)^2}{4b(m-2s)}\right)+$$

$$e^{\frac{p^2}{2ibm-4ibs}}\sqrt{ib(m-2s)}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(-ib(m-2s))^{-n-\frac{1}{2}}(p-2ib(m-2s)z)^{q+1}$$

$$\left.\left.\left(-\frac{i(p-2ib(m-2s)z)^2}{b(m-2s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{i(p-2ib(m-2s)z)^2}{4b(m-2s)}\right)\right)\right)-$$

$$2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{c(v-2s)}}\left(e^{\frac{p^2}{8cs-4cv}}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(c(v-2s))^{-n-\frac{1}{2}}\right.\right.$$

$$(p+2c(v-2s)z)^{q+1}\left(-\frac{(p+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+2c(v-2s)z)^2}{c(8s-4v)}\right)+$$

$$\frac{1}{\sqrt{c(2s-v)}}\left(e^{\frac{p^2}{4cv-8cs}}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(c(2s-v))^{-n-\frac{1}{2}}(p+4csz-2cvz)^{q+1}\left(-\frac{(p+4csz-2cvz)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\left.\left.\binom{n}{q}\Gamma\left(q+1,\ \ (p+4csz-2cvz)^2\right)\right)\right)\Big/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0\wedge n\in\mathbb{N}$$

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$$\int z^n e^{p z} \cos^m\left(b \sqrt{z}\right) \cosh^v\left(c \sqrt{z}\right) dz =$$

$$-2^{-m-v} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma(n+1, -p z) (1 - m \bmod 2) (1 - v \bmod 2) (-p)^{-n-1} + 2^{-m-2n-v-1} p^{-2(n+1)} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s}$$

$$\left(e^{\frac{b^2 (m-2s)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-i b (m-2s))^{-h-i+2n} \left(2 p \sqrt{z} - i b (m-2s)\right)^{h+i} \left(-\frac{\left(2 p \sqrt{z} - i b (m-2s)\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \right.$$

$$\binom{i}{h} \binom{n}{i} \left(2 p \sqrt{-\frac{\left(2 p \sqrt{z} - i b (m-2s)\right)^2}{p}} \; \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2 p \sqrt{z} - i b (m-2s)\right)^2}{4p}\right) - \right.$$

$$\left. \left. i b (m-2s) \left(2 p \sqrt{z} - i b (m-2s)\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2 p \sqrt{z} - i b (m-2s)\right)^2}{4p}\right) \right) +$$

$$e^{\frac{b^2 (m-2s)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (i b (m-2s))^{-h-i+2n} \left(2 \sqrt{z}\, p + b i (m-2s)\right)^{h+i} \left(-\frac{\left(2 \sqrt{z}\, p + b i (m-2s)\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h} \binom{n}{i} \left(b i (m-2s) \left(2 \sqrt{z}\, p + b i (m-2s)\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2 \sqrt{z}\, p + b i (m-2s)\right)^2}{4p}\right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(2 \sqrt{z}\, p + b i (m-2s)\right)^2}{p}} \; p \, \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2 \sqrt{z}\, p + b i (m-2s)\right)^2}{4p}\right) \right) \right) +$$

$$2^{-m-2n-v-1} p^{-2(n+1)} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{-\frac{c^2 (v-2k)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c (v-2k))^{-h-i+2n} \right.$$

$$\left. \left(2 p \sqrt{z} - c (v-2k)\right)^{h+i} \left(-\frac{\left(2 p \sqrt{z} - c (v-2k)\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \right)$$

$$\left(2\,p\,\sqrt{-\frac{\left(2\,p\,\sqrt{z}-c\,(v-2\,k)\right)^2}{p}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),-\frac{\left(2\,p\,\sqrt{z}-c\,(v-2\,k)\right)^2}{4\,p}\right)-\right.$$

$$\left.c\,(v-2\,k)\left(2\,p\,\sqrt{z}-c\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),-\frac{\left(2\,p\,\sqrt{z}-c\,(v-2\,k)\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,k)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,k))^{-h-i+2\,n}\left(2\,\sqrt{z}\;p+c\,(v-2\,k)\right)^{h+i}\left(-\frac{\left(2\,\sqrt{z}\;p+c\,(v-2\,k)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(c\,(v-2\,k)\left(2\,\sqrt{z}\;p+c\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),-\frac{\left(2\,\sqrt{z}\;p+c\,(v-2\,k)\right)^2}{4\,p}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(2\,\sqrt{z}\;p+c\,(v-2\,k)\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}\,(h+i+2),-\frac{\left(2\,\sqrt{z}\;p+c\,(v-2\,k)\right)^2}{4\,p}\right)\right)+$$

$$2^{-m-2\,n-v-1}\,p^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\left(e^{-\frac{(c\,(v-2\,k)-i\,b\,(m-2\,s))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,k)-i\,b\,(m-2\,s))^{-h-i+2\,n}\right.$$

$$\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)+c\,(v-2\,k)\right)^{h+i}\left(-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)+c\,(v-2\,k)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((c\,(v-2\,k)-i\,b\,(m-2\,s))\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)+c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,p}\right)+2\,p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\right.$$

$$\left.\left.\left.-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,p}\right)\sqrt{-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)+c\,(v-2\,k)\right)^2}{p}}\right)+\right.$$

$$e^{-\frac{(b\,i\,(m-2\,s)+c\,(v-2\,k))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b\,i\,(m-2\,s)+c\,(v-2\,k))^{-h-i+2\,n}\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,s)+c\,(v-2\,k)\right)^{h+i}$$

$$\left(-\frac{\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,s)+c\,(v-2\,k)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b\,i\,(m-2\,s)+c\,(v-2\,k))\right.$$

$$\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,s)+c\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,p}\right)+$$

$$2\,p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,s)+c\,(v-2\,k)\right)^2}{4\,p}\right)$$

$$\left.\sqrt{-\frac{\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,s)+c\,(v-2\,k)\right)^2}{p}}\right)+e^{-\frac{(-i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,p}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-i+2\,n}\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)-c\,(v-2\,k)\right)^{h+i}$$

$$\left(-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)-c\,(v-2\,k)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-i\,b\,(m-2\,s)-c\,(v-2\,k))\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)-c\,(v-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,p}\right)+2\,p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\right.$$

$$\left.\left.-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,p}\right)\sqrt{-\frac{\left(2\,\sqrt{z}\;p-i\,b\,(m-2\,s)-c\,(v-2\,k)\right)^2}{p}}\right)+$$

$$e^{-\frac{(i\,b\,(m-2\,s)-c\,(v-2\,k))^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(i\,b\,(m-2\,s)-c\,(v-2\,k))^{-h-i+2\,n}\left(2\,\sqrt{z}\;p+b\,i\,(m-2\,s)-c\,(v-2\,k)\right)^{h+i}$$

$$\left(-\frac{\left(2\sqrt{z}\ p+b\,i\,(m-2\,s)-c\,(v-2\,k)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(i\,b\,(m-2\,s)-c\,(v-2\,k)\right)$$

$$\left(2\sqrt{z}\ p+b\,i\,(m-2\,s)-c\,(v-2\,k)\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2\sqrt{z}\ p+b\,i\,(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,p}\right)+$$

$$2\,p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2\sqrt{z}\ p+b\,i\,(m-2\,s)-c\,(v-2\,k)\right)^2}{4\,p}\right)$$

$$\sqrt{-\frac{\left(2\sqrt{z}\ p+b\,i\,(m-2\,s)-c\,(v-2\,k)\right)^2}{p}}\Bigg)\Bigg)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\cos^m(b\,z^r)\cosh^v(c\,z^r)$

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$$\int z^{\alpha-1}\,e^{p\,z^r}\cos^m(b\,z^r)\cosh^v(c\,z^r)\,dz==-\frac{2^{-m-v}\,z^\alpha}{r}\left(\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{\alpha}{r},-p\,z^r\right)(1-m\bmod 2)\,(1-v\bmod 2)\,(-p\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},(-2\,b\,i\,k+i\,b\,m-p)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-p)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.\left.((2\,i\,b\,k-i\,b\,m-p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,i\,b\,k-i\,b\,m-p)\,z^r\right)\right)+\binom{m}{\frac{m}{2}}(1-m\bmod 2)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},(-p-2\,c\,s+c\,v)\,z^r\right)((-p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+((-p-c\,(v-2\,s))\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-p-c\,(v-2\,s))\,z^r\right)\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},(-2\,b\,i\,k+i\,b\,m-p-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,i\,k+i\,b\,m-p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$((2\,i\,b\,k-i\,b\,m-p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,i\,b\,k-i\,b\,m-p-2\,c\,s+c\,v)\,z^r\right)+$$

$$((-2\,b\,i\,k+i\,b\,m-p+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2\,b\,i\,k+i\,b\,m-p+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.\left.((2\,i\,b\,k-i\,b\,m-p+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,i\,b\,k-i\,b\,m-p+2\,c\,s-c\,v)\,z^r\right)\right)\right)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4017.01

$$\int z^n e^{p z^2} \cos^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == -2^{-m-v-1} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -p z^2\right) (1 - m \bmod 2) (1 - v \bmod 2) \left(-p z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-m-v-1} z^{n+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\Gamma\left(\frac{n+1}{2}, (i b (m-2s) - p) z^2\right) \left((i b (m-2s) - p) z^2\right)^{\frac{1}{2}(-n-1)} + \left((-p - i b (m-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-p - i b (m-2s)) z^2\right)\right) -$$

$$2^{-m-v-1} z^{n+1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\Gamma\left(\frac{n+1}{2}, (c (v-2k) - p) z^2\right) \left((c (v-2k) - p) z^2\right)^{\frac{1}{2}(-n-1)} + \left((-p - c (v-2k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-p - c (v-2k)) z^2\right)\right) -$$

$$2^{-m-v-1} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\Gamma\left(\frac{n+1}{2}, (-p + b i (m-2s) + c (v-2k)) z^2\right) \left((-p + b i (m-2s) + c (v-2k)) z^2\right)^{\frac{1}{2}(-n-1)} + \left((-p - i b (m-2s) + c (v-2k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-p - i b (m-2s) + c (v-2k)) z^2\right) + \left((-p + b i (m-2s) - c (v-2k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-p + b i (m-2s) - c (v-2k)) z^2\right) + \left((-p - i b (m-2s) - c (v-2k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-p - i b (m-2s) - c (v-2k)) z^2\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4018.01

$$\int z^n e^{p \sqrt{z}} \cos^m\left(b \sqrt{z}\right) \cosh^v\left(c \sqrt{z}\right) dz == -2^{-m-v+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(2 (n+1), -p \sqrt{z}\right) (1 - m \bmod 2) (1 - v \bmod 2) p^{-2(n+1)} -$$

$$2^{-m-v+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\Gamma\left(2 (n+1), (i b (m-2s) - p) \sqrt{z}\right) (i b (m-2s) - p)^{-2(n+1)} + (-p - i b (m-2s))^{-2(n+1)} \Gamma\left(2 (n+1), (-p - i b (m-2s)) \sqrt{z}\right)\right) -$$

$$2^{-m-v+1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(\Gamma\left(2 (n+1), (c (v-2k) - p) \sqrt{z}\right) (c (v-2k) - p)^{-2(n+1)} + (-p - c (v-2k))^{-2(n+1)} \Gamma\left(2 (n+1), (-p - c (v-2k)) \sqrt{z}\right)\right) -$$

$$2^{-m-v+1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(\Gamma\left(2 (n+1), (-p + b i (m-2s) + c (v-2k)) \sqrt{z}\right) (-p + b i (m-2s) + c (v-2k))^{-2(n+1)} + (-p - i b (m-2s) + c (v-2k))^{-2(n+1)} \Gamma\left(2 (n+1), (-p - i b (m-2s) + c (v-2k)) \sqrt{z}\right) + (-p + b i (m-2s) - c (v-2k))^{-2(n+1)} \Gamma\left(2 (n+1), (-p + b i (m-2s) - c (v-2k)) \sqrt{z}\right) + (-p - i b (m-2s) - c (v-2k))^{-2(n+1)} \Gamma\left(2 (n+1), (-p - i b (m-2s) - c (v-2k)) \sqrt{z}\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^{\alpha-1}\, e^{b\, z^r+e} \cos^m(a\, z^r+q) \cosh^v(c\, z^r+g)$

01.20.21.4019.01

$$\int z^{\alpha-1}\, e^{b\, z^r+e} \cos^m(a\, z^r+q) \cosh^v(c\, z^r+g)\, dz == -\frac{2^{-m-v}\, z^\alpha}{r}\left(e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{\alpha}{r}, -b\, z^r\right)(1-m \bmod 2)\,(1-v \bmod 2)\,(-b\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$\binom{v}{\frac{v}{2}}(1-v \bmod 2) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k}\left(e^{e+2\,i\,k\,q-i\,m\,q}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\,i\,a\,k+i\,a\,m)\, z^r\right)((-b-2\,i\,a\,k+i\,a\,m)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$\left.\left. e^{e-2\,i\,k\,q+i\,m\,q}\, ((-b+2\,i\,a\,k-i\,a\,m)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\,i\,a\,k-i\,a\,m)\, z^r\right)\right)+ \right.$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2) \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s}\left(e^{e+2\,g\,s-g\,v}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\,c\,s+c\,v)\, z^r\right)((-b-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$\left.\left. e^{e-2\,g\,s+g\,v}\, ((-b+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\,c\,s-c\,v)\, z^r\right)\right)+ \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{k} \right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s}\left(e^{e+2\,i\,k\,q-i\,m\,q+2\,g\,s-g\,v}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\,i\,a\,k+i\,a\,m-2\,c\,s+c\,v)\, z^r\right)((-b-2\,i\,a\,k+i\,a\,m-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$e^{e-2\,i\,k\,q+i\,m\,q+2\,g\,s-g\,v}\, ((-b+2\,i\,a\,k-i\,a\,m-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\,i\,a\,k-i\,a\,m-2\,c\,s+c\,v)\, z^r\right)+$$

$$e^{e+2\,i\,k\,q-i\,m\,q-2\,g\,s+g\,v}\, ((-b-2\,i\,a\,k+i\,a\,m+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\,i\,a\,k+i\,a\,m+2\,c\,s-c\,v)\, z^r\right)+$$

$$\left. e^{e-2\,i\,k\,q+i\,m\,q-2\,g\,s+g\,v}\, ((-b+2\,i\,a\,k-i\,a\,m+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}} \right.$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r}, (-b+2\,i\,a\,k-i\,a\,m+2\,c\,s-c\,v)\, z^r\right)\right)\right/;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4020.01

$$\int z^n e^{b z^2+e} \cos^m\left(a z^2+q\right) \cosh^v\left(c z^2+g\right) dz ==$$

$$-2^{-m-v-1} e^e z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1-m \bmod 2) (1-v \bmod 2) \left(-b z^2\right)^{\frac{1}{2}(-n-1)} -$$

$$2^{-m-v-1} z^{n+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{e-i q (m-2 s)} \Gamma\left(\frac{n+1}{2}, (i a (m-2 s)-b) z^2\right) \left((i a (m-2 s)-b) z^2\right)^{\frac{1}{2}(-n-1)} + e^{e+i q (m-2 s)} \left((-b-i a (m-2 s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-i a (m-2 s)) z^2\right)\right) -$$

$$2^{-m-v-1} z^{n+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \left(e^{e-g (v-2 k)} \Gamma\left(\frac{n+1}{2}, (c (v-2 k)-b) z^2\right) \left((c (v-2 k)-b) z^2\right)^{\frac{1}{2}(-n-1)} + e^{e+g (v-2 k)} \left((-b-c (v-2 k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-c (v-2 k)) z^2\right)\right) - 2^{-m-v-1} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s}$$

$$\left(e^{e-i q (m-2 s)-g (v-2 k)} \Gamma\left(\frac{n+1}{2}, (-b+a i (m-2 s)+c (v-2 k)) z^2\right) \left((-b+a i (m-2 s)+c (v-2 k)) z^2\right)^{\frac{1}{2}(-n-1)} + e^{e+i q (m-2 s)-g (v-2 k)} \left((-b-i a (m-2 s)+c (v-2 k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-i a (m-2 s)+c (v-2 k)) z^2\right) + e^{e-i q (m-2 s)+g (v-2 k)} \left((-b+a i (m-2 s)-c (v-2 k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+a i (m-2 s)-c (v-2 k)) z^2\right) + e^{e+i q (m-2 s)+g (v-2 k)} \left((-b-i a (m-2 s)-c (v-2 k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-i a (m-2 s)-c (v-2 k)) z^2\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4021.01

$$\int z^n\, e^{\sqrt{z}\,b+e} \cos^m\left(\sqrt{z}\,a+q\right) \cosh^v\left(\sqrt{z}\,c+g\right) dz ==$$

$$-2^{-m-v+1}\, e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(2\,(n+1),\, -b\,\sqrt{z}\right) (1-m \bmod 2)\,(1-v \bmod 2)\, b^{-2\,(n+1)} -$$

$$2^{-m-v+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \left(e^{e-i\,(m-2\,k)\,q}\, \Gamma\left(2\,(n+1),\, (i\,a\,(m-2\,k)-b)\,\sqrt{z}\right) (i\,a\,(m-2\,k)-b)^{-2\,(n+1)} + \right.$$

$$\left. e^{e+i\,(m-2\,k)\,q}\, (-b-i\,a\,(m-2\,k))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1),\, (-b-i\,a\,(m-2\,k))\,\sqrt{z}\right) \right) -$$

$$2^{-m-v+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-g\,(v-2\,s)}\, \Gamma\left(2\,(n+1),\, (c\,(v-2\,s)-b)\,\sqrt{z}\right) (c\,(v-2\,s)-b)^{-2\,(n+1)} + \right.$$

$$\left. e^{e+g\,(v-2\,s)}\, (-b-c\,(v-2\,s))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1),\, (-b-c\,(v-2\,s))\,\sqrt{z}\right) \right) - 2^{-m-v+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-i\,(m-2\,k)\,q-g\,(v-2\,s)}\, \Gamma\left(2\,(n+1),\, (-b+a\,i\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}\right) (-b+a\,i\,(m-2\,k)+c\,(v-2\,s))^{-2\,(n+1)} + \right.$$

$$e^{e+i\,(m-2\,k)\,q-g\,(v-2\,s)}\, (-b-i\,a\,(m-2\,k)+c\,(v-2\,s))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1),\, (-b-i\,a\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}\right) +$$

$$e^{e-i\,(m-2\,k)\,q+g\,(v-2\,s)}\, (-b+a\,i\,(m-2\,k)-c\,(v-2\,s))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1),\, (-b+a\,i\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}\right) +$$

$$e^{e+i\,(m-2\,k)\,q+g\,(v-2\,s)}\, (-b-i\,a\,(m-2\,k)-c\,(v-2\,s))^{-2\,(n+1)}$$

$$\left. \Gamma\left(2\,(n+1),\, (-b-i\,a\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}\right) \right) /;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^n\, e^{b\,z^r+d\,z+e} \cos^m\left(a\,z^r+p\,z+q\right) \cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4022.01

$$\int z^n\, e^{b\,z^2+d\,z+e} \cos^m\left(a\,z^2+p\,z+q\right) \cosh^v\left(c\,z^2+f\,z+g\right) dz == -2^{-m-v-1}\, e^{e-\frac{d^2}{4\,b}} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)$$

$$(1-v \bmod 2) \left(\sum_{j=0}^{n} 2^{j-n}\, (-d)^{n-j}\, (d+2\,b\,z)^{j+1} \left(-\frac{(d+2\,b\,z)^2}{b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(d+2\,b\,z)^2}{4\,b} \right) \right) b^{-n-1} -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{s} \left(e^{-\frac{(d+i\,p\,(2\,s-m))^2}{4\,(b+a\,i\,(2\,s-m))}+e+i\,q\,(2\,s-m)} \left(\sum_{j=0}^{n} 2^{j-n}\, (-d-i\,p\,(2\,s-m))^{n-j} \right. \right.$$

$$(d+i\,p\,(2\,s-m)+2\,(b+a\,i\,(2\,s-m))\,z)^{j+1} \left(-\frac{(d+i\,p\,(2\,s-m)+2\,(b+a\,i\,(2\,s-m))\,z)^2}{b+a\,i\,(2\,s-m)} \right)^{\frac{1}{2}(-j-1)}$$

$$\left. \left. \binom{n}{j} \Gamma\left(\frac{j+1}{2},\, -\frac{(d+i\,p\,(2\,s-m)+2\,(b+a\,i\,(2\,s-m))\,z)^2}{4\,(b+a\,i\,(2\,s-m))} \right) \right) (b+a\,i\,(2\,s-m))^{-n-1} +$$

$$e^{-\frac{(d+i\,p\,(m-2\,s))^2}{4\,(b+a\,i\,(m-2\,s))}+e+i\,q\,(m-2\,s)}\,(b+a\,i\,(m-2\,s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-i\,p\,(m-2\,s))^{n-j}$$

$$(d+i\,p\,(m-2\,s)+2\,(b+a\,i\,(m-2\,s))\,z)^{j+1}\left(-\frac{(d+i\,p\,(m-2\,s)+2\,(b+a\,i\,(m-2\,s))\,z)^2}{b+a\,i\,(m-2\,s)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+i\,p\,(m-2\,s)+2\,(b+a\,i\,(m-2\,s))\,z)^2}{4\,(b+a\,i\,(m-2\,s))}\right)\Bigg)-2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{(d+f\,(2\,k-v))^2}{4\,(b+c\,(2\,k-v))}+e+g\,(2\,k-v)}\left(\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(2\,k-v))^{n-j}\,(d+f\,(2\,k-v)+2\,(b+c\,(2\,k-v))\,z)^{j+1}\right.$$

$$\left.\left(-\frac{(d+f\,(2\,k-v)+2\,(b+c\,(2\,k-v))\,z)^2}{b+c\,(2\,k-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(2\,k-v)+2\,(b+c\,(2\,k-v))\,z)^2}{4\,(b+c\,(2\,k-v))}\right)\right)$$

$$(b+c\,(2\,k-v))^{-n-1}+e^{-\frac{(d+f\,(v-2\,k))^2}{4\,(b+c\,(v-2\,k))}+e+g\,(v-2\,k)}\,(b+c\,(v-2\,k))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(v-2\,k))^{n-j}\,(d+f\,(v-2\,k)+2\,(b+c\,(v-2\,k))\,z)^{j+1}$$

$$\left(-\frac{(d+f\,(v-2\,k)+2\,(b+c\,(v-2\,k))\,z)^2}{b+c\,(v-2\,k)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(v-2\,k)+2\,(b+c\,(v-2\,k))\,z)^2}{4\,(b+c\,(v-2\,k))}\right)\Bigg)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{s=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{s}\Bigg(e^{-\frac{(d+i\,p\,(2\,s-m)+f\,(2\,k-v))^2}{4\,(b+a\,i\,(2\,s-m)+c\,(2\,k-v))}+e+i\,q\,(2\,s-m)+g\,(2\,k-v)}\left(\sum_{j=0}^{n}2^{j-n}\,(-d-i\,p\,(2\,s-m)-f\,(2\,k-v))^{n-j}\right.$$

$$(d+i\,p\,(2\,s-m)+f\,(2\,k-v)+2\,(b+a\,i\,(2\,s-m)+c\,(2\,k-v))\,z)^{j+1}\left(-(d+i\,p\,(2\,s-m)+f\,(2\,k-\right.$$

$$\left.v)+2\,(b+a\,i\,(2\,s-m)+c\,(2\,k-v))\,z)^2\Big/(b+a\,i\,(2\,s-m)+c\,(2\,k-v))\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-(d+i\,p\,(2\,s-m)+f\,(2\,k-v)+2\,(b+a\,i\,(2\,s-m)+c\,(2\,k-v))\,z)^2\Big/\right.$$

$$\left.\left.(4\,(b+a\,i\,(2\,s-m)+c\,(2\,k-v)))\right)\right)(b+a\,i\,(2\,s-m)+c\,(2\,k-v))^{-n-1}+$$

$$e^{-\frac{(d+i\,p\,(m-2\,s)+f\,(2\,k-v))^2}{4\,(b+a\,i\,(m-2\,s)+c\,(2\,k-v))}+e+i\,q\,(m-2\,s)+g\,(2\,k-v)}\,(b+a\,i\,(m-2\,s)+c\,(2\,k-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-d-i\,p\,(m-2\,s)-f\,(2\,k-v))^{n-j}\,(d+i\,p\,(m-2\,s)+f\,(2\,k-v)+2\,(b+a\,i\,(m-2\,s)+c\,(2\,k-v))\,z)^{j+1}$$

$$\left(-(d+i\,p\,(m-2\,s)+f\,(2\,k-v)+2\,(b+a\,i\,(m-2\,s)+c\,(2\,k-v))\,z)^2\Big/\right.$$

$$(b+a\,i\,(m-2\,s)+c\,(2\,k-v))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-(d+i\,p\,(m-2\,s)+f\,(2\,k-v)+\right.$$

$$\left.\left.2\,(b+a\,i\,(m-2\,s)+c\,(2\,k-v))\,z)^2\Big/(4\,(b+a\,i\,(m-2\,s)+c\,(2\,k-v)))\right)\right)+$$

$$e^{-\frac{(d+i\,p\,(2\,s-m)+f\,(v-2\,k))^2}{4\,(b+a\,i\,(2\,s-m)+c\,(v-2\,k))}+e+i\,q\,(2\,s-m)+g\,(v-2\,k)}\,(b+a\,i\,(2\,s-m)+c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-d-i\,p\,(2\,s-m)-f\,(v-2\,k))^{n-j}\,(d+i\,p\,(2\,s-m)+f\,(v-2\,k)+2\,(b+a\,i\,(2\,s-m)+c\,(v-2\,k))\,z)^{j+1}$$
$$\left(-(d+i\,p\,(2\,s-m)+f\,(v-2\,k)+2\,(b+a\,i\,(2\,s-m)+c\,(v-2\,k))\,z)^2\Big/\right.$$
$$(b+a\,i\,(2\,s-m)+c\,(v-2\,k))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},\,-(d+i\,p\,(2\,s-m)+f\,(v-2\,k)+\right.$$
$$\left.2\,(b+a\,i\,(2\,s-m)+c\,(v-2\,k))\,z)^2\Big/(4\,(b+a\,i\,(2\,s-m)+c\,(v-2\,k)))\right)+$$

$$e^{-\frac{(d+i\,p\,(m-2\,s)+f\,(v-2\,k))^2}{4\,(b+a\,i\,(m-2\,s)+c\,(v-2\,k))}+e+i\,q\,(m-2\,s)+g\,(v-2\,k)}\,(b+a\,i\,(m-2\,s)+c\,(v-2\,k))^{-n-1}\sum_{j=0}^{n}2^{j-n}$$

$$(-d-i\,p\,(m-2\,s)-f\,(v-2\,k))^{n-j}\,(d+i\,p\,(m-2\,s)+f\,(v-2\,k)+2\,(b+a\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^{j+1}$$
$$\left(-(d+i\,p\,(m-2\,s)+f\,(v-2\,k)+2\,(b+a\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2\Big/\right.$$
$$(b+a\,i\,(m-2\,s)+c\,(v-2\,k))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}$$
$$\left.\Gamma\left(\frac{j+1}{2},\,-(d+i\,p\,(m-2\,s)+f\,(v-2\,k)+2\,(b+a\,i\,(m-2\,s)+c\,(v-2\,k))\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(b+a\,i\,(m-2\,s)+c\,(v-2\,k)))\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\,e^{\sqrt{z}\,b+d\,z+e}\cos^m\left(\sqrt{z}\,a+p\,z+q\right)\cosh^v\left(\sqrt{z}\,c+f\,z+g\right)dz=2^{-m-2\,n-v-1}\,e^{e-\frac{b^2}{4\,d}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)$$

$$(1-v\bmod 2)\,d^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,b^{-h-i+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$
$$\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{-\frac{(b+a\,i\,(2\,k-m))^2}{4\,(d+i\,(2\,k-m)\,p)}+e+i\,(2\,k-m)\,q}\,(d+i\,(2\,k-m)\,p)^{-2\,n-2}\right.$$
$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(2\,k-m))^{-h-i+2\,n}\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{h+i}$$
$$\left(-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+a\,i\,(2\,k-m))\left(b+a\,i\,(2\,k-m)+\right.\right.$$

$$2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\Big)\,\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)+$$

$$2\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\;(d+i\,(2\,k-m)\,p)\,\Gamma\Bigg($$

$$\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\Bigg)\Bigg)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k))^2}{4\,(d+i\,(m-2\,k)\,p)}+e+i\,(m-2\,k)\,q}\,(d+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(m-2\,k))^{-h-i+2\,n}$$

$$\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\Bigg((b+a\,i\,(m-2\,k))\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}\,(h+i+1),\,-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\Bigg)+$$

$$2\,(d+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\Bigg)\Bigg)+2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}$$

$$(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(b+c\,(2\,s-v))^2}{4\,(d+f\,(2\,s-v))}+e+g\,(2\,s-v)}\,(d+f\,(2\,s-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c\,(2\,s-v))^{-h-i+2\,n}$$

$$\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b+c\,(2\,s-v))\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.\right.$$

$$\left.-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)+2\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}}$$

$$\left.(d+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)\right)+$$

$$e^{-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}+e+g\,(v-2\,s)}\,(d+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}\,(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b+c\,(v-2\,s))\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+f\,(v-2\,s)}}$$

$$\left.\left.(d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,s))}\right)\right)\right)+$$

$$2^{-m-2\,n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,s-v))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))}+e+i\,(2\,k-m)\,q+g\,(2\,s-v)}\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))^{-2\,n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(2\,s-v))^{-h-i+2\,n}$$

$$\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\right)^{\frac{1}{2}\,(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b+a\,i\,(2\,k-m)+c\,(2\,s-v))\right.$$

$$\left.\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v)))\right)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))$$
$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v)))\right)\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,s-v)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+f\,(2\,s-v))\right)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,s-v))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))}+e+i\,(m-2\,k)\,q+g\,(2\,s-v)}\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i$$
$$(b+a\,i\,(m-2\,k)+c\,(2\,s-v))^{-h-i+2\,n}\left(b+a\,i\,(m-2\,k)+c\,(2\,s-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\right.$$
$$\left.\sqrt{z}\right)^{h+i}\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,s-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$
$$\left((b+a\,i\,(m-2\,k)+c\,(2\,s-v))\left(b+a\,i\,(m-2\,k)+c\,(2\,s-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\left(b+a\,i\,(m-2\,k)+c\,(2\,s-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v)))\right)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))$$
$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(b+a\,i\,(m-2\,k)+c\,(2\,s-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v)))\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,s-v)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+f\,(2\,s-v))\right)\Big)+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,s))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))}+e+i\,(2\,k-m)\,q+g\,(v-2\,s)}\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i$$
$$(b+a\,i\,(2\,k-m)+c\,(v-2\,s))^{-h-i+2\,n}\left(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\right.$$
$$\left.\sqrt{z}\right)^{h+i}\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$
$$\left((b+a\,i\,(2\,k-m)+c\,(v-2\,s))\left(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(h+i+1),\,-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s)))\right)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))$$
$$\Gamma\left(\frac{1}{2}(h+i+2),\,-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s)))\right)\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,s)+\right.\right.}$$

$$2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+f\,(v-2\,s))\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))}+e+i\,(m-2\,k)\,q+g\,(v-2\,s)}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\Big)^{h+i}$$

$$\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\Big)^2\Big/$$

$$(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\Big)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Big((b+a\,i\,(m-2\,k)+c\,(v-2\,s))\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(h+i+1),\,-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s)))\Big)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))$$

$$\Gamma\Big(\frac{1}{2}\,(h+i+2),\,-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s)))\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,s)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\Big)^2\Big/$$

$$(d+i\,(m-2\,k)\,p+f\,(v-2\,s))\Big)\Big)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving functions of the direct function and hyperbolic functions

Involving powers of the direct function and hyperbolic functions

Involving sinh

Involving $\sinh(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.4024.01

$$\int\sinh(c\,z)\cosh^{\nu}(a\,z)\,dz==\frac{1}{2\,((c-a\,\nu)\,(c+a\,\nu))}\,e^{-c\,z}\cosh^{\nu}(a\,z)\left(1+e^{2\,a\,z}\right)^{-\nu}$$

$$\left(e^{2\,c\,z}\,(c+a\,\nu)\,{}_2F_1\Big(\frac{c-a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\Big(\frac{c}{a}-\nu+2\Big);\,-e^{2\,a\,z}\Big)+(c-a\,\nu)\,{}_2F_1\Big(-\frac{c+a\,\nu}{2\,a},\,-\nu;\,-\frac{c+a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\Big)\right)$$

01.20.21.4025.01

$$\int \sinh(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-(c+a(2s+\nu))z}\left(c\left(1+e^{2cz}\right)\left(e^{4asz}+e^{2avz}\right)-a\left(-1+e^{2cz}\right)\left(e^{4asz}-e^{2avz}\right)(2s-\nu)\right)\right)/$$

$$((c+2as-a\nu)(c+a(\nu-2s))) - \frac{2^{-\nu}\cosh(c\,z)(\nu \bmod 2-1)}{c}\binom{\nu}{\frac{\nu}{2}} /;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4026.01

$$\int \sinh(a\,z)\cosh^{n}(a\,z)\,dz == \frac{\cosh^{n+1}(a\,z)}{n\,a+a}$$

01.20.21.4027.01

$$\int \sinh(a\,z)\cosh^{2}(a\,z)\,dz == \frac{\cosh^{3}(a\,z)}{3\,a}$$

01.20.21.4028.01

$$\int \sinh(a\,z)\cosh^{3}(a\,z)\,dz == \frac{4\cosh(2\,a\,z)+\cosh(4\,a\,z)}{32\,a}$$

01.20.21.4029.01

$$\int \sinh(a\,z)\cosh^{4}(a\,z)\,dz == \frac{\cosh^{5}(a\,z)}{5\,a}$$

01.20.21.4030.01

$$\int \sinh(2\,a\,z)\cosh^{n}(a\,z)\,dz == \frac{2\cosh^{n+2}(a\,z)}{n\,a+2\,a}$$

01.20.21.4031.01

$$\int \sinh(3\,a\,z)\cosh^{n}(a\,z)\,dz == \frac{\cosh^{n}(a\,z)(2\,n\cosh(a\,z)+(n+1)\cosh(3\,a\,z))}{a\,(n+1)\,(n+3)}$$

01.20.21.4032.01

$$\int \sinh(4\,a\,z)\cosh^{n}(a\,z)\,dz == \frac{4\cosh^{n+2}(a\,z)((n+2)\cosh(2\,a\,z)-2)}{a\,(n+2)\,(n+4)}$$

01.20.21.4033.01

$$\int \sinh((n+2)\,z)\cosh^{n}(z)\,dz == \frac{\cosh^{n+1}(z)\cosh((n+1)\,z)}{n+1}$$

01.20.21.4034.01

$$\int \sinh(a\,z)\sqrt{\cosh^{3}(2\,a\,z)}\;dz ==$$

$$\frac{\sqrt{\cosh^{3}(2\,a\,z)}}{16\,a\cosh^{\frac{3}{2}}(2\,a\,z)}\left(-4\cosh^{\frac{1}{2}}(2\,a\,z)\cosh(a\,z)+2\cosh^{\frac{1}{2}}(2\,a\,z)\cosh(3\,a\,z)+3\sqrt{2}\,\log\left(\sqrt{2}\,\cosh(a\,z)+\cosh^{\frac{1}{2}}(2\,a\,z)\right)\right)$$

01.20.21.4035.01

$$\int \frac{\sinh(a\,z)}{\cosh^{\frac{1}{2}}(2\,a\,z)}\,dz == \frac{\log\left(\sqrt{2}\,\cosh(a\,z)+\cosh^{\frac{1}{2}}(2\,a\,z)\right)}{\sqrt{2}\,a}$$

01.20.21.4036.01

$$\int \frac{\sinh(a\,z)}{\sqrt{\cosh^3(2\,a\,z)}}\,dz == -\frac{\cosh(a\,z)\cosh(2\,a\,z)}{a\sqrt{\cosh^3(2\,a\,z)}}$$

01.20.21.4037.01

$$\int \frac{\sinh(a\,z)}{\sqrt{\cosh^5(2\,a\,z)}}\,dz == \frac{\cosh(a\,z)\cosh(2\,a\,z)\,(2\cosh(2\,a\,z)-1)}{3\,a\sqrt{\cosh^5(2\,a\,z)}}$$

01.20.21.4038.01

$$\int \sinh(c\,z)\cosh^{\frac{1}{a}}(c\,z)^{\,b}\,dz == \frac{a\cosh(c\,z)\cosh^{\frac{1}{a}}(c\,z)^{\,b}}{(a+b)\,c}$$

Involving $\sinh(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.4039.01

$$\int \sinh(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{2\,((c-a\,\nu)\,(c+a\,\nu))}\left(e^{-d-c\,z}\cosh^{\nu}(a\,z)\left(1+e^{2\,a\,z}\right)^{-\nu}\right.$$
$$\left.\left(e^{2\,(d+c\,z)}\,(c+a\,\nu)\,{}_2F_1\left(\frac{c-a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c}{a}-\nu+2\right);\,-e^{2\,a\,z}\right)-(a\,\nu-c)\,{}_2F_1\left(-\frac{c+a\,\nu}{2\,a},\,-\nu;\,-\frac{c+a\,(\nu-2)}{2\,a};\,-e^{2\,a\,z}\right)\right)\right)$$

01.20.21.4040.01

$$\int \sinh(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(d+c\,z)\,(1-\nu \bmod 2)}{c} +$$
$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{s}\left(a\,(2\,s-\nu)\sinh((2\,s-\nu)\,a\,z)\sinh(d+c\,z)-c\cosh((2\,s-\nu)\,a\,z)\cosh(d+c\,z)\right)}{a^2\,(\nu-2\,s)^2-c^2}\;/;\;\nu\in\mathbb{N}^+$$

Involving $\sinh(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.4041.01

$$\int \sinh(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{2\,((c-a\,\nu)\,(c+a\,\nu))}\left(e^{-c\,z}\cosh^{\nu}(b+a\,z)\left(1+e^{2\,(b+a\,z)}\right)^{-\nu}\right.$$
$$\left.\left(e^{2\,c\,z}\,(c+a\,\nu)\,{}_2F_1\left(\frac{c-a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c}{a}-\nu+2\right);\,-e^{2\,(b+a\,z)}\right)-(a\,\nu-c)\,{}_2F_1\left(-\frac{c+a\,\nu}{2\,a},\,-\nu;\,-\frac{c+a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)\right)\right)$$

01.20.21.4042.01

$$\int \sinh(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(c\,z)\,(1-\nu \bmod 2)}{c} +$$
$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{a^2\,(\nu-2\,s)^2-c^2}\left(\binom{\nu}{s}\left(a\,(2\,s-\nu)\sinh((2\,s-\nu)\,(b+a\,z))\sinh(c\,z)-c\cosh((2\,s-\nu)\,(b+a\,z))\cosh(c\,z)\right)\right)\;/;\;\nu\in\mathbb{N}^+$$

Involving $\sinh(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.4043.01

$$\int \sinh(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{2\,((c-a\,\nu)\,(c+a\,\nu))}\left(e^{-d-c\,z}\cosh^{\nu}(b+a\,z)\left(1+e^{2\,(b+a\,z)}\right)^{-\nu}\right.$$
$$\left.\left(e^{2\,(d+c\,z)}\,(c+a\,\nu)\,{}_2F_1\left(\frac{c-a\,\nu}{2\,a},\,-\nu;\,\frac{1}{2}\left(\frac{c}{a}-\nu+2\right);\,-e^{2\,(b+a\,z)}\right)-(a\,\nu-c)\,{}_2F_1\left(-\frac{c+a\,\nu}{2\,a},\,-\nu;\,-\frac{c+a\,(\nu-2)}{2\,a};\,-e^{2\,(b+a\,z)}\right)\right)\right)$$

01.20.21.4044.01

$$\int \sinh(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == \binom{\nu}{\frac{\nu}{2}}\frac{2^{-\nu}\cosh(d+c\,z)\,(1-\nu \bmod 2)}{c}+2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$
$$\frac{1}{a^2\,(\nu-2\,s)^2-c^2}\,(a\,(2\,s-\nu)\sinh((2\,s-\nu)\,(b+a\,z))\sinh(d+c\,z)-c\cosh((2\,s-\nu)\,(b+a\,z))\cosh(d+c\,z))\;/;\;\nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r\right)\cosh^{\nu}(c\,z)$

01.20.21.4045.01

$$\int \sinh\left(b\,z^2\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu-2}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\,\operatorname{erfi}\left(\sqrt{-b}\,z\right)+\sqrt{b}\,\operatorname{erfi}\left(\sqrt{b}\,z\right)\right)(1-\nu \bmod 2)}{b}+$$
$$2^{-\nu-2}\,\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\sqrt{-b}\;e^{\frac{(c\,\nu-2\,c\,s)^2}{4\,b}}\operatorname{erfi}\left(\frac{c\,(2\,s-\nu)-2\,b\,z}{2\,\sqrt{-b}}\right)}{b}+\frac{e^{-\frac{(c\,\nu-2\,c\,s)^2}{4\,b}}\operatorname{erfi}\left(\frac{2\,b\,z-c\,(2\,s-\nu)}{2\,\sqrt{b}}\right)}{\sqrt{b}}+\right.$$
$$\left.\frac{e^{\frac{c^2\,(\nu-2\,s)^2}{4\,b}}\left(\sqrt{-b}\,\operatorname{erfi}\left(\frac{-c\,(2\,s-\nu)-2\,b\,z}{2\,\sqrt{-b}}\right)+\sqrt{b}\;e^{-\frac{(c\,\nu-2\,c\,s)^2}{2\,b}}\operatorname{erfi}\left(\frac{c\,(2\,s-\nu)+2\,b\,z}{2\,\sqrt{b}}\right)\right)}{b}\right)\;/;\;\nu\in\mathbb{N}^+$$

01.20.21.4046.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh^{v}(c\,z)\,dz ==$$

$$2^{-v-2}\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{b\,e^{\frac{b^2}{4cv-8cs}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2c(v-2s)\sqrt{z}-b}{2\sqrt{c(2s-v)}}\right)}{(c(2s-v))^{3/2}}+\frac{b\,e^{\frac{b^2}{4cv-8cs}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2c(v-2s)\sqrt{z}}{2\sqrt{c(2s-v)}}\right)}{(c(2s-v))^{3/2}}+\frac{8\sinh\left(b\sqrt{z}\right)\sinh(c(2s-v)z)}{c(2s-v)}-\right.\right.$$

$$\left.\left.\frac{b\,e^{\frac{b^2}{8cs-4cv}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2c(v-2s)\sqrt{z}-b}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}-\frac{b\,e^{\frac{b^2}{8cs-4cv}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)-\right.$$

$$\left.\frac{4\,e^{-b\sqrt{z}}\left(\sqrt{z}\ b+e^{2b\sqrt{z}}\left(b\sqrt{z}-1\right)+1\right)\binom{v}{\frac{v}{2}}(v\bmod 2-1)}{b^2}\right)/;\ v\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r}+e\right)\cosh^{v}(c\,z)$

01.20.21.4047.01

$$\int \sinh\left(b\,z^2+e\right)\cosh^{v}(c\,z)\,dz == \frac{2^{-v-2}\,e^{-e}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)+\sqrt{b}\ e^{2e}\operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-v\bmod 2)}{b}+$$

$$2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{\sqrt{-b}\ e^{\frac{(cv-2cs)^2}{4b}-e}\operatorname{erfi}\left(\frac{c(2s-v)-2bz}{2\sqrt{-b}}\right)}{b}+\frac{e^{e-\frac{(cv-2cs)^2}{4b}}\operatorname{erfi}\left(\frac{2bz-c(2s-v)}{2\sqrt{b}}\right)}{\sqrt{b}}+\right.$$

$$\left.\frac{1}{b}\left(e^{\frac{c^2(v-2s)^2}{4b}-e}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{-c(2s-v)-2bz}{2\sqrt{-b}}\right)+\sqrt{b}\ e^{2\left(e-\frac{(cv-2cs)^2}{4b}\right)}\operatorname{erfi}\left(\frac{c(2s-v)+2bz}{2\sqrt{b}}\right)\right)\right)\right)/;\ v\in\mathbb{N}^{+}$$

01.20.21.4048.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh^{\nu}(c\,z)\,dz == \frac{2^{-\nu}\,e^{-\sqrt{z}\ b-e}\left(\sqrt{z}\ b+e^{2\left(\sqrt{z}\ b+e\right)}\left(b\sqrt{z}\ -1\right)+1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\left(\frac{4\,e^{-e}\cosh\left(\sqrt{z}\ b+e+c\,(2\,s-\nu)\,z\right)}{c\,(2\,s-\nu)}+\frac{b\,e^{\frac{b^2}{4\,c\,(\nu-2\,s)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\,c\,(\nu-2\,s)\sqrt{z}\ -b}{2\sqrt{-c\,(\nu-2\,s)}}\right)}{(-c\,(\nu-2\,s))^{3/2}}-\right.\right.$$

$$\left.\frac{b\,e^{-\frac{b^2}{4\,c\,(\nu-2\,s)}-2\,e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2\,c\,(\nu-2\,s)\sqrt{z}\ -b}{2\sqrt{c\,(\nu-2\,s)}}\right)}{(c\,(\nu-2\,s))^{3/2}}\right)-e^{-e}\left(\frac{4\,e^{e}\cosh\left(\sqrt{z}\ b+e+c\,(\nu-2\,s)\,z\right)}{c\,(2\,s-\nu)}+\right.$$

$$\left.\left.\frac{b\,e^{2\,e-\frac{b^2}{4\,c\,(\nu-2\,s)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,c\,(\nu-2\,s)\sqrt{z}}{2\sqrt{c\,(\nu-2\,s)}}\right)}{(c\,(\nu-2\,s))^{3/2}}-\frac{b\,e^{\frac{b^2}{4\,c\,(\nu-2\,s)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,c\,(\nu-2\,s)\sqrt{z}}{2\sqrt{-c\,(\nu-2\,s)}}\right)}{(-c\,(\nu-2\,s))^{3/2}}\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r}+d\,z\right)\cosh^{\nu}(c\,z)$

01.20.21.4049.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$\frac{2^{-\nu-2}\,e^{-\frac{d^2}{4\,b}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\ \operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right)+\sqrt{-b}\ e^{\frac{d^2}{2\,b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{2\,b}\right)\right)(1-\nu \bmod 2)}{b}+2^{-\nu-2}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\sqrt{-b}\ e^{\frac{(d-2\,c\,s+c\,\nu)^2}{4\,b}}\operatorname{erfi}\left(\frac{-d+c\,(2\,s-\nu)-2\,b\,z}{2\sqrt{-b}}\right)}{b}+\frac{1}{b}\left(e^{\frac{(c\,(\nu-2\,s)-d)^2}{4\,b}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{-d-c\,(2\,s-\nu)-2\,b\,z}{2\sqrt{-b}}\right)+\sqrt{b}\ e^{-\frac{(-d-2\,c\,s+c\,\nu)^2}{2\,b}}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+c\,(2\,s-\nu)+2\,b\,z}{2\sqrt{b}}\right)\right)+\frac{e^{-\frac{(d-2\,c\,s+c\,\nu)^2}{4\,b}}\operatorname{erfi}\left(\frac{d-c\,(2\,s-\nu)+2\,b\,z}{2\sqrt{b}}\right)}{\sqrt{b}}\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4050.01

$$\int \sinh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}(c\,z)\, dz ==$$

$$2^{-\nu-2}\left(\frac{4\cosh\left(\sqrt{z}\ b + d\,z\right)}{d} + \frac{b\, e^{\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} - \frac{b\, e^{-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2) +$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{4\cosh\left(\sqrt{z}\ b + (d-2\,c\,s+c\,\nu)\,z\right)}{d+c\,(\nu-2\,s)} + \frac{4\cosh\left(\sqrt{z}\ b + (d+2\,c\,s-c\,\nu)\,z\right)}{d+2\,c\,s-c\,\nu} + \right.$$

$$\frac{b\, e^{-\frac{b^2}{4(-d-c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+c(\nu-2s))\sqrt{z}}{2\sqrt{-d-c(\nu-2s)}}\right)}{(-d-c\,(\nu-2\,s))^{3/2}} + \frac{b\, e^{-\frac{b^2}{4(d-c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c(\nu-2s)-d)\sqrt{z}-b}{2\sqrt{d-c(\nu-2s)}}\right)}{(d-c\,(\nu-2\,s))^{3/2}} -$$

$$\left.\frac{b\, e^{-\frac{b^2}{4(c(\nu-2s)-d)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c(\nu-2s)-d)\sqrt{z}-b}{2\sqrt{c(\nu-2s)-d}}\right)}{(c\,(\nu-2\,s)-d)^{3/2}} - \frac{b\, e^{-\frac{b^2}{4(d+c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+c(\nu-2s))\sqrt{z}}{2\sqrt{d+c(\nu-2s)}}\right)}{(d+c\,(\nu-2\,s))^{3/2}}\right) /;\ \nu \in \mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r} + d\,z + e\right)\cosh^{\nu}(c\,z)$

01.20.21.4051.01

$$\int \sinh\left(b\,z^2 + d\,z + e\right)\cosh^{\nu}(c\,z)\, dz ==$$

$$\frac{1}{b}\left(2^{-\nu-2}\, e^{-\frac{d^2}{4b}-e}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\ e^{2e}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right) + \sqrt{-b}\ e^{\frac{d^2}{2b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{2\,b}\right)\right)(1-\nu \bmod 2)\right) +$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\sqrt{-b}\ e^{\frac{(d-2cs+c\nu)^2}{4b}-e}\operatorname{erfi}\left(\frac{-d+c(2s-\nu)-2bz}{2\sqrt{-b}}\right)}{b} + \frac{1}{b}\left(e^{\frac{(c(\nu-2s)-d)^2}{4b}-e}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{-d-c(2s-\nu)-2bz}{2\sqrt{-b}}\right) + \right.\right.\right.$$

$$\left.\left.\left.\sqrt{b}\ e^{2\left(e-\frac{(-d-2cs+c\nu)^2}{4b}\right)}\operatorname{erfi}\left(\frac{d+c(2s-\nu)+2bz}{2\sqrt{b}}\right)\right)\right) + \frac{e^{e-\frac{(d-2cs+c\nu)^2}{4b}}\operatorname{erfi}\left(\frac{d-c(2s-\nu)+2bz}{2\sqrt{b}}\right)}{\sqrt{b}}\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.4052.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-\nu-2}\left(\frac{4\,e^{e}\cosh\left(\sqrt{z}\ b+e+d\,z\right)}{d}+\frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{2e-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{-e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\left(\frac{4\,e^{-e}\cosh\left(\sqrt{z}\ b+e+(d+2\,c\,s-c\,\nu)\,z\right)}{d+2\,c\,s-c\,\nu}+\frac{b\,e^{-\frac{b^2}{4(d-c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c(\nu-2s)-d)\sqrt{z}-b}{2\sqrt{d-c(\nu-2s)}}\right)}{(d-c(\nu-2s))^{3/2}}-\right.\right.$$

$$\left.\frac{b\,e^{-\frac{b^2}{4(c(\nu-2s)-d)}-2e}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2(c(\nu-2s)-d)\sqrt{z}-b}{2\sqrt{c(\nu-2s)-d}}\right)}{(c(\nu-2s)-d)^{3/2}}\right)-e^{-e}\left(-\frac{4\,e^{e}\cosh\left(\sqrt{z}\ b+e+(d-2\,c\,s+c\,\nu)\,z\right)}{d+c(\nu-2s)}+\right.$$

$$\left.\left.\frac{b\,e^{2e-\frac{b^2}{4(d+c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+c(\nu-2s))\sqrt{z}}{2\sqrt{d+c(\nu-2s)}}\right)}{(d+c(\nu-2s))^{3/2}}-\frac{b\,e^{-\frac{b^2}{4(-d-c(\nu-2s))}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2(d+c(\nu-2s))\sqrt{z}}{2\sqrt{-d-c(\nu-2s)}}\right)}{(-d-c(\nu-2s))^{3/2}}\right)\right);\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r}\right)\cosh^{\nu}(f\,z+g)$

01.20.21.4053.01

$$\int \sinh\left(b\,z^{2}\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)+\sqrt{b}\ \operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-\nu \bmod 2)}{b}+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\sqrt{-b}\ e^{\frac{(f\nu-2fs)^2}{4b}+g(2s-\nu)}\operatorname{erfi}\left(\frac{f(2s-\nu)-2bz}{2\sqrt{-b}}\right)}{b}+\frac{e^{g(\nu-2s)-\frac{(f\nu-2fs)^2}{4b}}\operatorname{erfi}\left(\frac{2bz-f(2s-\nu)}{2\sqrt{b}}\right)}{\sqrt{b}}+\frac{1}{b}\left(e^{\frac{f^2(\nu-2s)^2}{4b}+g(\nu-2s)}\right.\right.$$

$$\left.\left.\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{-f(2s-\nu)-2bz}{2\sqrt{-b}}\right)+\sqrt{b}\ e^{2\left(g(2s-\nu)-\frac{(f\nu-2fs)^2}{4b}\right)}\operatorname{erfi}\left(\frac{f(2s-\nu)+2bz}{2\sqrt{b}}\right)\right)\right)\right);\ \nu\in\mathbb{N}^{+}$$

01.20.21.4054.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu}\,e^{-b\sqrt{z}}\left(\sqrt{z}\;b+e^{2b\sqrt{z}}\left(b\sqrt{z}\;-1\right)+1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-g(\nu-2s)}\left(\frac{4\,e^{g(\nu-2s)}\cosh\left(\sqrt{z}\;b+(2s-\nu)(g+f\,z)\right)}{f(2s-\nu)}+\frac{b\,e^{\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2f(\nu-2s)\sqrt{z}-b}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}-\right.\right.$$

$$\left.\frac{b\,e^{2g(\nu-2s)-\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{2f(\nu-2s)\sqrt{z}-b}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}\right)-e^{-g(\nu-2s)}\left(\frac{4\,e^{g(\nu-2s)}\cosh\left(b\sqrt{z}\;-(2s-\nu)(g+f\,z)\right)}{f(2s-\nu)}+\right.$$

$$\left.\left.\frac{b\,e^{2g(\nu-2s)-\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{b+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-\frac{b\,e^{\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\;\operatorname{erfi}\left(\frac{b+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r}+e\right)\cosh^{\nu}(f\,z+g)$

01.20.21.4055.01

$$\int \sinh\left(b\,z^2+e\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu-2}\,e^{-e}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\;\operatorname{erfi}\left(\sqrt{-b}\;z\right)+\sqrt{b}\;e^{2e}\operatorname{erfi}\left(\sqrt{b}\;z\right)\right)(1-\nu \bmod 2)}{b}+2^{-\nu-2}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\sqrt{-b}\;e^{\frac{(f\nu-2fs)^2}{4b}-e+g(2s-\nu)}\operatorname{erfi}\left(\frac{f(2s-\nu)-2bz}{2\sqrt{-b}}\right)}{b}+\frac{e^{-\frac{(f\nu-2fs)^2}{4b}+e+g(\nu-2s)}\operatorname{erfi}\left(\frac{2bz-f(2s-\nu)}{2\sqrt{b}}\right)}{\sqrt{b}}+\frac{1}{b}\left(e^{\frac{f^2(\nu-2s)^2}{4b}+g(\nu-2s)-e}\right.\right.$$

$$\left.\left.\left(\sqrt{-b}\;\operatorname{erfi}\left(\frac{-f(2s-\nu)-2bz}{2\sqrt{-b}}\right)+\sqrt{b}\;e^{2\left(-\frac{(f\nu-2fs)^2}{4b}+e+g(2s-\nu)\right)}\operatorname{erfi}\left(\frac{f(2s-\nu)+2bz}{2\sqrt{b}}\right)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4056.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh^{\nu}(g+f\,z)\,dz == \frac{2^{-\nu}\,e^{-\sqrt{z}\ b-e}\left(\sqrt{z}\ b+e^{2\left(\sqrt{z}\ b+e\right)}\left(b\sqrt{z}\ -1\right)+1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e-g(\nu-2s)}\left(\frac{4\,e^{g(\nu-2s)-e}\cosh\left(\sqrt{z}\ b+e+(2s-\nu)(g+f\,z)\right)}{f(2s-\nu)}+\right.\right.$$

$$\left.\frac{b\,e^{\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2f(\nu-2s)\sqrt{z}-b}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}-\frac{b\,e^{2(g(\nu-2s)-e)-\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{2f(\nu-2s)\sqrt{z}-b}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}\right)-$$

$$e^{-e-g(\nu-2s)}\left(\frac{4\,e^{e+g(\nu-2s)}\cosh\left(\sqrt{z}\ b+e-(2s-\nu)(g+f\,z)\right)}{f(2s-\nu)}+\frac{b\,e^{2(e+g(\nu-2s))-\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-\right.$$

$$\left.\left.\frac{b\,e^{\frac{b^2}{4f(\nu-2s)}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r}+d\,z\right)\cosh^{\nu}(f\,z+g)$

01.20.21.4057.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$\frac{2^{-\nu-2}\,e^{-\frac{d^2}{4b}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\ \operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)+\sqrt{-b}\ e^{\frac{d^2}{2b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\ (d+2bz)}{2b}\right)\right)(1-\nu \bmod 2)}{b}+2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{\sqrt{-b}\ e^{\frac{(d-2fs+f\nu)^2}{4b}+g(2s-\nu)}\operatorname{erfi}\left(\frac{-d+f(2s-\nu)-2bz}{2\sqrt{-b}}\right)}{b}+\frac{1}{b}\left(e^{\frac{(f(\nu-2s)-d)^2}{4b}+g(\nu-2s)}\left(\sqrt{-b}\ \operatorname{erfi}\left(\frac{-d-f(2s-\nu)-2bz}{2\sqrt{-b}}\right)+\sqrt{b}\right.\right.\right.$$

$$\left.\left.\left.e^{2\left(g(2s-\nu)-\frac{(-d-2fs+f\nu)^2}{4b}\right)}\operatorname{erfi}\left(\frac{d+f(2s-\nu)+2bz}{2\sqrt{b}}\right)\right)\right)+\frac{e^{g(\nu-2s)-\frac{(d-2fs+f\nu)^2}{4b}}\operatorname{erfi}\left(\frac{d-f(2s-\nu)+2bz}{2\sqrt{b}}\right)}{\sqrt{b}}\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4058.01

$$\int \sinh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}(g + f\,z)\, dz ==$$

$$2^{-\nu-2}\left(\frac{4\cosh\left(\sqrt{z}\ b + d\,z\right)}{d} + \frac{b\, e^{\frac{b^2}{4d}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} - \frac{b\, e^{-\frac{b^2}{4d}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1 - \nu \bmod 2) +$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-g(\nu-2s)}\left(\frac{4\, e^{g(\nu-2s)}\cosh\left(\sqrt{z}\ b + d\,z + (2s-\nu)(g + f\,z)\right)}{d + 2fs - f\nu} + \right.\right.$$

$$\left.\frac{b\, e^{-\frac{b^2}{4(d-f(\nu-2s))}}\sqrt{\pi}\ \text{erfi}\left(\frac{2(f(\nu-2s)-d)\sqrt{z}-b}{2\sqrt{d-f(\nu-2s)}}\right)}{(d - f(\nu-2s))^{3/2}} - \frac{b\, e^{2g(\nu-2s)-\frac{b^2}{4(f(\nu-2s)-d)}}\sqrt{\pi}\ \text{erfi}\left(\frac{2(f(\nu-2s)-d)\sqrt{z}-b}{2\sqrt{f(\nu-2s)-d}}\right)}{(f(\nu-2s) - d)^{3/2}}\right) -$$

$$e^{-g(\nu-2s)}\left(-\frac{4\, e^{g(\nu-2s)}\cosh\left(\sqrt{z}\ b + d\,z - (2s-\nu)(g + f\,z)\right)}{d + f(\nu-2s)} + \frac{b\, e^{2g(\nu-2s)-\frac{b^2}{4(d+f(\nu-2s))}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2(d+f(\nu-2s))\sqrt{z}}{2\sqrt{d+f(\nu-2s)}}\right)}{(d + f(\nu-2s))^{3/2}} - \right.$$

$$\left.\left.\frac{b\, e^{-\frac{b^2}{4(-d-f(\nu-2s))}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2(d+f(\nu-2s))\sqrt{z}}{2\sqrt{-d-f(\nu-2s)}}\right)}{(-d - f(\nu-2s))^{3/2}}\right)\right) /;\ \nu \in \mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r} + d\,z + e\right)\cosh^{\nu}(f\,z + g)$

01.20.21.4059.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$\frac{1}{b}\left(2^{-\nu-2}\,e^{-\frac{d^2}{4\,b}-e}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\;e^{2\,e}\,\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\,\sqrt{b}}\right)+\sqrt{-b}\;e^{\frac{d^2}{2\,b}}\,\operatorname{erfi}\left(\frac{\sqrt{-b}\;(d+2\,b\,z)}{2\,b}\right)\right)(1-\nu \bmod 2)\right)+$$

$$2^{-\nu-2}\,\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\sqrt{-b}\;e^{\frac{(d-2\,f\,s+f\,\nu)^2}{4\,b}-e+g\,(2\,s-\nu)}\,\operatorname{erfi}\left(\frac{-d+f\,(2\,s-\nu)-2\,b\,z}{2\,\sqrt{-b}}\right)}{b}+\right.$$

$$\left.\frac{1}{b}\left(e^{\frac{(f\,(\nu-2\,s)-d)^2}{4\,b}-e+g\,(\nu-2\,s)}\left(\sqrt{-b}\;\operatorname{erfi}\left(\frac{-d-f\,(2\,s-\nu)-2\,b\,z}{2\,\sqrt{-b}}\right)+\sqrt{b}\;e^{2\left(-\frac{(-d-2\,f\,s+f\,\nu)^2}{4\,b}+e+g\,(2\,s-\nu)\right)}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+f\,(2\,s-\nu)+2\,b\,z}{2\,\sqrt{b}}\right)\right)+\frac{e^{-\frac{(d-2\,f\,s+f\,\nu)^2}{4\,b}+e+g\,(\nu-2\,s)}\,\operatorname{erfi}\left(\frac{d-f\,(2\,s-\nu)+2\,b\,z}{2\,\sqrt{b}}\right)}{\sqrt{b}}\right)\right/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4060.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{v}(g+f\,z)\,dz ==$$

$$2^{-v-2}\left(\frac{4\,e^{e}\cosh\left(\sqrt{z}\ b+e+d\,z\right)}{d}+\frac{b\,e^{\frac{b^2}{4\,d}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{2\,e-\frac{b^2}{4\,d}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{-e}\binom{v}{\frac{v}{2}}(1-v \bmod 2)+$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e-g\,(v-2\,s)}\left(\frac{4\,e^{g\,(v-2\,s)-e}\cosh\left(\sqrt{z}\ b+e+d\,z+(2\,s-v)\,(g+f\,z)\right)}{d+2\,f\,s-f\,v}+\right.\right.$$

$$\left.\frac{b\,e^{-\frac{b^2}{4\,(d-f\,(v-2\,s))}}\sqrt{\pi}\ \text{erfi}\left(\frac{2\,(f\,(v-2\,s)-d)\sqrt{z}-b}{2\sqrt{d-f\,(v-2\,s)}}\right)}{(d-f\,(v-2\,s))^{3/2}}-\frac{b\,e^{2\,(g\,(v-2\,s)-e)-\frac{b^2}{4\,(f\,(v-2\,s)-d)}}\sqrt{\pi}\ \text{erfi}\left(\frac{2\,(f\,(v-2\,s)-d)\sqrt{z}-b}{2\sqrt{f\,(v-2\,s)-d}}\right)}{(f\,(v-2\,s)-d)^{3/2}}\right)+$$

$$e^{-e-g\,(v-2\,s)}\left(-\frac{4\,e^{e+g\,(v-2\,s)}\cosh\left(\sqrt{z}\ b+e+d\,z-(2\,s-v)\,(g+f\,z)\right)}{d+f\,(v-2\,s)}+\right.$$

$$\frac{b\,e^{2\,(e+g\,(v-2\,s))-\frac{b^2}{4\,(d+f\,(v-2\,s))}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2\,(d+f\,(v-2\,s))\sqrt{z}}{2\sqrt{d+f\,(v-2\,s)}}\right)}{(d+f\,(v-2\,s))^{3/2}}-$$

$$\left.\left.\frac{b\,e^{-\frac{b^2}{4\,(-d-f\,(v-2\,s))}}\sqrt{\pi}\ \text{erfi}\left(\frac{b+2\,(d+f\,(v-2\,s))\sqrt{z}}{2\sqrt{-d-f\,(v-2\,s)}}\right)}{(-d-f\,(v-2\,s))^{3/2}}\right)\right)\Big/;\ v\in\mathbb{N}^{+}$$

Involving $\sinh^{m}(b\,z)\cosh^{v}\left(c\,z^{r}\right)$

01.20.21.4061.01

$$\int \sinh(b\,z)\cosh^{\nu}\left(c\,z^2\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(b\,z)\,(1-\nu \bmod 2)}{b} +$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{b^2}{8cs-4c\nu}}\operatorname{erfi}\left(\frac{b-2c(2s-\nu)z}{2\sqrt{c(\nu-2s)}}\right)}{\sqrt{c(\nu-2s)}} + \frac{e^{-\frac{b^2}{8cs-4c\nu}}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{2c(2s-\nu)z-b}{2\sqrt{2cs-c\nu}}\right)}{c(\nu-2s)} + \frac{1}{2cs-c\nu}\right.$$

$$\left.\left(e^{-\frac{b^2}{4c\nu-8cs}}\left(\sqrt{c\nu-2cs}\,\operatorname{erfi}\left(\frac{-b-2c(2s-\nu)z}{2\sqrt{c\nu-2cs}}\right)+e^{\frac{b^2}{2c\nu-4cs}}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{b+2c(2s-\nu)z}{2\sqrt{2cs-c\nu}}\right)\right)\right)\right) /;\ \nu\in\mathbb{N}^+$$

01.20.21.4062.01

$$\int \sinh(b\,z)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(b\,z)\,(1-\nu \bmod 2)}{b} +$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{8\cosh\left(c(\nu-2s)\sqrt{z}\right)\cosh(b\,z)}{b} + \frac{c\,e^{\frac{c^2(\nu-2s)^2}{4b}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,b+c(\nu-2s)}{2\sqrt{-b}}\right)}{(-b)^{3/2}} + \right.$$

$$\frac{c\,e^{\frac{c^2(\nu-2s)^2}{4b}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2b\sqrt{z}}{2\sqrt{-b}}\right)}{(-b)^{3/2}} - \frac{c\,e^{-\frac{c^2(\nu-2s)^2}{4b}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,b+c(\nu-2s)}{2\sqrt{b}}\right)}{b^{3/2}} -$$

$$\left.\frac{c\,e^{-\frac{c^2(\nu-2s)^2}{4b}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2b\sqrt{z}}{2\sqrt{b}}\right)}{b^{3/2}}\right) /;\ \nu\in\mathbb{N}^+$$

Involving $\sinh(d\,z+e)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.4063.01

$$\int \sinh(e+d\,z)\cosh^{\nu}\left(c\,z^2\right)dz == \frac{2^{-\nu}\cosh(e+d\,z)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d} +$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{d^2}{8cs-4c\nu}+e}\operatorname{erfi}\left(\frac{d-2c(2s-\nu)z}{2\sqrt{c(\nu-2s)}}\right)}{\sqrt{c(\nu-2s)}} + \frac{e^{-\frac{d^2}{8cs-4c\nu}-e}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{2c(2s-\nu)z-d}{2\sqrt{2cs-c\nu}}\right)}{c(\nu-2s)} + \frac{1}{2cs-c\nu}\left(e^{-\frac{d^2}{4c\nu-8cs}-e}\right.\right.$$

$$\left.\left.\left(\sqrt{c\nu-2cs}\,\operatorname{erfi}\left(\frac{-d-2c(2s-\nu)z}{2\sqrt{c\nu-2cs}}\right)+e^{2\left(\frac{d^2}{4c\nu-8cs}+e\right)}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{d+2c(2s-\nu)z}{2\sqrt{2cs-c\nu}}\right)\right)\right)\right) /;\ \nu\in\mathbb{N}^+$$

01.20.21.4064.01

$$\int \sinh(e+d\,z)\cosh^{\nu}\left(c\sqrt{z}\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(e+d\,z)(1-\nu \bmod 2)}{d} +$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\left(\frac{4e^{-e}\cosh\left(e+d\,z+c(2s-\nu)\sqrt{z}\right)}{d} + \frac{c\,e^{\frac{c^2(\nu-2s)^2}{4d}-2e}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} - \right.\right.$$

$$\left.\frac{c\,e^{-\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right) - e^{-e}\left(-\frac{4e^{e}\cosh\left(e+d\,z+c(\nu-2s)\sqrt{z}\right)}{d} + \right.$$

$$\left.\left.\frac{c\,e^{2e-\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(\nu-2s)}{2\sqrt{d}}\right)}{d^{3/2}} - \frac{c\,e^{\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(\nu-2s)}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right) /;\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.4065.01

$$\int \sinh(b\,z^r)\cosh^{\nu}(c\,z^r)\,dz == 2^{-\nu-1}\,z\left(\frac{\binom{\nu}{\frac{\nu}{2}}\left((-b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-b\,z^r\right)-(b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b\,z^r\right)\right)(\nu \bmod 2-1)}{r}-\frac{1}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{1}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)\right.\right.$$
$$((-b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}-((b-2\,c\,s+c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+((-b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}$$
$$\left.\left.\Gamma\left(\frac{1}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)-((b+2\,c\,s-c\,\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right/;\ \nu\in\mathbb{N}^+$$

01.20.21.4066.01

$$\int \sinh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2\right)dz == \frac{1}{b}\left(2^{-\nu-2}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)+\sqrt{b}\ \operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-\nu \bmod 2)\right)+2^{-\nu-2}\,\sqrt{\pi}$$
$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{\sqrt{-b+2\,c\,s-c\,\nu}\ \operatorname{erfi}\left(\frac{2\,c\,(2\,s-\nu)\,z-2\,b\,z}{2\,\sqrt{-b+2\,c\,s-c\,\nu}}\right)}{b+c\,(\nu-2\,s)}+\frac{1}{b+2\,c\,s-c\,\nu}\left(\sqrt{-b-2\,c\,s+c\,\nu}\ \operatorname{erfi}\left(\frac{-2\,b\,z-2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{-b-2\,c\,s+c\,\nu}}\right)+\right.\right.$$
$$\left.\left.\sqrt{b+2\,c\,s-c\,\nu}\ \operatorname{erfi}\left(\frac{2\,b\,z+2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{b+2\,c\,s-c\,\nu}}\right)\right)+\frac{\operatorname{erfi}\left(\frac{2\,b\,z-2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{b+c\,(\nu-2\,s)}}\right)}{\sqrt{b+c\,(\nu-2\,s)}}\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.4067.01

$$\int \sinh\left(b\,\sqrt{z}\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz == \frac{2^{1-\nu}\,\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\,\sqrt{z}\,\cosh\left(b\,\sqrt{z}\right)-\sinh\left(b\,\sqrt{z}\right)\right)}{b^2}-$$
$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{(-b-2\,c\,s+c\,\nu)\,\sqrt{z}\,\cosh\left((-b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)-\sinh\left((-b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)}{(-b-2\,c\,s+c\,\nu)^2}+\frac{1}{(-b+2\,c\,s-c\,\nu)^2}\right.$$
$$\left.\left((-b+2\,c\,s-c\,\nu)\,\sqrt{z}\,\cosh\left((-b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-\sinh\left((-b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)\right)\right/;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.4068.01

$$\int \sinh(b\,z^r+e)\cosh^\nu(c\,z^r)\,dz == 2^{-\nu-1}\,z$$

$$\left(\frac{e^{-e}\binom{\nu}{\frac{\nu}{2}}\left(e^{2e}(-b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-b\,z^r\right)-(b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b\,z^r\right)\right)(\nu \bmod 2-1)}{r}-\frac{1}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-e}\binom{\nu}{s}\left(e^{2e}\,\Gamma\left(\frac{1}{r},(-b-2cs+c\nu)\,z^r\right)\right.\right.$$

$$((-b-2cs+c\nu)\,z^r)^{-1/r}-((b-2cs+c\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2cs+c\nu)\,z^r\right)+e^{2e}((-b+2cs-c\nu)\,z^r)^{-1/r}$$

$$\left.\left.\Gamma\left(\frac{1}{r},(-b+2cs-c\nu)\,z^r\right)-((b+2cs-c\nu)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2cs-c\nu)\,z^r\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4069.01

$$\int \sinh\left(b\,z^2+e\right)\cosh^\nu\left(c\,z^2\right)dz ==$$

$$\frac{2^{-\nu-2}\,e^{-e}\,\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)+\sqrt{b}\ e^{2e}\operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-\nu \bmod 2)}{b}+2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{e^{-e}\sqrt{-b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{2c(2s-\nu)z-2bz}{2\sqrt{-b+2cs-c\nu}}\right)}{b+c(\nu-2s)}+\frac{1}{b+2cs-c\nu}\left(e^{-e}\left(\sqrt{-b-2cs+c\nu}\ \operatorname{erfi}\left(\frac{-2bz-2c(2s-\nu)z}{2\sqrt{-b-2cs+c\nu}}\right)+\right.\right.\right.$$

$$\left.\left.\left.e^{2e}\sqrt{b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{2bz+2c(2s-\nu)z}{2\sqrt{b+2cs-c\nu}}\right)\right)\right)+\frac{e^{e}\operatorname{erfi}\left(\frac{2bz-2c(2s-\nu)z}{2\sqrt{b+c(\nu-2s)}}\right)}{\sqrt{b+c(\nu-2s)}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4070.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh^\nu\left(c\sqrt{z}\right)dz ==$$

$$\frac{2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\sqrt{z}\ \cosh\left(\sqrt{z}\ b+e\right)-\sinh\left(\sqrt{z}\ b+e\right)\right)}{b^2}-2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-b-2cs+c\nu)^2}\right.$$

$$\left((-b-2cs+c\nu)\sqrt{z}\ \cosh\left(e-(-b-2cs+c\nu)\sqrt{z}\right)+\sinh\left(e-(-b-2cs+c\nu)\sqrt{z}\right)\right)+\frac{1}{(-b+2cs-c\nu)^2}$$

$$\left.\left.\left((-b+2cs-c\nu)\sqrt{z}\ \cosh\left(e-(-b+2cs-c\nu)\sqrt{z}\right)+\sinh\left(e-(-b+2cs-c\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh^\nu\left(c\,z^r\right)$

01.20.21.4071.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2\right)dz == \frac{2^{-\nu-2}\,e^{-\frac{d^2}{4b}}\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\,\operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)+\sqrt{-b}\,e^{\frac{d^2}{2b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\,(d+2bz)}{2b}\right)\right)(1-\nu \bmod 2)}{b}+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{d^2}{-4b+8cs-4c\nu}}\sqrt{-b+2cs-c\nu}\,\operatorname{erfi}\left(\frac{-d-2bz+2c(2s-\nu)z}{2\sqrt{-b+2cs-c\nu}}\right)}{b+c(\nu-2s)}+\right.$$

$$\frac{1}{b+2cs-c\nu}\left(e^{-\frac{d^2}{-4b-8cs+4c\nu}}\left(\sqrt{-b-2cs+c\nu}\,\operatorname{erfi}\left(\frac{-d-2bz-2c(2s-\nu)z}{2\sqrt{-b-2cs+c\nu}}\right)+e^{\frac{d^2}{-2b-4cs+2c\nu}}\right.\right.$$

$$\left.\left.\left.\sqrt{b+2cs-c\nu}\,\operatorname{erfi}\left(\frac{d+2bz+2c(2s-\nu)z}{2\sqrt{b+2cs-c\nu}}\right)\right)\right)+\left.\frac{e^{\frac{d^2}{-4b+8cs-4c\nu}}\operatorname{erfi}\left(\frac{d+2bz-2c(2s-\nu)z}{2\sqrt{b+c(\nu-2s)}}\right)}{\sqrt{b+c(\nu-2s)}}\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

01.20.21.4072.01

$$\int \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(c\sqrt{z}\,\right)dz ==$$

$$2^{-\nu-2}\left(\frac{4\cosh\left(\sqrt{z}\;b+d\,z\right)}{d}+\frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{8\cosh\left(c\,(2s-\nu)\sqrt{z}\,\right)\cosh\left(\sqrt{z}\;b+d\,z\right)}{d}+\frac{e^{\frac{(-b-c(\nu-2s))^2}{4d}}\sqrt{\pi}\,(b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}+\right.$$

$$\frac{e^{\frac{(c(\nu-2s)-b)^2}{4d}}\sqrt{\pi}\,(c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{e^{-\frac{(b+c(\nu-2s))^2}{4d}}\sqrt{\pi}\,(b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}-$$

$$\left.\frac{e^{-\frac{(b-c(\nu-2s))^2}{4d}}\sqrt{\pi}\,(c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.4073.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$\frac{1}{b}\left(2^{-\nu-2}\,e^{-\frac{d^2}{4\,b}-e}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\;e^{2\,e}\,\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\,\sqrt{b}}\right)+\sqrt{-b}\;e^{\frac{d^2}{2\,b}}\,\operatorname{erfi}\left(\frac{\sqrt{-b}\;(d+2\,b\,z)}{2\,b}\right)\right)(1-\nu \bmod 2)\right)+$$

$$2^{-\nu-2}\,\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}-e}\,\sqrt{-b+2\,c\,s-c\,\nu}\;\operatorname{erfi}\left(\frac{-d-2\,b\,z+2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{-b+2\,c\,s-c\,\nu}}\right)}{b+c\,(\nu-2\,s)}+\right.$$

$$\frac{1}{b+2\,c\,s-c\,\nu}\left(e^{-\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}-e}\left(\sqrt{-b-2\,c\,s+c\,\nu}\;\operatorname{erfi}\left(\frac{-d-2\,b\,z-2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{-b-2\,c\,s+c\,\nu}}\right)+e^{2\left(\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}+e\right)}\right.\right.$$

$$\left.\left.\left.\sqrt{b+2\,c\,s-c\,\nu}\;\operatorname{erfi}\left(\frac{d+2\,b\,z+2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{b+2\,c\,s-c\,\nu}}\right)\right)\right)+\frac{e^{\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}+e}\,\operatorname{erfi}\left(\frac{d+2\,b\,z-2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{b+c\,(\nu-2\,s)}}\right)}{\sqrt{b+c\,(\nu-2\,s)}}\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

01.20.21.4074.01

$$\int \sinh\left(\sqrt{z}\;b+e+d\,z\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$2^{-\nu-2}\left(\frac{4\,e^{e}\cosh\left(\sqrt{z}\;b+e+d\,z\right)}{d}+\frac{b\,e^{\frac{b^2}{4\,d}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\,\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{2\,e-\frac{b^2}{4\,d}}\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\,\sqrt{d}}\right)}{d^{3/2}}\right)e^{-e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\left(\frac{4\,e^{-e}\cosh\left(e+d\,z+(b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)}{d}+\frac{e^{\frac{(c\,(\nu-2\,s)-b)^2}{4\,d}-2\,e}\,\sqrt{\pi}\,(c\,(\nu-2\,s)-b)\,\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}}{2\,\sqrt{-d}}\right)}{(-d)^{3/2}}-\right.\right.$$

$$\left.\left.\frac{e^{-\frac{(b-c\,(\nu-2\,s))^2}{4\,d}}\,\sqrt{\pi}\,(c\,(\nu-2\,s)-b)\,\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)-2\,d\,\sqrt{z}}{2\,\sqrt{d}}\right)}{d^{3/2}}\right)-\right.$$

$$e^{-e}\left(-\frac{4\,e^{e}\cosh\left(e+d\,z+(b+c\,(\nu-2\,s))\,\sqrt{z}\right)}{d}-\frac{e^{\frac{(-b-c\,(\nu-2\,s))^2}{4\,d}}\,\sqrt{\pi}\,(b+c\,(\nu-2\,s))\,\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,d\,\sqrt{z}}{2\,\sqrt{-d}}\right)}{(-d)^{3/2}}+\right.$$

$$\left.\left.\frac{e^{2\,e-\frac{(b+c\,(\nu-2\,s))^2}{4\,d}}\,\sqrt{\pi}\,(b+c\,(\nu-2\,s))\,\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,d\,\sqrt{z}}{2\,\sqrt{d}}\right)}{d^{3/2}}\right)\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

Involving $\sinh(d\,z)\cosh^{\nu}\left(c\,z^{r}+g\right)$

01.20.21.4075.01

$$\int \sinh(d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(d\,z)\,(1-\nu \bmod 2)}{d}+2^{-\nu-2}\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{d^2}{8cs-4c\nu}+g(\nu-2s)}\operatorname{erfi}\left(\frac{d-2c(2s-\nu)z}{2\sqrt{c(\nu-2s)}}\right)}{\sqrt{c(\nu-2s)}}+\frac{e^{g(2s-\nu)-\frac{d^2}{8cs-4c\nu}}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{2c(2s-\nu)z-d}{2\sqrt{2cs-c\nu}}\right)}{c(\nu-2s)}+\frac{1}{2cs-c\nu}\left(e^{g(\nu-2s)-\frac{d^2}{4c\nu-8cs}}\right.\right.$$

$$\left.\left.\left(\sqrt{c\nu-2cs}\,\operatorname{erfi}\left(\frac{-d-2c(2s-\nu)z}{2\sqrt{c\nu-2cs}}\right)+e^{2\left(\frac{d^2}{4c\nu-8cs}+g(2s-\nu)\right)}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{d+2c(2s-\nu)z}{2\sqrt{2cs-c\nu}}\right)\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4945.01

$$\int \sinh(d\,z)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(d\,z)\,(1-\nu \bmod 2)}{d}+2^{-\nu-2}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-g(\nu-2s)}\left(\frac{2e^{c(2s-\nu)\sqrt{z}-dz}\left(e^{2(\nu-2s)\left(\sqrt{z}\,c+g\right)}+e^{2dz}\right)}{d}+\frac{ce^{\frac{c^2(\nu-2s)^2}{4d}+2g(\nu-2s)}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\right.\right.$$

$$\left.\left.\frac{ce^{-\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)-e^{-g(\nu-2s)}\right.$$

$$\left.\left(-\frac{4e^{g(\nu-2s)}\cosh\left(g(\nu-2s)+c\sqrt{z}\,(\nu-2s)+dz\right)}{d}+\frac{ce^{2g(\nu-2s)-\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(\nu-2s)}{2\sqrt{d}}\right)}{d^{3/2}}-\right.\right.$$

$$\left.\left.\frac{ce^{\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(\nu-2s)}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh(d\,z+e)\cosh^{\nu}\left(c\,z^{r}+g\right)$

01.20.21.4076.01

$$\int \sinh(e+d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu}\cosh(e+d\,z)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{d} +$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{d^2}{8cs-4c\nu}+e+g(\nu-2s)}\operatorname{erfi}\left(\frac{d-2c(2s-\nu)z}{2\sqrt{c(\nu-2s)}}\right)}{\sqrt{c(\nu-2s)}}+\frac{e^{-\frac{d^2}{8cs-4c\nu}-e+g(2s-\nu)}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{2c(2s-\nu)z-d}{2\sqrt{2cs-c\nu}}\right)}{c(\nu-2s)}+\right.$$

$$\frac{1}{2cs-c\nu}\left(e^{-\frac{d^2}{4c\nu-8cs}-e+g(\nu-2s)}\left(\sqrt{c\nu-2cs}\,\operatorname{erfi}\left(\frac{-d-2c(2s-\nu)z}{2\sqrt{c\nu-2cs}}\right)+\right.\right.$$

$$\left.\left.\left.e^{2\left(\frac{d^2}{4c\nu-8cs}+e+g(2s-\nu)\right)}\sqrt{2cs-c\nu}\,\operatorname{erfi}\left(\frac{d+2c(2s-\nu)z}{2\sqrt{2cs-c\nu}}\right)\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4077.01

$$\int \sinh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(e+d\,z)(1-\nu \bmod 2)}{d}+2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e-g(\nu-2s)}\left(\frac{4e^{g(\nu-2s)-e}\cosh\left(e+(2s-\nu)\left(\sqrt{z}\;c+g\right)+d\,z\right)}{d}+\right.\right.$$

$$\left.\frac{c\,e^{\frac{c^2(\nu-2s)^2}{4d}+2(g(\nu-2s)-e)}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{c\,e^{-\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)-$$

$$e^{-e-g(\nu-2s)}\left(-\frac{4e^{e+g(\nu-2s)}\cosh\left(e+g(\nu-2s)+d\,z-c(2s-\nu)\sqrt{z}\right)}{d}+\right.$$

$$\frac{c\,e^{2(e+g(\nu-2s))-\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(\nu-2s)}{2\sqrt{d}}\right)}{d^{3/2}}-$$

$$\left.\left.\frac{c\,e^{\frac{c^2(\nu-2s)^2}{4d}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{2\sqrt{z}\,d+c(\nu-2s)}{2\sqrt{-d}}\right)}{(-d)^{3/2}}\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.4078.01

$$\int \sinh(b\,z^r)\cosh^v(c\,z^r+g)\,dz == 2^{-v-1}\,z\left(\frac{\binom{v}{\frac{v}{2}}\left((-b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-b\,z^r\right)-(b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b\,z^r\right)\right)(v \bmod 2-1)}{r}-\right.$$

$$\frac{1}{r}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-2\,g\,s-g\,v}\binom{v}{s}\left(e^{2\,g\,v}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,s-c\,v)\,z^r\right)((-b+2\,c\,s-c\,v)\,z^r)^{-1/r}+\right.$$

$$e^{4\,g\,s}\left(((-b-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,s+c\,v)\,z^r\right)-((b-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2\,c\,s+c\,v)\,z^r\right)\right)-$$

$$\left.\left.e^{2\,g\,v}\,((b+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2\,c\,s-c\,v)\,z^r\right)\right)\right/;\ v\in\mathbb{N}^+$$

01.20.21.4079.01

$$\int \sinh\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz == \frac{2^{-v-2}\,\sqrt{\pi}\,\binom{v}{\frac{v}{2}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)+\sqrt{b}\ \operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-v \bmod 2)}{b}+$$

$$2^{-v-2}\,\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{g\,(2\,s-v)}\,\sqrt{-b+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z-2\,b\,z}{2\,\sqrt{-b+2\,c\,s-c\,v}}\right)}{b+c\,(v-2\,s)}+\right.$$

$$\frac{1}{b+2\,c\,s-c\,v}\left(e^{g\,(v-2\,s)}\left(\sqrt{-b-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{-2\,b\,z-2\,c\,(2\,s-v)\,z}{2\,\sqrt{-b-2\,c\,s+c\,v}}\right)+\right.\right.$$

$$\left.\left.\left.e^{2\,g\,(2\,s-v)}\,\sqrt{b+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,b\,z+2\,c\,(2\,s-v)\,z}{2\,\sqrt{b+2\,c\,s-c\,v}}\right)\right)\right)+\frac{e^{g\,(v-2\,s)}\,\operatorname{erfi}\left(\frac{2\,b\,z-2\,c\,(2\,s-v)\,z}{2\,\sqrt{b+c\,(v-2\,s)}}\right)}{\sqrt{b+c\,(v-2\,s)}}\right)\Bigg/;\ v\in\mathbb{N}^+$$

01.20.21.4080.01

$$\int \sinh\left(b\,\sqrt{z}\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz ==$$

$$\frac{2^{1-v}\,\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(b\,\sqrt{z}\,\cosh\left(b\,\sqrt{z}\right)-\sinh\left(b\,\sqrt{z}\right)\right)}{b^2}-2^{1-v}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(-b+2\,c\,s-c\,v)^2}\right.$$

$$\left(\left(-b+2\,c\,s-c\,v\right)\sqrt{z}\,\cosh\left(2\,g\,s-g\,v+\left(-b+2\,c\,s-c\,v\right)\sqrt{z}\right)-\sinh\left(2\,g\,s-g\,v+\left(-b+2\,c\,s-c\,v\right)\sqrt{z}\right)\right)+$$

$$\frac{1}{(-b-2\,c\,s+c\,v)^2}\left(\left(-b-2\,c\,s+c\,v\right)\sqrt{z}\,\cosh\left(2\,g\,s-g\,v-\left(-b-2\,c\,s+c\,v\right)\sqrt{z}\right)+\right.$$

$$\left.\left.\sinh\left(2\,g\,s-g\,v-\left(-b-2\,c\,s+c\,v\right)\sqrt{z}\right)\right)\right/;\ v\in\mathbb{N}^+$$

Involving $\sinh(b\,z^r+e)\cosh^v(c\,z^r+g)$

01.20.21.4081.01

$$\int \sinh(b\,z^r+e)\cosh^v(c\,z^r+g)\,dz == 2^{-v-1}\,z\left(\frac{e^{-e}\binom{v}{\frac{v}{2}}\left(e^{2e}(-b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},-b\,z^r\right)-(b\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},b\,z^r\right)\right)(v \bmod 2-1)}{r}-\right.$$

$$\frac{1}{r}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-e-2gs-gv}\binom{v}{s}\left(e^{2e+2gv}\,\Gamma\left(\frac{1}{r},(-b+2cs-cv)z^r\right)((-b+2cs-cv)z^r)^{-1/r}+e^{4gs}\right.$$

$$\left(e^{2e}((-b-2cs+cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-2cs+cv)z^r\right)-((b-2cs+cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b-2cs+cv)z^r\right)\right)-$$

$$\left.\left.e^{2gv}((b+2cs-cv)z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(b+2cs-cv)z^r\right)\right)\right/;\ v\in\mathbb{N}^+$$

01.20.21.4082.01

$$\int \sinh\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+g\right)dz == 2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{g(2s-v)-e}\sqrt{-b+2cs-cv}\ \operatorname{erfi}\left(\frac{2c(2s-v)z-2bz}{2\sqrt{-b+2cs-cv}}\right)}{b+c(v-2s)}+\right.$$

$$\frac{1}{b+2cs-cv}\left(e^{g(v-2s)-e}\left(\sqrt{-b-2cs+cv}\ \operatorname{erfi}\left(\frac{-2bz-2c(2s-v)z}{2\sqrt{-b-2cs+cv}}\right)+\right.\right.$$

$$\left.\left.e^{2(e+g(2s-v))}\sqrt{b+2cs-cv}\ \operatorname{erfi}\left(\frac{2bz+2c(2s-v)z}{2\sqrt{b+2cs-cv}}\right)\right)+\frac{e^{e+g(v-2s)}\operatorname{erfi}\left(\frac{2bz-2c(2s-v)z}{2\sqrt{b+c(v-2s)}}\right)}{\sqrt{b+c(v-2s)}}\right)+$$

$$\left.\frac{2^{-v-2}\,e^{-e}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)+\sqrt{b}\ e^{2e}\operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-v \bmod 2)}{b}\right/;\ v\in\mathbb{N}^+$$

01.20.21.4083.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz == \frac{i\,2^{1-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(i\sinh\left(\sqrt{z}\ b+e\right)-i\,b\sqrt{z}\ \cosh\left(\sqrt{z}\ b+e\right)\right)}{b^2} -$$

$$2^{1-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(-b-2\,c\,s+c\,\nu)^2}\left((-b-2\,c\,s+c\,\nu)\sqrt{z}\ \cosh\left(e+2\,g\,s-g\,\nu-(-b-2\,c\,s+c\,\nu)\sqrt{z}\right)+\right.\right.$$
$$\left.\sinh\left(e+2\,g\,s-g\,\nu-(-b-2\,c\,s+c\,\nu)\sqrt{z}\right)\right)+\frac{1}{(-b+2\,c\,s-c\,\nu)^2}\left((-b+2\,c\,s-c\,\nu)\sqrt{z}\right.$$
$$\left.\left.\cosh\left(e-2\,g\,s+g\,\nu-(-b+2\,c\,s-c\,\nu)\sqrt{z}\right)+\sinh\left(e-2\,g\,s+g\,\nu-(-b+2\,c\,s-c\,\nu)\sqrt{z}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.4084.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz == \frac{2^{-\nu-2}\,e^{-\frac{d^2}{4b}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\ \operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right)+\sqrt{-b}\ e^{\frac{d^2}{2b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\ (d+2\,b\,z)}{2\,b}\right)\right)(1-\nu \bmod 2)}{b}+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{g(2s-\nu)-\frac{d^2}{-4b+8cs-4c\nu}}\sqrt{-b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{-d-2bz+2c(2s-\nu)z}{2\sqrt{-b+2cs-c\nu}}\right)}{b+c(\nu-2s)}+\frac{1}{b+2cs-c\nu}\left(e^{g(\nu-2s)-\frac{d^2}{-4b-8cs+4c\nu}}\right.\right.$$
$$\left(\sqrt{-b-2cs+c\nu}\ \operatorname{erfi}\left(\frac{-d-2bz-2c(2s-\nu)z}{2\sqrt{-b-2cs+c\nu}}\right)+e^{2\left(\frac{d^2}{-4b-8cs+4c\nu}+g(2s-\nu)\right)}\sqrt{b+2cs-c\nu}\right.$$
$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+2bz+2c(2s-\nu)z}{2\sqrt{b+2cs-c\nu}}\right)\right)\right)+\frac{e^{\frac{d^2}{-4b+8cs-4c\nu}+g(\nu-2s)}\operatorname{erfi}\left(\frac{d+2bz-2c(2s-\nu)z}{2\sqrt{b+c(\nu-2s)}}\right)}{\sqrt{b+c(\nu-2s)}}\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4085.01

$$\int \sinh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}\left(\sqrt{z}\ c + g\right) dz ==$$

$$2^{-\nu-2}\left(\frac{4\cosh\left(\sqrt{z}\ b + d\,z\right)}{d} + \frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} - \frac{b\,e^{-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2) +$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-g\,(\nu-2\,s)}\left(\frac{4\,e^{g\,(\nu-2\,s)}\cosh\left(2\,g\,s - g\,\nu + d\,z + (b + 2\,c\,s - c\,\nu)\sqrt{z}\right)}{d} + \right.\right.$$

$$\frac{e^{\frac{(c\,(\nu-2\,s)-b)^2}{4\,d}+2\,g\,(\nu-2\,s)}\sqrt{\pi}\ (c\,(\nu-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)-2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} -$$

$$\left.\left.\frac{e^{-\frac{(b-c\,(\nu-2\,s))^2}{4\,d}}\sqrt{\pi}\ (c\,(\nu-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)-2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right) -\right.$$

$$e^{-g\,(\nu-2\,s)}\left(-\frac{4\,e^{g\,(\nu-2\,s)}\cosh\left(g\,(\nu-2\,s) + d\,z + (b - 2\,c\,s + c\,\nu)\sqrt{z}\right)}{d} - \right.$$

$$\frac{e^{\frac{(-b-c\,(\nu-2\,s))^2}{4\,d}}\sqrt{\pi}\ (b + c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}} +$$

$$\left.\left.\left.\frac{e^{2\,g\,(\nu-2\,s)-\frac{(b+c\,(\nu-2\,s))^2}{4\,d}}\sqrt{\pi}\ (b + c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\right)\right) /;\ \nu \in \mathbb{N}^+$$

Involving $\sinh\left(b\,z^r + d\,z + e\right)\cosh^{\nu}\left(c\,z^r + g\right)$

01.20.21.4086.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$\frac{1}{b}\left(2^{-\nu-2}\,e^{-\frac{d^2}{4\,b}-e}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\;e^{2\,e}\,\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\,\sqrt{b}}\right)+\sqrt{-b}\;e^{\frac{d^2}{2\,b}}\,\operatorname{erfi}\left(\frac{\sqrt{-b}\;(d+2\,b\,z)}{2\,b}\right)\right)(1-\nu \bmod 2)\right)+2^{-\nu-2}\,\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}-e+g\,(2\,s-\nu)}\,\sqrt{-b+2\,c\,s-c\,\nu}\;\operatorname{erfi}\left(\frac{-d-2\,b\,z+2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{-b+2\,c\,s-c\,\nu}}\right)}{b+c\,(\nu-2\,s)}+\frac{1}{b+2\,c\,s-c\,\nu}\left(e^{-\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}-e+g\,(\nu-2\,s)}\right.\right.$$

$$\left(\sqrt{-b-2\,c\,s+c\,\nu}\;\operatorname{erfi}\left(\frac{-d-2\,b\,z-2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{-b-2\,c\,s+c\,\nu}}\right)+e^{2\left(\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}+e+g\,(2\,s-\nu)\right)}\,\sqrt{b+2\,c\,s-c\,\nu}\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+2\,b\,z+2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{b+2\,c\,s-c\,\nu}}\right)\right)\right)+\frac{e^{\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}+e+g\,(\nu-2\,s)}\,\operatorname{erfi}\left(\frac{d+2\,b\,z-2\,c\,(2\,s-\nu)\,z}{2\,\sqrt{b+c\,(\nu-2\,s)}}\right)}{\sqrt{b+c\,(\nu-2\,s)}}\right)/;\;\nu\in\mathbb{N}^{+}$$

01.20.21.4087.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-\nu-2}\left(\frac{4\,e^{e}\cosh\left(\sqrt{z}\ b+e+d\,z\right)}{d}+\frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{2e-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{-e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e-g(\nu-2s)}\left(\frac{4\,e^{g(\nu-2s)-e}\cosh\left(e+2gs-g\nu+dz+(b+2cs-c\nu)\sqrt{z}\right)}{d}+\right.\right.$$

$$\frac{e^{\frac{(c(\nu-2s)-b)^2}{4d}+2(g(\nu-2s)-e)}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)-2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-$$

$$\left.\left.\frac{e^{-\frac{(b-c(\nu-2s))^2}{4d}}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)-2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)-\right.$$

$$e^{-e-g(\nu-2s)}\left(-\frac{4\,e^{e+g(\nu-2s)}\cosh\left(e+g(\nu-2s)+dz+(b-2cs+c\nu)\sqrt{z}\right)}{d}-\right.$$

$$\frac{e^{\frac{(-b-c(\nu-2s))^2}{4d}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}+$$

$$\left.\left.\left.\frac{e^{2(e+g(\nu-2s))-\frac{(b+c(\nu-2s))^2}{4d}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh(d\,z)\cosh^{\nu}\left(c\,z^{r}+f\,z\right)$

01.20.21.4088.01

$$\int \sinh(d\,z)\cosh^{v}\left(c\,z^2+f\,z\right)dz == \frac{2^{-v}\binom{v}{\frac{v}{2}}\cosh(d\,z)\,(1-v \bmod 2)}{d} +$$

$$2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(d-2fs+fv)^2}{8cs-4cv}}\operatorname{erfi}\left(\frac{d-(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)}{\sqrt{c(v-2s)}}+\frac{e^{-\frac{(d-2fs+fv)^2}{8cs-4cv}}\sqrt{2cs-cv}\,\operatorname{erfi}\left(\frac{(2s-v)(f+2cz)-d}{2\sqrt{2cs-cv}}\right)}{c(v-2s)}+\right.$$

$$\frac{1}{2cs-cv}\left(e^{-\frac{(f(v-2s)-d)^2}{4cv-8cs}}\left(\sqrt{cv-2cs}\,\operatorname{erfi}\left(\frac{-d-(2s-v)(f+2cz)}{2\sqrt{cv-2cs}}\right)+\right.\right.$$

$$\left.\left.\left.e^{\frac{(-d-2fs+fv)^2}{2cv-4cs}}\sqrt{2cs-cv}\,\operatorname{erfi}\left(\frac{d+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)\right)\right)\Bigg/;\ v\in\mathbb{N}^+$$

01.20.21.4089.01

$$\int \sinh(d\,z)\cosh^{v}\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$\frac{2^{-v}\binom{v}{\frac{v}{2}}\cosh(d\,z)\,(1-v \bmod 2)}{d}+2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{c\,e^{-\frac{c^2(v-2s)^2}{4(f(v-2s)-d)}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(f(v-2s)-d)\sqrt{z}}{2\sqrt{f(v-2s)-d}}\right)}{(f(v-2s)-d)^{3/2}}+\right.$$

$$\frac{c\,e^{-\frac{c^2(v-2s)^2}{4(-d-f(v-2s))}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(d+f(v-2s))\sqrt{z}}{2\sqrt{-d-f(v-2s)}}\right)}{(-d-f(v-2s))^{3/2}}-\frac{2\,e^{c\sqrt{z}\,(v-2s)+(f(v-2s)-d)z}}{f(v-2s)-d}+\frac{2\,e^{c\sqrt{z}\,(v-2s)+(d+f(v-2s))z}}{d+f(v-2s)}-$$

$$\frac{c\,e^{-\frac{c^2(v-2s)^2}{4(d+f(v-2s))}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(d+f(v-2s))\sqrt{z}}{2\sqrt{d+f(v-2s)}}\right)}{(d+f(v-2s))^{3/2}}-\frac{2\,e^{(-d-f(v-2s))z-c(v-2s)\sqrt{z}}}{-d-f(v-2s)}+$$

$$\left.\frac{2\,e^{(d-f(v-2s))z-c(v-2s)\sqrt{z}}}{d-f(v-2s)}-\frac{c\,e^{-\frac{c^2(v-2s)^2}{4(d-f(v-2s))}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(f(v-2s)-d)\sqrt{z}}{2\sqrt{d-f(v-2s)}}\right)}{(d-f(v-2s))^{3/2}}\right)\Bigg/;\ v\in\mathbb{N}^+$$

Involving $\sinh(d\,z+e)\cosh^{v}\left(c\,z^{r}+f\,z\right)$

01.20.21.4090.01

$$\int \sinh(e+d\,z)\cosh^{v}\left(c\,z^2+f\,z\right)dz == \frac{2^{-v}\binom{v}{\frac{v}{2}}\cosh(e+d\,z)\,(1-v \bmod 2)}{d} +$$

$$2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(d-2fs+fv)^2}{8cs-4cv}+e}\,\text{erfi}\left(\frac{d-(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)}{\sqrt{c(v-2s)}}+\frac{e^{-\frac{(d-2fs+fv)^2}{8cs-4cv}-e}\sqrt{2cs-cv}\,\text{erfi}\left(\frac{(2s-v)(f+2cz)-d}{2\sqrt{2cs-cv}}\right)}{c(v-2s)}+\right.$$

$$\frac{1}{2cs-cv}\left(e^{-\frac{(f(v-2s)-d)^2}{4cv-8cs}-e}\left(\sqrt{cv-2cs}\,\text{erfi}\left(\frac{-d-(2s-v)(f+2cz)}{2\sqrt{cv-2cs}}\right)+\right.\right.$$

$$\left.\left.\left.e^{2\left(\frac{(-d-2fs+fv)^2}{4cv-8cs}+e\right)}\sqrt{2cs-cv}\,\text{erfi}\left(\frac{d+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)\right)\right)\right/;\ v\in\mathbb{N}^{+}$$

01.20.21.4091.01

$$\int \sinh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz ==$$

$$\frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(e+d\,z)\,(1-\nu \bmod 2)}{d}+2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\left(\frac{4\,e^{-e}\cosh\left(e+(d+2\,f\,s-f\,\nu)\,z+c\,(2\,s-\nu)\,\sqrt{z}\right)}{d+2\,f\,s-f\,\nu}+\right.\right.$$

$$\frac{c\,e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(f\,(\nu-2\,s)-d)}-2\,e}\,\sqrt{\pi}\;(\nu-2\,s)\,\operatorname{erfi}\left(\frac{c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\,\sqrt{z}}{2\,\sqrt{f\,(\nu-2\,s)-d}}\right)}{(f\,(\nu-2\,s)-d)^{3/2}}-$$

$$\left.\frac{c\,e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(d-f\,(\nu-2\,s))}}\,\sqrt{\pi}\;(\nu-2\,s)\,\operatorname{erfi}\left(\frac{c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\,\sqrt{z}}{2\,\sqrt{d-f\,(\nu-2\,s)}}\right)}{(d-f\,(\nu-2\,s))^{3/2}}\right)-$$

$$e^{-e}\left(-\frac{4\,e^{e}\cosh\left(e+(d-2\,f\,s+f\,\nu)\,z-c\,(2\,s-\nu)\,\sqrt{z}\right)}{d+f\,(\nu-2\,s)}+\right.$$

$$\frac{c\,e^{2\,e-\frac{c^2\,(\nu-2\,s)^2}{4\,(d+f\,(\nu-2\,s))}}\,\sqrt{\pi}\;(\nu-2\,s)\,\operatorname{erfi}\left(\frac{c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}}{2\,\sqrt{d+f\,(\nu-2\,s)}}\right)}{(d+f\,(\nu-2\,s))^{3/2}}-$$

$$\left.\left.\frac{c\,e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,(-d-f\,(\nu-2\,s))}}\,\sqrt{\pi}\;(\nu-2\,s)\,\operatorname{erfi}\left(\frac{c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\,\sqrt{z}}{2\,\sqrt{-d-f\,(\nu-2\,s)}}\right)}{(-d-f\,(\nu-2\,s))^{3/2}}\right)\right);\;\nu\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r}\right)\cosh^{\nu}\left(c\,z^{r}+f\,z\right)$

01.20.21.4092.01

$$\int \sinh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-2}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\,\operatorname{erfi}\left(\sqrt{-b}\,z\right)+\sqrt{b}\,\operatorname{erfi}\left(\sqrt{b}\,z\right)\right)(1-\nu \bmod 2)}{b}+$$

$$2^{-\nu-2}\,\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}}\,\sqrt{-b+2cs-c\nu}\,\operatorname{erfi}\left(\frac{(2s-\nu)(f+2cz)-2bz}{2\sqrt{-b+2cs-c\nu}}\right)}{b+c(\nu-2s)}+\right.$$

$$\frac{1}{b+2cs-c\nu}\left(e^{-\frac{f^2(\nu-2s)^2}{-4b-8cs+4c\nu}}\left(\sqrt{-b-2cs+c\nu}\,\operatorname{erfi}\left(\frac{-2bz-(2s-\nu)(f+2cz)}{2\sqrt{-b-2cs+c\nu}}\right)+e^{\frac{(f\nu-2fs)^2}{-2b-4cs+2c\nu}}\right.\right.$$

$$\left.\left.\left.\sqrt{b+2cs-c\nu}\,\operatorname{erfi}\left(\frac{2bz+(2s-\nu)(f+2cz)}{2\sqrt{b+2cs-c\nu}}\right)\right)\right)+\left.\frac{e^{\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}}\operatorname{erfi}\left(\frac{2bz-(2s-\nu)(f+2cz)}{2\sqrt{b+c(\nu-2s)}}\right)}{\sqrt{b+c(\nu-2s)}}\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.4093.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz == \frac{2^{-\nu}\,e^{-b\sqrt{z}}\left(\sqrt{z}\,b+e^{2b\sqrt{z}}\left(b\sqrt{z}-1\right)+1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{(-b-c(\nu-2s))^2}{4f(\nu-2s)}}\,\sqrt{\pi}\,(b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}+\right.$$

$$\frac{e^{-\frac{(c(\nu-2s)-b)^2}{4f(\nu-2s)}}\,\sqrt{\pi}\,(c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-$$

$$\frac{2\,e^{\sqrt{z}\,(c(\nu-2s)-b)+f(\nu-2s)z}}{f(\nu-2s)}+\frac{2\,e^{\sqrt{z}\,(b+c(\nu-2s))+f(\nu-2s)z}}{f(\nu-2s)}+\frac{2\,e^{(-b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-$$

$$\frac{2\,e^{(b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-\frac{e^{\frac{(b-c(\nu-2s))^2}{4f(\nu-2s)}}\,\sqrt{\pi}\,(c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}-$$

$$\left.\frac{e^{-\frac{(b+c(\nu-2s))^2}{4f(\nu-2s)}}\,\sqrt{\pi}\,(b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r+e\right)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.4094.01

$$\int \sinh\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-2}\,e^{-e}\,\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)+\sqrt{b}\ e^{2e}\operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-\nu \bmod 2)}{b}+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}-e}\sqrt{-b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{(2s-\nu)(f+2cz)-2bz}{2\sqrt{-b+2cs-c\nu}}\right)}{b+c(\nu-2s)}+\right.$$

$$\frac{1}{b+2cs-c\nu}\left(e^{-\frac{f^2(\nu-2s)^2}{-4b-8cs+4c\nu}-e}\left(\sqrt{-b-2cs+c\nu}\ \operatorname{erfi}\left(\frac{-2bz-(2s-\nu)(f+2cz)}{2\sqrt{-b-2cs+c\nu}}\right)+e^{2\left(\frac{(f\nu-2fs)^2}{-4b-8cs+4c\nu}+e\right)}\right.\right.$$

$$\left.\left.\left.\sqrt{b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{2bz+(2s-\nu)(f+2cz)}{2\sqrt{b+2cs-c\nu}}\right)\right)\right)+\left.\frac{e^{\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}+e}\operatorname{erfi}\left(\frac{2bz-(2s-\nu)(f+2cz)}{2\sqrt{b+c(\nu-2s)}}\right)}{\sqrt{b+c(\nu-2s)}}\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.4095.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz == \frac{2^{-\nu}\,e^{-\sqrt{z}\ b-e}\left(\sqrt{z}\ b+e^{2\left(\sqrt{z}\ b+e\right)}\left(b\sqrt{z}-1\right)+1\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\left(\frac{e^{-\frac{(c(\nu-2s)-b)^2}{4f(\nu-2s)}-2e}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-\frac{2e^{-2e+f(\nu-2s)z+(c(\nu-2s)-b)\sqrt{z}}}{f(\nu-2s)}-\right.\right.$$

$$\left.\left.\frac{2e^{(b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-\frac{e^{\frac{(b-c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)-\right.$$

$$e^{-e}\left(\frac{e^{2e-\frac{(b+c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-\frac{2e^{2e+f(\nu-2s)z+(b+c(\nu-2s))\sqrt{z}}}{f(\nu-2s)}-\right.$$

$$\left.\left.\left.\frac{2e^{(-b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-\frac{e^{\frac{(-b-c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+f\,z\right)$

01.20.21.4096.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == \frac{2^{-\nu-2}\,e^{-\frac{d^2}{4b}}\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\left(\sqrt{b}\,\operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)+\sqrt{-b}\,e^{\frac{d^2}{2b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\,(d+2bz)}{2b}\right)\right)(1-\nu \bmod 2)}{b}+$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{(d-2fs+fv)^2}{-4b+8cs-4cv}}\sqrt{-b+2cs-cv}\,\operatorname{erfi}\left(\frac{-d-2bz+(2s-v)(f+2cz)}{2\sqrt{-b+2cs-cv}}\right)}{b+c(v-2s)}+\frac{1}{b+2cs-cv}\right.$$

$$\left(e^{-\frac{(f(v-2s)-d)^2}{-4b-8cs+4cv}}\left(\sqrt{-b-2cs+cv}\,\operatorname{erfi}\left(\frac{-d-2bz-(2s-v)(f+2cz)}{2\sqrt{-b-2cs+cv}}\right)+e^{\frac{(-d-2fs+fv)^2}{-2b-4cs+2cv}}\sqrt{b+2cs-cv}\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+2bz+(2s-v)(f+2cz)}{2\sqrt{b+2cs-cv}}\right)\right)\right)+\left.\frac{e^{\frac{(d-2fs+fv)^2}{-4b+8cs-4cv}}\operatorname{erfi}\left(\frac{d+2bz-(2s-v)(f+2cz)}{2\sqrt{b+c(v-2s)}}\right)}{\sqrt{b+c(v-2s)}}\right)\Big/;\ v\in\mathbb{N}^+$$

01.20.21.4097.01

$$\int \sinh\left(\sqrt{z}\,b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(\frac{2\,e^{-dz-b\sqrt{z}}\left(1+e^{2\left(\sqrt{z}\,b+dz\right)}\right)}{d}+\frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4d}}\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b+2d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{(c(v-2s)-b)^2}{4(f(v-2s)-d)}}\sqrt{\pi}\,(c(v-2s)-b)\operatorname{erfi}\left(\frac{-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}}{2\sqrt{f(v-2s)-d}}\right)}{(f(v-2s)-d)^{3/2}}+\right.$$

$$\frac{e^{-\frac{(-b-c(v-2s))^2}{4(-d-f(v-2s))}}\sqrt{\pi}\,(b+c(v-2s))\operatorname{erfi}\left(\frac{b+c(v-2s)+2(d+f(v-2s))\sqrt{z}}{2\sqrt{-d-f(v-2s)}}\right)}{(-d-f(v-2s))^{3/2}}-\frac{2\,e^{\sqrt{z}\,(c(v-2s)-b)+(f(v-2s)-d)z}}{f(v-2s)-d}+$$

$$\frac{2\,e^{\sqrt{z}\,(b+c(v-2s))+(d+f(v-2s))z}}{d+f(v-2s)}-\frac{e^{-\frac{(b+c(v-2s))^2}{4(d+f(v-2s))}}\sqrt{\pi}\,(b+c(v-2s))\operatorname{erfi}\left(\frac{b+c(v-2s)+2(d+f(v-2s))\sqrt{z}}{2\sqrt{d+f(v-2s)}}\right)}{(d+f(v-2s))^{3/2}}-$$

$$\frac{2\,e^{\sqrt{z}\,(-b-c(v-2s))+(-d-f(v-2s))z}}{-d-f(v-2s)}+\frac{2\,e^{\sqrt{z}\,(b-c(v-2s))+(d-f(v-2s))z}}{d-f(v-2s)}-$$

$$\left.\frac{e^{-\frac{(b-c(v-2s))^2}{4(d-f(v-2s))}}\sqrt{\pi}\,(c(v-2s)-b)\operatorname{erfi}\left(\frac{-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}}{2\sqrt{d-f(v-2s)}}\right)}{(d-f(v-2s))^{3/2}}\right)\Big/;\ v\in\mathbb{N}^+$$

Involving $\sinh(b\,z^r + d\,z + e)\cosh^v(c\,z^r + f\,z)$

01.20.21.4098.01

$$\int \sinh(b\,z^2 + d\,z + e)\cosh^v(c\,z^2 + f\,z)\,dz ==$$

$$\frac{1}{b}\left(2^{-v-2}\,e^{-\frac{d^2}{4b}-e}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\sqrt{b}\;e^{2e}\,\text{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)+\sqrt{-b}\;e^{\frac{d^2}{2b}}\,\text{erfi}\left(\frac{\sqrt{-b}\;(d+2bz)}{2b}\right)\right)(1-v \bmod 2)\right)+$$

$$2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{-\frac{(d-2fs+fv)^2}{-4b+8cs-4cv}-e}\sqrt{-b+2cs-cv}\;\text{erfi}\left(\frac{-d-2bz+(2s-v)(f+2cz)}{2\sqrt{-b+2cs-cv}}\right)}{b+c(v-2s)}+\frac{1}{b+2cs-cv}\right.$$

$$\left(e^{-\frac{(f(v-2s)-d)^2}{-4b-8cs+4cv}-e}\left(\sqrt{-b-2cs+cv}\;\text{erfi}\left(\frac{-d-2bz-(2s-v)(f+2cz)}{2\sqrt{-b-2cs+cv}}\right)+e^{2\left(\frac{(-d-2fs+fv)^2}{-4b-8cs+4cv}+e\right)}\sqrt{b+2cs-cv}\right.\right.$$

$$\left.\left.\text{erfi}\left(\frac{d+2bz+(2s-v)(f+2cz)}{2\sqrt{b+2cs-cv}}\right)\right)\right)+\left.\frac{e^{\frac{(d-2fs+fv)^2}{-4b+8cs-4cv}+e}\,\text{erfi}\left(\frac{d+2bz-(2s-v)(f+2cz)}{2\sqrt{b+c(v-2s)}}\right)}{\sqrt{b+c(v-2s)}}\right);\ v\in\mathbb{N}^+$$

01.20.21.4099.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(\frac{2\,e^{-d\,z-b\sqrt{z}}\left(1+e^{2\left(\sqrt{z}\ b+e+d\,z\right)}\right)}{d}+\frac{b\,e^{\frac{b^2}{4\,d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{2\,e-\frac{b^2}{4\,d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{-e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\left(\frac{e^{-\frac{(c\,(\nu-2\,s)-b)^2}{4\,(f\,(\nu-2\,s)-d)}-2\,e}\sqrt{\pi}\ (c\,(\nu-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\sqrt{z}}{2\sqrt{f\,(\nu-2\,s)-d}}\right)}{(f\,(\nu-2\,s)-d)^{3/2}}-\frac{2\,e^{-2\,e+(f\,(\nu-2\,s)-d)\,z+(c\,(\nu-2\,s)-b)\sqrt{z}}}{f\,(\nu-2\,s)-d}+\right.\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b-c\,(\nu-2\,s))+(d-f\,(\nu-2\,s))\,z}}{d-f\,(\nu-2\,s)}-\frac{e^{-\frac{(b-c\,(\nu-2\,s))^2}{4\,(d-f\,(\nu-2\,s))}}\sqrt{\pi}\ (c\,(\nu-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\sqrt{z}}{2\sqrt{d-f\,(\nu-2\,s)}}\right)}{(d-f\,(\nu-2\,s))^{3/2}}\right)-$$

$$e^{-e}\left(\frac{e^{2\,e-\frac{(b+c\,(\nu-2\,s))^2}{4\,(d+f\,(\nu-2\,s))}}\sqrt{\pi}\ (b+c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\sqrt{z}}{2\sqrt{d+f\,(\nu-2\,s)}}\right)}{(d+f\,(\nu-2\,s))^{3/2}}-\right.$$

$$\frac{2\,e^{2\,e+(d+f\,(\nu-2\,s))\,z+(b+c\,(\nu-2\,s))\sqrt{z}}}{d+f\,(\nu-2\,s)}+\frac{2\,e^{\sqrt{z}\ (-b-c\,(\nu-2\,s))+(-d-f\,(\nu-2\,s))\,z}}{-d-f\,(\nu-2\,s)}-$$

$$\left.\left.\frac{e^{-\frac{(-b-c\,(\nu-2\,s))^2}{4\,(-d-f\,(\nu-2\,s))}}\sqrt{\pi}\ (b+c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\sqrt{z}}{2\sqrt{-d-f\,(\nu-2\,s)}}\right)}{(-d-f\,(\nu-2\,s))^{3/2}}\right)\right);\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh(d\,z)\cosh^{\nu}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.4100.01

$$\int \sinh(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{(d-2fs+fv)^2}{8cs-4cv}+g(\nu-2s)}\operatorname{erfi}\left(\frac{d-(2s-\nu)(f+2cz)}{2\sqrt{c(\nu-2s)}}\right)}{\sqrt{c(\nu-2s)}}+\frac{e^{g(2s-\nu)-\frac{(d-2fs+fv)^2}{8cs-4cv}}\sqrt{2cs-cv}\,\operatorname{erfi}\left(\frac{(2s-\nu)(f+2cz)-d}{2\sqrt{2cs-cv}}\right)}{c(\nu-2s)}+\right.$$

$$\left.\frac{1}{2cs-cv}\left(e^{g(\nu-2s)-\frac{(f(\nu-2s)-d)^2}{4cv-8cs}}\left(\sqrt{cv-2cs}\,\operatorname{erfi}\left(\frac{-d-(2s-\nu)(f+2cz)}{2\sqrt{cv-2cs}}\right)+e^{2\left(\frac{(-d-2fs+fv)^2}{4cv-8cs}+g(2s-\nu)\right)}\right.\right.\right.$$

$$\left.\left.\left.\sqrt{2cs-cv}\,\operatorname{erfi}\left(\frac{d+(2s-\nu)(f+2cz)}{2\sqrt{2cs-cv}}\right)\right)\right)\right)-\frac{2^{-\nu}\cosh(d\,z)\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)}{d}\;/;\;\nu\in\mathbb{N}^+$$

01.20.21.4101.01

$$\int \sinh(d\,z)\cosh^{\nu}\left(\sqrt{z}\,c+g+f\,z\right)dz == \frac{2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\cosh(d\,z)(1-\nu \bmod 2)}{d}+2^{-\nu-2}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-g(\nu-2s)}\left(\frac{c\,e^{2g(\nu-2s)-\frac{c^2(\nu-2s)^2}{4(f(\nu-2s)-d)}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)+2(f(\nu-2s)-d)\sqrt{z}}{2\sqrt{f(\nu-2s)-d}}\right)}{(f(\nu-2s)-d)^{3/2}}-\frac{2e^{2g(\nu-2s)+c\sqrt{z}(\nu-2s)+(f(\nu-2s)-d)z}}{f(\nu-2s)-d}+\right.\right.$$

$$\left.\left.\frac{2e^{(d-f(\nu-2s))z-c(\nu-2s)\sqrt{z}}}{d-f(\nu-2s)}-\frac{c\,e^{-\frac{c^2(\nu-2s)^2}{4(d-f(\nu-2s))}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)+2(f(\nu-2s)-d)\sqrt{z}}{2\sqrt{d-f(\nu-2s)}}\right)}{(d-f(\nu-2s))^{3/2}}\right)-\right.$$

$$e^{-g(\nu-2s)}\left(\frac{c\,e^{2g(\nu-2s)-\frac{c^2(\nu-2s)^2}{4(d+f(\nu-2s))}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}}{2\sqrt{d+f(\nu-2s)}}\right)}{(d+f(\nu-2s))^{3/2}}-\frac{2e^{2g(\nu-2s)+c\sqrt{z}(\nu-2s)+(d+f(\nu-2s))z}}{d+f(\nu-2s)}+\right.$$

$$\left.\left.\frac{2e^{(-d-f(\nu-2s))z-c(\nu-2s)\sqrt{z}}}{-d-f(\nu-2s)}-\frac{c\,e^{-\frac{c^2(\nu-2s)^2}{4(-d-f(\nu-2s))}}\sqrt{\pi}\,(\nu-2s)\operatorname{erfi}\left(\frac{c(\nu-2s)+2(d+f(\nu-2s))\sqrt{z}}{2\sqrt{-d-f(\nu-2s)}}\right)}{(-d-f(\nu-2s))^{3/2}}\right)\right)\;/;\;\nu\in\mathbb{N}^+$$

Involving $\sinh(d\,z+e)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.4102.01

$$\int \sinh(e+d\,z)\cosh^{v}\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(d-2fs+fv)^2}{8cs-4cv}+e+g(v-2s)}\operatorname{erfi}\left(\frac{d-(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)}{\sqrt{c(v-2s)}}+\frac{e^{-\frac{(d-2fs+fv)^2}{8cs-4cv}-e+g(2s-v)}\sqrt{2cs-cv}\,\operatorname{erfi}\left(\frac{(2s-v)(f+2cz)-d}{2\sqrt{2cs-cv}}\right)}{c(v-2s)}+\right.$$

$$\frac{1}{2cs-cv}\left(e^{-\frac{(f(v-2s)-d)^2}{4cv-8cs}-e+g(v-2s)}\left(\sqrt{cv-2cs}\,\operatorname{erfi}\left(\frac{-d-(2s-v)(f+2cz)}{2\sqrt{cv-2cs}}\right)+e^{2\left(\frac{(-d-2fs+fv)^2}{4cv-8cs}+e+g(2s-v)\right)}\right.\right.$$

$$\left.\left.\left.\sqrt{2cs-cv}\,\operatorname{erfi}\left(\frac{d+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)\right)\right)\right)-\frac{2^{-v}\cosh(e+d\,z)\binom{v}{\frac{v}{2}}(v\bmod 2-1)}{d}\ /;\ v\in\mathbb{N}^{+}$$

01.20.21.4103.01

$$\int \sinh(e+d\,z)\cosh^{v}\left(\sqrt{z}\;c+g+f\,z\right)dz == \frac{2^{-v}\binom{v}{\frac{v}{2}}\cosh(e+d\,z)(1-v\bmod 2)}{d}+$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e-g(v-2s)}\left(\frac{c\,e^{2(g(v-2s)-e)-\frac{c^2(v-2s)^2}{4(f(v-2s)-d)}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(f(v-2s)-d)\sqrt{z}}{2\sqrt{f(v-2s)-d}}\right)}{(f(v-2s)-d)^{3/2}}-\right.\right.$$

$$\frac{2\,e^{c\sqrt{z}\,(v-2s)+2(g(v-2s)-e)+(f(v-2s)-d)z}}{f(v-2s)-d}+\frac{2\,e^{(d-f(v-2s))z-c(v-2s)\sqrt{z}}}{d-f(v-2s)}-$$

$$\left.\left.\frac{c\,e^{-\frac{c^2(v-2s)^2}{4(d-f(v-2s))}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(f(v-2s)-d)\sqrt{z}}{2\sqrt{d-f(v-2s)}}\right)}{(d-f(v-2s))^{3/2}}\right)-e^{-e-g(v-2s)}\right)$$

$$\left(\frac{c\,e^{2(e+g(v-2s))-\frac{c^2(v-2s)^2}{4(d+f(v-2s))}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(d+f(v-2s))\sqrt{z}}{2\sqrt{d+f(v-2s)}}\right)}{(d+f(v-2s))^{3/2}}-\frac{2\,e^{c\sqrt{z}\,(v-2s)+2(e+g(v-2s))+(d+f(v-2s))z}}{d+f(v-2s)}+\right.$$

$$\left.\left.\frac{2\,e^{(-d-f(v-2s))z-c(v-2s)\sqrt{z}}}{-d-f(v-2s)}-\frac{c\,e^{-\frac{c^2(v-2s)^2}{4(-d-f(v-2s))}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2(d+f(v-2s))\sqrt{z}}{2\sqrt{-d-f(v-2s)}}\right)}{(-d-f(v-2s))^{3/2}}\right)\right)\ /;\ v\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^{r}\right)\cosh^{v}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.4104.01

$$\int \sinh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{g(2s-\nu)-\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}}\sqrt{-b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{(2s-\nu)(f+2cz)-2bz}{2\sqrt{-b+2cs-c\nu}}\right)}{b+c(\nu-2s)}+\frac{1}{b+2cs-c\nu}\right.$$

$$\left(e^{g(\nu-2s)-\frac{f^2(\nu-2s)^2}{-4b-8cs+4c\nu}}\left(\sqrt{-b-2cs+c\nu}\ \operatorname{erfi}\left(\frac{-2bz-(2s-\nu)(f+2cz)}{2\sqrt{-b-2cs+c\nu}}\right)+e^{2\left(\frac{(f\nu-2fs)^2}{-4b-8cs+4c\nu}+g(2s-\nu)\right)}\right.\right.$$

$$\left.\left.\sqrt{b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{2bz+(2s-\nu)(f+2cz)}{2\sqrt{b+2cs-c\nu}}\right)\right)\right)+\frac{e^{\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}+g(\nu-2s)}\operatorname{erfi}\left(\frac{2bz-(2s-\nu)(f+2cz)}{2\sqrt{b+c(\nu-2s)}}\right)}{\sqrt{b+c(\nu-2s)}}\Bigg)-$$

$$\frac{2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(-\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)-\sqrt{b}\ \operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-\nu\bmod 2)}{b}\ /;\ \nu\in\mathbb{N}^+$$

01.20.21.4105.01

$$\int \sinh\left(b\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{2^{-\nu-2}e^{-b\sqrt{z}}\left(4\sqrt{z}\ b+4e^{2b\sqrt{z}}\left(b\sqrt{z}-1\right)+4\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)}{b^2}+2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(e^{-g(\nu-2s)}\left(\frac{e^{2g(\nu-2s)-\frac{(c(\nu-2s)-b)^2}{4f(\nu-2s)}}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-\frac{2e^{2g(\nu-2s)+fz(\nu-2s)+(c(\nu-2s)-b)\sqrt{z}}}{f(\nu-2s)}-\right.\right.$$

$$\left.\left.\frac{2e^{(b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-\frac{e^{\frac{(b-c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)-e^{-g(\nu-2s)}\right.$$

$$\left(\frac{e^{2g(\nu-2s)-\frac{(b+c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-\frac{2e^{2g(\nu-2s)+fz(\nu-2s)+(b+c(\nu-2s))\sqrt{z}}}{f(\nu-2s)}-\right.$$

$$\left.\left.\frac{2e^{(-b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-\frac{e^{\frac{(-b-c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)\right)\ /;\ \nu\in\mathbb{N}^+$$

Involving $\sinh(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.4106.01

$$\int \sinh\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{-\frac{(f\,v-2\,f\,s)^2}{-4\,b+8\,c\,s-4\,c\,v}-e+g\,(2\,s-v)}\sqrt{-b+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{(2\,s-v)\,(f+2\,c\,z)-2\,b\,z}{2\sqrt{-b+2\,c\,s-c\,v}}\right)}{b+c\,(v-2\,s)}+\frac{1}{b+2\,c\,s-c\,v}\right.$$

$$\left(e^{-\frac{f^2\,(v-2\,s)^2}{-4\,b-8\,c\,s+4\,c\,v}+g\,(v-2\,s)-e}\left(\sqrt{-b-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{-2\,b\,z-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{-b-2\,c\,s+c\,v}}\right)+e^{2\left(\frac{(f\,v-2\,f\,s)^2}{-4\,b-8\,c\,s+4\,c\,v}+e+g\,(2\,s-v)\right)}\right.\right.$$

$$\left.\left.\sqrt{b+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,b\,z+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{b+2\,c\,s-c\,v}}\right)\right)\right)+\left.\frac{e^{\frac{(f\,v-2\,f\,s)^2}{-4\,b+8\,c\,s-4\,c\,v}+e+g\,(v-2\,s)}\operatorname{erfi}\left(\frac{2\,b\,z-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{b+c\,(v-2\,s)}}\right)}{\sqrt{b+c\,(v-2\,s)}}\right)-$$

$$\frac{2^{-v-2}\,e^{-e}\sqrt{\pi}\left(\begin{matrix}v\\ \frac{v}{2}\end{matrix}\right)\left(-\sqrt{-b}\ \operatorname{erfi}\left(\sqrt{-b}\ z\right)-\sqrt{b}\ e^{2\,e}\operatorname{erfi}\left(\sqrt{b}\ z\right)\right)(1-v \bmod 2)}{b}\ /;\ v\in\mathbb{N}^+$$

01.20.21.4107.01

$$\int \sinh\left(\sqrt{z}\ b+e\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\ z\right)dz ==$$

$$\frac{2^{-\nu-2}\ e^{-\sqrt{z}\ b-e}\left(4\sqrt{z}\ b+4\ e^{2\left(\sqrt{z}\ b+e\right)}\left(b\sqrt{z}\ -1\right)+4\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)}{b^2}+2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(e^{e-g(\nu-2s)}\left(\frac{1}{(f(\nu-2s))^{3/2}}\left(e^{2(g(\nu-2s)-e)-\frac{(c(\nu-2s)-b)^2}{4f(\nu-2s)}}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)\right)-\right.\right.$$

$$\frac{2e^{\sqrt{z}\ (c(\nu-2s)-b)+2(g(\nu-2s)-e)+f(\nu-2s)z}}{f(\nu-2s)}-\frac{2e^{(b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-$$

$$\left.\left.\frac{e^{\frac{(b-c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (c(\nu-2s)-b)\operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)-e^{-e-g(\nu-2s)}\right.$$

$$\left(\frac{e^{2(e+g(\nu-2s))-\frac{(b+c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{f(\nu-2s)}}\right)}{(f(\nu-2s))^{3/2}}-\frac{2e^{\sqrt{z}\ (b+c(\nu-2s))+2(e+g(\nu-2s))+f(\nu-2s)z}}{f(\nu-2s)}-\right.$$

$$\left.\left.\frac{2e^{(-b-c(\nu-2s))\sqrt{z}-f(\nu-2s)z}}{f(\nu-2s)}-\frac{e^{\frac{(-b-c(\nu-2s))^2}{4f(\nu-2s)}}\sqrt{\pi}\ (b+c(\nu-2s))\operatorname{erfi}\left(\frac{b+c(\nu-2s)+2f(\nu-2s)\sqrt{z}}{2\sqrt{-f(\nu-2s)}}\right)}{(-f(\nu-2s))^{3/2}}\right)\right)/;\ \nu\in\mathbb{N}^{+}$$

Involving $\sinh\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.4108.01

$$\int \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{g(2s-\nu)-\frac{(d-2fs+f\nu)^2}{-4b+8cs-4c\nu}}\sqrt{-b+2cs-c\nu}\ \operatorname{erfi}\left(\frac{-d-2bz+(2s-\nu)(f+2cz)}{2\sqrt{-b+2cs-c\nu}}\right)}{b+c(\nu-2s)}+\frac{1}{b+2cs-c\nu}\left(e^{g(\nu-2s)-\frac{(f(\nu-2s)-d)^2}{-4b-8cs+4c\nu}}\right.\right.$$

$$\left(\sqrt{-b-2cs+c\nu}\ \operatorname{erfi}\left(\frac{-d-2bz-(2s-\nu)(f+2cz)}{2\sqrt{-b-2cs+c\nu}}\right)+e^{2\left(\frac{(-d-2fs+f\nu)^2}{-4b-8cs+4c\nu}+g(2s-\nu)\right)}\sqrt{b+2cs-c\nu}\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{d+2bz+(2s-\nu)(f+2cz)}{2\sqrt{b+2cs-c\nu}}\right)\right)\right)+\frac{e^{\frac{(d-2fs+f\nu)^2}{-4b+8cs-4c\nu}+g(\nu-2s)}\operatorname{erfi}\left(\frac{d+2bz-(2s-\nu)(f+2cz)}{2\sqrt{b+c(\nu-2s)}}\right)}{\sqrt{b+c(\nu-2s)}}\right)-$$

$$\frac{1}{b}\left(2^{-\nu-2}e^{-\frac{d^2}{4b}}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left(-\sqrt{b}\ \operatorname{erfi}\left(\frac{d+2bz}{2\sqrt{b}}\right)-\sqrt{-b}\ e^{\frac{d^2}{2b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\ (d+2bz)}{2b}\right)\right)(1-\nu \bmod 2)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4109.01

$$\int \sinh\left(\sqrt{z}\ b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(\frac{2\,e^{-d\,z-b\sqrt{z}}\left(1+e^{2\left(\sqrt{z}\ b+d\,z\right)}\right)}{d}+\frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-g\,(\nu-2\,s)}\left(\left(e^{2\,g\,(\nu-2\,s)-\frac{(c\,(\nu-2\,s)-b)^2}{4\,(f\,(\nu-2\,s)-d)}}\sqrt{\pi}\ (c\,(\nu-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\sqrt{z}}{2\sqrt{f\,(\nu-2\,s)-d}}\right)\right)\Big/\right.$$

$$(f\,(\nu-2\,s)-d)^{3/2}-\frac{2\,e^{2\,g\,(\nu-2\,s)+(f\,(\nu-2\,s)-d)\,z+(c\,(\nu-2\,s)-b)\sqrt{z}}}{f\,(\nu-2\,s)-d}+$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b-c\,(\nu-2\,s))+(d-f\,(\nu-2\,s))\,z}}{d-f\,(\nu-2\,s)}-\frac{e^{-\frac{(b-c\,(\nu-2\,s))^2}{4\,(d-f\,(\nu-2\,s))}}\sqrt{\pi}\ (c\,(\nu-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(\nu-2\,s)+2\,(f\,(\nu-2\,s)-d)\sqrt{z}}{2\sqrt{d-f\,(\nu-2\,s)}}\right)}{(d-f\,(\nu-2\,s))^{3/2}}\right)-$$

$$e^{-g\,(\nu-2\,s)}\left(\left(e^{2\,g\,(\nu-2\,s)-\frac{(b+c\,(\nu-2\,s))^2}{4\,(d+f\,(\nu-2\,s))}}\sqrt{\pi}\ (b+c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\sqrt{z}}{2\sqrt{d+f\,(\nu-2\,s)}}\right)\right)\Big/\right.$$

$$(d+f\,(\nu-2\,s))^{3/2}-\frac{2\,e^{2\,g\,(\nu-2\,s)+(d+f\,(\nu-2\,s))\,z+(b+c\,(\nu-2\,s))\sqrt{z}}}{d+f\,(\nu-2\,s)}+\frac{2\,e^{\sqrt{z}\ (-b-c\,(\nu-2\,s))+(-d-f\,(\nu-2\,s))\,z}}{-d-f\,(\nu-2\,s)}-$$

$$\left.\left.\frac{e^{-\frac{(-b-c\,(\nu-2\,s))^2}{4\,(-d-f\,(\nu-2\,s))}}\sqrt{\pi}\ (b+c\,(\nu-2\,s))\operatorname{erfi}\left(\frac{b+c\,(\nu-2\,s)+2\,(d+f\,(\nu-2\,s))\sqrt{z}}{2\sqrt{-d-f\,(\nu-2\,s)}}\right)}{(-d-f\,(\nu-2\,s))^{3/2}}\right)\right);\ \nu\in\mathbb{N}^+$$

Involving $\sinh\left(b\,z^r+d\,z+e\right)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.4110.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-\nu-\frac{1}{2}}\sqrt{\pi}\;i\left(\frac{\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(C\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{d^2}{4\,b}-e\right)-i\cosh\left(\frac{d^2}{4\,b}-e\right)S\left(\frac{d+2\,b\,z}{\sqrt{i\,b}\;\sqrt{2\,\pi}}\right)\right)}{\sqrt{i\,b}}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\right.$$

$$\left(\frac{1}{\sqrt{i\,(-b-2\,c\,s+c\,\nu)}}\left(i\cosh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}+e+2\,g\,s-g\,\nu\right)S\left(\frac{-d-2\,f\,s+f\,\nu+2\,(-b-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\;\sqrt{i\,(-b-2\,c\,s+c\,\nu)}}\right)-\right.\right.$$

$$C\left(\frac{-d-2\,f\,s+f\,\nu+2\,(-b-2\,c\,s+c\,\nu)\,z}{\sqrt{2\,\pi}\;\sqrt{i\,(-b-2\,c\,s+c\,\nu)}}\right)\sinh\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}+e+2\,g\,s-g\,\nu\right)\Bigg)+$$

$$\frac{1}{\sqrt{-i\,b+2\,i\,c\,s-i\,c\,\nu}}\left(i\cosh\left(\frac{(d+f\,(\nu-2\,s))^2}{-4\,b+8\,c\,s-4\,c\,\nu}+e-2\,g\,s+g\,\nu\right)S\left(\frac{-d-2\,b\,z+(2\,s-\nu)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\;\sqrt{i\,(-b+2\,c\,s-c\,\nu)}}\right)-\right.$$

$$\left.\left.\left.C\left(\frac{-d-2\,b\,z+(2\,s-\nu)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\;\sqrt{i\,(-b+2\,c\,s-c\,\nu)}}\right)\sinh\left(\frac{(d+f\,(\nu-2\,s))^2}{-4\,b+8\,c\,s-4\,c\,\nu}+e-2\,g\,s+g\,\nu\right)\right)\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

01.20.21.4111.01

$$\int \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-\nu-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{-\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}-e+g\,(2\,s-\nu)}\sqrt{-b+2\,c\,s-c\,\nu}\;\operatorname{erfi}\left(\frac{-d-2\,b\,z+(2\,s-\nu)\,(f+2\,c\,z)}{2\sqrt{-b+2\,c\,s-c\,\nu}}\right)}{b+c\,(\nu-2\,s)}+\right.$$

$$\frac{1}{b+2\,c\,s-c\,\nu}\left(e^{-\frac{(f\,(\nu-2\,s)-d)^2}{-4\,b-8\,c\,s+4\,c\,\nu}-e+g\,(\nu-2\,s)}\left(\sqrt{-b-2\,c\,s+c\,\nu}\;\operatorname{erfi}\left(\frac{-d-2\,b\,z-(2\,s-\nu)\,(f+2\,c\,z)}{2\sqrt{-b-2\,c\,s+c\,\nu}}\right)+\right.\right.$$

$$\left.\left.e^{2\left(\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}+e+g\,(2\,s-\nu)\right)}\sqrt{b+2\,c\,s-c\,\nu}\;\operatorname{erfi}\left(\frac{d+2\,b\,z+(2\,s-\nu)\,(f+2\,c\,z)}{2\sqrt{b+2\,c\,s-c\,\nu}}\right)\right)\right)+$$

$$\left.\frac{e^{\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}+e+g\,(\nu-2\,s)}\operatorname{erfi}\left(\frac{d+2\,b\,z-(2\,s-\nu)\,(f+2\,c\,z)}{2\sqrt{b+c\,(\nu-2\,s)}}\right)}{\sqrt{b+c\,(\nu-2\,s)}}\right)-\frac{1}{b}\left(2^{-\nu-2}\,e^{-\frac{d^2}{4\,b}-e}\sqrt{\pi}\,\binom{\nu}{\frac{\nu}{2}}\right.$$

$$\left.\left(-\sqrt{b}\;e^{2\,e}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right)-\sqrt{-b}\;e^{\frac{d^2}{2\,b}}\operatorname{erfi}\left(\frac{\sqrt{-b}\;(d+2\,b\,z)}{2\,b}\right)\right)(1-\nu \bmod 2)\right)\Bigg/;\ \nu\in\mathbb{N}^+$$

01.20.21.4112.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-\nu-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(i\,(-d-2\,f\,s+f\,\nu))^{3/2}}\left(-2\,i\,\sqrt{i\,(-d-2\,f\,s+f\,\nu)}\ \cosh\left(e+2\,g\,s-\right.\right.\right.$$

$$\left.g\,\nu-(-d-2\,f\,s+f\,\nu)\,z-(-b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)-\sqrt{2\,\pi}\ (-b-2\,c\,s+c\,\nu)$$

$$\left(i\cosh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{-4\,d-8\,f\,s+4\,f\,\nu}+e+2\,g\,s-g\,\nu\right)S\left(\frac{-b-2\,c\,s+c\,\nu+2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)-\right.$$

$$\left.\left.\left.C\left(\frac{-b-2\,c\,s+c\,\nu+2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,(-d-2\,f\,s+f\,\nu)}}\right)\sinh\left(\frac{(-b-2\,c\,s+c\,\nu)^2}{-4\,d-8\,f\,s+4\,f\,\nu}+e+2\,g\,s-g\,\nu\right)\right)\right)+$$

$$\frac{1}{(i\,(-d+2\,f\,s-f\,\nu))^{3/2}}\left(-2\,i\,\sqrt{i\,(-d+2\,f\,s-f\,\nu)}\ \cosh\left(e-2\,g\,s+g\,\nu-(-d+2\,f\,s-f\,\nu)\,z-\right.\right.$$

$$\left.(-b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-\sqrt{2\,\pi}\ (-b+2\,c\,s-c\,\nu)$$

$$\left(i\cosh\left(\frac{(b+c\,(\nu-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e-2\,g\,s+g\,\nu\right)S\left(\frac{-b+2\,c\,s-c\,\nu+2\,(-d+2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)-\right.$$

$$\left.\left.\left.\left.C\left(\frac{-b+2\,c\,s-c\,\nu+2\,(-d+2\,f\,s-f\,\nu)\,\sqrt{z}}{\sqrt{2\,\pi}\ \sqrt{i\,(-d+2\,f\,s-f\,\nu)}}\right)\sinh\left(\frac{(b+c\,(\nu-2\,s))^2}{-4\,d+8\,f\,s-4\,f\,\nu}+e-2\,g\,s+g\,\nu\right)\right)\right)\right)-$$

$$\frac{1}{(-i\,d)^{3/2}}\left(2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(2\,i\,\sqrt{-i\,d}\ \cosh\left(\sqrt{z}\ b+e+d\,z\right)-b\,\sqrt{2\,\pi}\right.\right.$$

$$\left.\left.\left.\left(i\cosh\left(\frac{b^2}{4\,d}-e\right)S\left(\frac{-b-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)+C\left(\frac{-b-2\,d\,\sqrt{z}}{\sqrt{-i\,d}\ \sqrt{2\,\pi}}\right)\sinh\left(\frac{b^2}{4\,d}-e\right)\right)\right)\right)/;\ m\in\mathbb{N}^{+}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.4113.01

$$\int \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{v}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-v-2}\left(\frac{2\,e^{-d\,z-b\sqrt{z}}\left(1+e^{2\left(\sqrt{z}\ b+e+d\,z\right)}\right)}{d}+\frac{b\,e^{\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{-d}}\right)}{(-d)^{3/2}}-\frac{b\,e^{2\,e-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)e^{-e}\binom{v}{\frac{v}{2}}(1-v \bmod 2)+$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e-g\,(v-2\,s)}\left(\left(e^{2\,(g\,(v-2\,s)-e)-\frac{(c\,(v-2\,s)-b)^2}{4\,(f\,(v-2\,s)-d)}}\sqrt{\pi}\ (c\,(v-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\sqrt{z}}{2\sqrt{f\,(v-2\,s)-d}}\right)\right)\Big/\right.\right.$$

$$(f\,(v-2\,s)-d)^{3/2}-\frac{2\,e^{\sqrt{z}\ (c\,(v-2\,s)-b)+2\,(g\,(v-2\,s)-e)+(f\,(v-2\,s)-d)\,z}}{f\,(v-2\,s)-d}+$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b-c\,(v-2\,s))+(d-f\,(v-2\,s))\,z}}{d-f\,(v-2\,s)}-\frac{e^{-\frac{(b-c\,(v-2\,s))^2}{4\,(d-f\,(v-2\,s))}}\sqrt{\pi}\ (c\,(v-2\,s)-b)\operatorname{erfi}\left(\frac{-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\sqrt{z}}{2\sqrt{d-f\,(v-2\,s)}}\right)}{(d-f\,(v-2\,s))^{3/2}}\right)-$$

$$e^{-e-g\,(v-2\,s)}\left(\left(e^{2\,(e+g\,(v-2\,s))-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}}\sqrt{\pi}\ (b+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\sqrt{z}}{2\sqrt{d+f\,(v-2\,s)}}\right)\right)\Big/\right.$$

$$(d+f\,(v-2\,s))^{3/2}-\frac{2\,e^{\sqrt{z}\ (b+c\,(v-2\,s))+2\,(e+g\,(v-2\,s))+(d+f\,(v-2\,s))\,z}}{d+f\,(v-2\,s)}+\frac{2\,e^{\sqrt{z}\ (-b-c\,(v-2\,s))+(-d-f\,(v-2\,s))\,z}}{-d-f\,(v-2\,s)}-$$

$$\left.\left.\frac{e^{-\frac{(-b-c\,(v-2\,s))^2}{4\,(-d-f\,(v-2\,s))}}\sqrt{\pi}\ (b+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\sqrt{z}}{2\sqrt{-d-f\,(v-2\,s)}}\right)}{(-d-f\,(v-2\,s))^{3/2}}\right)\right);\ v\in\mathbb{N}^{+}$$

Involving powers of sinh

Involving $\sinh^{\mu}(c\,z)\cosh^{v}(a\,z)$

01.20.21.4114.01

$$\int \sinh^{\mu}(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu}\sinh^{\mu}(c\,z)$$

$$\left(\frac{(\nu \bmod 2-1)\sinh(2\,c\,z)\left(-\sinh^2(c\,z)\right)^{\frac{1}{2}(-\mu-1)}}{2\,c}\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(\frac{1}{2},\frac{1-\mu}{2};\frac{3}{2};\cosh^2(c\,z)\right)+\left(1-e^{-2\,c\,z}\right)^{-\mu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{1}{a^2\,(\nu-2\,s)^2-c^2\,\mu^2}\right.$$

$$e^{a\,(2\,s-\nu)\,z}\binom{\nu}{s}\left((2\,a\,s-a\,\nu-c\,\mu)\,{}_2F_1\left(-\frac{2\,a\,s-a\,\nu+c\,\mu}{2\,c},-\mu;\frac{1}{2}\left(\frac{a\,(\nu-2\,s)}{c}-\mu+2\right);e^{-2\,c\,z}\right)+\right.$$

$$\left.\left.e^{2\,a\,(\nu-2\,s)\,z}\,(a\,(\nu-2\,s)-c\,\mu)\,{}_2F_1\left(-\frac{a\,(\nu-2\,s)+c\,\mu}{2\,c},-\mu;\frac{1}{2}\left(\frac{a\,(2\,s-\nu)}{c}-\mu+2\right);e^{-2\,c\,z}\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.4115.01

$$\int \sinh^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz ==$$

$$2^{-m}\left(\binom{m}{\frac{m}{2}}\frac{i^{-m}\,\cosh^{\nu+1}(a\,z)\,(m \bmod 2-1)\sinh(a\,z)}{a\,(\nu+1)\sqrt{-\sinh^2(a\,z)}}\,{}_2F_1\left(\frac{\nu+1}{2},\frac{1}{2};\frac{\nu+3}{2};\cosh^2(a\,z)\right)+\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^{k+m}\,e^{c\,(2\,k-m)\,z}\left(1+e^{2\,a\,z}\right)^{-\nu}}{a^2\,\nu^2-c^2\,(m-2\,k)^2}\right.$$

$$\binom{m}{k}\cosh^{\nu}(a\,z)\left((c\,(m-2\,k)-a\,\nu)\,{}_2F_1\left(-\frac{c\,(m-2\,k)+a\,\nu}{2\,a},-\nu;-\frac{c\,(m-2\,k)+a\,(\nu-2)}{2\,a};-e^{2\,a\,z}\right)-\right.$$

$$\left.\left.(-1)^m\,e^{2\,c\,(m-2\,k)\,z}\,(c\,(m-2\,k)+a\,\nu)\,{}_2F_1\left(-\frac{2\,c\,k-c\,m+a\,\nu}{2\,a},-\nu;\frac{1}{2}\left(\frac{c\,(m-2\,k)}{a}-\nu+2\right);-e^{2\,a\,z}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+$$

01.20.21.4116.01

$$\int \sinh^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz == i^m\,2^{-m-\nu}\left(z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)+\right.$$

$$\frac{2\,i\,(\nu \bmod 2-1)}{c}\binom{\nu}{\frac{\nu}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\frac{(-1)^k\sin\left(\frac{\pi\,m}{2}+c\,i\,(m-2\,k)\,z\right)}{m-2\,k}-\frac{2\,(m \bmod 2-1)}{a}\binom{m}{\frac{m}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\frac{\sinh(a\,(2\,s-\nu)\,z)}{2\,s-\nu}+$$

$$2\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(i\,(2\,c\,k-c\,m-2\,a\,s+a\,\nu)\sin\left(\frac{\pi\,m}{2}+i\,(c\,(m-2\,k)+a\,(\nu-2\,s))\,z\right)+\right.$$

$$(c\,(m-2\,k)+a\,(\nu-2\,s))\sinh\left(-\frac{1}{2}\,i\,\pi\,m+c\,(m-2\,k)\,z-a\,(\nu-2\,s)\,z\right)\Big)\Big/$$

$$\left.\left.((-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,(c\,(m-2\,k)+a\,(\nu-2\,s)))\right)\right/;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4117.01

$$\int \sinh^{\mu}(a\,z)\cosh^{\nu}(a\,z)\,dz == \frac{\cosh^{\nu+1}(a\,z)\sinh^{\mu+3}(a\,z)\left(-\sinh^2(a\,z)\right)^{-\frac{\mu}{2}-\frac{3}{2}}}{\nu\,a+a}\,{}_2F_1\left(\frac{\nu+1}{2},\frac{1-\mu}{2};\frac{\nu+3}{2};\cosh^2(a\,z)\right)$$

01.20.21.4118.01

$$\int \sinh^2(a\,z)\cosh^2(a\,z)\,dz == \frac{\sinh(4\,a\,z)-4\,a\,z}{32\,a}$$

01.20.21.4119.01

$$\int \sinh^2(z)\cosh^3(z)\,dz == \frac{1}{30}(3\cosh(2\,z)+7)\sinh^3(z)$$

01.20.21.4120.01

$$\int \sinh^2(z)\cosh^4(z)\,dz == \frac{1}{192}(-12\,z-3\sinh(2\,z)+3\sinh(4\,z)+\sinh(6\,z))$$

01.20.21.4121.01

$$\int \sinh^3(z)\cosh^2(z)\,dz == \frac{1}{30}\cosh^3(z)(3\cosh(2\,z)-7)$$

01.20.21.4122.01

$$\int \sinh^3(z)\cosh^3(z)\,dz == \frac{1}{192}(\cosh(6\,z)-9\cosh(2\,z))$$

01.20.21.4123.01

$$\int \sinh^3(z)\cosh^4(z)\,dz == \frac{1}{70}\cosh^5(z)(5\cosh(2\,z)-9)$$

01.20.21.4124.01

$$\int \sinh^4(z)\cosh^2(z)\,dz == \frac{1}{192}(12\,z-3\sinh(2\,z)-3\sinh(4\,z)+\sinh(6\,z))$$

01.20.21.4125.01

$$\int \sinh^4(z)\cosh^3(z)\,dz == \frac{1}{70}(5\cosh(2\,z)+9)\sinh^5(z)$$

01.20.21.4126.01

$$\int \sinh^4(z)\cosh^4(z)\,dz == \frac{24\,z-8\sinh(4\,z)+\sinh(8\,z)}{1024}$$

01.20.21.4127.01

$$\int \sinh^4(z)\cosh^6(z)\,dz == \frac{120\,z+20\sinh(2\,z)-40\sinh(4\,z)-10\sinh(6\,z)+5\sinh(8\,z)+2\sinh(10\,z)}{10\,240}$$

01.20.21.4128.01

$$\int \sinh^7(z)\cosh^6(z)\,dz == \frac{\cosh^7(z)(6377\cosh(2\,z)-1890\cosh(4\,z)+231\cosh(6\,z)-5230)}{96\,096}$$

01.20.21.4129.01

$$\int \sinh^{\frac{1}{2}}(2\,a\,z)\cosh^2(a\,z)\,dz == \frac{\sinh^2(2\,a\,z)+3\,E\left(\frac{\pi}{4}-i\,a\,z\,\middle|\,2\right)\sqrt{i\sinh(2\,a\,z)}}{6\,a\sinh^{\frac{1}{2}}(2\,a\,z)}$$

01.20.21.4130.01

$$\int \frac{\cosh^2(a\,z)}{\sinh^{\frac{1}{2}}(2\,a\,z)}\,dz == \frac{i\sqrt{i\sinh(2\,a\,z)}\;F\left(\frac{\pi}{4}-i\,a\,z\,\middle|\,2\right)+\sinh(2\,a\,z)}{2\,a\sinh^{\frac{1}{2}}(2\,a\,z)}$$

01.20.21.4131.01

$$\int \frac{\cosh^3(a\,z)}{\sinh^{\frac{1}{2}}(2\,a\,z)}\,dz == \frac{\operatorname{csch}(a\,z)\sinh^{\frac{1}{2}}(2\,a\,z)}{8\,a\coth^{\frac{1}{2}}(a\,z)}\left(-3\tan^{-1}\left(\coth^{\frac{1}{2}}(a\,z)\right)+3\tanh^{-1}\left(\coth^{\frac{1}{2}}(a\,z)\right)+\coth^{\frac{1}{2}}(a\,z)\sinh(2\,a\,z)\right)$$

01.20.21.4132.01

$$\int \frac{\cosh^7(a\,z)}{\sqrt{\sinh^7(2\,a\,z)}}\,dz == \left(\sinh^4(2\,a\,z)\left(2\,(2-3\cosh(2\,a\,z))\tanh^{\frac{1}{2}}(a\,z)\operatorname{csch}^3(a\,z)+5\coth^{-1}\left(\tanh^{\frac{1}{2}}(a\,z)\right)\operatorname{sech}(a\,z)-5\tan^{-1}\left(\tanh^{\frac{1}{2}}(a\,z)\right)\operatorname{sech}(a\,z)\right)\right)\Big/\left(80\,a\sqrt{\sinh^7(2\,a\,z)}\,\tanh^{\frac{1}{2}}(a\,z)\right)$$

01.20.21.4133.01

$$\int \frac{\sinh(a\,z)}{\cosh^{\frac{1}{2}}(a\,z)}\,dz == \frac{2\cosh^{\frac{1}{2}}(a\,z)}{a}$$

01.20.21.4134.01

$$\int \frac{\sinh^2(a\,z)}{\cosh^{\frac{1}{2}}(a\,z)}\,dz == \frac{2}{3\,a}\left(2\,i\,F\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)+\cosh^{\frac{1}{2}}(a\,z)\sinh(a\,z)\right)$$

01.20.21.4135.01

$$\int \frac{\sinh^2(a\,z)}{\cosh^{\frac{5}{2}}(a\,z)}\,dz == -\frac{1}{3\,a}\left(4\,i\,F\left(\frac{i\,a\,z}{2}\,\middle|\,2\right)+\frac{2\sinh(a\,z)}{\cosh^{\frac{3}{2}}(a\,z)}\right)$$

01.20.21.4136.01

$$\int \sqrt{\sinh^3(2\,a\,z)}\,\cosh^5(a\,z)\,dz == \frac{1}{6144\,a\coth^{\frac{1}{2}}(a\,z)}\left(\operatorname{csch}^2(a\,z)\operatorname{sech}(a\,z)\sqrt{\sinh^3(2\,a\,z)}\left(231\tan^{-1}\left(\coth^{\frac{1}{2}}(a\,z)\right)-231\tanh^{-1}\left(\coth^{\frac{1}{2}}(a\,z)\right)+\coth^{\frac{1}{2}}(a\,z)\left(-25\sinh(2\,a\,z)+65\sinh(4\,a\,z)+34\sinh(6\,a\,z)+6\sinh(8\,a\,z)\right)\right)\right)$$

01.20.21.4137.01

$$\int \sqrt{\sinh^4(z)\cosh(z)}\,dz == \frac{2\operatorname{csch}^2(z)\sqrt{\cosh(z)\sinh^4(z)}}{5\cosh^{\frac{1}{2}}(z)}\left(\sinh(z)\cosh^{\frac{3}{2}}(z)+2\,i\,E\left(\frac{i\,z}{2}\,\middle|\,2\right)\right)$$

01.20.21.4138.01

$$\int \sqrt{\sinh(a\,z)\cosh(a\,z)}\,dz == \frac{\sqrt{i\sinh(2\,a\,z)}}{2\,a\sqrt{\cosh(a\,z)\sinh(a\,z)}}\,E\left(\frac{\pi}{4}-i\,a\,z\,\middle|\,2\right)$$

01.20.21.4139.01

$$\int \frac{1}{\sqrt[4]{\sinh^{13}(z)\cosh^{11}(z)}}\,dz == \frac{2\,(-8\cosh(2\,z)+16\cosh(4\,z)-15)\sinh(2\,z)}{63\sqrt[4]{\cosh^{11}(z)\sinh^{13}(z)}}$$

Involving $\sinh^{\mu}(c\,z+d)\cosh^{\nu}(a\,z)$

01.20.21.4140.01

$$\int \sinh^{\mu}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == \frac{1}{c\,\mu}\,2^{-\nu}\left(1-e^{2(d+c\,z)}\right)^{-\mu}\sinh^{\mu}(d+c\,z)\left(\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,e^{2(d+c\,z)}\right)(\nu \bmod 2-1)+\right.$$

$$c\,\mu\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{a(2s-\nu)z}}{2as-a\nu-c\mu}\,{}_2F_1\left(-\frac{-2as+a\nu+c\mu}{2c},\,-\mu;\,-\frac{a(\nu-2s)+c(\mu-2)}{2c};\,e^{2(d+cz)}\right)-\right.$$

$$\left.\left.\frac{e^{(\nu-2s)az}}{2as-a\nu+c\mu}\,{}_2F_1\left(-\frac{2as-a\nu+c\mu}{2c},\,-\mu;\,\frac{1}{2}\left(\frac{a(\nu-2s)}{c}-\mu+2\right);\,e^{2(d+cz)}\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

01.20.21.4141.01

$$\int \sinh^{m}(d+c\,z)\cosh^{\nu}(a\,z)\,dz ==$$

$$\left(\frac{i}{2}\right)^{m}\cosh^{\nu}(a\,z)\left(\frac{\left(1+e^{2az}\right)^{-\nu}}{a\,\nu}\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{2az}\right)(m \bmod 2-1)+i^{-m}\left(1+e^{-2az}\right)^{-\nu}\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{d(m-2k)}\binom{m}{k}\left(\frac{e^{4dk+2czk-2dm-cmz+im\pi}}{2ck-cm+a\nu}\,{}_2F_1\left(-\frac{2ck-cm+a\nu}{2a},\,-\nu;\,\frac{-\nu a+2a-2ck+cm}{2a};\,-e^{-2az}\right)+\right.$$

$$\left.\left.\frac{e^{c(m-2k)z}}{c(m-2k)+a\nu}\,{}_2F_1\left(-\frac{c(m-2k)+a\nu}{2a},\,-\nu;\,-\frac{c(m-2k)+a(\nu-2)}{2a};\,-e^{-2az}\right)\right)\right)/;\,m\in\mathbb{Z}\wedge m>0$$

01.20.21.4142.01

$$\int \sinh^{m}(d+c\,z)\cosh^{\nu}(a\,z)\,dz ==$$

$$i^m\,2^{-m-\nu}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)(1-\nu \bmod 2)\,z+\frac{i^m\,2^{-m-\nu+1}}{a}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{s}\sinh((2s-\nu)\,az)}{2s-\nu}+$$

$$\frac{i^{m-1}\,2^{-m-\nu+1}}{c}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\binom{m}{k}\sin\left(\frac{\pi m}{2}+i(m-2k)(d+cz)\right)}{m-2k}+$$

$$i^m\,2^{-m-\nu+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}\left((c(m-2k)-a(\nu-2s))\sinh\left(-\frac{1}{2}i\pi m+d(m-2k)+(c(m-2k)+a(\nu-2s))z\right)+\right.\right.$$

$$\left.\left.(c(m-2k)+a(\nu-2s))\sinh\left(-\frac{1}{2}i\pi m+d(m-2k)+c(m-2k)z-a(\nu-2s)z\right)\right)\right)\Big/$$

$$((c(m-2k)-a(\nu-2s))(c(m-2k)+a(\nu-2s)))\;/;\,m\in\mathbb{N}^+\wedge\nu\in\mathbb{N}^+$$

Involving $\sinh^{\mu}(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.4143.01

$$\int \sinh^{\mu}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{c\,\mu}\,2^{-\nu}\left(1-e^{2\,c\,z}\right)^{-\mu}\sinh^{\mu}(c\,z)\left(\binom{\nu}{\frac{\nu}{2}}\,{}_2F_1\left(-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2};\,e^{2\,c\,z}\right)(\nu \bmod 2-1)+\right.$$

$$c\,\mu\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{2\,b\,s-b\,\nu}\binom{\nu}{s}\left(\frac{e^{a\,(2\,s-\nu)\,z}}{2\,a\,s-a\,\nu-c\,\mu}\,{}_2F_1\left(-\frac{-2\,a\,s+a\,\nu+c\,\mu}{2\,c},\,-\mu;\,-\frac{a\,(\nu-2\,s)+c\,(\mu-2)}{2\,c};\,e^{2\,c\,z}\right)-\right.$$

$$\left.\left.\frac{e^{(\nu-2\,s)\,(2\,b+a\,z)}}{2\,a\,s-a\,\nu+c\,\mu}\,{}_2F_1\left(-\frac{2\,a\,s-a\,\nu+c\,\mu}{2\,c},\,-\mu;\,\frac{1}{2}\left(\frac{a\,(\nu-2\,s)}{c}-\mu+2\right);\,e^{2\,c\,z}\right)\right)\right)\Big/;\,\nu\in\mathbb{N}^+$$

01.20.21.4144.01

$$\int \sinh^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$\left(\frac{i}{2}\right)^{m}\cosh^{\nu}(b+a\,z)\left(\frac{\left(1+e^{2\,(b+a\,z)}\right)^{-\nu}(m \bmod 2-1)}{a\,\nu}\binom{m}{\frac{m}{2}}\,{}_2F_1\left(-\frac{\nu}{2},\,-\nu;\,1-\frac{\nu}{2};\,-e^{2\,(b+a\,z)}\right)+i^{-m}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\frac{e^{-c\,z\,m+i\,\pi\,m+2\,c\,k\,z}}{2\,c\,k-c\,m+a\,\nu}\,{}_2F_1\left(-\frac{2\,c\,k-c\,m+a\,\nu}{2\,a},\,-\nu;\,\frac{-\nu\,a+2\,a-2\,c\,k+c\,m}{2\,a};\,-e^{-2\,(b+a\,z)}\right)+\right.$$

$$\left.\left.\frac{e^{c\,(m-2\,k)\,z}}{c\,(m-2\,k)+a\,\nu}\,{}_2F_1\left(-\frac{c\,(m-2\,k)+a\,\nu}{2\,a},\,-\nu;\,-\frac{c\,(m-2\,k)+a\,(\nu-2)}{2\,a};\,-e^{-2\,(b+a\,z)}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+$$

01.20.21.4145.01

$$\int \sinh^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$i^m\,2^{-m-\nu}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)\,z+\frac{i^m\,2^{-m-\nu+1}}{a}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{s}\sinh((2\,s-\nu)\,(b+a\,z))}{2\,s-\nu}+$$

$$\frac{i^{m-1}\,2^{-m-\nu+1}}{c}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\binom{m}{k}\sin\left(\frac{\pi\,m}{2}+c\,i\,(m-2\,k)\,z\right)}{m-2\,k}+$$

$$i^m\,2^{-m-\nu+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}\left((c\,(m-2\,k)-a\,(\nu-2\,s))\sinh\left(-\frac{1}{2}\,i\,\pi\,m+b\,(\nu-2\,s)+(c\,(m-2\,k)+a\,(\nu-2\,s))\,z\right)+\right.\right.$$

$$\left.\left.(c\,(m-2\,k)+a\,(\nu-2\,s))\sinh\left(-\frac{1}{2}\,i\,\pi\,m-b\,(\nu-2\,s)+c\,(m-2\,k)\,z-a\,(\nu-2\,s)\,z\right)\right)\right)\Big/$$

$$((c\,(m-2\,k)-a\,(\nu-2\,s))\,(c\,(m-2\,k)+a\,(\nu-2\,s)))\,/;\,m\in\mathbb{N}^+\wedge\nu\in\mathbb{N}^+$$

Involving $\sinh^{\mu}(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.4146.01

$$\int \sinh^{\mu}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$\frac{1}{c\,\mu}2^{-\nu}\left(1-e^{2(d+c\,z)}\right)^{-\mu}\sinh^{\mu}(d+c\,z)\left(\binom{\nu}{\frac{\nu}{2}}{}_2F_1\left(-\frac{\mu}{2},-\mu;1-\frac{\mu}{2};e^{2(d+c\,z)}\right)(\nu \bmod 2-1)+c\,\mu\right.$$

$$\left.\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{2\,b\,s-b\,\nu}\binom{\nu}{s}\left(\frac{e^{a(2\,s-\nu)\,z}}{2\,a\,s-a\,\nu-c\,\mu}{}_2F_1\left(-\frac{-2\,a\,s+a\,\nu+c\,\mu}{2\,c},-\mu;-\frac{a\,(\nu-2\,s)+c\,(\mu-2)}{2\,c};e^{2(d+c\,z)}\right)-\frac{e^{(\nu-2\,s)(2\,b+a\,z)}}{2\,a\,s-a\,\nu+c\,\mu}\right.\right.$$

$$\left.\left.{}_2F_1\left(-\frac{2\,a\,s-a\,\nu+c\,\mu}{2\,c},-\mu;\frac{1}{2}\left(\frac{a\,(\nu-2\,s)}{c}-\mu+2\right);e^{2(d+c\,z)}\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4147.01

$$\int \sinh^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz ==\left(\frac{i}{2}\right)^{m}\cosh^{\nu}(b+a\,z)$$

$$\left(\frac{\left(1+e^{2(b+a\,z)}\right)^{-\nu}\binom{m}{\frac{m}{2}}{}_2F_1\left(-\frac{\nu}{2},-\nu;1-\frac{\nu}{2};-e^{2(b+a\,z)}\right)(m \bmod 2-1)}{a\,\nu}+i^{-m}\left(1+e^{-2(b+a\,z)}\right)^{-\nu}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{d(m-2\,k)}\binom{m}{k}\right.$$

$$\left(\frac{1}{2\,c\,k-c\,m+a\,\nu}\left(e^{4\,d\,k+2\,c\,z\,k-2\,d\,m-c\,m\,z+i\,m\,\pi}{}_2F_1\left(-\frac{2\,c\,k-c\,m+a\,\nu}{2\,a},-\nu;\frac{-\nu\,a+2\,a-2\,c\,k+c\,m}{2\,a};-e^{-2(b+a\,z)}\right)\right)+\right.$$

$$\left.\left.\frac{e^{c(m-2\,k)\,z}{}_2F_1\left(-\frac{c\,(m-2\,k)+a\,\nu}{2\,a},-\nu;-\frac{c\,(m-2\,k)+a\,(\nu-2)}{2\,a};-e^{-2(b+a\,z)}\right)}{c\,(m-2\,k)+a\,\nu}\right)\right)/;\ m\in\mathbb{Z}\wedge m>0$$

01.20.21.4148.01

$$\int \sinh^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz ==$$

$$i^m\,2^{-m-\nu}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)(1-\nu \bmod 2)\,z+\frac{i^m\,2^{-m-\nu+1}(1-m \bmod 2)}{a}\binom{m}{\frac{m}{2}}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{s}\sinh((2\,s-\nu)(b+a\,z))}{2\,s-\nu}+$$

$$\frac{i^{m-1}\,2^{-m-\nu+1}(1-\nu \bmod 2)}{c}\binom{\nu}{\frac{\nu}{2}}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\binom{m}{k}\sin\left(\frac{\pi\,m}{2}+i\,(m-2\,k)\,(d+c\,z)\right)}{m-2\,k}+i^m\,2^{-m-\nu+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left((c\,(m-2\,k)-a\,(\nu-2\,s))\sinh\left(-\frac{1}{2}i\,\pi\,m+d\,(m-2\,k)+b\,(\nu-2\,s)+(c\,(m-2\,k)+a\,(\nu-2\,s))\,z\right)+\right.$$

$$\left.(c\,(m-2\,k)+a\,(\nu-2\,s))\sinh\left(-\frac{1}{2}i\,\pi\,m+d\,(m-2\,k)-b\,(\nu-2\,s)+c\,(m-2\,k)\,z-a\,(\nu-2\,s)\,z\right)\right)\Big/$$

$$((c\,(m-2\,k)-a\,(\nu-2\,s))\,(c\,(m-2\,k)+a\,(\nu-2\,s)))\ /;\ m\in\mathbb{N}^+\wedge\nu\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh^v(c\,z)$

01.20.21.4149.01

$$\int \sinh^m\left(b\,z^2\right)\cosh^v(c\,z)\,dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k\binom{m}{k}\left(\sqrt{b\,(m-2k)}\ \operatorname{erfi}\left(\frac{b\,(2k-m)\,z}{\sqrt{b\,(m-2k)}}\right)+(-1)^m\sqrt{b\,(2k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\sinh((2s-v)\,c\,z)}{v-2s}+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(c\,v-2\,c\,s)^2}{8\,b\,k-4\,b\,m}}\operatorname{erfi}\left(\frac{-c\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\frac{1}{b\,m-2\,b\,k}\left(e^{-\frac{c^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m}}\left(e^{\frac{(c\,v-2\,c\,s)^2}{4\,b\,k-2\,b\,m}}\sqrt{b\,m-2\,b\,k}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{c\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,m-2\,b\,k}}\right)-(-1)^m\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{-c\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(c\,v-2\,c\,s)^2}{8\,b\,k-4\,b\,m}}\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)}{b\,(m-2\,k)}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4150.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b^2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\,e^{-b(2k+m)\sqrt{z}}\left(e^{4b\sqrt{z}\,k+im\pi}\left(4b(2k-m)\sqrt{z}-4\right)+4e^{2mb\sqrt{z}}\left(b(m-2k)\sqrt{z}-1\right)\right)\binom{m}{k}\right)+$$

$$i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\sinh((2s-v)\,c\,z)\binom{v}{s}}{c(2s-v)}+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(-\frac{b\,e^{\frac{b^2(m-2k)^2}{4c(v-2s)}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}+\right.\right.$$

$$\frac{2(-1)^m\,e^{b\sqrt{z}\,(m-2k)+c(v-2s)z}}{c(v-2s)}-\frac{2e^{-b\sqrt{z}\,(m-2k)-c(v-2s)z}}{c(v-2s)}-$$

$$\left.\left.\frac{(-1)^m\,b\,e^{-\frac{b^2(m-2k)^2}{4c(v-2s)}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)+\frac{2(-1)^m\,e^{b\sqrt{z}\,(2k-m)+c(v-2s)z}}{c(v-2s)}-\right.$$

$$\frac{2e^{-b\sqrt{z}\,(2k-m)-c(v-2s)z}}{c(v-2s)}-\frac{b\,e^{\frac{b^2(2k-m)^2}{4c(v-2s)}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(2k-m)+2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}-$$

$$\left.\left.\frac{(-1)^m\,b\,e^{-\frac{b^2(2k-m)^2}{4c(v-2s)}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(2k-m)+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+e\right)\cosh^v(c\,z)$

01.20.21.4151.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh^v(c\,z)\,dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}$$

$$\left((-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\left(e^{2\,e\,(m-2\,k)}\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)\,z}{\sqrt{b\,(m-2\,k)}}\right)+(-1)^m\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2\,k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\sinh((2\,s-v)\,c\,z)}{v-2\,s}+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(c\,v-2\,c\,s)^2}{8\,b\,k-4\,b\,m}+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{-c\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\right.$$

$$\frac{1}{b\,m-2\,b\,k}\left(e^{-\frac{c^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m}-e\,(2\,k+m)}\left(e^{2\left(\frac{(c\,v-2\,c\,s)^2}{8\,b\,k-4\,b\,m}+e\,m\right)}\sqrt{b\,m-2\,b\,k}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,m-2\,b\,k}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{-c\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{e\,(2\,k-m)-\frac{(c\,v-2\,c\,s)^2}{8\,b\,k-4\,b\,m}}\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)}{b\,(m-2\,k)}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4152.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v(c\,z)\,dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2\,k)^2}\left((-1)^k\right.\right.$$

$$\left.\left.e^{-e\,(2\,k+m)-b\,\sqrt{z}\ (2\,k+m)}\left(e^{4\,e\,k+4\,b\,\sqrt{z}\ k+i\,m\,\pi}\left(4\,b\,(2\,k-m)\,\sqrt{z}\ -4\right)+4\,e^{2\,m\left(\sqrt{z}\ b+e\right)}\left(b\,(m-2\,k)\,\sqrt{z}\ -1\right)\right)\binom{m}{k}\right)+\right.$$

$$i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\sinh((2\,s-v)\,c\,z)\binom{v}{s}}{c\,(2\,s-v)}+2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e\,(2\,k-m)}\left(-\frac{1}{(c\,(v-2\,s))^{3/2}}\left((-1)^m\,b\,e^{2\,e\,(2\,k-m)-\frac{b^2\,(2\,k-m)^2}{4\,c\,(v-2\,s)}}\,(2\,k-m)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,c\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{c\,(v-2\,s)}}\right)\right)-\right.\right.$$

$$\frac{2\,e^{-b\,\sqrt{z}\ (2\,k-m)-c\,(v-2\,s)\,z}}{c\,(v-2\,s)}+\frac{2\,(-1)^m\,e^{2\,e\,(2\,k-m)+b\,\sqrt{z}\ (2\,k-m)+c\,(v-2\,s)\,z}}{c\,(v-2\,s)}-$$

$$\left.\left.\frac{b\,e^{\frac{b^2\,(2\,k-m)^2}{4\,c\,(v-2\,s)}}\,(2\,k-m)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,c\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{-c\,(v-2\,s)}}\right)}{(-c\,(v-2\,s))^{3/2}}\right)+(-1)^m\,e^{-e\,(m-2\,k)}\right.$$

$$\left(-\frac{1}{(c\,(v-2\,s))^{3/2}}\left((-1)^m\,b\,e^{2\,e\,(m-2\,k)-\frac{b^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,c\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{c\,(v-2\,s)}}\right)\right)-\right.$$

$$\frac{2\,e^{-b\,\sqrt{z}\ (m-2\,k)-c\,(v-2\,s)\,z}}{c\,(v-2\,s)}+\frac{2\,(-1)^m\,e^{2\,e\,(m-2\,k)+b\,\sqrt{z}\ (m-2\,k)+c\,(v-2\,s)\,z}}{c\,(v-2\,s)}-$$

$$\left.\left.\left.\frac{b\,e^{\frac{b^2\,(m-2\,k)^2}{4\,c\,(v-2\,s)}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,c\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{-c\,(v-2\,s)}}\right)}{(-c\,(v-2\,s))^{3/2}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+d\,z)\cosh^v(c\,z)$

01.20.21.4153.01

$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh^v(c\,z)\,dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k\,e^{-\frac{d^2\,(m-2k)}{4\,b}}\binom{m}{k}\right.\right.$$

$$\left.\left.\left((-1)^m\,e^{\frac{d^2\,(m-2k)}{2\,b}}\sqrt{b\,(2k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b\,(2k-m)}\ (d+2\,b\,z)}{2\,b}\right)+\sqrt{b\,(m-2k)}\ \operatorname{erfi}\left(\frac{(2k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2k)}}\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\sinh((2s-v)\,c\,z)}{v-2s}}{c}+2^{-m-v-1}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(-2dk+dm-2cs+cv)^2}{8bk-4bm}}\operatorname{erfi}\left(\frac{-c\,(2s-v)-2k\,(d+2bz)+m\,(d+2bz)}{2\sqrt{b\,(m-2k)}}\right)}{\sqrt{b\,(m-2k)}}+\right.$$

$$\frac{1}{bm-2bk}\left(e^{-\frac{(2dk-dm+c\,(v-2s))^2}{8bk-4bm}}\left(e^{\frac{(2dk-dm-2cs+cv)^2}{4bk-2bm}}\sqrt{bm-2bk}\ \operatorname{erfi}\left(\frac{c\,(2s-v)-2k\,(d+2bz)+m\,(d+2bz)}{2\sqrt{bm-2bk}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\sqrt{2bk-bm}\ \operatorname{erfi}\left(\frac{-c\,(2s-v)+2k\,(d+2bz)-m\,(d+2bz)}{2\sqrt{2bk-bm}}\right)\right)-\frac{1}{b\,(m-2k)}\right.$$

$$\left.\left((-1)^m\,e^{-\frac{(-2dk+dm-2cs+cv)^2}{8bk-4bm}}\sqrt{2bk-bm}\ \operatorname{erfi}\left(\frac{c\,(2s-v)+2k\,(d+2bz)-m\,(d+2bz)}{2\sqrt{2bk-bm}}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4154.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v(c\,z)\,dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{\left(i^m\,2^{-m-v+1}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\sinh((2\,s-v)\,c\,z)\binom{v}{s}}{v-2\,s}+2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\sqrt{z}\,(2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+d\,z\right)}\right)}{d\,(m-2\,k)}-\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-\right.$$

$$\left.\frac{b\,e^{-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{2\,(-1)^m\,e^{b\sqrt{z}\,(m-2\,k)+(d\,(m-2\,k)+c\,(v-2\,s))\,z}}{d\,(m-2\,k)+c\,(v-2\,s)}-\right.\right.$$

$$\left.\left(\left(-1)^m\,b\,e^{-\frac{b^2\,(m-2\,k)^2}{4\,(d\,(m-2\,k)+c\,(v-2\,s))}}\,(m-2\,k)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,(d\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)+c\,(v-2\,s)}}\right)\right)\right/$$

$$(d\,(m-2\,k)+c\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(2\,k-m)-c\,(v-2\,s))\,z-b\,(m-2\,k)\,\sqrt{z}}}{d\,(2\,k-m)-c\,(v-2\,s)}-$$

$$\left(b\,e^{-\frac{b^2\,(m-2\,k)^2}{4\,(d\,(2\,k-m)-c\,(v-2\,s))}}\,(m-2\,k)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(m-2\,k)+2\,(d\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)-c\,(v-2\,s)}}\right)\right)\Big/$$

$$\left.(d\,(2\,k-m)-c\,(v-2\,s))^{3/2}\right)+\frac{2\,(-1)^m\,e^{b\sqrt{z}\ (2\,k-m)+(d\,(2\,k-m)+c\,(v-2\,s))\,z}}{d\,(2\,k-m)+c\,(v-2\,s)}-$$

$$\left(\left(-1)^m\,b\,e^{-\frac{b^2\,(2\,k-m)^2}{4\,(d\,(2\,k-m)+c\,(v-2\,s))}}\,(2\,k-m)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(2\,k-m)+2\,(d\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)+c\,(v-2\,s)}}\right)\right)\right/$$

$$(d\,(2\,k-m)+c\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(m-2\,k)-c\,(v-2\,s))\,z-b\,(2\,k-m)\,\sqrt{z}}}{d\,(m-2\,k)-c\,(v-2\,s)}-$$

$$\left.\frac{b\,e^{-\frac{b^2\,(2\,k-m)^2}{4\,(d\,(m-2\,k)-c\,(v-2\,s))}}\,(2\,k-m)\,\sqrt{\pi}\ \text{erfi}\left(\frac{b\,(2\,k-m)+2\,(d\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)-c\,(v-2\,s)}}\right)}{(d\,(m-2\,k)-c\,(v-2\,s))^{3/2}}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

01.20.21.4155.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v(c\,z)\,dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{(m-2\,k)\,d^2}{4\,b}+2\,e\,k-e\,m}\binom{m}{k}\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sqrt{b\,(2\,k-m)}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\;(d+2\,b\,z)}{2\,b}\right)+e^{2\,e\,(m-2\,k)}\sqrt{b\,(m-2\,k)}\;\operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\sinh((2\,s-v)\,c\,z)}{v-2\,s}}{c}+2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(-2\,d\,k+d\,m-2\,c\,s+c\,v)^2}{8\,b\,k-4\,b\,m}+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{-c\,(2\,s-v)-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\right.$$

$$\frac{1}{b\,m-2\,b\,k}\left(e^{-\frac{(2\,d\,k-d\,m+c\,(v-2\,s))^2}{8\,b\,k-4\,b\,m}-e\,(2\,k+m)}\left(e^{2\left(\frac{(2\,d\,k-d\,m-2\,c\,s+c\,v)^2}{8\,b\,k-4\,b\,m}+e\,m\right)}\sqrt{b\,m-2\,b\,k}\right.\right.$$

$$\operatorname{erfi}\left(\frac{c\,(2\,s-v)-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,m-2\,b\,k}}\right)-(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m}$$

$$\left.\left.\operatorname{erfi}\left(\frac{-c\,(2\,s-v)+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-\frac{1}{b\,(m-2\,k)}\left((-1)^m\,e^{e\,(2\,k-m)-\frac{(-2\,d\,k+d\,m-2\,c\,s+c\,v)^2}{8\,b\,k-4\,b\,m}}\right.$$

$$\left.\left.\sqrt{2\,b\,k-b\,m}\;\operatorname{erfi}\left(\frac{c\,(2\,s-v)+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4156.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v(c\,z)\,dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{\left(i^m\,2^{-m-v+1}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\sinh((2\,s-v)\,c\,z)\binom{v}{s}}{v-2\,s}+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-e\,(m-2\,k)}\binom{m}{k}\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\,\sqrt{z}\,(2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+e+d\,z\right)}\right)}{d\,(m-2\,k)}-\right.$$

$$\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-$$

$$\left.\frac{b\,e^{2\,e\,(m-2\,k)-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e\,(2\,k-m)}\left(\frac{2\,(-1)^m\,e^{2\,e\,(2\,k-m)+b\,\sqrt{z}\,(2\,k-m)+(d\,(2\,k-m)+c\,(v-2\,s))\,z}}{d\,(2\,k-m)+c\,(v-2\,s)}-\right.\right.$$

$$\left.\left((-1)^m\,b\,e^{2\,e\,(2\,k-m)-\frac{b^2\,(2\,k-m)^2}{4\,(d\,(2\,k-m)+c\,(v-2\,s))}}\,(2\,k-m)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,(d\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)+c\,(v-2\,s)}}\right)\right)\Big/$$

$$(d\,(2\,k-m)+c\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(m-2\,k)-c\,(v-2\,s))\,z-b\,(2\,k-m)\,\sqrt{z}}}{d\,(m-2\,k)-c\,(v-2\,s)}-\left(b\,e^{-\frac{b^2\,(2\,k-m)^2}{4\,(d\,(m-2\,k)-c\,(v-2\,s))}}\,(2\,k-m)\right.$$

$$\left.\left.\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,(d\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)-c\,(v-2\,s)}}\right)\right)\Big/(d\,(m-2\,k)-c\,(v-2\,s))^{3/2}\right)+$$

$$(-1)^m\,e^{-e\,(m-2\,k)}\left(\frac{2\,(-1)^m\,e^{2\,e\,(m-2\,k)+b\,\sqrt{z}\,(m-2\,k)+(d\,(m-2\,k)+c\,(v-2\,s))\,z}}{d\,(m-2\,k)+c\,(v-2\,s)}-\left((-1)^m\,b\,e^{2\,e\,(m-2\,k)-\frac{b^2\,(m-2\,k)^2}{4\,(d\,(m-2\,k)+c\,(v-2\,s))}}\right.\right.$$

$$(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,(d\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)+c\,(v-2\,s)}}\right)\Big/$$

$$(d\,(m-2\,k)+c\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(2\,k-m)-c\,(v-2\,s))\,z-b\,(m-2\,k)\,\sqrt{z}}}{d\,(2\,k-m)-c\,(v-2\,s)}-$$

$$\left.\left.\left(b\,e^{-\frac{b^2\,(m-2\,k)^2}{4\,(d\,(2\,k-m)-c\,(v-2\,s))}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,(d\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)-c\,(v-2\,s)}}\right)\right)\Big/\right.\right.$$

$$\left.\left.(d\,(2\,k-m)-c\,(v-2\,s))^{3/2}\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh^v(f\,z+g)$

01.20.21.4157.01

$$\int \sinh^m\left(b\,z^2\right)\cosh^v(g+f\,z)\,dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - \frac{2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\binom{m}{k}\left(\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)\,z}{\sqrt{b\,(m-2\,k)}}\right)+(-1)^m\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2\,k-m)}\ z\right)\right)\right) -$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{f}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\sinh((2\,s-v)\,(g+f\,z))}{v-2\,s} +$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m}+g\,(v-2\,s)}\operatorname{erfi}\left(\frac{-f\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\right.$$

$$\frac{1}{b\,m-2\,b\,k}\left(e^{g\,(v-2\,s)-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m}}\left(e^{2\left(\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m}+g\,(2\,s-v)\right)}\sqrt{b\,m-2\,b\,k}\ \operatorname{erfi}\left(\frac{f\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,m-2\,b\,k}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{-f\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right) -$$

$$\left.\frac{(-1)^m\,e^{g\,(2\,s-v)-\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m}}\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{f\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)}{b\,(m-2\,k)}\right) /;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4158.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh^v(g+f\,z)\,dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b^2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\,e^{-b(2k+m)\sqrt{z}}\left(e^{4b\sqrt{z}\,k+i\,m\,\pi}\left(4\,b\,(2k-m)\sqrt{z}-4\right)+4\,e^{2mb\sqrt{z}}\left(b\,(m-2k)\sqrt{z}-1\right)\right)\binom{m}{k}\right)+$$

$$i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\sinh((2s-v)(g+f\,z))\binom{v}{s}}{f\,(2s-v)}+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g(v-2s)}\left(-\frac{b\,e^{\frac{b^2(2k-m)^2}{4f(v-2s)}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(2k-m)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}}+\right.\right.$$

$$\frac{2(-1)^m\,e^{b\sqrt{z}(2k-m)+2g(v-2s)+f(v-2s)z}}{f(v-2s)}-\frac{2\,e^{-b\sqrt{z}(2k-m)-f(v-2s)z}}{f(v-2s)}-$$

$$\left.\left.\frac{1}{(f(v-2s))^{3/2}}\left((-1)^m\,b\,e^{2g(v-2s)-\frac{b^2(2k-m)^2}{4f(v-2s)}}(2k-m)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(2k-m)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)\right)+$$

$$(-1)^m\,e^{-g(v-2s)}\left(-\frac{b\,e^{\frac{b^2(m-2k)^2}{4f(v-2s)}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}}+\right.$$

$$\frac{2(-1)^m\,e^{b\sqrt{z}(m-2k)+2g(v-2s)+f(v-2s)z}}{f(v-2s)}-\frac{2\,e^{-b\sqrt{z}(m-2k)-f(v-2s)z}}{f(v-2s)}-\frac{1}{(f(v-2s))^{3/2}}$$

$$\left.\left.\left((-1)^m\,b\,e^{2g(v-2s)-\frac{b^2(m-2k)^2}{4f(v-2s)}}(m-2k)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b(m-2k)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)\right)\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+e)\cosh^v(f\,z+g)$

01.20.21.4159.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh^v(g+f\,z)\,dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}$$

$$\left((-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\left(e^{2\,e\,(m-2\,k)}\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)\,z}{\sqrt{b\,(m-2\,k)}}\right)+(-1)^m\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2\,k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{f}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\sinh((2\,s-v)\,(g+f\,z))}{v-2\,s}+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m}+e\,(m-2\,k)+g\,(v-2\,s)}\operatorname{erfi}\left(\frac{-f\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\frac{1}{b\,m-2\,b\,k}\right.$$

$$\left(e^{-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m}+g\,(v-2\,s)-e\,(2\,k+m)}\left(e^{2\left(\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m}+e\,m+g\,(2\,s-v)\right)}\sqrt{b\,m-2\,b\,k}\ \operatorname{erfi}\left(\frac{f\,(2\,s-v)-4\,b\,k\,z+2\,b\,m\,z}{2\sqrt{b\,m-2\,b\,k}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{-f\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-\frac{1}{b\,(m-2\,k)}$$

$$\left.\left((-1)^m\,e^{-\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m}+e\,(2\,k-m)+g\,(2\,s-v)}\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{f\,(2\,s-v)+4\,b\,k\,z-2\,b\,m\,z}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.4160.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v(g+f\,z)\,dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\right.\right.$$

$$\left.\left.e^{-e(2k+m)-b\sqrt{z}\ (2k+m)}\left(e^{4ek+4b\sqrt{z}\ k+im\pi}\left(4b(2k-m)\sqrt{z}\ -4\right)+4e^{2m\left(\sqrt{z}\ b+e\right)}\left(b(m-2k)\sqrt{z}\ -1\right)\right)\binom{m}{k}\right)\right)+$$

$$i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\sinh((2s-v)(g+fz))\binom{v}{s}}{f(2s-v)}+2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e(2k-m)-g(v-2s)}\right.$$

$$\left(-\frac{1}{(f(v-2s))^{3/2}}\left((-1)^m\,b\,e^{2(e(2k-m)+g(v-2s))-\frac{b^2(2k-m)^2}{4f(v-2s)}}(2k-m)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(2k-m)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)-\right.$$

$$\frac{2e^{-b\sqrt{z}\ (2k-m)-f(v-2s)z}}{f(v-2s)}+\frac{2(-1)^m e^{b\sqrt{z}\ (2k-m)+2(e(2k-m)+g(v-2s))+f(v-2s)z}}{f(v-2s)}-$$

$$\left.\left.\frac{b\,e^{\frac{b^2(2k-m)^2}{4f(v-2s)}}(2k-m)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(2k-m)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}}\right)+(-1)^m\,e^{-e(m-2k)-g(v-2s)}\right.$$

$$\left(-\frac{1}{(f(v-2s))^{3/2}}\left((-1)^m\,b\,e^{2(e(m-2k)+g(v-2s))-\frac{b^2(m-2k)^2}{4f(v-2s)}}(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)-\right.$$

$$\frac{2e^{-b\sqrt{z}\ (m-2k)-f(v-2s)z}}{f(v-2s)}+\frac{2(-1)^m e^{b\sqrt{z}\ (m-2k)+2(e(m-2k)+g(v-2s))+f(v-2s)z}}{f(v-2s)}-$$

$$\left.\left.\left.\frac{b\,e^{\frac{b^2(m-2k)^2}{4f(v-2s)}}(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh^v(f\,z+g)$

01.20.21.4161.01

$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh^\nu(g+f\,z)\,dz ==$$

$$i^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)-\frac{1}{b}\left(2^{-m-\nu-1}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{d^2\,(m-2\,k)}{4\,b}}\binom{m}{k}\right.\right.$$

$$\left.\left.\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-\nu+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{s}\sinh((2\,s-\nu)\,(g+f\,z))}{\nu-2\,s}}{f}+2^{-m-\nu-1}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,\nu)^2}{8\,b\,k-4\,b\,m}+g\,(\nu-2\,s)}\operatorname{erfi}\left(\frac{-f\,(2\,s-\nu)-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\right.$$

$$\frac{1}{b\,m-2\,b\,k}\left(e^{g\,(\nu-2\,s)-\frac{(2\,d\,k-d\,m+f\,(\nu-2\,s))^2}{8\,b\,k-4\,b\,m}}\left(e^{2\left(\frac{(2\,d\,k-d\,m-2\,f\,s+f\,\nu)^2}{8\,b\,k-4\,b\,m}+g\,(2\,s-\nu)\right)}\sqrt{b\,m-2\,b\,k}\right.\right.$$

$$\operatorname{erfi}\left(\frac{f\,(2\,s-\nu)-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,m-2\,b\,k}}\right)-(-1)^m\sqrt{2\,b\,k-b\,m}$$

$$\left.\left.\operatorname{erfi}\left(\frac{-f\,(2\,s-\nu)+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-\frac{1}{b\,(m-2\,k)}\left((-1)^m\,e^{g\,(2\,s-\nu)-\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,\nu)^2}{8\,b\,k-4\,b\,m}}\right.$$

$$\left.\left.\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{f\,(2\,s-\nu)+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4162.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh^\nu(g+f\,z)\,dz == i^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)-$$

$$\frac{\left(i^m\,2^{-m-\nu+1}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\sinh((2\,s-\nu)\,(g+f\,z))\binom{\nu}{s}}{\nu-2\,s}}{f}+2^{-m-\nu-1}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\sqrt{z}\ (2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+d\,z\right)}\right)}{d\,(m-2\,k)}-\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\sqrt{z}\ (m-2\,k)}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-\right.$$

$$\left.\frac{b\, e^{-\frac{b^2 (m-2k)}{4d}} (m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2d\sqrt{z}\ (m-2k)}{2\sqrt{d(m-2k)}}\right)}{(d(m-2k))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g(v-2s)}\left(\frac{2(-1)^m e^{b\sqrt{z}\ (2k-m)+2g(v-2s)+(d(2k-m)+f(v-2s))z}}{d(2k-m)+f(v-2s)}-\right.\right.$$

$$\left.\left((-1)^m b\, e^{2g(v-2s)-\frac{b^2(2k-m)^2}{4(d(2k-m)+f(v-2s))}}(2k-m)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(2k-m)+2(d(2k-m)+f(v-2s))\sqrt{z}}{2\sqrt{d(2k-m)+f(v-2s)}}\right)\right)\Big/$$

$$(d(2k-m)+f(v-2s))^{3/2}+\frac{2e^{(d(m-2k)-f(v-2s))z-b(2k-m)\sqrt{z}}}{d(m-2k)-f(v-2s)}-\left(b\, e^{-\frac{b^2(2k-m)^2}{4(d(m-2k)-f(v-2s))}}(2k-m)\right.$$

$$\left.\left.\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(2k-m)+2(d(2k-m)+f(v-2s))\sqrt{z}}{2\sqrt{d(m-2k)-f(v-2s)}}\right)\right)\Big/(d(m-2k)-f(v-2s))^{3/2}\right)+$$

$$(-1)^m e^{-g(v-2s)}\left(\frac{2(-1)^m e^{b\sqrt{z}\ (m-2k)+2g(v-2s)+(d(m-2k)+f(v-2s))z}}{d(m-2k)+f(v-2s)}-\left((-1)^m b\, e^{2g(v-2s)-\frac{b^2(m-2k)^2}{4(d(m-2k)+f(v-2s))}}\right.\right.$$

$$\left.\left.(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2(d(m-2k)+f(v-2s))\sqrt{z}}{2\sqrt{d(m-2k)+f(v-2s)}}\right)\right)\Big/\right.$$

$$(d(m-2k)+f(v-2s))^{3/2}+\frac{2e^{(d(2k-m)-f(v-2s))z-b(m-2k)\sqrt{z}}}{d(2k-m)-f(v-2s)}-$$

$$\left.\left(b\, e^{-\frac{b^2(m-2k)^2}{4(d(2k-m)-f(v-2s))}}(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2(d(m-2k)+f(v-2s))\sqrt{z}}{2\sqrt{d(2k-m)-f(v-2s)}}\right)\right)\Big/\right.$$

$$\left.(d(2k-m)-f(v-2s))^{3/2}\right)\Bigg)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b z^r + d z + e)\cosh^v(f z + g)$

01.20.21.4163.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^\nu(g+f\,z)\,dz ==$$

$$i^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)-\frac{1}{b}\left(2^{-m-\nu-1}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{(m-2k)\,d^2}{4b}+2ek-em}\binom{m}{k}\left((-1)^m\,e^{\frac{d^2\,(m-2k)}{2b}}\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+\right.\right.$$

$$\left.\left.e^{2e\,(m-2k)}\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)\right)\right)\Bigg)-$$

$$\frac{i^m\,2^{-m-\nu+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\binom{\nu}{s}\sinh((2\,s-\nu)\,(g+f\,z))}{\nu-2\,s}}{f}+2^{-m-\nu-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}$$

$$\left(\frac{e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,\nu)^2}{8\,b\,k-4\,b\,m}+e\,(m-2\,k)+g\,(\nu-2\,s)}\operatorname{erfi}\left(\frac{-f\,(2\,s-\nu)-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)}{\sqrt{b\,(m-2\,k)}}+\frac{1}{b\,m-2\,b\,k}\left(e^{-\frac{(2\,d\,k-d\,m+f\,(\nu-2\,s))^2}{8\,b\,k-4\,b\,m}-e\,(2\,k+m)+g\,(\nu-2\,s)}\right.\right.$$

$$\left(e^{2\left(\frac{(2\,d\,k-d\,m-2\,f\,s+f\,\nu)^2}{8\,b\,k-4\,b\,m}+e\,m+g\,(2\,s-\nu)\right)}\sqrt{b\,m-2\,b\,k}\ \operatorname{erfi}\left(\frac{f\,(2\,s-\nu)-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,m-2\,b\,k}}\right)-\right.$$

$$\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m}\ \operatorname{erfi}\left(\frac{-f\,(2\,s-\nu)+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right)-$$

$$\frac{1}{b\,(m-2\,k)}\left((-1)^m\,e^{-\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,\nu)^2}{8\,b\,k-4\,b\,m}+e\,(2\,k-m)+g\,(2\,s-\nu)}\sqrt{2\,b\,k-b\,m}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{f\,(2\,s-\nu)+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m}}\right)\right)\right/;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4164.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^\nu(g+f\,z)\,dz ==$$

$$i^m\,2^{-m-\nu}\,z\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)-\frac{\left(i^m\,2^{-m-\nu+1}\right)\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\frac{\sinh((2\,s-\nu)\,(g+f\,z))\binom{\nu}{s}}{\nu-2\,s}}{f}+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-e(m-2k)}\binom{m}{k}\left(\frac{2e^{dz(2k-m)+b\sqrt{z}(2k-m)}\left(-(-1)^m+e^{2(m-2k)\left(\sqrt{z}\,b+e+dz\right)}\right)}{d(m-2k)}-\right.$$

$$\frac{(-1)^m b e^{\frac{b^2(m-2k)}{4d}}(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2d\sqrt{z}(m-2k)}{2\sqrt{d(2k-m)}}\right)}{(d(2k-m))^{3/2}}-$$

$$\left.\frac{b e^{2e(m-2k)-\frac{b^2(m-2k)}{4d}}(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2d\sqrt{z}(m-2k)}{2\sqrt{d(m-2k)}}\right)}{(d(m-2k))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e(2k-m)-g(v-2s)}\left(\frac{2(-1)^m e^{b\sqrt{z}(2k-m)+2(e(2k-m)+g(v-2s))+(d(2k-m)+f(v-2s))z}}{d(2k-m)+f(v-2s)}-\right.\right.$$

$$\left(\left(-1)^m b e^{2(e(2k-m)+g(v-2s))-\frac{b^2(2k-m)^2}{4(d(2k-m)+f(v-2s))}}(2k-m)\sqrt{\pi}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b(2k-m)+2(d(2k-m)+f(v-2s))\sqrt{z}}{2\sqrt{d(2k-m)+f(v-2s)}}\right)\right)\Big/(d(2k-m)+f(v-2s))^{3/2}+$$

$$\frac{2e^{(d(m-2k)-f(v-2s))z-b(2k-m)\sqrt{z}}}{d(m-2k)-f(v-2s)}-\left(b e^{-\frac{b^2(2k-m)^2}{4(d(m-2k)-f(v-2s))}}(2k-m)\sqrt{\pi}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b(2k-m)+2(d(2k-m)+f(v-2s))\sqrt{z}}{2\sqrt{d(m-2k)-f(v-2s)}}\right)\right)\Big/(d(m-2k)-f(v-2s))^{3/2}\right)+$$

$$(-1)^m e^{-e(m-2k)-g(v-2s)}\left(\frac{2(-1)^m e^{b\sqrt{z}(m-2k)+2(e(m-2k)+g(v-2s))+(d(m-2k)+f(v-2s))z}}{d(m-2k)+f(v-2s)}-\right.$$

$$\left(\left(-1)^m b e^{2(e(m-2k)+g(v-2s))-\frac{b^2(m-2k)^2}{4(d(m-2k)+f(v-2s))}}(m-2k)\sqrt{\pi}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b(m-2k)+2(d(m-2k)+f(v-2s))\sqrt{z}}{2\sqrt{d(m-2k)+f(v-2s)}}\right)\right)\Big/$$

$$(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(2\,k-m)-f\,(v-2\,s))\,z-b\,(m-2\,k)\,\sqrt{z}}}{d\,(2\,k-m)-f\,(v-2\,s)}-$$

$$\left(b\,e^{-\frac{b^2\,(m-2\,k)^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}\,(m-2\,k)\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\right)\Big/$$

$$(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\Bigg)\Bigg)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.4165.01

$$\int\sinh^m(b\,z)\cosh^v\left(c\,z^2\right)dz==i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)}{b}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}\frac{(-1)^k\,e^{(m-2\,k)\,b\,z}\left(-1+(-1)^m\,e^{2\,(2\,k-m)\,b\,z}\right)\binom{m}{k}}{2\,k-m}-$$

$$\frac{i^m\,2^{-m-v-1}\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m\bmod 2)}{c}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\frac{\binom{v}{s}\left(\sqrt{c\,(v-2\,s)}\,\operatorname{erfi}\left(\frac{c\,(2\,s-v)\,z}{\sqrt{c\,(v-2\,s)}}\right)+\sqrt{c\,(2\,s-v)}\,\operatorname{erfi}\left(\sqrt{c\,(2\,s-v)}\,z\right)\right)}{v-2\,s}+$$

$$2^{-m-v-1}\,\sqrt{\pi}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\binom{v}{s}\Bigg(\frac{e^{\frac{(b\,m-2\,b\,k)^2}{8\,c\,s-4\,c\,v}}\operatorname{erfi}\left(\frac{-2\,b\,k+b\,m-2\,c\,(2\,s-v)\,z}{2\,\sqrt{c\,(v-2\,s)}}\right)}{\sqrt{c\,(v-2\,s)}}+\frac{1}{2\,c\,s-c\,v}\left(e^{-\frac{(2\,b\,k-b\,m)^2}{4\,c\,v-8\,c\,s}}\left(e^{\frac{(2\,b\,k-b\,m)^2}{2\,c\,v-4\,c\,s}}\,\sqrt{2\,c\,s-c\,v}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{-2\,b\,k+b\,m+2\,c\,(2\,s-v)\,z}{2\,\sqrt{2\,c\,s-c\,v}}\right)-(-1)^m\,\sqrt{c\,v-2\,c\,s}\,\operatorname{erfi}\left(\frac{2\,b\,k-b\,m-2\,c\,(2\,s-v)\,z}{2\,\sqrt{c\,v-2\,c\,s}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(b\,m-2\,b\,k)^2}{8\,c\,s-4\,c\,v}}\,\sqrt{2\,c\,s-c\,v}\,\operatorname{erfi}\left(\frac{2\,b\,k-b\,m+2\,c\,(2\,s-v)\,z}{2\,\sqrt{2\,c\,s-c\,v}}\right)}{c\,(v-2\,s)}\Bigg)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4166.01

$$\int \sinh^m(b\,z)\cosh^v\left(c\,\sqrt{z}\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{b\,(2\,k-m)\,z}\left(-(-1)^m+e^{2\,(m-2\,k)\,b\,z}\right)\binom{m}{k}}{m-2\,k}+$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{e^{(-2\,s-v)\,c\,\sqrt{z}}\left(e^{4\,s\,c\,\sqrt{z}}\left(c\,(2\,s-v)\,\sqrt{z}-1\right)+e^{2\,v\,c\,\sqrt{z}}\left(c\,(v-2\,s)\,\sqrt{z}-1\right)\right)\binom{v}{s}}{(v-2\,s)^2}+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,b\,(2\,k-m)}}\sqrt{\pi}\,(v-2\,s)\,\operatorname{erfi}\left(\frac{2\,b\,\sqrt{z}\,(m-2\,k)+c\,(v-2\,s)}{2\sqrt{b\,(2\,k-m)}}\right)}{(b\,(2\,k-m))^{3/2}}+\frac{2\,e^{b\,(2\,k-m)\,z-c\,(v-2\,s)\,\sqrt{z}}}{b\,(2\,k-m)}+\right.\right.$$

$$\left.\frac{2\,(-1)^m\,e^{c\,\sqrt{z}\,(v-2\,s)+b\,(m-2\,k)\,z}}{b\,(m-2\,k)}-\frac{(-1)^m\,c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,b\,(m-2\,k)}}\sqrt{\pi}\,(v-2\,s)\,\operatorname{erfi}\left(\frac{2\,b\,\sqrt{z}\,(m-2\,k)+c\,(v-2\,s)}{2\sqrt{b\,(m-2\,k)}}\right)}{(b\,(m-2\,k))^{3/2}}\right)+$$

$$\frac{2\,(-1)^m\,e^{c\,\sqrt{z}\,(v-2\,s)+b\,(2\,k-m)\,z}}{b\,(2\,k-m)}-\frac{(-1)^m\,c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,b\,(2\,k-m)}}\sqrt{\pi}\,(v-2\,s)\,\operatorname{erfi}\left(\frac{2\,b\,\sqrt{z}\,(2\,k-m)+c\,(v-2\,s)}{2\sqrt{b\,(2\,k-m)}}\right)}{(b\,(2\,k-m))^{3/2}}+$$

$$\left.\left.\frac{2\,e^{b\,(m-2\,k)\,z-c\,(v-2\,s)\,\sqrt{z}}}{b\,(m-2\,k)}-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,b\,(m-2\,k)}}\sqrt{\pi}\,(v-2\,s)\,\operatorname{erfi}\left(\frac{2\,b\,\sqrt{z}\,(2\,k-m)+c\,(v-2\,s)}{2\sqrt{b\,(m-2\,k)}}\right)}{(b\,(m-2\,k))^{3/2}}\right)\right/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh^v\left(c\,z^r\right)$

01.20.21.4167.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{d}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}\frac{(-1)^k\,e^{(m-2k)(e+dz)}\left(-1+(-1)^m\,e^{2(2k-m)(e+dz)}\right)\binom{m}{k}}{2k-m}-\frac{i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}$$

$$\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\frac{\binom{v}{s}\left(\sqrt{c\,(v-2s)}\ \operatorname{erfi}\left(\frac{c\,(2s-v)\,z}{\sqrt{c\,(v-2s)}}\right)+\sqrt{c\,(2s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2s-v)}\ z\right)\right)}{v-2s}+2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(d\,m-2\,d\,k)^2}{8\,c\,s-4\,c\,v}+e\,(m-2k)}\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m-2\,c\,(2s-v)\,z}{2\sqrt{c\,(v-2s)}}\right)}{\sqrt{c\,(v-2s)}}+\frac{1}{2\,c\,s-c\,v}\left(e^{-\frac{(2\,d\,k-d\,m)^2}{4\,c\,v-8\,c\,s}-e\,(2k+m)}\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{4\,c\,v-8\,c\,s}+e\,m\right)}\sqrt{2\,c\,s-c\,v}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m+2\,c\,(2s-v)\,z}{2\sqrt{2\,c\,s-c\,v}}\right)-(-1)^m\,e^{4\,e\,k}\sqrt{c\,v-2\,c\,s}\ \operatorname{erfi}\left(\frac{2\,d\,k-d\,m-2\,c\,(2s-v)\,z}{2\sqrt{c\,v-2\,c\,s}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{e\,(2k-m)-\frac{(d\,m-2\,d\,k)^2}{8\,c\,s-4\,c\,v}}\sqrt{2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,d\,k-d\,m+2\,c\,(2s-v)\,z}{2\sqrt{2\,c\,s-c\,v}}\right)}{c\,(v-2s)}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4168.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(c\sqrt{z}\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{d}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}\frac{(-1)^k\,e^{d\,(2\,k-m)\,z-e\,(m-2\,k)}\left(-(-1)^m+e^{2\,(m-2\,k)\,(e+d\,z)}\right)\binom{m}{k}}{m-2\,k}+$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\frac{e^{(-2\,s-v)\,c\sqrt{z}}\left(e^{4\,s\,c\sqrt{z}}\left(c\,(2\,s-v)\sqrt{z}-1\right)+e^{2\,v\,c\sqrt{z}}\left(c\,(v-2\,s)\sqrt{z}-1\right)\right)\binom{v}{s}}{(v-2\,s)^2}+$$

$$2^{-m-v-1}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\binom{v}{s}\left(e^{-e\,(2\,k-m)}\left(-\frac{1}{(d\,(2\,k-m))^{3/2}}\left((-1)^m\,c\,e^{2\,e\,(2\,k-m)-\frac{c^2\,(v-2\,s)^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\,(v-2\,s)\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{2\,d\sqrt{z}\,(2\,k-m)+c\,(v-2\,s)}{2\sqrt{d\,(2\,k-m)}}\right)\right)+\frac{2\,(-1)^m\,e^{2\,e\,(2\,k-m)+d\,z\,(2\,k-m)+c\,(v-2\,s)\sqrt{z}}}{d\,(2\,k-m)}+\right.\right.$$

$$\left.\left.\frac{2\,e^{d\,(m-2\,k)\,z-c\,(v-2\,s)\sqrt{z}}}{d\,(m-2\,k)}-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\,(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\sqrt{z}\,(2\,k-m)+c\,(v-2\,s)}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+\right.$$

$$(-1)^m\,e^{-e\,(m-2\,k)}\left(-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\,(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\sqrt{z}\,(m-2\,k)+c\,(v-2\,s)}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\right.$$

$$\frac{2\,e^{d\,(2\,k-m)\,z-c\,(v-2\,s)\sqrt{z}}}{d\,(2\,k-m)}+\frac{2\,(-1)^m\,e^{2\,e\,(m-2\,k)+d\,z\,(m-2\,k)+c\,(v-2\,s)\sqrt{z}}}{d\,(m-2\,k)}-$$

$$\left.\left.\frac{(-1)^m\,c\,e^{2\,e\,(m-2\,k)-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\,(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\sqrt{z}\,(m-2\,k)+c\,(v-2\,s)}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.4169.01

$$\int \sinh^m(b\,z^r)\cosh^v(c\,z^r)\,dz == 2^{-m-v}\,z\left(i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)+\frac{1}{r}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,b\,(m-2\,k)\,z^r\right)(-b\,(2\,k-m)\,z^r)^{-1/r}+(b\,(2\,k-m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,b\,(2\,k-m)\,z^r\right)\right)+$$

$$\frac{i^{-m}}{r}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,c\,(2\,s-v)\,z^r\right)(c\,(2\,s-v)\,z^r)^{-1/r}+(c\,(v-2\,s)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,(v-2\,s)\,z^r\right)\right)-$$

$$\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.$$

$$((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.\left.((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4170.01

$$\int \sinh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - \frac{2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\binom{m}{k}\left(\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)\,z}{\sqrt{b\,(m-2\,k)}}\right)+(-1)^m\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2\,k-m)}\ z\right)\right)\right) -$$

$$\frac{i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(\binom{v}{s}\left(\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)\,z}{\sqrt{c\,(v-2\,s)}}\right)+\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2\,s-v)}\ z\right)\right)\right) +$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\right.$$

$$\left(\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\left(-4\,b\,k\,z+2\,b\,m\,z+2\,c\,(2\,s-v)\,z\right)\Big/\left(2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\right)\right)-\right.$$

$$\left.(-1)^m\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z-2\,c\,(2\,s-v)\,z}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)+$$

$$\frac{\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z-2\,c\,(2\,s-v)\,z}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-\left((-1)^m\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z+2\,c\,(2\,s-v)\,z}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/$$

$$\left.(b\,(m-2\,k)+c\,(v-2\,s))\right);\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4171.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,i^{-m}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - \frac{2^{-m-v+2}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\left(\cosh\left((2s-v)\,c\sqrt{z}\right)+c\,(v-2s)\sqrt{z}\,\sinh\left((2s-v)\,c\sqrt{z}\right)\right)}{(v-2s)^2} - \frac{i^{-m}\,2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b^2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\binom{m}{k}\left(\cosh\left(b\,(2k-m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-b\,(2k-m)\sqrt{z}\,\sinh\left(b\,(2k-m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)\right) -$$

$$2^{-m-v+2}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}\left(\cosh\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-\right.\right.$$
$$\left.(2\,b\,k-b\,m-2\,c\,s+c\,v)\sqrt{z}\,\sinh\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+$$
$$\frac{1}{(2\,b\,k-b\,m+2\,c\,s-c\,v)^2}\left(\cosh\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-$$
$$\left.\left.(2\,b\,k-b\,m+2\,c\,s-c\,v)\sqrt{z}\,\sinh\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+e)\cosh^v(c\,z^r)$

01.20.21.4172.01

$$\int \sinh^m(b\,z^r+e)\cosh^v(c\,z^r)\,dz ==$$

$$2^{-m-v}\,z\left(i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)+\frac{1}{r}\left(\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\right.\right.$$

$$\left.\left.\left((-1)^m\,\Gamma\left(\frac{1}{r},\,b\,(m-2\,k)\,z^r\right)(-b\,(2\,k-m)\,z^r)^{-1/r}+e^{2\,e\,m-4\,e\,k}\,(b\,(2\,k-m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,b\,(2\,k-m)\,z^r\right)\right)\right)+$$

$$\frac{1}{r}\left(i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{1}{r},\,c\,(2\,s-v)\,z^r\right)(c\,(2\,s-v)\,z^r)^{-1/r}+(c\,(v-2\,s)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,(v-2\,s)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-2\,e\,k-e\,m}\binom{v}{s}\left((-1)^m\,e^{4\,e\,k}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\right.\right.$$

$$z^r)^{-1/r}+e^{2\,e\,m}\,((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,e^{4\,e\,k}\,((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.\left.e^{2\,e\,m}\,((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4173.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}$$

$$\left((-1)^k\,e^{2e\,k-e\,m}\binom{m}{k}\left(e^{2e\,(m-2k)}\sqrt{b\,(m-2k)}\ \operatorname{erfi}\left(\frac{b\,(2k-m)\,z}{\sqrt{b\,(m-2k)}}\right)+(-1)^m\sqrt{b\,(2k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\left(\sqrt{c\,(v-2s)}\ \operatorname{erfi}\left(\frac{c\,(2s-v)\,z}{\sqrt{c\,(v-2s)}}\right)+\sqrt{c\,(2s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2s-v)}\ z\right)\right)}{v-2s}+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-e\,(2k+m)}\left(e^{2e\,m}\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z+2\,c\,(2s-v)\,z}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z-2\,c\,(2s-v)\,z}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+\frac{e^{e\,(m-2k)}\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z-2\,c\,(2s-v)\,z}{2\sqrt{b\,(m-2k)+c\,(v-2s)}}\right)}{\sqrt{b\,(m-2k)+c\,(v-2s)}}-\right.$$

$$\left.\frac{(-1)^m\,e^{e\,(2k-m)}\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z+2\,c\,(2s-v)\,z}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)}{b\,(m-2k)+c\,(v-2s)}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\,i^{-m}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{1}{c^2}\left(2^{-m-v+2}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\left(\cosh\left((2s-v)\,c\sqrt{z}\right)+c\,(v-2s)\sqrt{z}\,\sinh\left((2s-v)\,c\sqrt{z}\right)\right)}{(v-2s)^2}\right)-$$

$$\frac{1}{b^2}\left(i^{-m}\,2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\binom{m}{k}\left(\cosh\left(2ek-em+b\,(2k-m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-\right.\right.\right.$$

$$\left.\left.\left.b\,(2k-m)\sqrt{z}\,\sinh\left(2ek-em+b\,(2k-m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)\right)-2^{-m-v+2}\,i^{-m}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2bk-bm-2cs+cv)^2}\left(\cosh\left(2ek-em+(2bk-bm-2cs+cv)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-\right.\right.$$

$$\left.(2bk-bm-2cs+cv)\sqrt{z}\,\sinh\left(2ek-em+(2bk-bm-2cs+cv)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)+$$

$$\frac{1}{(2bk-bm+2cs-cv)^2}\left(\cosh\left(2ek-em+(2bk-bm+2cs-cv)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-(2bk-bm+\right.$$

$$\left.\left.2cs-cv)\sqrt{z}\,\sinh\left(2ek-em+(2bk-bm+2cs-cv)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r\right)$

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$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\left(\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)\,z}{\sqrt{c\,(v-2\,s)}}\right)+\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2\,s-v)}\ z\right)\right)}{v-2\,s}\right)-$$

$$\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{d^2\,(m-2\,k)}{4\,b}}\binom{m}{k}\right.\right.$$

$$\left.\left.\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-\frac{(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}}\right.\right.\right.$$

$$\left(e^{\frac{2\,(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}}\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-\right.$$

$$\left.\left.\left.(-1)^m\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+\right.$$

$$\left.\frac{e^{\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-\left((-1)^m\,e^{-\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\left(b\,(m-2\,k)+c\,(v-2\,s)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(c\,\sqrt{z}\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{e^{(-2s-v)\,c\,\sqrt{z}}\left(e^{4\,s\,c\,\sqrt{z}}\left(c\,(2\,s-v)\,\sqrt{z}\ -1\right)+e^{2\,v\,c\,\sqrt{z}}\left(c\,(v-2\,s)\,\sqrt{z}\ -1\right)\right)\binom{v}{s}}{(v-2\,s)^2}+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\,\sqrt{z}\ (2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+d\,z\right)}\right)}{d\,(m-2\,k)}-\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-\right.$$

$$\left.\frac{b\,e^{-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\ (b\,(m-2\,k)+c\,(v-2\,s))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}+\frac{2\,e^{\sqrt{z}\ (-b\,(m-2\,k)-c\,(v-2\,s))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\right.\right.$$

$$\frac{1}{(d\,(2\,k-m))^{3/2}}\left(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\right.$$

$$\left.\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)\right)-\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^m\,e^{-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,d\,(m-2\,k)}}\right.$$

$$\left.\left.\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)\right)\right)+$$

$$\frac{2\,(-1)^m\,e^{\sqrt{z}\ (b\,(2\,k-m)+c\,(v-2\,s))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\frac{1}{(d\,(2\,k-m))^{3/2}}\left((-1)^m\,e^{-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\right.$$

$$\left.(b\,(2\,k-m)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,d\,\sqrt{z}\ (2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)\right)+$$

$$\frac{2\,e^{\sqrt{z}\ (-b\,(2\,k-m)-c\,(v-2\,s))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{1}{(d\,(m-2\,k))^{3/2}}\left(e^{-\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,d\,\sqrt{z}\ (2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r\right)$

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$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\left(\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)\,z}{\sqrt{c\,(v-2\,s)}}\right)+\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2\,s-v)}\ z\right)\right)}{v-2\,s}\right)-$$

$$\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{(m-2\,k)\,d^2}{4\,b}+2\,e\,k-e\,m}\binom{m}{k}\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sqrt{b\,(2\,k-m)}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+e^{2\,e\,(m-2\,k)}\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-\frac{(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}-e\,(2\,k+m)}\right.\right.\right.$$

$$\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+e\,m\right)}\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-\right.$$

$$\left.\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+$$

$$\frac{e^{\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-$$

$$\left((-1)^m\,e^{e\,(2\,k-m)-\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\left(b\,(m-2\,k)+c\,(v-2\,s)\right)\right);\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4178.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(c\,\sqrt{z}\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{e^{(-2s-v)\,c\,\sqrt{z}}\left(e^{4\,s\,c\,\sqrt{z}}\left(c\,(2\,s-v)\,\sqrt{z}\ -1\right)+e^{2\,v\,c\,\sqrt{z}}\left(c\,(v-2\,s)\,\sqrt{z}\ -1\right)\right)\binom{v}{s}}{(v-2\,s)^2}+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-e\,(m-2\,k)}\binom{m}{k}\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\,\sqrt{z}\ (2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+e+d\,z\right)}\right)}{d\,(m-2\,k)}-\right.$$

$$\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-$$

$$\left.\frac{b\,e^{2\,e\,(m-2\,k)-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e\,(2\,k-m)}\left(\frac{2\,(-1)^m\,e^{2\,e\,(2\,k-m)+d\,z\,(2\,k-m)+(b\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}}{d\,(2\,k-m)}-\frac{1}{(d\,(2\,k-m))^{3/2}}\left((-1)^m\,e^{2\,e\,(2\,k-m)-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,d\,(2\,k-m)}}\right.\right.\right.$$

$$\left.\left.\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,d\,\sqrt{z}\ (2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)\right)+\right.$$

$$\frac{2\,e^{\sqrt{z}\ (-b\,(2\,k-m)-c\,(v-2\,s))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{1}{(d\,(m-2\,k))^{3/2}}\left(e^{-\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\right.$$

$$\left.\left.\left.(b\,(2\,k-m)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,d\,\sqrt{z}\ (2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)\right)\right)+(-1)^m\,e^{-e\,(m-2\,k)}\right.$$

$$\left(\frac{2\,(-1)^m\,e^{2\,e\,(m-2\,k)+d\,z\,(m-2\,k)+(b\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}}{d\,(m-2\,k)}+\frac{2\,e^{\sqrt{z}\ (-b\,(m-2\,k)-c\,(v-2\,s))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\frac{1}{(d\,(2\,k-m))^{3/2}}\right.$$

$$\left(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)\right)-$$

$$\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^m\,e^{2\,e\,(m-2\,k)-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\right.$$

$$\left.\left.\left.\left.\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4179.01

$$\int \sinh^m(d\,z)\cosh^v\left(c\,z^2+g\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{d}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{(m-2k)\,d\,z}\left(-1+(-1)^m\,e^{2(2k-m)\,d\,z}\right)\binom{m}{k}}{2k-m}-\frac{i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{g(2s-v)}\binom{v}{s}\left(e^{2g(v-2s)}\sqrt{c\,(v-2s)}\ \operatorname{erfi}\left(\frac{c\,(2s-v)\,z}{\sqrt{c\,(v-2s)}}\right)+\sqrt{c\,(2s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2s-v)}\ z\right)\right)\right)+2^{-m-v-1}$$

$$\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(d\,m-2\,d\,k)^2}{8\,c\,s-4\,c\,v}+g(v-2s)}\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m-2\,c\,(2s-v)\,z}{2\sqrt{c\,(v-2s)}}\right)}{\sqrt{c\,(v-2s)}}+\frac{1}{2\,c\,s-c\,v}\left(e^{g(v-2s)-\frac{(2\,d\,k-d\,m)^2}{4\,c\,v-8\,c\,s}}\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{4\,c\,v-8\,c\,s}+g(2s-v)\right)}\sqrt{2\,c\,s-c\,v}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m+2\,c\,(2s-v)\,z}{2\sqrt{2\,c\,s-c\,v}}\right)-(-1)^m\sqrt{c\,v-2\,c\,s}\ \operatorname{erfi}\left(\frac{2\,d\,k-d\,m-2\,c\,(2s-v)\,z}{2\sqrt{c\,v-2\,c\,s}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{g(2s-v)-\frac{(d\,m-2\,d\,k)^2}{8\,c\,s-4\,c\,v}}\sqrt{2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,d\,k-d\,m+2\,c\,(2s-v)\,z}{2\sqrt{2\,c\,s-c\,v}}\right)}{c\,(v-2s)}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4180.01

$$\int \sinh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{d}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}\frac{(-1)^k\,e^{d\,(2\,k-m)\,z}\left(-(-1)^m+e^{2\,(m-2\,k)\,d\,z}\right)\binom{m}{k}}{m-2\,k}+\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}$$

$$\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\frac{1}{(v-2\,s)^2}\left(e^{(-2\,s-v)\left(\sqrt{z}\;c+g\right)}\left(e^{4\,s\left(\sqrt{z}\;c+g\right)}\left(c\,(2\,s-v)\,\sqrt{z}\;-1\right)+e^{2\,v\left(\sqrt{z}\;c+g\right)}\left(c\,(v-2\,s)\,\sqrt{z}\;-1\right)\right)\binom{v}{s}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\binom{v}{s}\left(e^{-g\,(v-2\,s)}\left(-\frac{1}{(d\,(2\,k-m))^{3/2}}\left((-1)^m\,c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\;(v-2\,s)\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)\right)+\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+c\,\sqrt{z}\;(v-2\,s)+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}+\right.\right.$$

$$\left.\left.\frac{2\,e^{d\,(m-2\,k)\,z-c\,(v-2\,s)\,\sqrt{z}}}{d\,(m-2\,k)}-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\;(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+\right.$$

$$(-1)^m\,e^{-g\,(v-2\,s)}\left(-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\;(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\right.$$

$$\frac{2\,e^{d\,(2\,k-m)\,z-c\,(v-2\,s)\,\sqrt{z}}}{d\,(2\,k-m)}+\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+c\,\sqrt{z}\;(v-2\,s)+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-$$

$$\left.\left.\frac{(-1)^m\,c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\;(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)\right)/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4181.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{d}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{(m-2k)(e+dz)}\left(-1+(-1)^m\,e^{2(2k-m)(e+dz)}\right)\binom{m}{k}}{2k-m}-\frac{i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{g(2s-v)}\binom{v}{s}\left(e^{2g(v-2s)}\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{c(2s-v)z}{\sqrt{c(v-2s)}}\right)+\sqrt{c(2s-v)}\ \operatorname{erfi}\left(\sqrt{c(2s-v)}\ z\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(dm-2dk)^2}{8cs-4cv}+e(m-2k)+g(v-2s)}\operatorname{erfi}\left(\frac{-2dk+dm-2c(2s-v)z}{2\sqrt{c(v-2s)}}\right)}{\sqrt{c(v-2s)}}+\right.$$

$$\frac{1}{2cs-cv}\left(e^{-\frac{(2dk-dm)^2}{4cv-8cs}-e(2k+m)+g(v-2s)}\left(e^{2\left(\frac{(2dk-dm)^2}{4cv-8cs}+em+g(2s-v)\right)}\sqrt{2cs-cv}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{-2dk+dm+2c(2s-v)z}{2\sqrt{2cs-cv}}\right)-(-1)^m\,e^{4ek}\sqrt{cv-2cs}\ \operatorname{erfi}\left(\frac{2dk-dm-2c(2s-v)z}{2\sqrt{cv-2cs}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(dm-2dk)^2}{8cs-4cv}+e(2k-m)+g(2s-v)}\sqrt{2cs-cv}\ \operatorname{erfi}\left(\frac{2dk-dm+2c(2s-v)z}{2\sqrt{2cs-cv}}\right)}{c(v-2s)}\right)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4182.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{d}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}\frac{(-1)^k\,e^{d\,(2\,k-m)\,z-e\,(m-2\,k)}\left(-(-1)^m+e^{2\,(m-2\,k)\,(e+d\,z)}\right)\binom{m}{k}}{m-2\,k}+\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}$$

$$\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\frac{1}{(v-2\,s)^2}\left(e^{(-2\,s-v)\left(\sqrt{z}\;c+g\right)}\left(e^{4\,s\left(\sqrt{z}\;c+g\right)}\left(c\,(2\,s-v)\,\sqrt{z}\;-1\right)+e^{2\,v\left(\sqrt{z}\;c+g\right)}\left(c\,(v-2\,s)\,\sqrt{z}\;-1\right)\right)\binom{v}{s}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\binom{v}{s}\left(e^{-e\,(2\,k-m)-g\,(v-2\,s)}\left(-\frac{1}{(d\,(2\,k-m))^{3/2}}\left((-1)^m\,c\,e^{2\,(e\,(2\,k-m)+g\,(v-2\,s))-\frac{c^2\,(v-2\,s)^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\;(v-2\,s)\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)\right)+\frac{2\,(-1)^m\,e^{c\,\sqrt{z}\;(v-2\,s)+2\,(e\,(2\,k-m)+g\,(v-2\,s))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}+\right.\right.$$

$$\left.\left.\frac{2\,e^{d\,(m-2\,k)\,z-c\,(v-2\,s)\,\sqrt{z}}}{d\,(m-2\,k)}-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\;(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(2\,k-m)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+\right.$$

$$(-1)^m\,e^{-e\,(m-2\,k)-g\,(v-2\,s)}\left(-\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\;(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\frac{2\,e^{d\,(2\,k-m)\,z-c\,(v-2\,s)\,\sqrt{z}}}{d\,(2\,k-m)}+\right.$$

$$\left.\frac{2\,(-1)^m\,e^{c\,\sqrt{z}\;(v-2\,s)+2\,(e\,(m-2\,k)+g\,(v-2\,s))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^m\,c\,e^{2\,(e\,(m-2\,k)+g\,(v-2\,s))-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,k)}}\right.\right.$$

$$\left.\left.\sqrt{\pi}\;(v-2\,s)\operatorname{erfi}\left(\frac{2\,d\,\sqrt{z}\;(m-2\,k)+c\,(v-2\,s)}{2\,\sqrt{d\,(m-2\,k)}}\right)\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.4183.01

$$\int \sinh^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz ==$$

$$2^{-m-v}\,z\left(i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)+\frac{1}{r}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,b\,(m-2\,k)\,z^r\right)\right.\right.$$

$$\left.\left.(-b\,(2\,k-m)\,z^r)^{-1/r}+(b\,(2\,k-m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,b\,(2\,k-m)\,z^r\right)\right)+\frac{i^{-m}}{r}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g\,(v-2\,s)}\,\Gamma\left(\frac{1}{r},\,c\,(2\,s-v)\,z^r\right)(c\,(2\,s-v)\,z^r)^{-1/r}+e^{2\,g\,s-g\,v}\,(c\,(v-2\,s)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,(v-2\,s)\,z^r\right)\right)-$$

$$\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-2\,g\,s-g\,v}\binom{v}{s}\left((-1)^m\,e^{2\,g\,v}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)((-2\,b\,k+b\,m+2\,c\,s-c\,v)\right.$$

$$\left.z^r)^{-1/r}+e^{4\,g\,s}\left((-1)^m\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+\right.\right.$$

$$\left.\left.((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)\right)+\right.$$

$$\left.e^{2\,g\,v}\,((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\Bigg)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4184.01

$$\int \sinh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+g\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k\binom{m}{k}\left(\sqrt{b\,(m-2k)}\ \operatorname{erfi}\left(\frac{b\,(2k-m)\,z}{\sqrt{b\,(m-2k)}}\right)+(-1)^m\sqrt{b\,(2k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{g\,(2s-v)}\binom{v}{s}\left(e^{2\,g\,(v-2s)}\sqrt{c\,(v-2s)}\ \operatorname{erfi}\left(\frac{c\,(2s-v)\,z}{\sqrt{c\,(v-2s)}}\right)+\sqrt{c\,(2s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2s-v)}\ z\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{g\,(v-2s)}\left(e^{2\,g\,(2s-v)}\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z+2\,c\,(2s-v)\,z}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-(-1)^m\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z-2\,c\,(2s-v)\,z}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+\frac{e^{g\,(v-2s)}\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z-2\,c\,(2s-v)\,z}{2\sqrt{b\,(m-2k)+c\,(v-2s)}}\right)}{\sqrt{b\,(m-2k)+c\,(v-2s)}}-\right.$$

$$\left.\frac{(-1)^m\,e^{g\,(2s-v)}\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z+2\,c\,(2s-v)\,z}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)}{b\,(m-2k)+c\,(v-2s)}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4185.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz == 2^{-m-v}\,i^{-m}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2) - \frac{2^{-m-v+2}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\left(\cosh\left((2s-v)\left(\sqrt{z}\,c+g\right)\right)+c\,(v-2s)\sqrt{z}\,\sinh\left((2s-v)\left(\sqrt{z}\,c+g\right)\right)\right)}{(v-2s)^2} - \frac{i^{-m}\,2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b^2}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\binom{m}{k}\left(\cosh\left(b\,(2k-m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)-b\,(2k-m)\sqrt{z}\,\sinh\left(b\,(2k-m)\sqrt{z}-\frac{i\,m\,\pi}{2}\right)\right)\right) - 2^{-m-v+2}$$

$$i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2bk-bm-2cs+cv)^2}\left(\cosh\left(-\frac{1}{2}i\pi m-2gs+gv+(2bk-bm-2cs+cv)\sqrt{z}\right)-\right.\right.$$
$$\left.(2bk-bm-2cs+cv)\sqrt{z}\,\sinh\left(-\frac{1}{2}i\pi m-2gs+gv+(2bk-bm-2cs+cv)\sqrt{z}\right)\right)+$$
$$\frac{1}{(2bk-bm+2cs-cv)^2}\left(\cosh\left(-\frac{1}{2}i\pi m+2gs-gv+(2bk-bm+2cs-cv)\sqrt{z}\right)-(2bk-bm+\right.$$
$$\left.\left.2cs-cv)\sqrt{z}\,\sinh\left(-\frac{1}{2}i\pi m+2gs-gv+(2bk-bm+2cs-cv)\sqrt{z}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+e)\cosh^v(c\,z^r+g)$

01.20.21.4186.01

$$\int \sinh^m(b\,z^r+e)\cosh^v(c\,z^r+g)\,dz ==$$

$$2^{-m-v}\,z\left(i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)+\frac{1}{r}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\right.$$

$$\left((-1)^m\,\Gamma\left(\frac{1}{r},\,b\,(m-2\,k)\,z^r\right)(-b\,(2\,k-m)\,z^r)^{-1/r}+e^{2\,e\,m-4\,e\,k}\,(b\,(2\,k-m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,b\,(2\,k-m)\,z^r\right)\right)+$$

$$\frac{i^{-m}}{r}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g\,(v-2\,s)}\,\Gamma\left(\frac{1}{r},\,c\,(2\,s-v)\,z^r\right)(c\,(2\,s-v)\,z^r)^{-1/r}+\right.$$

$$e^{2\,g\,s-g\,v}\,(c\,(v-2\,s)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,c\,(v-2\,s)\,z^r\right)\Big)-\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-2\,e\,k-e\,m-2\,g\,s-g\,v}\binom{v}{s}$$

$$\left((-1)^m\,e^{4\,e\,k+2\,g\,v}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}+\right.$$

$$e^{4\,g\,s}\left((-1)^m\,e^{4\,e\,k}\,\Gamma\left(\frac{1}{r},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}+e^{2\,e\,m}\right.$$

$$\left.((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)\right)+$$

$$\left.\left.e^{2\,e\,m+2\,g\,v}\,((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4187.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+g\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}$$

$$\left((-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\left(e^{2\,e\,(m-2\,k)}\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)\,z}{\sqrt{b\,(m-2\,k)}}\right)+(-1)^m\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2\,k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}$$

$$\left(e^{g\,(2\,s-v)}\binom{v}{s}\left(e^{2\,g\,(v-2\,s)}\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)\,z}{\sqrt{c\,(v-2\,s)}}\right)+\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2\,s-v)}\ z\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\right.$$

$$\left(e^{g\,(v-2\,s)-e\,(2\,k+m)}\left(e^{2\,(e\,m+g\,(2\,s-v))}\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z+2\,c\,(2\,s-v)\,z}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z-2\,c\,(2\,s-v)\,z}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+$$

$$\frac{e^{e\,(m-2\,k)+g\,(v-2\,s)}\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z-2\,c\,(2\,s-v)\,z}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-\left((-1)^m\,e^{e\,(2\,k-m)+g\,(2\,s-v)}\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z+2\,c\,(2\,s-v)\,z}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\left(b\,(m-2\,k)+c\,(v-2\,s)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4188.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == 2^{-m-v}\,i^{-m}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\,-$$

$$\frac{1}{c^2}\left(2^{-m-v+2}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{\binom{v}{s}\left(\cosh\left((2\,s-v)\left(\sqrt{z}\ c+g\right)\right)+c\,(v-2\,s)\,\sqrt{z}\ \sinh\left((2\,s-v)\left(\sqrt{z}\ c+g\right)\right)\right)}{(v-2\,s)^2}\right)-$$

$$\frac{1}{b^2}\left(i^{-m}\,2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2\,k)^2}\left((-1)^k\binom{m}{k}\left(\cosh\left(2\,e\,k-e\,m+b\,(2\,k-m)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)-\right.\right.\right.$$

$$\left.\left.\left.b\,(2\,k-m)\,\sqrt{z}\ \sinh\left(2\,e\,k-e\,m+b\,(2\,k-m)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)\right)\right)-$$

$$2^{-m-v+2}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}\left(\cosh\left(2\,e\,k-e\,m-2\,g\,s+g\,v+\right.\right.\right.$$

$$\left.\left.\left.(2\,b\,k-b\,m-2\,c\,s+c\,v)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)-(2\,b\,k-b\,m-2\,c\,s+c\,v)\,\sqrt{z}\right.\right.$$

$$\left.\left.\sinh\left(2\,e\,k-e\,m-2\,g\,s+g\,v+(2\,b\,k-b\,m-2\,c\,s+c\,v)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)+\frac{1}{(2\,b\,k-b\,m+2\,c\,s-c\,v)^2}\right.$$

$$\left.\left(\cosh\left(2\,e\,k-e\,m+2\,g\,s-g\,v+(2\,b\,k-b\,m+2\,c\,s-c\,v)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)-(2\,b\,k-b\,m+2\,c\,s-c\,v)\right.\right.$$

$$\left.\left.\sqrt{z}\ \sinh\left(2\,e\,k-e\,m+2\,g\,s-g\,v+(2\,b\,k-b\,m+2\,c\,s-c\,v)\,\sqrt{z}\ -\frac{i\,m\,\pi}{2}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4189.01

$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+g\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{c}\left(i^m\,2^{-m-v-1}\,\sqrt{\pi}\,\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left.\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(e^{g\,(2\,s-v)}\binom{v}{s}\left(e^{2\,g\,(v-2\,s)}\,\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)\,z}{\sqrt{c\,(v-2\,s)}}\right)+\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2\,s-v)}\ z\right)\right)\right)\right)-$$

$$\frac{1}{b}\left(2^{-m-v-1}\,\sqrt{\pi}\,\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{d^2\,(m-2\,k)}{4\,b}}\binom{m}{k}\right.\right.$$

$$\left.\left.\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\,\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\,\sqrt{b\,(m-2\,k)}}\right)\right)\right)\right)+$$

$$2^{-m-v-1}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{g\,(v-2\,s)-\frac{(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}}\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+g\,(2\,s-v)\right)}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-(-1)^m\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)\right)+$$

$$\frac{e^{\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+g\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-$$

$$\left.\left((-1)^m\,e^{g\,(2\,s-v)-\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\,\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\left(b\,(m-2\,k)+c\,(v-2\,s)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4190.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,s)^2}\left(e^{(-2\,s-v)\left(\sqrt{z}\ c+g\right)}\left(e^{4\,s\left(\sqrt{z}\ c+g\right)}\left(c\,(2\,s-v)\,\sqrt{z}\ -1\right)+e^{2\,v\left(\sqrt{z}\ c+g\right)}\left(c\,(v-2\,s)\,\sqrt{z}\ -1\right)\right)\binom{v}{s}\right)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\sqrt{z}\ (2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+d\,z\right)}\right)}{d\,(m-2\,k)}-\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-\right.$$

$$\left.\frac{b\,e^{-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g\,(v-2\,s)}\left(\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+d\,(2\,k-m)\,z+(b\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}}{d\,(2\,k-m)}-\frac{1}{(d\,(2\,k-m))^{3/2}}\left((-1)^m\,e^{2\,g\,(v-2\,s)-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,d\,(2\,k-m)}}\right.\right.\right.$$

$$\left.\left.\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,d\,\sqrt{z}\ (2\,k-m)+c\,(v-2\,s)}{2\sqrt{d\,(2\,k-m)}}\right)\right)+\right.$$

$$\frac{2\,e^{\sqrt{z}\ (-b\,(2\,k-m)-c\,(v-2\,s))+d\,(m-2\,k)\,z}}{d\,(m-2\,k)}-\frac{1}{(d\,(m-2\,k))^{3/2}}\left(e^{-\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\right.$$

$$\left.\left.\left.(b\,(2\,k-m)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(2\,k-m)+2\,d\,\sqrt{z}\ (2\,k-m)+c\,(v-2\,s)}{2\sqrt{d\,(m-2\,k)}}\right)\right)\right)+(-1)^m\,e^{-g\,(v-2\,s)}\right.$$

$$\left(\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+d\,(m-2\,k)\,z+(b\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}}{d\,(m-2\,k)}+\frac{2\,e^{\sqrt{z}\ (-b\,(m-2\,k)-c\,(v-2\,s))+d\,(2\,k-m)\,z}}{d\,(2\,k-m)}-\frac{1}{(d\,(2\,k-m))^{3/2}}\right.$$

$$\left(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,d\,(2\,k-m)}}\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)+c\,(v-2\,s)}{2\sqrt{d\,(2\,k-m)}}\right)\right)-$$

$$\frac{1}{(d\,(m-2\,k))^{3/2}}\left((-1)^m\,e^{2\,g\,(v-2\,s)-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,d\,(m-2\,k)}}\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)+c\,(v-2\,s)}{2\sqrt{d\,(m-2\,k)}}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4191.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+g\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{c}\left(i^m\,2^{-m-v-1}\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\right.$$

$$\left.\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(e^{g\,(2\,s-v)}\binom{v}{s}\left(e^{2\,g\,(v-2\,s)}\,\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{c\,(2\,s-v)\,z}{\sqrt{c\,(v-2\,s)}}\right)+\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\sqrt{c\,(2\,s-v)}\ z\right)\right)\right)\right)-$$

$$\frac{1}{b}\left(2^{-m-v-1}\,\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{(m-2\,k)\,d^2}{4\,b}+2\,e\,k-e\,m}\binom{m}{k}\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\,\sqrt{b\,(2\,k-m)}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+e^{2\,e\,(m-2\,k)}\,\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\,\sqrt{b\,(m-2\,k)}}\right)\right)\right)\right)+2^{-m-v-1}\,\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-\frac{(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}-e\,(2\,k+m)+g\,(v-2\,s)}\left(e^{2\left(\frac{(2\,d\,k-d\,m)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+e\,m+g\,(2\,s-v)\right)}\right.\right.\right.\right.$$

$$\left.\left.\left.\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-(-1)^m\right.\right.\right.$$

$$\left.\left.\left.e^{4\,e\,k}\,\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+$$

$$\frac{e^{\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(m-2\,k)+g\,(v-2\,s)}\operatorname{erfi}\left(\frac{-2\,c\,(2\,s-v)\,z-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)}{2\,\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-$$

$$\left.\left((-1)^m\,e^{-\frac{(d\,m-2\,d\,k)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(2\,k-m)+g\,(2\,s-v)}\,\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{2\,c\,(2\,s-v)\,z+2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)}{2\,\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\left(b\,(m-2\,k)+c\,(v-2\,s)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4192.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)}{c^2}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2s)^2}\left(e^{(-2s-v)\left(\sqrt{z}\ c+g\right)}\left(e^{4s\left(\sqrt{z}\ c+g\right)}\left(c(2s-v)\sqrt{z}\ -1\right)+e^{2v\left(\sqrt{z}\ c+g\right)}\left(c(v-2s)\sqrt{z}\ -1\right)\right)\binom{v}{s}\right)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-e(m-2k)}\binom{m}{k}\left(\frac{2e^{dz(2k-m)+b\sqrt{z}\ (2k-m)}\left(-(-1)^m+e^{2(m-2k)\left(\sqrt{z}\ b+e+dz\right)}\right)}{d(m-2k)}-\right.$$

$$\frac{(-1)^m b e^{\frac{b^2(m-2k)}{4d}}(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2d\sqrt{z}\ (m-2k)}{2\sqrt{d(2k-m)}}\right)}{(d(2k-m))^{3/2}}-$$

$$\left.\frac{b e^{2e(m-2k)-\frac{b^2(m-2k)}{4d}}(m-2k)\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b(m-2k)+2d\sqrt{z}\ (m-2k)}{2\sqrt{d(m-2k)}}\right)}{(d(m-2k))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e(2k-m)-g(v-2s)}\left(\frac{2(-1)^m e^{\sqrt{z}\ (b(2k-m)+c(v-2s))+2(e(2k-m)+g(v-2s))+d(2k-m)z}}{d(2k-m)}-\right.\right.$$

$$\frac{1}{(d(2k-m))^{3/2}}\left(e^{2(e(2k-m)+g(v-2s))-\frac{(b(2k-m)+c(v-2s))^2}{4d(2k-m)}}\sqrt{\pi}\right.$$

$$\left.(b(2k-m)+c(v-2s))\operatorname{erfi}\left(\frac{b(2k-m)+2d\sqrt{z}\ (2k-m)+c(v-2s)}{2\sqrt{d(2k-m)}}\right)\right)+$$

$$\frac{2e^{\sqrt{z}\ (-b(2k-m)-c(v-2s))+d(m-2k)z}}{d(m-2k)}-\frac{1}{(d(m-2k))^{3/2}}\left(e^{-\frac{(-b(2k-m)-c(v-2s))^2}{4d(m-2k)}}\sqrt{\pi}\right.$$

$$\left.\left.(b(2k-m)+c(v-2s))\operatorname{erfi}\left(\frac{b(2k-m)+2d\sqrt{z}\ (2k-m)+c(v-2s)}{2\sqrt{d(m-2k)}}\right)\right)\right)+$$

$$(-1)^m e^{-e(m-2k)-g(v-2s)}\left(\frac{2(-1)^m e^{\sqrt{z}\ (b(m-2k)+c(v-2s))+2(e(m-2k)+g(v-2s))+d(m-2k)z}}{d(m-2k)}+\right.$$

$$\frac{2e^{\sqrt{z}\ (-b(m-2k)-c(v-2s))+d(2k-m)z}}{d(2k-m)}-\frac{1}{(d(2k-m))^{3/2}}$$

$$\left(e^{-\frac{(-b(m-2k)-c(v-2s))^2}{4d(2k-m)}}\sqrt{\pi}\ (b(m-2k)+c(v-2s))\operatorname{erfi}\left(\frac{b(m-2k)+2d\sqrt{z}\ (m-2k)+c(v-2s)}{2\sqrt{d(2k-m)}}\right)\right)-$$

$$\frac{1}{(d(m-2k))^{3/2}}\left(\left(-1\right)^m e^{2(e(m-2k)+g(v-2s))-\frac{(b(m-2k)+c(v-2s))^2}{4d(m-2k)}}\sqrt{\pi}\ (b(m-2k)+c(v-2s))\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b(m-2k)+2d\sqrt{z}\ (m-2k)+c(v-2s)}{2\sqrt{d(m-2k)}}\right)\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.4193.01

$$\int \sinh^m(d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(v \bmod 2-1)}{d}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{(m-2k)\,d\,z}\left(-1+(-1)^m\,e^{2(2k-m)\,d\,z}\right)\binom{m}{k}}{2k-m}-\frac{i^m\,2^{-m-v-1}\sqrt{\pi}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}$$

$$\left(e^{\frac{f^2(2s-v)}{4c}}\binom{v}{s}\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c(2s-v)}\ (f+2cz)}{2c}\right)+\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(-2dk+dm-2fs+fv)^2}{8cs-4cv}}\operatorname{erfi}\left(\frac{-2dk+dm-(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)}{\sqrt{c(v-2s)}}+\right.$$

$$\frac{1}{2cs-cv}\left(e^{-\frac{(2dk-dm+f(v-2s))^2}{4cv-8cs}}\left(e^{\frac{(2dk-dm-2fs+fv)^2}{2cv-4cs}}\sqrt{2cs-cv}\ \operatorname{erfi}\left(\frac{-2dk+dm+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\sqrt{cv-2cs}\ \operatorname{erfi}\left(\frac{2dk-dm-(2s-v)(f+2cz)}{2\sqrt{cv-2cs}}\right)\right)\right)-$$

$$\left.\frac{(-1)^m\,e^{-\frac{(-2dk+dm-2fs+fv)^2}{8cs-4cv}}\sqrt{2cs-cv}\ \operatorname{erfi}\left(\frac{2dk-dm+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)}{c(v-2s)}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4194.01

$$\int \sinh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{2\,(-1)^k\,e^{d\,(2\,k-m)\,z}\left(-(-1)^m+e^{2\,(m-2\,k)\,d\,z}\right)\binom{m}{k}}{d\,(m-2\,k)}-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{2\,e^{(2\,s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\;c+f\,z\right)}\right)}{f\,(2\,s-v)}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}+\frac{c\,e^{-\frac{c^2\,(v-2\,s)}{4\,f}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{2\,(-1)^m\,e^{c\sqrt{z}\;(v-2\,s)+(d\,(m-2\,k)+f\,(v-2\,s))\,z}}{d\,(m-2\,k)+f\,(v-2\,s)}-\right.\right.$$

$$\left.\left((-1)^m\,c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)+f\,(v-2\,s)}}\right)\right)\Big/$$

$$(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(2\,k-m)-f\,(v-2\,s))\,z-c\,(v-2\,s)\sqrt{z}}}{d\,(2\,k-m)-f\,(v-2\,s)}-$$

$$\left.\left(c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\right)\Big/\right.$$

$$\left.(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\right)+\frac{2\,(-1)^m\,e^{c\sqrt{z}\;(v-2\,s)+(d\,(2\,k-m)+f\,(v-2\,s))\,z}}{d\,(2\,k-m)+f\,(v-2\,s)}-$$

$$\left(\left((-1)^m\,c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(2\,k-m)+f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)+f\,(v-2\,s)}}\right)\right)\Big/\right.$$

$$(d\,(2\,k-m)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(m-2\,k)-f\,(v-2\,s))\,z-c\,(v-2\,s)\sqrt{z}}}{d\,(m-2\,k)-f\,(v-2\,s)}-$$

$$\left.\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)-f\,(v-2\,s)}}\right)}{(d\,(m-2\,k)-f\,(v-2\,s))^{3/2}}\right)\Big/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.4195.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(v \bmod 2-1)}{d}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{(m-2k)(e+dz)}\left(-1+(-1)^m\,e^{2(2k-m)(e+dz)}\right)\binom{m}{k}}{2k-m}-\frac{i^m\,2^{-m-v-1}\sqrt{\pi}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}$$

$$\left(e^{\frac{f^2(2s-v)}{4c}}\binom{v}{s}\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c(2s-v)}\ (f+2cz)}{2c}\right)+\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(-2dk+dm-2fs+fv)^2}{8cs-4cv}+e(m-2k)}\operatorname{erfi}\left(\frac{-2dk+dm-(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)}{\sqrt{c(v-2s)}}+\frac{1}{2cs-cv}\right.$$

$$\left(e^{-\frac{(2dk-dm+f(v-2s))^2}{4cv-8cs}-e(2k+m)}\left(e^{2\left(\frac{(2dk-dm-2fs+fv)^2}{4cv-8cs}+em\right)}\sqrt{2cs-cv}\ \operatorname{erfi}\left(\frac{-2dk+dm+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,e^{4ek}\sqrt{cv-2cs}\ \operatorname{erfi}\left(\frac{2dk-dm-(2s-v)(f+2cz)}{2\sqrt{cv-2cs}}\right)\right)\right)-\frac{1}{c(v-2s)}$$

$$\left.\left((-1)^m\,e^{e(2k-m)-\frac{(-2dk+dm-2fs+fv)^2}{8cs-4cv}}\sqrt{2cs-cv}\ \operatorname{erfi}\left(\frac{2dk-dm+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4196.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{2\,(-1)^k\,e^{d\,(2\,k-m)\,z-e\,(m-2\,k)}\left(-(-1)^m+e^{2\,(m-2\,k)\,(e+d\,z)}\right)\binom{m}{k}}{d\,(m-2\,k)}-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{2\,e^{(2\,s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\;c+f\,z\right)}\right)}{f\,(2\,s-v)}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}+\frac{c\,e^{-\frac{c^2\,(v-2\,s)}{4\,f}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e\,(2\,k-m)}\left(\frac{2\,(-1)^m\,e^{2\,e\,(2\,k-m)+(d\,(2\,k-m)+f\,(v-2\,s))\,z+c\,(v-2\,s)\,\sqrt{z}}}{d\,(2\,k-m)+f\,(v-2\,s)}-\right.\right.$$

$$\left.\left((-1)^m\,c\,e^{2\,e\,(2\,k-m)-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(2\,k-m)+f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)+f\,(v-2\,s)}}\right)\right)\Big/$$

$$(d\,(2\,k-m)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(m-2\,k)-f\,(v-2\,s))\,z-c\,(v-2\,s)\,\sqrt{z}}}{d\,(m-2\,k)-f\,(v-2\,s)}-\left(c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}}\sqrt{\pi}\right.$$

$$\left.\left.(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)-f\,(v-2\,s)}}\right)\right)\Big/(d\,(m-2\,k)-f\,(v-2\,s))^{3/2}\right)+$$

$$(-1)^m\,e^{-e\,(m-2\,k)}\left(\frac{2\,(-1)^m\,e^{2\,e\,(m-2\,k)+(d\,(m-2\,k)+f\,(v-2\,s))\,z+c\,(v-2\,s)\,\sqrt{z}}}{d\,(m-2\,k)+f\,(v-2\,s)}-\left((-1)^m\,c\,e^{2\,e\,(m-2\,k)-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\right.\right.$$

$$\left.\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)+f\,(v-2\,s)}}\right)\right)\Big/$$

$$(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(2\,k-m)-f\,(v-2\,s))\,z-c\,(v-2\,s)\,\sqrt{z}}}{d\,(2\,k-m)-f\,(v-2\,s)}-$$

$$\left.\left(c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\right)\Big/\right.$$

$$\left.(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\right)\Big);\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r)\cosh^v(c\,z^r+f\,z)$

01.20.21.4197.01

$$\int \sinh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)}{b}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\binom{m}{k}\left(\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)\,z}{\sqrt{b\,(m-2\,k)}}\right)+(-1)^m\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2\,k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v-1}\sqrt{\pi}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}$$

$$\left(e^{\frac{f^2\,(2\,s-v)}{4\,c}}\binom{v}{s}\left(e^{\frac{f^2\,(v-2\,s)}{2\,c}}\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c\,(2\,s-v)}\ (f+2\,c\,z)}{2\,c}\right)+\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{c\,(v-2\,s)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}}\right.\right.\right.$$

$$\left(e^{\frac{(f\,v-2\,f\,s)^2}{4\,b\,k-2\,b\,m-4\,c\,s+2\,c\,v}}\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-\right.$$

$$\left.\left.\left.(-1)^m\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+\right.$$

$$\frac{e^{\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-\left((-1)^m\,e^{-\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\left(b\,(m-2\,k)+c\,(v-2\,s)\right)\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.4198.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\right.$$

$$\left.\left((-1)^k\binom{m}{k}\left(e^{-b(2k+m)\sqrt{z}}\left(e^{4b\sqrt{z}\,k+im\pi}\left(4b(2k-m)\sqrt{z}-4\right)+4e^{2mb\sqrt{z}}\left(b(m-2k)\sqrt{z}-1\right)\right)\right)\right)\right)-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{2e^{(2s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2(v-2s)\left(\sqrt{z}\,c+fz\right)}\right)}{f(2s-v)}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2(v-2s)}{4f}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}\,(v-2s)}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}}+\frac{c\,e^{-\frac{c^2(v-2s)}{4f}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}\,(v-2s)}{2\sqrt{f(v-2s)}}\right)}{(f(v-2s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{2(-1)^m e^{\sqrt{z}\,(b(m-2k)+c(v-2s))+f(v-2s)z}}{f(v-2s)}-\frac{2e^{(-b(m-2k)-c(v-2s))\sqrt{z}-f(v-2s)z}}{f(v-2s)}-\right.\right.$$

$$\frac{1}{(-f(v-2s))^{3/2}}\left(e^{\frac{(-b(m-2k)-c(v-2s))^2}{4f(v-2s)}}\sqrt{\pi}\,(b(m-2k)+c(v-2s))\right.$$

$$\left.\operatorname{erfi}\left(\frac{b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)\right)-\frac{1}{(f(v-2s))^{3/2}}\left((-1)^m e^{-\frac{(b(m-2k)+c(v-2s))^2}{4f(v-2s)}}\right.$$

$$\left.\left.\sqrt{\pi}\,(b(m-2k)+c(v-2s))\operatorname{erfi}\left(\frac{b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)\right)+$$

$$\frac{2(-1)^m e^{\sqrt{z}\,(b(2k-m)+c(v-2s))+f(v-2s)z}}{f(v-2s)}-\frac{2e^{(-b(2k-m)-c(v-2s))\sqrt{z}-f(v-2s)z}}{f(v-2s)}-\frac{1}{(-f(v-2s))^{3/2}}$$

$$\left(e^{\frac{(-b(2k-m)-c(v-2s))^2}{4f(v-2s)}}\sqrt{\pi}\,(b(2k-m)+c(v-2s))\operatorname{erfi}\left(\frac{b(2k-m)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)\right)-$$

$$\frac{1}{(f(v-2s))^{3/2}}\left((-1)^m e^{-\frac{(b(2k-m)+c(v-2s))^2}{4f(v-2s)}}\sqrt{\pi}\,(b(2k-m)+c(v-2s))\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b(2k-m)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+e)\cosh^v(c\,z^r+f\,z)$

01.20.21.4199.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v-1}\sqrt{\pi}}{b}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}$$

$$\left((-1)^k\,e^{2\,e\,k-e\,m}\binom{m}{k}\left(e^{2\,e\,(m-2\,k)}\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{b\,(2\,k-m)\,z}{\sqrt{b\,(m-2\,k)}}\right)+(-1)^m\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2\,k-m)}\ z\right)\right)\right)-$$

$$\frac{i^m\,2^{-m-v-1}\sqrt{\pi}}{c}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}$$

$$\left(e^{\frac{f^2\,(2\,s-v)}{4\,c}}\binom{v}{s}\left(e^{\frac{f^2\,(v-2\,s)}{2\,c}}\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c\,(2\,s-v)}\ (f+2\,c\,z)}{2\,c}\right)+\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{c\,(v-2\,s)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-\frac{f^2\,(v-2\,s)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}-e\,(2\,k+m)}\right.\right.\right.$$

$$\left(e^{2\left(\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+e\,m\right)}\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-\right.$$

$$\left.\left.\left.(-1)^m\,e^{4\,e\,k}\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+\right.$$

$$\frac{e^{\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{-4\,b\,k\,z+2\,b\,m\,z-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-\left((-1)^m\,e^{e\,(2\,k-m)-\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\right.$$

$$\left.\left.\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{4\,b\,k\,z-2\,b\,m\,z+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\right.$$

$$\left.(b\,(m-2\,k)+c\,(v-2\,s))\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

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$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\,e^{-e\,(m-2\,k)}\binom{m}{k}\right.\right.$$

$$\left(e^{-4\,e\,k-b\,(2\,k+m)\,\sqrt{z}}\left(e^{4\,e\,k+4\,b\,\sqrt{z}\;k+i\,m\,\pi}\left(4\,b\,(2\,k-m)\,\sqrt{z}\;-4\right)+4\,e^{2\,m\left(\sqrt{z}\;b+e\right)}\left(b\,(m-2\,k)\,\sqrt{z}\;-1\right)\right)\right)\Bigg)-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\frac{2\,e^{(2\,s-v)\left(c+f\,\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\;c+f\,z\right)}\right)}{f\,(2\,s-v)}+$$

$$\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\,\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}+\frac{c\,e^{-\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\,\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\Bigg)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-e\,(2\,k-m)}\Bigg(\frac{2\,(-1)^m\,e^{2\,e\,(2\,k-m)+f\,(v-2\,s)\,z+(b\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}}{f\,(v-2\,s)}-$$

$$\frac{2\,e^{(-b\,(2\,k-m)-c\,(v-2\,s))\,\sqrt{z}-f\,(v-2\,s)\,z}}{f\,(v-2\,s)}-\frac{1}{(-f\,(v-2\,s))^{3/2}}$$

$$\left(e^{\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(2\,k-m)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{-f\,(v-2\,s)}}\right)\right)-$$

$$\frac{1}{(f\,(v-2\,s))^{3/2}}\Bigg((-1)^m\,e^{2\,e\,(2\,k-m)-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(2\,k-m)+c\,(v-2\,s))$$

$$\text{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{f\,(v-2\,s)}}\right)\Bigg)\Bigg)+(-1)^m\,e^{-e\,(m-2\,k)}$$

$$\Bigg(\frac{2\,(-1)^m\,e^{2\,e\,(m-2\,k)+f\,(v-2\,s)\,z+(b\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}}{f\,(v-2\,s)}-\frac{2\,e^{(-b\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}-f\,(v-2\,s)\,z}}{f\,(v-2\,s)}-\frac{1}{(-f\,(v-2\,s))^{3/2}}$$

$$\left(e^{\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(m-2\,k)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{-f\,(v-2\,s)}}\right)\right)-$$

$$\frac{1}{(f\,(v-2\,s))^{3/2}}\Bigg((-1)^m\,e^{2\,e\,(m-2\,k)-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(m-2\,k)+c\,(v-2\,s))$$

$$\text{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{f\,(v-2\,s)}}\right)\Bigg)\Bigg)\Bigg

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$$\int \sinh^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k e^{-\frac{d^2(m-2k)}{4b}}\binom{m}{k}\right.\right.$$

$$\left.\left.\left((-1)^m e^{\frac{d^2(m-2k)}{2b}}\sqrt{b(2k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b(2k-m)}\,(d+2bz)}{2b}\right)+\sqrt{b(m-2k)}\ \operatorname{erfi}\left(\frac{(2k-m)(d+2bz)}{2\sqrt{b(m-2k)}}\right)\right)\right)\right)-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{\frac{f^2(2s-v)}{4c}}\binom{v}{s}\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c(2s-v)}\,(f+2cz)}{2c}\right)+\right.\right.\right.$$

$$\left.\left.\left.\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2bk+bm+2cs-cv}\left(e^{-\frac{(2dk-dm+f(v-2s))^2}{8bk-4bm-8cs+4cv}}\left(e^{\frac{(2dk-dm-2fs+fv)^2}{4bk-2bm-4cs+2cv}}\right.\right.\right.\right.$$

$$\left.\left.\sqrt{-2bk+bm+2cs-cv}\ \operatorname{erfi}\left(\frac{-2k(d+2bz)+m(d+2bz)+(2s-v)(f+2cz)}{2\sqrt{-2bk+bm+2cs-cv}}\right)-(-1)^m\right.\right.$$

$$\left.\left.\left.\sqrt{2bk-bm-2cs+cv}\ \operatorname{erfi}\left(\frac{2k(d+2bz)-m(d+2bz)-(2s-v)(f+2cz)}{2\sqrt{2bk-bm-2cs+cv}}\right)\right)\right)+\right.$$

$$\left.\frac{e^{\frac{(-2dk+dm-2fs+fv)^2}{8bk-4bm+8cs-4cv}}\operatorname{erfi}\left(\frac{-2k(d+2bz)+m(d+2bz)-(2s-v)(f+2cz)}{2\sqrt{b(m-2k)+c(v-2s)}}\right)}{\sqrt{b(m-2k)+c(v-2s)}}-\left((-1)^m e^{-\frac{(-2dk+dm-2fs+fv)^2}{8bk-4bm+8cs-4cv}}\sqrt{2bk-bm+2cs-cv}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{2k(d+2bz)-m(d+2bz)+(2s-v)(f+2cz)}{2\sqrt{2bk-bm+2cs-cv}}\right)\right)\Big/\left(b(m-2k)+c(v-2s)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\,\sqrt{z}\,(2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\,b+d\,z\right)}\right)}{d\,(m-2\,k)}-\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-\right.$$

$$\left.\frac{b\,e^{-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\,\operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)-i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{2\,e^{(2\,s-v)\left(c+f\,\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\,c+f\,z\right)}\right)}{f\,(2\,s-v)}+\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\,(v-2\,s)\,\operatorname{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\,(v-2\,s)}{2\,\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}+\right.$$

$$\left.\frac{c\,e^{-\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\,(v-2\,s)\,\operatorname{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\,(v-2\,s)}{2\,\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\right)+2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}$$

$$\left((-1)^m\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\,(b\,(m-2\,k)+c\,(v-2\,s))+(d\,(m-2\,k)+f\,(v-2\,s))\,z}}{d\,(m-2\,k)+f\,(v-2\,s)}-\left((-1)^m\,e^{-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\,\sqrt{\pi}\,(b\,(m-2\,k)+c\,(v-2\,s))\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)+f\,(v-2\,s)}}\right)\right)\Big/(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\right.\right.$$

$$\left.\left.\frac{2\,e^{\sqrt{z}\,(-b\,(m-2\,k)-c\,(v-2\,s))+(d\,(2\,k-m)-f\,(v-2\,s))\,z}}{d\,(2\,k-m)-f\,(v-2\,s)}-\left(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}\,\sqrt{\pi}\,(b\,(m-2\,k)+c\,(v-2\,s))\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\right)\Big/(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\right)+\right.$$

$$\left.\frac{2\,(-1)^m\,e^{\sqrt{z}\,(b\,(2\,k-m)+c\,(v-2\,s))+(d\,(2\,k-m)+f\,(v-2\,s))\,z}}{d\,(2\,k-m)+f\,(v-2\,s)}-\left((-1)^m\,e^{-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,k-m)+f\,(v-2\,s))}}\,\sqrt{\pi}\,(b\,(2\,k-m)+c\,(v-2\,s))\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)+f\,(v-2\,s)}}\right)\right)\Big/(d\,(2\,k-m)+f\,(v-2\,s))^{3/2}+\right.$$

$$\frac{2\,e^{\sqrt{z}\ (-b\,(2\,k-m)-c\,(v-2\,s))+(d\,(m-2\,k)-f\,(v-2\,s))\,z}}{d\,(m-2\,k)-f\,(v-2\,s)}-\left(e^{-\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}}\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))\right.$$

$$\left.\text{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)-f\,(v-2\,s)}}\right)\right)\Big/$$

$$\left.(d\,(m-2\,k)-f\,(v-2\,s))^{3/2}\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+d\,z+e)\cosh^v(c\,z^r+f\,z)$

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$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{(m-2k)\,d^2}{4\,b}+2\,e\,k-e\,m}\binom{m}{k}\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+e^{2\,e\,(m-2\,k)}\right.\right.$$

$$\left.\left.\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)\right)\right)-\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\right.$$

$$\left.\left(e^{\frac{f^2\,(2\,s-v)}{4\,c}}\binom{v}{s}\left(e^{\frac{f^2\,(v-2\,s)}{2\,c}}\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c\,(2\,s-v)}\ (f+2\,c\,z)}{2\,c}\right)+\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{c\,(v-2\,s)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-\frac{(2\,d\,k-d\,m+f\,(v-2\,s))^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}-e\,(2\,k+m)}\left(e^{2\left(\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+e\,m\right)}\right.\right.\right.$$

$$\left.\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-(-1)^m\right.$$

$$\left.\left.e^{4\,e\,k}\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+$$

$$\frac{e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(m-2\,k)}\operatorname{erfi}\left(\frac{-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)}{\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}-$$

$$\left.\left.\left((-1)^m\,e^{e\,(2\,k-m)-\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\right.\right.\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\Big/\left(b\,(m-2\,k)+c\,(v-2\,s)\right)\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

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$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-e\,(m-2\,k)}\binom{m}{k}\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\sqrt{z}\ (2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+e+d\,z\right)}\right)}{d\,(m-2\,k)}-\right.$$

$$\frac{(-1)^m\, b\, e^{\frac{b^2 (m-2k)}{4d}}\, (m-2k)\, \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b (m-2k)+2d\sqrt{z}\ (m-2k)}{2\sqrt{d (2k-m)}}\right)}{(d (2k-m))^{3/2}} -$$

$$\left.\frac{b\, e^{2e (m-2k)-\frac{b^2 (m-2k)}{4d}}\, (m-2k)\, \sqrt{\pi}\ \operatorname{erfi}\left(\frac{b (m-2k)+2d\sqrt{z}\ (m-2k)}{2\sqrt{d (m-2k)}}\right)}{(d (m-2k))^{3/2}}\right) +$$

$$i^m\, 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(-\frac{2\, e^{(2s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2(v-2s)\left(\sqrt{z}\ c+fz\right)}\right)}{f (2s-v)} - \right.$$

$$\left.\frac{c\, e^{\frac{c^2 (v-2s)}{4f}}\, \sqrt{\pi}\ (v-2s) \operatorname{erfi}\left(\frac{c (v-2s)+2f\sqrt{z}\ (v-2s)}{2\sqrt{-f (v-2s)}}\right)}{(-f (v-2s))^{3/2}} - \frac{c\, e^{-\frac{c^2 (v-2s)}{4f}}\, \sqrt{\pi}\ (v-2s) \operatorname{erfi}\left(\frac{c (v-2s)+2f\sqrt{z}\ (v-2s)}{2\sqrt{f (v-2s)}}\right)}{(f (v-2s))^{3/2}}\right) +$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(e^{-e (2k-m)} \left(\frac{2 (-1)^m\, e^{2e (2k-m)+(d (2k-m)+f (v-2s))z+(b (2k-m)+c (v-2s))\sqrt{z}}}{d (2k-m)+f (v-2s)} - \right.\right.$$

$$\left((-1)^m\, e^{2e (2k-m)-\frac{(b (2k-m)+c (v-2s))^2}{4 (d (2k-m)+f (v-2s))}}\, \sqrt{\pi}\ (b (2k-m)+c (v-2s)) \right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b (2k-m)+c (v-2s)+2 (d (2k-m)+f (v-2s))\sqrt{z}}{2\sqrt{d (2k-m)+f (v-2s)}}\right)\right) \Big/ (d (2k-m)+f (v-2s))^{3/2} + \right.\right.$$

$$\frac{2\, e^{\sqrt{z}\ (-b (2k-m)-c (v-2s))+(d (m-2k)-f (v-2s))z}}{d (m-2k)-f (v-2s)} - \left(e^{-\frac{(-b (2k-m)-c (v-2s))^2}{4 (d (m-2k)-f (v-2s))}}\, \sqrt{\pi}\ (b (2k-m)+c (v-2s)) \right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b (2k-m)+c (v-2s)+2 (d (2k-m)+f (v-2s))\sqrt{z}}{2\sqrt{d (m-2k)-f (v-2s)}}\right)\right) \Big/ (d (m-2k)-f (v-2s))^{3/2}\right) +$$

$$(-1)^m\, e^{-e (m-2k)} \left(\frac{2 (-1)^m\, e^{2e (m-2k)+(d (m-2k)+f (v-2s))z+(b (m-2k)+c (v-2s))\sqrt{z}}}{d (m-2k)+f (v-2s)} - \left((-1)^m\, e^{2e (m-2k)-\frac{(b (m-2k)+c (v-2s))^2}{4 (d (m-2k)+f (v-2s))}} \right.\right.$$

$$\left.\left. \sqrt{\pi}\ (b (m-2k)+c (v-2s)) \operatorname{erfi}\left(\frac{b (m-2k)+c (v-2s)+2 (d (m-2k)+f (v-2s))\sqrt{z}}{2\sqrt{d (m-2k)+f (v-2s)}}\right)\right) \Big/ \right.$$

$$(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{\sqrt{z}\,(-b\,(m-2\,k)-c\,(v-2\,s))+(d\,(2\,k-m)-f\,(v-2\,s))\,z}}{d\,(2\,k-m)-f\,(v-2\,s)}-\left(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}\right.$$

$$\left.\sqrt{\pi}\;(b\,(m-2\,k)+c\,(v-2\,s))\,\operatorname{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\right)\Big/$$

$$\left.(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\right)\Big/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4205.01

$$\int\sinh^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)-\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(v\bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{(m-2k)\,d\,z}\left(-1+(-1)^m\,e^{2\,(2\,k-m)\,d\,z}\right)\binom{m}{k}}{2\,k-m}}{d}-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\,\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(e^{\frac{\left(f^2+4\,c\,g\right)(2\,s-v)}{4\,c}}\binom{v}{s}\right.\right.$$

$$\left.\left.\left(e^{\frac{f^2\,(v-2\,s)}{2\,c}}\,\sqrt{c\,(2\,s-v)}\;\operatorname{erfi}\left(\frac{\sqrt{c\,(2\,s-v)}\;(f+2\,c\,z)}{2\,c}\right)+e^{2\,g\,(v-2\,s)}\,\sqrt{c\,(v-2\,s)}\;\operatorname{erfi}\left(\frac{(2\,s-v)\,(f+2\,c\,z)}{2\,\sqrt{c\,(v-2\,s)}}\right)\right)\right)+\right.$$

$$2^{-m-v-1}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,c\,s-4\,c\,v}+g\,(v-2\,s)}\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m-(2\,s-v)\,(f+2\,c\,z)}{2\,\sqrt{c\,(v-2\,s)}}\right)}{\sqrt{c\,(v-2\,s)}}+\frac{1}{2\,c\,s-c\,v}\right.$$

$$\left(e^{g\,(v-2\,s)-\frac{(2\,d\,k-d\,m+f\,(v-2\,s))^2}{4\,c\,v-8\,c\,s}}\left(e^{2\left(\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{4\,c\,v-8\,c\,s}+g\,(2\,s-v)\right)}\,\sqrt{2\,c\,s-c\,v}\;\operatorname{erfi}\left(\frac{-2\,d\,k+d\,m+(2\,s-v)\,(f+2\,c\,z)}{2\,\sqrt{2\,c\,s-c\,v}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\,\sqrt{c\,v-2\,c\,s}\;\operatorname{erfi}\left(\frac{2\,d\,k-d\,m-(2\,s-v)\,(f+2\,c\,z)}{2\,\sqrt{c\,v-2\,c\,s}}\right)\right)\right)-\frac{1}{c\,(v-2\,s)}$$

$$\left.\left.\left((-1)^m\,e^{g\,(2\,s-v)-\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,c\,s-4\,c\,v}}\,\sqrt{2\,c\,s-c\,v}\;\operatorname{erfi}\left(\frac{2\,d\,k-d\,m+(2\,s-v)\,(f+2\,c\,z)}{2\,\sqrt{2\,c\,s-c\,v}}\right)\right)\right)\Big/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\right)$$

01.20.21.4206.01

$$\int \sinh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{2\,(-1)^k\,e^{d\,(2\,k-m)\,z}\left(-(-1)^m+e^{2\,(m-2\,k)\,d\,z}\right)\binom{m}{k}}{d\,(m-2\,k)}-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g\,(v-2\,s)}\binom{v}{s}\left(\frac{2\,e^{(2\,s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\;c+g+f\,z\right)}\right)}{f\,(2\,s-v)}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\sqrt{z}\;(v-2\,s)}{2\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}+\frac{c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)}{4\,f}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\sqrt{z}\;(v-2\,s)}{2\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g\,(v-2\,s)}\left(\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+c\sqrt{z}\;(v-2\,s)+(d\,(2\,k-m)+f\,(v-2\,s))\,z}}{d\,(2\,k-m)+f\,(v-2\,s)}-\right.\right.$$

$$\left.\left((-1)^m\,c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(2\,k-m)+f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)+f\,(v-2\,s)}}\right)\right)\Big/$$

$$(d\,(2\,k-m)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(m-2\,k)-f\,(v-2\,s))\,z-c\,(v-2\,s)\sqrt{z}}}{d\,(m-2\,k)-f\,(v-2\,s)}-\left(c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}}\sqrt{\pi}\right.$$

$$\left.\left.(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)-f\,(v-2\,s)}}\right)\right)\Big/(d\,(m-2\,k)-f\,(v-2\,s))^{3/2}\right)+$$

$$(-1)^m\,e^{-g\,(v-2\,s)}\left(\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+c\sqrt{z}\;(v-2\,s)+(d\,(m-2\,k)+f\,(v-2\,s))\,z}}{d\,(m-2\,k)+f\,(v-2\,s)}-\left((-1)^m\,c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\right.\right.$$

$$\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(m-2\,k)+f\,(v-2\,s)}}\right)\Big)\Big/$$

$$(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{(d\,(2\,k-m)-f\,(v-2\,s))\,z-c\,(v-2\,s)\sqrt{z}}}{d\,(2\,k-m)-f\,(v-2\,s)}-$$

$$\left.\left(c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\right)\Big/$$

$$\left.(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\right)\Big);\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4207.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{2^{-m-v}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k\,e^{(m-2k)(e+dz)}\left(-1+(-1)^m\,e^{2(2k-m)(e+dz)}\right)\binom{m}{k}}{2k-m}}{d}-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{\frac{\left(f^2+4cg\right)(2s-v)}{4c}}\binom{v}{s}\right.\right.$$

$$\left.\left.\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c(2s-v)}\,(f+2cz)}{2c}\right)+e^{2g(v-2s)}\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{\frac{(-2dk+dm-2fs+fv)^2}{8cs-4cv}+e(m-2k)+g(v-2s)}\operatorname{erfi}\left(\frac{-2dk+dm-(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)}{\sqrt{c(v-2s)}}+\right.$$

$$\frac{1}{2cs-cv}\left(e^{-\frac{(2dk-dm+f(v-2s))^2}{4cv-8cs}-e(2k+m)+g(v-2s)}\left(e^{2\left(\frac{(2dk-dm-2fs+fv)^2}{4cv-8cs}+em+g(2s-v)\right)}\sqrt{2cs-cv}\right.\right.$$

$$\operatorname{erfi}\left(\frac{-2dk+dm+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)-(-1)^m\,e^{4ek}\sqrt{cv-2cs}$$

$$\left.\left.\operatorname{erfi}\left(\frac{2dk-dm-(2s-v)(f+2cz)}{2\sqrt{cv-2cs}}\right)\right)-\frac{1}{c(v-2s)}\left((-1)^m\,e^{-\frac{(-2dk+dm-2fs+fv)^2}{8cs-4cv}+e(2k-m)+g(2s-v)}\right.\right.$$

$$\left.\left.\left.\sqrt{2cs-cv}\ \operatorname{erfi}\left(\frac{2dk-dm+(2s-v)(f+2cz)}{2\sqrt{2cs-cv}}\right)\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4208.01

$$\int \sinh^m(e+d\,z)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{2(-1)^k\,e^{d(2k-m)z-e(m-2k)}\left(-(-1)^m+e^{2(m-2k)(e+dz)}\right)\binom{m}{k}}{d(m-2k)}-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g(v-2s)}\binom{v}{s}\left(\frac{2e^{(2s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2(v-2s)\left(\sqrt{z}\ c+g+fz\right)}\right)}{f(2s-v)}+\right.$$

$$\frac{c\, e^{\frac{c^2 (v-2s)}{4f}} \sqrt{\pi}\ (v-2s)\, \text{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}\ (v-2s)}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}} + \frac{c\, e^{2g(v-2s)-\frac{c^2 (v-2s)}{4f}} \sqrt{\pi}\ (v-2s)\, \text{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}\ (v-2s)}{2\sqrt{f(v-2s)}}\right)}{(f(v-2s))^{3/2}}\Bigg) +$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \Bigg(e^{-e(2k-m)-g(v-2s)} \Bigg(\frac{2(-1)^m e^{c\sqrt{z}\ (v-2s)+2(e(2k-m)+g(v-2s))+(d(2k-m)+f(v-2s))z}}{d(2k-m)+f(v-2s)} -$$

$$\Bigg((-1)^m c\, e^{2(e(2k-m)+g(v-2s))-\frac{c^2 (v-2s)^2}{4(d(2k-m)+f(v-2s))}} \sqrt{\pi}\ (v-2s)$$

$$\text{erfi}\left(\frac{c(v-2s)+2(d(2k-m)+f(v-2s))\sqrt{z}}{2\sqrt{d(2k-m)+f(v-2s)}}\right)\Bigg) \Big/ (d(2k-m)+f(v-2s))^{3/2} +$$

$$\frac{2\, e^{(d(m-2k)-f(v-2s))z-c(v-2s)\sqrt{z}}}{d(m-2k)-f(v-2s)} - \Bigg(c\, e^{-\frac{c^2 (v-2s)^2}{4(d(m-2k)-f(v-2s))}} \sqrt{\pi}\ (v-2s)$$

$$\text{erfi}\left(\frac{c(v-2s)+2(d(2k-m)+f(v-2s))\sqrt{z}}{2\sqrt{d(m-2k)-f(v-2s)}}\right)\Bigg) \Big/ (d(m-2k)-f(v-2s))^{3/2} \Bigg) +$$

$$(-1)^m e^{-e(m-2k)-g(v-2s)} \Bigg(\frac{2(-1)^m e^{c\sqrt{z}\ (v-2s)+2(e(m-2k)+g(v-2s))+(d(m-2k)+f(v-2s))z}}{d(m-2k)+f(v-2s)} -$$

$$\Bigg((-1)^m c\, e^{2(e(m-2k)+g(v-2s))-\frac{c^2 (v-2s)^2}{4(d(m-2k)+f(v-2s))}} \sqrt{\pi}\ (v-2s)$$

$$\text{erfi}\left(\frac{c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}}{2\sqrt{d(m-2k)+f(v-2s)}}\right)\Bigg) \Big/$$

$$(d(m-2k)+f(v-2s))^{3/2} + \frac{2\, e^{(d(2k-m)-f(v-2s))z-c(v-2s)\sqrt{z}}}{d(2k-m)-f(v-2s)} -$$

$$\Bigg(c\, e^{-\frac{c^2 (v-2s)^2}{4(d(2k-m)-f(v-2s))}} \sqrt{\pi}\ (v-2s)\, \text{erfi}\left(\frac{c(v-2s)+2(d(m-2k)+f(v-2s))\sqrt{z}}{2\sqrt{d(2k-m)-f(v-2s)}}\right)\Bigg) \Big/$$

$$(d(2k-m)-f(v-2s))^{3/2}\Bigg)\Bigg) /;\ m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $\sinh^m(b\, z^r) \cosh^v(c\, z^r + f\, z + g)$

01.20.21.4209.01

$$\int \sinh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k\binom{m}{k}\left(\sqrt{b\,(m-2k)}\ \operatorname{erfi}\left(\frac{b\,(2k-m)\,z}{\sqrt{b\,(m-2k)}}\right)+(-1)^m\sqrt{b\,(2k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2k-m)}\ z\right)\right)\right)\right)-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{\frac{\left(f^2+4cg\right)(2s-v)}{4c}}\binom{v}{s}\right.\right.$$

$$\left.\left.\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c\,(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c\,(2s-v)}\ (f+2cz)}{2c}\right)+e^{2g(v-2s)}\sqrt{c\,(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)\,(f+2cz)}{2\sqrt{c\,(v-2s)}}\right)\right)\right)\right)+$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2bk+bm+2cs-cv}\left(e^{g(v-2s)-\frac{f^2(v-2s)^2}{8bk-4bm-8cs+4cv}}\right.\right.$$

$$\left.\left(e^{2\left(\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}+g(2s-v)\right)}\sqrt{-2bk+bm+2cs-cv}\ \operatorname{erfi}\left(\frac{-4bkz+2bmz+(2s-v)\,(f+2cz)}{2\sqrt{-2bk+bm+2cs-cv}}\right)-\right.\right.$$

$$\left.\left.(-1)^m\sqrt{2bk-bm-2cs+cv}\ \operatorname{erfi}\left(\frac{4bkz-2bmz-(2s-v)\,(f+2cz)}{2\sqrt{2bk-bm-2cs+cv}}\right)\right)\right)+$$

$$\frac{e^{\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}+g(v-2s)}\operatorname{erfi}\left(\frac{-4bkz+2bmz-(2s-v)\,(f+2cz)}{2\sqrt{b\,(m-2k)+c\,(v-2s)}}\right)}{\sqrt{b\,(m-2k)+c\,(v-2s)}}-\left((-1)^m\,e^{g(2s-v)-\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}}\right.$$

$$\left.\left.\sqrt{2bk-bm+2cs-cv}\ \operatorname{erfi}\left(\frac{4bkz-2bmz+(2s-v)\,(f+2cz)}{2\sqrt{2bk-bm+2cs-cv}}\right)\right)\right/$$

$$\left.(b\,(m-2k)+c\,(v-2s))\right)\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4210.01

$$\int \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g+f\,z\right)dz == i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{2^{-m-v-1}}{b^2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\binom{m}{k}\left(e^{-b(2k+m)\sqrt{z}}\left(e^{4b\sqrt{z}\,k+im\pi}\left(4b(2k-m)\sqrt{z}-4\right)+4e^{2mb\sqrt{z}}\left(b(m-2k)\sqrt{z}-1\right)\right)\right)\right)-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g(v-2s)}\binom{v}{s}\left(\frac{2e^{(2s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2(v-2s)\left(\sqrt{z}\,c+g+fz\right)}\right)}{f(2s-v)}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2(v-2s)}{4f}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}\,(v-2s)}{2\sqrt{-f(v-2s)}}\right)}{(-f(v-2s))^{3/2}}+\frac{c\,e^{2g(v-2s)-\frac{c^2(v-2s)}{4f}}\sqrt{\pi}\,(v-2s)\operatorname{erfi}\left(\frac{c(v-2s)+2f\sqrt{z}\,(v-2s)}{2\sqrt{f(v-2s)}}\right)}{(f(v-2s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g(v-2s)}\left(\frac{2(-1)^m e^{2g(v-2s)+fz(v-2s)+(b(2k-m)+c(v-2s))\sqrt{z}}}{f(v-2s)}-\right.\right.$$

$$\frac{2e^{(-b(2k-m)-c(v-2s))\sqrt{z}-f(v-2s)z}}{f(v-2s)}-\frac{1}{(-f(v-2s))^{3/2}}\left(e^{\frac{(-b(2k-m)-c(v-2s))^2}{4f(v-2s)}}\sqrt{\pi}\,(b(2k-m)+c(v-2s))\right.$$

$$\left.\operatorname{erfi}\left(\frac{b(2k-m)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)\right)-\frac{1}{(f(v-2s))^{3/2}}\left((-1)^m e^{2g(v-2s)-\frac{(b(2k-m)+c(v-2s))^2}{4f(v-2s)}}\right.$$

$$\left.\left.\sqrt{\pi}\,(b(2k-m)+c(v-2s))\operatorname{erfi}\left(\frac{b(2k-m)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)\right)+(-1)^m e^{-g(v-2s)}$$

$$\left(\frac{2(-1)^m e^{2g(v-2s)+fz(v-2s)+(b(m-2k)+c(v-2s))\sqrt{z}}}{f(v-2s)}-\frac{2e^{(-b(m-2k)-c(v-2s))\sqrt{z}-f(v-2s)z}}{f(v-2s)}-\frac{1}{(-f(v-2s))^{3/2}}\right.$$

$$\left(e^{\frac{(-b(m-2k)-c(v-2s))^2}{4f(v-2s)}}\sqrt{\pi}\,(b(m-2k)+c(v-2s))\operatorname{erfi}\left(\frac{b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{-f(v-2s)}}\right)\right)-$$

$$\frac{1}{(f(v-2s))^{3/2}}\left((-1)^m e^{2g(v-2s)-\frac{(b(m-2k)+c(v-2s))^2}{4f(v-2s)}}\sqrt{\pi}\,(b(m-2k)+c(v-2s))\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{b(m-2k)+c(v-2s)+2f(v-2s)\sqrt{z}}{2\sqrt{f(v-2s)}}\right)\right)\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4211.01

$$\int \sinh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k\,e^{2ek-em}\binom{m}{k}\right.\right.$$

$$\left.\left.\left(e^{2e(m-2k)}\sqrt{b\,(m-2k)}\ \operatorname{erfi}\left(\frac{b\,(2k-m)\,z}{\sqrt{b\,(m-2k)}}\right)+(-1)^m\sqrt{b\,(2k-m)}\ \operatorname{erfi}\left(\sqrt{b\,(2k-m)}\ z\right)\right)\right)\right)-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{\frac{\left(f^2+4cg\right)(2s-v)}{4c}}\binom{v}{s}\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c\,(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c\,(2s-v)}\ (f+2cz)}{2c}\right)+\right.\right.\right.$$

$$\left.\left.\left.e^{2g(v-2s)}\sqrt{c\,(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)\,(f+2cz)}{2\sqrt{c\,(v-2s)}}\right)\right)\right)\right)+2^{-m-v-1}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2bk+bm+2cs-cv}\left(e^{-\frac{f^2(v-2s)^2}{8bk-4bm-8cs+4cv}+g(v-2s)-e(2k+m)}\left(e^{2\left(\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}+em+g(2s-v)\right)}\right.\right.\right.\right.$$

$$\left.\left.\sqrt{-2bk+bm+2cs-cv}\ \operatorname{erfi}\left(\frac{-4bkz+2bmz+(2s-v)\,(f+2cz)}{2\sqrt{-2bk+bm+2cs-cv}}\right)-(-1)^m\right.\right.$$

$$\left.\left.e^{4ek}\sqrt{2bk-bm-2cs+cv}\ \operatorname{erfi}\left(\frac{4bkz-2bmz-(2s-v)\,(f+2cz)}{2\sqrt{2bk-bm-2cs+cv}}\right)\right)\right)+$$

$$\frac{e^{\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}+e(m-2k)+g(v-2s)}\operatorname{erfi}\left(\frac{-4bkz+2bmz-(2s-v)\,(f+2cz)}{2\sqrt{b\,(m-2k)+c\,(v-2s)}}\right)}{\sqrt{b\,(m-2k)+c\,(v-2s)}}-$$

$$\left.\left((-1)^m\,e^{-\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}+e(2k-m)+g(2s-v)}\sqrt{2bk-bm+2cs-cv}\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{4bkz-2bmz+(2s-v)\,(f+2cz)}{2\sqrt{2bk-bm+2cs-cv}}\right)\right)\Big/\left(b\,(m-2k)+c\,(v-2s)\right)\right);\ m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

01.20.21.4212.01

$$\int \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+\frac{1}{b^2}\left(2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(m-2k)^2}\left((-1)^k\,e^{-e(m-2k)}\binom{m}{k}\right.\right.$$

$$\left(e^{-4\,e\,k-b\,(2\,k+m)\,\sqrt{z}}\left(e^{4\,e\,k+4\,b\,\sqrt{z}\;k+i\,m\,\pi}\left(4\,b\,(2\,k-m)\,\sqrt{z}\;-4\right)+4\,e^{2\,m\left(\sqrt{z}\;b+e\right)}\left(b\,(m-2\,k)\,\sqrt{z}\;-1\right)\right)\right)\Bigg)-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g\,(v-2\,s)}\binom{v}{s}\Bigg(\frac{2\,e^{(2\,s-v)\left(c+f\,\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\;c+g+f\,z\right)}\right)}{f\,(2\,s-v)}+$$

$$\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\,\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}+\frac{c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\;(v-2\,s)\,\text{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{2\,\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\Bigg)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-e\,(2\,k-m)-g\,(v-2\,s)}\Bigg(\frac{2\,(-1)^m\,e^{\sqrt{z}\;(b\,(2\,k-m)+c\,(v-2\,s))+2\,(e\,(2\,k-m)+g\,(v-2\,s))+f\,(v-2\,s)\,z}}{f\,(v-2\,s)}-$$

$$\frac{2\,e^{(-b\,(2\,k-m)-c\,(v-2\,s))\,\sqrt{z}\;-f\,(v-2\,s)\,z}}{f\,(v-2\,s)}-\frac{1}{(-f\,(v-2\,s))^{3/2}}$$

$$\left(e^{\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(2\,k-m)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{-f\,(v-2\,s)}}\right)\right)-$$

$$\frac{1}{(f\,(v-2\,s))^{3/2}}\Bigg((-1)^m\,e^{2\,(e\,(2\,k-m)+g\,(v-2\,s))-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(2\,k-m)+c\,(v-2\,s))$$

$$\text{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{f\,(v-2\,s)}}\right)\Bigg)\Bigg)+$$

$$(-1)^m\,e^{-e\,(m-2\,k)-g\,(v-2\,s)}\Bigg(\frac{2\,(-1)^m\,e^{\sqrt{z}\;(b\,(m-2\,k)+c\,(v-2\,s))+2\,(e\,(m-2\,k)+g\,(v-2\,s))+f\,(v-2\,s)\,z}}{f\,(v-2\,s)}-$$

$$\frac{2\,e^{(-b\,(m-2\,k)-c\,(v-2\,s))\,\sqrt{z}\;-f\,(v-2\,s)\,z}}{f\,(v-2\,s)}-\frac{1}{(-f\,(v-2\,s))^{3/2}}$$

$$\left(e^{\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(m-2\,k)+c\,(v-2\,s))\,\text{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{-f\,(v-2\,s)}}\right)\right)-$$

$$\frac{1}{(f\,(v-2\,s))^{3/2}}\Bigg((-1)^m\,e^{2\,(e\,(m-2\,k)+g\,(v-2\,s))-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,f\,(v-2\,s)}}\,\sqrt{\pi}\;(b\,(m-2\,k)+c\,(v-2\,s))$$

$$\text{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,f\,(v-2\,s)\,\sqrt{z}}{2\,\sqrt{f\,(v-2\,s)}}\right)\Bigg)\Bigg)\Bigg

Involving $\sinh^m(b z^r + d z)\cosh^v(c z^r + f z + g)$

01.20.21.4213.01

$$\int \sinh^m\left(b z^2 + d z\right)\cosh^v\left(c z^2 + f z + g\right) dz ==$$

$$i^m\, 2^{-m-v}\, z \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2) - \frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k e^{-\frac{d^2(m-2k)}{4b}}\binom{m}{k}\right.\right.$$

$$\left.\left.\left((-1)^m e^{\frac{d^2(m-2k)}{2b}}\sqrt{b(2k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b(2k-m)}\,(d+2bz)}{2b}\right) + \sqrt{b(m-2k)}\ \operatorname{erfi}\left(\frac{(2k-m)(d+2bz)}{2\sqrt{b(m-2k)}}\right)\right)\right)\right) -$$

$$\frac{1}{c}\left(i^m\, 2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1 - m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(e^{\frac{\left(f^2+4cg\right)(2s-v)}{4c}}\binom{v}{s}\right.\right.$$

$$\left.\left.\left(e^{\frac{f^2(v-2s)}{2c}}\sqrt{c(2s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c(2s-v)}\,(f+2cz)}{2c}\right) + e^{2g(v-2s)}\sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{(2s-v)(f+2cz)}{2\sqrt{c(v-2s)}}\right)\right)\right)\right) +$$

$$2^{-m-v-1}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(e^{g(v-2s)-\frac{(2dk-dm+f(v-2s))^2}{8bk-4bm-8cs+4cv}}\left(e^{2\left(\frac{(2dk-dm-2fs+fv)^2}{8bk-4bm-8cs+4cv}+g(2s-v)\right)}\sqrt{-2bk+bm+2cs-cv}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\operatorname{erfi}\left(\frac{-2k(d+2bz)+m(d+2bz)+(2s-v)(f+2cz)}{2\sqrt{-2bk+bm+2cs-cv}}\right) - (-1)^m\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{2bk-bm-2cs+cv}\ \operatorname{erfi}\left(\frac{2k(d+2bz)-m(d+2bz)-(2s-v)(f+2cz)}{2\sqrt{2bk-bm-2cs+cv}}\right)\right)\right)\right)\Big/$$

$$(-2bk+bm+2cs-cv) + \frac{e^{\frac{(-2dk+dm-2fs+fv)^2}{8bk-4bm+8cs-4cv}+g(v-2s)}\operatorname{erfi}\left(\frac{-2k(d+2bz)+m(d+2bz)-(2s-v)(f+2cz)}{2\sqrt{b(m-2k)+c(v-2s)}}\right)}{\sqrt{b(m-2k)+c(v-2s)}} -$$

$$\left((-1)^m e^{g(2s-v)-\frac{(-2dk+dm-2fs+fv)^2}{8bk-4bm+8cs-4cv}}\sqrt{2bk-bm+2cs-cv}\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{2k(d+2bz)-m(d+2bz)+(2s-v)(f+2cz)}{2\sqrt{2bk-bm+2cs-cv}}\right)\right)\Big/(b(m-2k)+c(v-2s))\right)\Big/; m\in\mathbb{N}^+ \wedge v\in\mathbb{N}^+$$

01.20.21.4214.01

$$\int \sinh^m\left(\sqrt{z}\ b+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{2\,e^{d\,z\,(2\,k-m)+b\sqrt{z}\,(2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+d\,z\right)}\right)}{d\,(m-2\,k)}-\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}-\right.$$

$$\left.\frac{b\,e^{-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\,(m-2\,k)}{2\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)-$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g\,(v-2\,s)}\binom{v}{s}\left(\frac{2\,e^{(2\,s-v)\left(c+f\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\ c+g+f\,z\right)}\right)}{f\,(2\,s-v)}+\right.$$

$$\left.\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\ (v-2\,s)\operatorname{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\,(v-2\,s)}{2\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}+\frac{c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\ (v-2\,s)\operatorname{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\,(v-2\,s)}{2\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-g\,(v-2\,s)}\left(\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+(d\,(2\,k-m)+f\,(v-2\,s))\,z+(b\,(2\,k-m)+c\,(v-2\,s))\,\sqrt{z}}}{d\,(2\,k-m)+f\,(v-2\,s)}-\right.\right.$$

$$\left.\left((-1)^m\,e^{2\,g\,(v-2\,s)-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,k-m)+f\,(v-2\,s))}}\,\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))\right.\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)+f\,(v-2\,s)}}\right)\right)\Big/(d\,(2\,k-m)+f\,(v-2\,s))^{3/2}+\right.$$

$$\frac{2\,e^{\sqrt{z}\ (-b\,(2\,k-m)-c\,(v-2\,s))+(d\,(m-2\,k)-f\,(v-2\,s))\,z}}{d\,(m-2\,k)-f\,(v-2\,s)}-\left(e^{-\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}}\,\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))\right.$$

$$\left.\left.\operatorname{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\right)\Big/(d\,(m-2\,k)-f\,(v-2\,s))^{3/2}\right)+$$

$$(-1)^m\,e^{-g\,(v-2\,s)}\left(\frac{2\,(-1)^m\,e^{2\,g\,(v-2\,s)+(d\,(m-2\,k)+f\,(v-2\,s))\,z+(b\,(m-2\,k)+c\,(v-2\,s))\,\sqrt{z}}}{d\,(m-2\,k)+f\,(v-2\,s)}-\left((-1)^m\,e^{2\,g\,(v-2\,s)-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\right.\right.$$

$$\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\ \text{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)+f\,(v-2\,s)}}\right)\Bigg/$$

$$(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+\frac{2\,e^{\sqrt{z}\ (-b\,(m-2\,k)-c\,(v-2\,s))+(d\,(2\,k-m)-f\,(v-2\,s))\,z}}{d\,(2\,k-m)-f\,(v-2\,s)}-\Bigg(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}$$

$$\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))\ \text{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\Bigg/$$

$$(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\Bigg)\Bigg);\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $\sinh^m(b\,z^r+d\,z+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.4215.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v}\,i^{-m}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)+2^{-m-v+\frac{1}{2}}\,i^{-m}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,b\,(m-2\,k)}}\left((-1)^k\binom{m}{k}\left(i\cosh\left(\frac{(m-2\,k)\,d^2}{4\,b}-e\,(m-2\,k)-\frac{i\,m\,\pi}{2}\right)C\left(\frac{d\,(m-2\,k)+2\,b\,z\,(m-2\,k)}{\sqrt{i\,b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)+\right.\right.$$

$$\left.\left.S\left(\frac{d\,(m-2\,k)+2\,b\,z\,(m-2\,k)}{\sqrt{i\,b\,(m-2\,k)}\,\sqrt{2\,\pi}}\right)\sinh\left(\frac{(m-2\,k)\,d^2}{4\,b}-e\,(m-2\,k)-\frac{i\,m\,\pi}{2}\right)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\,i^{-m}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\sqrt{i\,c\,(v-2\,s)}}\left(\binom{v}{s}\left(i\cosh\left(\frac{f^2\,(v-2\,s)}{4\,c}-g\,(v-2\,s)\right)\right.\right.$$

$$\left.\left.C\left(\frac{f\,(v-2\,s)+2\,c\,z\,(v-2\,s)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,s)}}\right)+S\left(\frac{f\,(v-2\,s)+2\,c\,z\,(v-2\,s)}{\sqrt{2\,\pi}\,\sqrt{i\,c\,(v-2\,s)}}\right)\sinh\left(\frac{f^2\,(v-2\,s)}{4\,c}-g\,(v-2\,s)\right)\right)\right)+$$

$$2^{-m-v+\frac{1}{2}}\,i^{-m}\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(i\cosh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+2\,e\,k-e\,m-2\,g\,s+g\,v-\frac{i\,m\,\pi}{2}\right)\right.\right.$$

$$\left.C\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m-2\,c\,s+c\,v)}}\right)-$$

$$S\left(\frac{2\,d\,k-d\,m-2\,f\,s+f\,v+2\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m-2\,c\,s+c\,v)}}\right)\sinh\left(-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+\right.$$

$$\left.\left.2\,e\,k-e\,m-2\,g\,s+g\,v-\frac{i\,m\,\pi}{2}\right)\right)\Big/\left(\sqrt{i\,(2\,b\,k-b\,m-2\,c\,s+c\,v)}\right)+$$

$$\left(i\cosh\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+2\,e\,k-e\,m+2\,g\,s-g\,v-\frac{i\,m\,\pi}{2}\right)\right.$$

$$\left.C\left(\frac{d\,(2\,k-m)+2\,b\,z\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m+2\,c\,s-c\,v)}}\right)-\right.$$

$$S\left(\frac{d\,(2\,k-m)+2\,b\,z\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z)}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,b\,k-b\,m+2\,c\,s-c\,v)}}\right)\sinh\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+\right.$$

$$\left.\left.\left.2\,e\,k-e\,m+2\,g\,s-g\,v-\frac{i\,m\,\pi}{2}\right)\right)\Big/\left(\sqrt{2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v}\right)\right/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4216.01

$$\int \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-\frac{1}{b}\left(2^{-m-v-1}\sqrt{\pi}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2\,k}\left((-1)^k\,e^{-\frac{(m-2\,k)\,d^2}{4\,b}+2\,e\,k-e\,m}\binom{m}{k}\left((-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sqrt{b\,(2\,k-m)}\ \operatorname{erfi}\left(\frac{\sqrt{b\,(2\,k-m)}\ (d+2\,b\,z)}{2\,b}\right)+\right.\right.$$

$$\left.\left.e^{2\,e\,(m-2\,k)}\sqrt{b\,(m-2\,k)}\ \operatorname{erfi}\left(\frac{(2\,k-m)\,(d+2\,b\,z)}{2\sqrt{b\,(m-2\,k)}}\right)\right)\right)-$$

$$\frac{1}{c}\left(i^m\,2^{-m-v-1}\sqrt{\pi}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2\,s}\left(e^{\frac{\left(f^2+4\,c\,g\right)(2\,s-v)}{4\,c}}\binom{v}{s}\left(e^{\frac{f^2\,(v-2\,s)}{2\,c}}\sqrt{c\,(2\,s-v)}\ \operatorname{erfi}\left(\frac{\sqrt{c\,(2\,s-v)}\ (f+2\,c\,z)}{2\,c}\right)+\right.\right.\right.$$

$$\left.\left.\left.e^{2\,g\,(v-2\,s)}\sqrt{c\,(v-2\,s)}\ \operatorname{erfi}\left(\frac{(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{c\,(v-2\,s)}}\right)\right)\right)+2^{-m-v-1}\sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-2\,b\,k+b\,m+2\,c\,s-c\,v}\left(e^{-\frac{(2\,d\,k-d\,m+f\,(v-2\,s))^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}-e\,(2\,k+m)+g\,(v-2\,s)}\left(e^{2\left(\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+e\,m+g\,(2\,s-v)\right)}\right.\right.\right.\right.$$

$$\left.\left.\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{-2\,b\,k+b\,m+2\,c\,s-c\,v}}\right)-(-1)^m\right.$$

$$\left.\left.\left.e^{4\,e\,k}\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}\ \operatorname{erfi}\left(\frac{2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m-2\,c\,s+c\,v}}\right)\right)\right)+\right.$$

$$\left.\left(e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(m-2\,k)+g\,(v-2\,s)}\operatorname{erfi}\left(\frac{-2\,k\,(d+2\,b\,z)+m\,(d+2\,b\,z)-(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}}\right)\right)\right/$$

$$\left(\sqrt{b\,(m-2\,k)+c\,(v-2\,s)}\right)-\frac{1}{b\,(m-2\,k)+c\,(v-2\,s)}\left((-1)^m\,e^{-\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(2\,k-m)+g\,(2\,s-v)}\right.$$

$$\left.\left.\left.\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}\ \operatorname{erfi}\left(\frac{2\,k\,(d+2\,b\,z)-m\,(d+2\,b\,z)+(2\,s-v)\,(f+2\,c\,z)}{2\sqrt{2\,b\,k-b\,m+2\,c\,s-c\,v}}\right)\right)\right)\right/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4217.01

$$\int \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-m-v}\,i^{-m}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)-2^{-m-v}\,i^{1-m}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{(i\,d\,(2\,k-m))^{3/2}}$$

$$\left((-1)^k\binom{m}{k}\left(b\,(2\,k-m)\sqrt{2\,\pi}\left(i\cosh\left(\frac{(2\,k-m)\,b^2}{4\,d}+e\,(m-2\,k)+\frac{i\,m\,\pi}{2}\right)C\left(\frac{b\,(2\,k-m)+2\,d\sqrt{z}\ (2\,k-m)}{\sqrt{i\,d\,(2\,k-m)}\ \sqrt{2\,\pi}}\right)+\right.\right.\right.$$

$$S\left(\frac{b\,(2\,k-m)+2\,d\,\sqrt{z}\;(2\,k-m)}{\sqrt{i\,d\,(2\,k-m)}\;\sqrt{2\,\pi}}\right)\sinh\left(\frac{(2\,k-m)\,b^2}{4\,d}+e\,(m-2\,k)+\frac{i\,m\,\pi}{2}\right)\Bigg)+$$

$$2\,\sqrt{i\,d\,(2\,k-m)}\;\sinh\left(-d\,z\,(2\,k-m)-b\,\sqrt{z}\;(2\,k-m)+e\,(m-2\,k)+\frac{i\,m\,\pi}{2}\right)\Bigg)\Bigg)+$$

$$2^{-m-v}\,i^{1-m}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(i\,f\,(v-2\,s))^{3/2}}\Bigg(\binom{v}{s}\Bigg(2\,\sqrt{i\,f\,(v-2\,s)}\;\sinh\left(g\,(v-2\,s)+f\,z\,(v-2\,s)+c\,\sqrt{z}\;(v-2\,s)\right)-$$

$$c\,\sqrt{2\,\pi}\;(v-2\,s)\Bigg(i\cosh\left(\frac{c^2\,(v-2\,s)}{4\,f}-g\,(v-2\,s)\right)C\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,s)}}\right)+$$

$$S\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\;(v-2\,s)}{\sqrt{2\,\pi}\;\sqrt{i\,f\,(v-2\,s)}}\right)\sinh\left(\frac{c^2\,(v-2\,s)}{4\,f}-g\,(v-2\,s)\right)\Bigg)\Bigg)\Bigg)+$$

$$2^{-m-v}\,i^{1-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\Bigg(2\,\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}\;\sinh\Bigg(2\,e\,k-e\,m-2\,g\,s+g\,v+$$

$$(2\,d\,k-d\,m-2\,f\,s+f\,v)\,z+(2\,b\,k-b\,m-2\,c\,s+c\,v)\,\sqrt{z}\;-\frac{i\,m\,\pi}{2}\Bigg)-$$

$$\sqrt{2\,\pi}\;(2\,b\,k-b\,m-2\,c\,s+c\,v)\Bigg(i\cosh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}+2\,e\,k-e\,m-\right.$$

$$\left.2\,g\,s+g\,v-\frac{i\,m\,\pi}{2}\right)C\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)-$$

$$S\left(\frac{2\,b\,k-b\,m-2\,c\,s+c\,v+2\,(2\,d\,k-d\,m-2\,f\,s+f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\;\sqrt{i\,(2\,d\,k-d\,m-2\,f\,s+f\,v)}}\right)$$

$$\left.\sinh\left(-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{8\,d\,k-4\,d\,m-8\,f\,s+4\,f\,v}+2\,e\,k-e\,m-2\,g\,s+g\,v-\frac{i\,m\,\pi}{2}\right)\Bigg)\Bigg)\Bigg)\Bigg/$$

$$(i\,(2\,d\,k-d\,m-2\,f\,s+f\,v))^{3/2}+\Bigg(2\,\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}\;\sinh\Bigg(2\,e\,k-e\,m+2\,g\,s-$$

$$g\,v+(2\,d\,k-d\,m+2\,f\,s-f\,v)\,z+(2\,b\,k-b\,m+2\,c\,s-c\,v)\,\sqrt{z}\;-\frac{i\,m\,\pi}{2}\Bigg)-$$

$$\sqrt{2\,\pi}\;(2\,b\,k-b\,m+2\,c\,s-c\,v)\Bigg(i\cosh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+2\,e\,k-e\,m+\right.$$

$$2\,g\,s-g\,v-\frac{i\,m\,\pi}{2}\Bigg)C\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)-$$

$$S\left(\frac{2\,b\,k-b\,m+2\,c\,s-c\,v+2\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\,\sqrt{z}}{\sqrt{2\,\pi}\,\sqrt{i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)}}\right)\sinh\left(-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{8\,d\,k-4\,d\,m+8\,f\,s-4\,f\,v}+\right.$$

$$\left.\left.2\,e\,k-e\,m+2\,g\,s-g\,v-\frac{i\,m\,\pi}{2}\right)\right)\Big/\left(i\,(2\,d\,k-d\,m+2\,f\,s-f\,v)\right)^{3/2}\Bigg)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4218.01

$$\int\sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz==i^m\,2^{-m-v}\,z\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)+$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-e\,(m-2\,k)}\binom{m}{k}\left(-\frac{(-1)^m\,b\,e^{\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\,\sqrt{d\,(2\,k-m)}}\right)}{(d\,(2\,k-m))^{3/2}}+\right.$$

$$\frac{2\,e^{d\,z\,(2\,k-m)+b\,\sqrt{z}\ (2\,k-m)}\left(-(-1)^m+e^{2\,(m-2\,k)\left(\sqrt{z}\ b+e+d\,z\right)}\right)}{d\,(m-2\,k)}-$$

$$\left.\frac{b\,e^{2\,e\,(m-2\,k)-\frac{b^2\,(m-2\,k)}{4\,d}}\,(m-2\,k)\,\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b\,(m-2\,k)+2\,d\,\sqrt{z}\ (m-2\,k)}{2\,\sqrt{d\,(m-2\,k)}}\right)}{(d\,(m-2\,k))^{3/2}}\right)+$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g\,(v-2\,s)}\binom{v}{s}\left(-\frac{2\,e^{(2\,s-v)\left(c+f\,\sqrt{z}\right)\sqrt{z}}\left(-1+e^{2\,(v-2\,s)\left(\sqrt{z}\ c+g+f\,z\right)}\right)}{f\,(2\,s-v)}-\right.$$

$$\frac{c\,e^{\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\ (v-2\,s)\operatorname{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\ (v-2\,s)}{2\,\sqrt{-f\,(v-2\,s)}}\right)}{(-f\,(v-2\,s))^{3/2}}-\frac{c\,e^{2\,g\,(v-2\,s)-\frac{c^2\,(v-2\,s)}{4\,f}}\,\sqrt{\pi}\ (v-2\,s)\operatorname{erfi}\left(\frac{c\,(v-2\,s)+2\,f\,\sqrt{z}\ (v-2\,s)}{2\,\sqrt{f\,(v-2\,s)}}\right)}{(f\,(v-2\,s))^{3/2}}\Bigg)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-e\,(2\,k-m)-g\,(v-2\,s)}\left(\frac{2\,(-1)^m\,e^{\sqrt{z}\ (b\,(2\,k-m)+c\,(v-2\,s))+2\,(e\,(2\,k-m)+g\,(v-2\,s))+(d\,(2\,k-m)+f\,(v-2\,s))\,z}}{d\,(2\,k-m)+f\,(v-2\,s)}-\right.\right.$$

$$\left.\left((-1)^m\,e^{2\,(e\,(2\,k-m)+g\,(v-2\,s))-\frac{(b\,(2\,k-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,k-m)+f\,(v-2\,s))}}\,\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))\right.\right.$$

$$\operatorname{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)+f\,(v-2\,s)}}\right)\Bigg)\Bigg/\,(d\,(2\,k-m)+f\,(v-2\,s))^{3/2}+$$

$$\frac{2\,e^{\sqrt{z}\ (-b\,(2\,k-m)-c\,(v-2\,s))+(d\,(m-2\,k)-f\,(v-2\,s))\,z}}{d\,(m-2\,k)-f\,(v-2\,s)}-\Bigg(e^{-\frac{(-b\,(2\,k-m)-c\,(v-2\,s))^2}{4\,(d\,(m-2\,k)-f\,(v-2\,s))}}\,\sqrt{\pi}\ (b\,(2\,k-m)+c\,(v-2\,s))$$

$$\operatorname{erfi}\left(\frac{b\,(2\,k-m)+c\,(v-2\,s)+2\,(d\,(2\,k-m)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)-f\,(v-2\,s)}}\right)\Bigg)\Bigg/\,(d\,(m-2\,k)-f\,(v-2\,s))^{3/2}\Bigg)+$$

$$(-1)^m\,e^{-e\,(m-2\,k)-g\,(v-2\,s)}\Bigg(\frac{2\,(-1)^m\,e^{\sqrt{z}\ (b\,(m-2\,k)+c\,(v-2\,s))+2\,(e\,(m-2\,k)+g\,(v-2\,s))+(d\,(m-2\,k)+f\,(v-2\,s))\,z}}{d\,(m-2\,k)+f\,(v-2\,s)}-$$

$$\Bigg((-1)^m\,e^{2\,(e\,(m-2\,k)+g\,(v-2\,s))-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,k)+f\,(v-2\,s))}}\,\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))$$

$$\operatorname{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(m-2\,k)+f\,(v-2\,s)}}\right)\Bigg)\Bigg/\,(d\,(m-2\,k)+f\,(v-2\,s))^{3/2}+$$

$$\frac{2\,e^{\sqrt{z}\ (-b\,(m-2\,k)-c\,(v-2\,s))+(d\,(2\,k-m)-f\,(v-2\,s))\,z}}{d\,(2\,k-m)-f\,(v-2\,s)}-\Bigg(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,(d\,(2\,k-m)-f\,(v-2\,s))}}\,\sqrt{\pi}\ (b\,(m-2\,k)+c\,(v-2\,s))$$

$$\operatorname{erfi}\left(\frac{b\,(m-2\,k)+c\,(v-2\,s)+2\,(d\,(m-2\,k)+f\,(v-2\,s))\,\sqrt{z}}{2\,\sqrt{d\,(2\,k-m)-f\,(v-2\,s)}}\right)\Bigg)\Bigg/$$

$$(d\,(2\,k-m)-f\,(v-2\,s))^{3/2}\Bigg)\Bigg)\Bigg);\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving sinh and rational functions of cosh

Involving $\frac{\sinh(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.4219.01

$$\int \frac{\sinh(d\,z)}{a+b\cosh(c\,z)}\,dz == \frac{e^{(c-d)\,z}}{2\,b\,\sqrt{a^2-b^2}}$$

$$\left(\frac{1}{d-c}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{d}{c},\,1;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(1-\frac{d}{c},\,1;\,2-\frac{d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)+\right.$$

$$\left.\frac{1}{c+d}\,e^{2\,d\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

01.20.21.4220.01

$$\int \frac{\sinh(c\,z)}{a+b\cosh(c\,z)}\,dz == \frac{\log(a+b\cosh(c\,z))}{b\,c}$$

01.20.21.4221.01

$$\int \frac{\sinh(z)}{\cosh(z)+1}\,dz == 2\log\left(\cosh\left(\frac{z}{2}\right)\right)$$

01.20.21.4222.01

$$\int \frac{\sinh(z)}{1-\cosh(z)}\,dz == -\log(\cosh(z)-1)$$

01.20.21.4223.01

$$\int \frac{A+B\sinh(c\,z)}{a+b\cosh(c\,z)}\,dz == \frac{B\log(a+b\cosh(c\,z))}{b\,c}-\frac{2\,A}{\sqrt{b^2-a^2}\;c}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)$$

01.20.21.4224.01

$$\int \frac{\sinh(2\,c\,z)}{a+b\cosh(c\,z)}\,dz == \frac{2\,b\cosh(c\,z)-2\,a\log(a+b\cosh(c\,z))}{b^2\,c}$$

01.20.21.4225.01

$$\int \frac{\sinh(c\,z)}{a+b\cosh(2\,c\,z)}\,dz == -\frac{1}{\sqrt{b}\;\sqrt{4\,b-2\,(a+b)}\;c}\tanh^{-1}\left(\frac{2\sqrt{b}\;\cosh(c\,z)}{\sqrt{2\,b-2\,a}}\right)$$

01.20.21.4226.01

$$\int \frac{A+B\sinh(z)+C\cosh(z)}{1-\cosh(z)}\,dz == -C\,z+(A+C)\coth\left(\frac{z}{2}\right)-2\,B\log\left(\sinh\left(\frac{z}{2}\right)\right)$$

01.20.21.4227.01

$$\int \frac{A+B\sinh(z)+C\cosh(z)}{\cosh(z)+1}\,dz == \frac{2\cosh\left(\frac{z}{2}\right)\left(\cosh\left(\frac{z}{2}\right)\left(C\,z+2\,B\log\left(\cosh\left(\frac{z}{2}\right)\right)\right)+(A-C)\sinh\left(\frac{z}{2}\right)\right)}{\cosh(z)+1}$$

Involving $\sinh(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.4228.01

$$\int \frac{\sinh(d\,z)}{(a+b\cosh(c\,z))^2}\,dz == \frac{1}{2\,b\left(a^2-b^2\right)^{3/2}}$$

$$\left(\frac{1}{c-d}\left(e^{(c-d)\,z}\left({}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)a^2-{}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)a^2+\left(a-\sqrt{a^2-b^2}\right)\right.\right.\right.$$
$${}_2F_1\left(1-\frac{d}{c},\,1;\,2-\frac{d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)a+\sqrt{a^2-b^2}\;{}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)a+\sqrt{a^2-b^2}$$
$${}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)a-a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(1-\frac{d}{c},\,1;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-$$
$$\left.\left.\left.b^2\,{}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+b^2\,{}_2F_1\left(1-\frac{d}{c},\,2;\,2-\frac{d}{c};-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$
$$\frac{1}{c+d}\left(e^{(c+d)\,z}\left(-{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)a^2+{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)a^2+\left(a+\sqrt{a^2-b^2}\right)\right.\right.$$
$${}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)a+\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)a-$$
$$\sqrt{a^2-b^2}\;{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)a-\sqrt{a^2-b^2}\;{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)a+$$
$$\left.\left.\left.b^2\,{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-b^2\,{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)$$

01.20.21.4229.01

$$\int \frac{A+B\sinh(z)}{(a+b\cosh(z))^2}\,dz == -\frac{B}{b\,(a+b\cosh(z))}+\frac{2\,a\,A\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{z}{2}\right)}{\sqrt{b^2-a^2}}\right)}{\left(b^2-a^2\right)^{3/2}}+\frac{A\,b\sinh(z)}{\left(b^2-a^2\right)(a+b\cosh(z))}$$

01.20.21.4230.01

$$\int \frac{A+B\sinh(z)}{(\cosh(z)+1)^2}\,dz == \frac{1}{12}\operatorname{sech}^3\left(\frac{z}{2}\right)\left(A\left(3\sinh\left(\frac{z}{2}\right)+\sinh\left(\frac{3\,z}{2}\right)\right)-6\,B\cosh\left(\frac{z}{2}\right)\right)$$

01.20.21.4231.01

$$\int \frac{A+B\sinh(z)}{(1-\cosh(z))^2}\,dz == \frac{1}{12}\operatorname{csch}^3\left(\frac{z}{2}\right)\left(-3\,A\cosh\left(\frac{z}{2}\right)+A\cosh\left(\frac{3\,z}{2}\right)-6\,B\sinh\left(\frac{z}{2}\right)\right)$$

01.20.21.4232.01

$$\int \frac{A+B\sinh(z)}{(a+b\cosh(z))^3}\,dz == \frac{1}{2}\left(-\frac{B}{b\,(a+b\cosh(z))^2}-\frac{2\,A\left(2\,a^2+b^2\right)\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{z}{2}\right)}{\sqrt{b^2-a^2}}\right)}{\left(b^2-a^2\right)^{5/2}}+\frac{A\,b\left(-4\,a^2-3\,b\cosh(z)\,a+b^2\right)\sinh(z)}{\left(a^2-b^2\right)^2(a+b\cosh(z))^2}\right)$$

01.20.21.4233.01

$$\int \frac{A+B\sinh(z)}{(\cosh(z)+1)^3}\,dz == \frac{1}{120}\operatorname{sech}^5\left(\frac{z}{2}\right)\left(A\left(10\sinh\left(\frac{z}{2}\right)+5\sinh\left(\frac{3z}{2}\right)+\sinh\left(\frac{5z}{2}\right)\right)-15\,B\cosh\left(\frac{z}{2}\right)\right)$$

01.20.21.4234.01

$$\int \frac{A+B\sinh(z)}{(1-\cosh(z))^3}\,dz == \frac{1}{120}\operatorname{csch}^5\left(\frac{z}{2}\right)\left(10\,A\cosh\left(\frac{z}{2}\right)-5\,A\cosh\left(\frac{3z}{2}\right)+A\cosh\left(\frac{5z}{2}\right)+15\,B\sinh\left(\frac{z}{2}\right)\right)$$

01.20.21.4235.01

$$\int \frac{A+B\sinh(z)+C\sinh^2(z)}{(a+b\cosh(z))^3}\,dz == \frac{1}{2}\left(-\frac{2\left((2\,A-C)\,a^2+b^2\,(A+C)\right)}{\left(b^2-a^2\right)^{5/2}}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{z}{2}\right)}{\sqrt{b^2-a^2}}\right)+\frac{a\left(\left(a^2-b^2\right)C-3\,A\,b^2\right)\sinh(z)}{b\left(a^2-b^2\right)^2(a+b\cosh(z))}+\frac{\left(a^2-b^2\right)B+\left(A\,b^2+\left(a^2-b^2\right)C\right)\sinh(z)}{\left(b^3-a^2\,b\right)(a+b\cosh(z))^2}\right)$$

Involving $\frac{\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4236.01

$$\int \frac{\sinh(d\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{1}{2\sqrt{a}\;b\sqrt{a+b}}\left(\frac{1}{2\,c-d}\left(e^{(2\,c-d)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)-\frac{1}{2\,c+d}\left(e^{(2\,c+d)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)-\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)$$

01.20.21.4237.01

$$\int \frac{\sinh(2\,c\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{\log(2\,a+b+b\cosh(2\,c\,z))}{b\,c}$$

Involving $\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.4238.01

$$\int \frac{\sinh(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == \frac{1}{4\,a^{3/2}\,b\,(a+b)^{3/2}}$$
$$\left(-\frac{1}{2\,c+d}\left(e^{(2\,c+d)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.\right.$$
$$(2\,a+b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\,\sqrt{a}\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d}{2\,c}+1,\,2;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left.\left.\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d}{2\,c}+1,\,2;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)+$$
$$\frac{1}{2\,c-d}\left(e^{(2\,c-d)\,z}\left(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)-\right.\right.$$
$$(2\,a+b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\,\sqrt{a}\left(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{d}{2\,c},\,2;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left.\left.\left.\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(1-\frac{d}{2\,c},\,2;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\right)$$

Involving rational functions of sinh

Involving $\frac{1}{a+b\sinh(c\,z)}$

01.20.21.4239.01

$$\int \frac{\cosh^{\frac{1}{2}}(2\,c\,z)}{a+b\sinh(c\,z)}\,dz == \frac{1}{b\,c}\left(\frac{\sqrt{-2\,a^2-b^2}}{\sqrt{a^2+b^2}}\tan^{-1}\left(\frac{\sqrt{-2\,a^2-b^2}\,\cosh(c\,z)}{\sqrt{a^2+b^2}\,\cosh^{\frac{1}{2}}(2\,c\,z)}\right)+\right.$$
$$\left.\frac{i\left(2\,a^2\,F(i\,c\,z\,|\,2)-\left(2\,a^2+b^2\right)\Pi\left(-\frac{b^2}{a^2};\,i\,c\,z\,|\,2\right)\right)}{a\,b}+\sqrt{2}\,\sqrt{\cosh^2(c\,z)}\,\log\left(\cosh^{\frac{1}{2}}(2\,c\,z)+\sqrt{\cosh(2\,c\,z)+1}\right)\operatorname{sech}(c\,z)\right)$$

01.20.21.4240.01

$$\int \frac{1}{\cosh^{\frac{1}{2}}(2\,c\,z)\,(a+b\sinh(c\,z))}\,dz == \frac{1}{b\,c}\left(-\frac{1}{\sqrt{\frac{a^2}{b^2}+1}\,\sqrt{\frac{2\,a^2}{b^2}+1}}\tanh^{-1}\left(\frac{\sqrt{\frac{2\,a^2}{b^2}+1}\,\cosh(c\,z)}{\sqrt{\frac{a^2}{b^2}+1}\,\cosh^{\frac{1}{2}}(2\,c\,z)}\right)-\frac{i\,b\,\Pi\left(-\frac{b^2}{a^2};\,i\,c\,z\,|\,2\right)}{a}\right)$$

Involving algebraic functions of sinh

01.20.21.4241.01

$$\int \sqrt{a+b\sinh(c\,z)}\,\cosh^2(c\,z)\,dz ==$$

$$\frac{1}{30\,b^2\,c\,\sqrt{a+b\sinh(c\,z)}}\left(8\sqrt{\frac{a+b\sinh(c\,z)}{a-i\,b}}\,\left(-i\,a^3-b\,a^2+3\,b^2\,i\,a+3\,b^3\right)E\left(\frac{1}{4}(\pi-2\,i\,c\,z)\,\middle|\,-\frac{2\,i\,b}{a-i\,b}\right)+8\,a\right.$$

$$\left.\sqrt{\frac{a+b\sinh(c\,z)}{a-i\,b}}\,\left(a^2+b^2\right)i\,F\left(\frac{1}{4}(\pi-2\,i\,c\,z)\,\middle|\,-\frac{2\,i\,b}{a-i\,b}\right)+2\,b\cosh(c\,z)\left(2\,a^2+8\,b\sinh(c\,z)\,a-3\,b^2+3\,b^2\cosh(2\,c\,z)\right)\right)$$

01.20.21.4242.01

$$\int \frac{\cosh^2(c\,z)}{\sinh^{\frac{1}{2}}(c\,z)\,(\sinh(c\,z)+1)^2}\,dz ==$$

$$\left(-2\,E\left(\frac{1}{4}(\pi-2\,i\,c\,z)\,\middle|\,2\right)\sqrt{i\sinh(c\,z)}\,(\sinh(c\,z)+1)+2\,i\,F\left(\frac{1}{4}(\pi-2\,i\,c\,z)\,\middle|\,2\right)\sqrt{i\sinh(c\,z)}\,(\sinh(c\,z)+1)+\sinh(2\,c\,z)\right)\Big/$$

$$\left(2\,c\sinh^{\frac{1}{2}}(c\,z)\,(\sinh(c\,z)+1)\right)$$

01.20.21.4243.01

$$\int \frac{\cosh^2(z)}{\sqrt{a+b\sinh(z)}\,(c+b\sinh(z))^2}\,dz ==$$

$$\frac{1}{4\,b\,(a-c)}\left(\frac{1}{\sqrt{\frac{1}{i\,b-a}}\,b^2\,(a-c)}\left(i\,(\cosh(z)+\cosh(3\,z))\left(2\,(a+i\,b)\,(a-c)\,E\left(i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\,\middle|\,\frac{a-i\,b}{a+i\,b}\right)+\right.\right.\right.$$

$$2\,(a-c)\,(c-i\,b)\,F\left(i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\,\middle|\,\frac{a-i\,b}{a+i\,b}\right)+\left(b^2+2\,c^2\right)\Pi\left(\frac{a-i\,b}{a-c};\right.$$

$$\left.\left.\left.i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\,\middle|\,\frac{a-i\,b}{a+i\,b}\right)\right)\operatorname{sech}(2\,z)\sqrt{\frac{b-i\,b\sinh(z)}{i\,a+b}}\,\sqrt{\frac{i\sinh(z)\,b+b}{b-i\,a}}\,\operatorname{sech}^2(z)\right)-$$

$$\frac{1}{\sqrt{\frac{1}{i\,b-a}}\,b^2\,(a-c)}\left(8\,i\,a\left((a-c)\,F\left(i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\,\middle|\,\frac{a-i\,b}{a+i\,b}\right)+\right.\right.$$

$$\left.\left.c\,\Pi\left(\frac{a-i\,b}{a-c};i\sinh^{-1}\left(\sqrt{\frac{1}{i\,b-a}}\,\sqrt{a+b\sinh(z)}\right)\,\middle|\,\frac{a-i\,b}{a+i\,b}\right)\right)\sqrt{\frac{b-i\,b\sinh(z)}{i\,a+b}}\,\sqrt{\frac{i\sinh(z)\,b+b}{b-i\,a}}\,\operatorname{sech}(z)+\right.$$

$$\left.\frac{6\,b\,\Pi\left(\frac{2\,b}{b+i\,c};\frac{1}{4}(\pi-2\,i\,z)\,\middle|\,-\frac{2\,i\,b}{a-i\,b}\right)\sqrt{\frac{a+b\sinh(z)}{a-i\,b}}}{(b+i\,c)\sqrt{a+b\sinh(z)}}-\frac{4\cosh(z)\sqrt{a+b\sinh(z)}}{c+b\sinh(z)}\right)$$

Involving products of the direct function and hyperbolic functions

Involving sinh

Involving $\sinh(a\,z)\cosh(b\,z)\cosh(c\,z)$

01.20.21.4244.01

$$\int \sinh(a\,z)\cosh(b\,z)\cosh(c\,z)\,dz == \frac{1}{4}\left(\frac{\cosh((a-b-c)\,z)}{a-b-c}+\frac{\cosh(a\,z+b\,z+c\,z)}{a+b+c}+\frac{\cosh(a\,z-b\,z+c\,z)}{a-b+c}+\frac{\cosh(a\,z+b\,z-c\,z)}{a+b-c}\right)$$

Involving rational functions of sinh

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sinh(c\,z)}$

01.20.21.4245.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sinh(c\,z)}\,dz == \frac{1}{4}\left(-\frac{1}{b\sqrt{a^2+b^2}\,(c-d-e)}\left(e^{(c-d-e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-e}{c},1;\frac{-d-e}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d-e}{c},1;\frac{-d-e}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-\frac{1}{b\sqrt{a^2+b^2}\,(c+d-e)}\left(e^{(c+d-e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e}{c},1;\frac{d-e}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d-e}{c},1;\frac{d-e}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-\frac{1}{b\sqrt{a^2+b^2}\,(c-d+e)}\left(e^{(c-d+e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+e}{c},1;\frac{e-d}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d+e}{c},1;\frac{e-d}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-\frac{1}{b\sqrt{a^2+b^2}\,(c+d+e)}\left(e^{(c+d+e)\,z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e}{c},1;\frac{d+e}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d+e}{c},1;\frac{d+e}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\,(a+b\sinh(c\,z))^{-n}$

01.20.21.4246.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{(a+b\sinh(c\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d-e)}\left(e^{(c-d-e)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d-e}{c},\,2;\,\frac{-d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d-e}{c},\,2;\,\frac{-d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-e)}\left(e^{(c+d-e)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d-e}{c},\,2;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d-e}{c},\,2;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d+e)}\left(e^{(c-d+e)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}-a}\right)+$$

$$\left.\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+e)}\left(e^{(c+d+e)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}}\right)+$$
$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d+e}{c},\,2;\,\frac{d+e}{c}+2;\,\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)+$$
$$\left.\left.\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d+e}{c},\,2;\,\frac{d+e}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}}\right)\right)\right)$$

Involving $\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sinh^2(c\,z)}$

01.20.21.4247.01

$$\int\frac{\cosh(e\,z)\cosh(d\,z)}{a+b\sinh^2(c\,z)}\,dz==$$
$$\frac{1}{4}\left(\frac{1}{\sqrt{a}\;\sqrt{a-b}\;b\,(-2\,c-d-e)}\left(e^{(-2\,c-d-e)z}\left(\left(2\,a+2\sqrt{a-b}\;\sqrt{a}-b\right){}_2F_1\left(1-\frac{-d-e}{2\,c},\,1;\,2-\frac{-d-e}{2\,c};\right.\right.\right.\right.$$
$$\left.\left.\frac{b\,e^{-2\,c\,z}}{-2\,a+2\sqrt{a-b}\;\sqrt{a}+b}\right)+\left(-2\,a+2\sqrt{a-b}\;\sqrt{a}+b\right)$$
$${}_2F_1\left(1-\frac{-d-e}{2\,c},\,1;\,2-\frac{-d-e}{2\,c};\,\frac{b\,e^{-2\,c\,z}}{-2\,a-2\sqrt{a-b}\;\sqrt{a}+b}\right)\Bigg)\Bigg)+\frac{1}{\sqrt{a}\;\sqrt{a-b}\;b\,(-2\,c+d-e)}$$
$$\left(e^{(-2\,c+d-e)z}\left(\left(2\,a+2\sqrt{a-b}\;\sqrt{a}-b\right){}_2F_1\left(1-\frac{d-e}{2\,c},\,1;\,2-\frac{d-e}{2\,c};\,\frac{b\,e^{-2\,c\,z}}{-2\,a+2\sqrt{a-b}\;\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a+2\sqrt{a-b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{d-e}{2\,c},\,1;\,2-\frac{d-e}{2\,c};\,\frac{b\,e^{-2\,c\,z}}{-2\,a-2\sqrt{a-b}\;\sqrt{a}+b}\right)\right)\right)+$$
$$\frac{1}{\sqrt{a}\;\sqrt{a-b}\;b\,(-2\,c-d+e)}\left(e^{(-2\,c-d+e)z}\left(\left(2\,a+2\sqrt{a-b}\;\sqrt{a}-b\right)\right.\right.$$
$${}_2F_1\left(1-\frac{e-d}{2\,c},\,1;\,2-\frac{e-d}{2\,c};\,\frac{b\,e^{-2\,c\,z}}{-2\,a+2\sqrt{a-b}\;\sqrt{a}+b}\right)+\left(-2\,a+2\sqrt{a-b}\;\sqrt{a}+b\right)$$
$${}_2F_1\left(1-\frac{e-d}{2\,c},\,1;\,2-\frac{e-d}{2\,c};\,\frac{b\,e^{-2\,c\,z}}{-2\,a-2\sqrt{a-b}\;\sqrt{a}+b}\right)\Bigg)\Bigg)+\frac{1}{\sqrt{a}\;\sqrt{a-b}\;b\,(-2\,c+d+e)}$$
$$\left(e^{(-2\,c+d+e)z}\left(\left(2\,a+2\sqrt{a-b}\;\sqrt{a}-b\right){}_2F_1\left(1-\frac{d+e}{2\,c},\,1;\,2-\frac{d+e}{2\,c};\,\frac{b\,e^{-2\,c\,z}}{-2\,a+2\sqrt{a-b}\;\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a+2\sqrt{a-b}\;\sqrt{a}+b\right){}_2F_1\left(1-\frac{d+e}{2\,c},\,1;\,2-\frac{d+e}{2\,c};\,\frac{b\,e^{-2\,c\,z}}{-2\,a-2\sqrt{a-b}\;\sqrt{a}+b}\right)\right)\right)$$

Involving $\cosh(e\,z)\cosh(d\,z)\left(a+b\sinh^2(c\,z)\right)^{-n}$

01.20.21.4248.01

$$\int \frac{\cosh(e\,z)\cosh(d\,z)}{\left(a+b\sinh^2(c\,z)\right)^2}\,dz == \frac{1}{4}\left(\frac{1}{2\,a^{3/2}\,(a-b)^{3/2}\,b\,(2\,c-d-e)}\right.$$
$$\left(e^{(2c-d-e)z}\left((2\,a-b)\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,1;\frac{-d-e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(2\,a-b)\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,1;\frac{-d-e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}-2\sqrt{a-b}\,a+2\,b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,2;\frac{-d-e}{2\,c}+\right.\right.$$
$$\left.2;\frac{b\,e^{2cz}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}-2\sqrt{a-b}\,a-2\,b\sqrt{a}+\sqrt{a-b}\,b\right)$$
$$\left.\left.{}_2F_1\left(\frac{-d-e}{2\,c}+1,2;\frac{-d-e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)+\frac{1}{2\,a^{3/2}\,(a-b)^{3/2}\,b\,(2\,c+d-e)}$$
$$\left(e^{(2c+d-e)z}\left((2\,a-b)\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-e}{2\,c}+1,1;\frac{d-e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(2\,a-b)\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-e}{2\,c}+1,1;\frac{d-e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2\,a^{3/2}-2\sqrt{a-b}\,a+2\,b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{d-e}{2\,c}+1,2;\frac{d-e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2\,a^{3/2}-2\sqrt{a-b}\,a-2\,b\sqrt{a}+\sqrt{a-b}\,b\right)$$
$$\left.\left.{}_2F_1\left(\frac{d-e}{2\,c}+1,2;\frac{d-e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)+\frac{1}{2\,a^{3/2}\,(a-b)^{3/2}\,b\,(2\,c-d+e)}$$
$$\left(e^{(2c-d+e)z}\left((2\,a-b)\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-d}{2\,c}+1,1;\frac{e-d}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(2\,a-b)\left(-2\,a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-d}{2\,c}+1,1;\frac{e-d}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2\,a^{3/2}-2\sqrt{a-b}\,a+2\,b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{e-d}{2\,c}+1,2;\frac{e-d}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2\,a^{3/2}-2\sqrt{a-b}\,a-2\,b\sqrt{a}+\sqrt{a-b}\,b\right)$$
$$\left.\left.{}_2F_1\left(\frac{e-d}{2\,c}+1,2;\frac{e-d}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\right)+\frac{1}{2\,a^{3/2}\,(a-b)^{3/2}\,b\,(2\,c+d+e)}$$
$$\left(e^{(2c+d+e)z}\left((2\,a-b)\left(2\,a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+e}{2\,c}+1,1;\frac{d+e}{2\,c}+2;\frac{b\,e^{2cz}}{-2\,a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+e}{2c}+1,\,1;\,\frac{d+e}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{d+e}{2c}+1,\,2;\,\frac{d+e}{2c}+2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\right)$$
$$\left.{}_2F_1\left(\frac{d+e}{2c}+1,\,2;\,\frac{d+e}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\Bigg)\Bigg)\Bigg)$$

Involving algebraic functions of sinh

Involving $\cosh(dz)\cosh(ez)(a+b\sinh(cz))^{\beta}$

01.20.21.4249.01

$$\int \cosh(dz)\cosh(ez)(a+b\sinh(cz))^{\beta}\,dz == \frac{1}{4}\left(\frac{e^{cz}b}{a-\sqrt{a^2+b^2}}+1\right)^{-\beta}\left(\frac{e^{cz}b}{a+\sqrt{a^2+b^2}}+1\right)^{-\beta}$$
$$(a+b\sinh(cz))^{\beta}\left(\frac{e^{(d-e)z}}{d-e-c\beta}F_1\left(\frac{d-e-c\beta}{c};-\beta,-\beta;\frac{-\beta c+c+d-e}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)+\right.$$
$$\frac{e^{(d+e)z}}{d+e-c\beta}F_1\left(\frac{d+e-c\beta}{c};-\beta,-\beta;\frac{-\beta c+c+d+e}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)-$$
$$\frac{e^{(e-d)z}}{d-e+c\beta}F_1\left(-\frac{d-e+c\beta}{c};-\beta,-\beta;\frac{-\beta c+c-d+e}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)-$$
$$\left.\frac{e^{-(d+e)z}}{d+e+c\beta}F_1\left(-\frac{d+e+c\beta}{c};-\beta,-\beta;-\frac{d+e+c(\beta-1)}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2+b^2}},\frac{b\,e^{cz}}{\sqrt{a^2+b^2}-a}\right)\right)$$

Involving $\cosh(dz)\cosh(ez)\left(a+b\sinh^2(cz)\right)^{\beta}$

01.20.21.4250.01

$$\int \cosh(d\,z)\cosh(e\,z)\left(a+b\sinh^2(c\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{4}\left(\frac{e^{2cz}\,b}{2a-b+2\sqrt{a(a-b)}}+1\right)^{-\beta}\left(1-\frac{b\,e^{2cz}}{-2a+b+2\sqrt{a(a-b)}}\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2cz}\left(-1+e^{2cz}\right)^2+a\right)^{\beta}$$
$$\left(\frac{e^{(d-e)z}}{d-e-2c\beta}F_1\left(\frac{d-e-2c\beta}{2c};-\beta,-\beta;\frac{d-e}{2c}-\beta+1;\frac{b\,e^{2cz}}{-2a+b-2\sqrt{a(a-b)}},\frac{b\,e^{2cz}}{-2a+b+2\sqrt{a(a-b)}}\right)+\right.$$
$$\frac{e^{(d+e)z}}{d+e-2c\beta}F_1\left(\frac{d+e-2c\beta}{2c};-\beta,-\beta;\frac{d+e}{2c}-\beta+1;\frac{b\,e^{2cz}}{-2a+b-2\sqrt{a(a-b)}},\frac{b\,e^{2cz}}{-2a+b+2\sqrt{a(a-b)}}\right)+$$
$$\frac{e^{(e-d)z}}{-d+e-2c\beta}F_1\left(-\frac{d-e+2c\beta}{2c};-\beta,-\beta;\frac{e-d}{2c}-\beta+1;\frac{b\,e^{2cz}}{-2a+b-2\sqrt{a(a-b)}},\frac{b\,e^{2cz}}{-2a+b+2\sqrt{a(a-b)}}\right)-$$
$$\left.\frac{e^{-(d+e)z}}{d+e+2c\beta}F_1\left(-\frac{d+e+2c\beta}{2c};-\beta,-\beta;-\frac{d+e+2c(\beta-1)}{2c};\frac{b\,e^{2cz}}{-2a+b-2\sqrt{a(a-b)}},\frac{b\,e^{2cz}}{-2a+b+2\sqrt{a(a-b)}}\right)\right)$$

Involving $\cosh(d\,z)\cosh(e\,z)\left(\left(a+b\sinh^2(c\,z)\right)^n\right)^{\beta}$

01.20.21.4251.01

$$\int \frac{\cosh(z)\cosh(2z)}{\sqrt{\left(a+b\sinh^2(z)\right)^3}}\,dz ==$$

$$\left(4a\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(z)}{\sqrt{2a-b+b\cosh(2z)}}\right)\left(b\sinh^2(z)+a\right)^{3/2}+\sqrt{b}\,(b-2a)(2a-b+b\cosh(2z))\sinh(z)\right)\Big/$$
$$\left(2a\,b^{3/2}\sqrt{\left(b\sinh^2(z)+a\right)^3}\right)$$

01.20.21.4252.01

$$\int \frac{\sinh(3z)\cosh(z)\cosh(2z)}{\sqrt{\left(b\sinh^2(z)+a\right)^5}}\,dz ==$$

$$\frac{1}{6b^3\sqrt{\left(b\sinh^2(z)+a\right)^5}}\left((2a-b+b\cosh(2z))\left(-24\sqrt{\frac{b\cosh(2z)}{2a-b}+1}\;a^2+64a^2+24\sqrt{\frac{b\cosh(2z)}{2a-b}+1}\;b\,a-\right.\right.$$
$$68\,b\,a+48\,b\cosh(2z)\,a-12\,b\cosh(2z)\sqrt{\frac{b\cosh(2z)}{2a-b}+1}\;a+21\,b^2+$$
$$\left.\left.6\sqrt{\frac{b\cosh(2z)}{2a-b}+1}\;b^2\cosh(2z)-27\,b^2\cosh(2z)+3\,b^2\cosh(4z)-6\,b^2\sqrt{\frac{b\cosh(2z)}{2a-b}+1}\right)\right)$$

Involving products of powers of several direct functions and hyperbolic functions

Involving sinh

01.20.21.4253.01

$$\int \sinh(z)\cosh^3(z)\sqrt[3]{\cosh^2(2z)}\,dz == \frac{1}{1280\left(1+e^{4z}\right)}\left(3e^{-4z}\sqrt[3]{\cosh^2(2z)}\left(10e^{4z}\sqrt[3]{1+e^{4z}}\;{}_2F_1\left(-\frac{1}{3},\frac{1}{3};\frac{2}{3};-e^{4z}\right)+16e^{2z}+5e^{4z}+32e^{6z}+5e^{8z}+16e^{10z}+5e^{12z}+5e^{8z}\sqrt[3]{1+e^{4z}}\;{}_2F_1\left(\frac{2}{3},\frac{1}{3};\frac{5}{3};-e^{4z}\right)+5\right)\right)$$

Involving rational functions of the direct function and hyperbolic functions

Involving sinh

Involving $\frac{\sinh(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.4254.01

$$\int \frac{\sinh(d\,z)}{a+b\cosh(c\,z)}\,dz == \frac{1}{2}\left(\frac{e^{(c+d)z}}{b\sqrt{a^2-b^2}\;(c+d)}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d}{c},1;\frac{d}{c}+2;\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d}{c},1;\frac{d}{c}+2;-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)-\frac{1}{b\sqrt{a^2-b^2}\;(c-d)}\left(e^{(c-d)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d}{c},1;2-\frac{d}{c};\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d}{c},1;2-\frac{d}{c};-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

01.20.21.4255.01

$$\int \frac{\sinh(c\,z)}{a+b\cosh(c\,z)}\,dz == \frac{\log(a+b\cosh(c\,z))}{b\,c}$$

Involving $\sinh(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.4256.01

$$\int \frac{\sinh(d\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$
$$\frac{1}{2}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d)}\left(e^{(c+d)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.{}_2F_1\left(\frac{c+d}{c},\,1;\,\frac{d}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)+\right.$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$\left.\left.a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+d}{c},\,2;\,\frac{d}{c}+2;\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$
$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d)}\left(e^{(c-d)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d}{c},\,1;\,2-\frac{d}{c};\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d}{c},\,1;\,2-\frac{d}{c};\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)+\right.$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d}{c},\,2;\,2-\frac{d}{c};\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-d}{c},\,2;\,2-\frac{d}{c};\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$\left.\left.\left.a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d}{c},\,2;\,2-\frac{d}{c};\,\frac{b\,e^{cz}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-d}{c},\,2;\,2-\frac{d}{c};\,-\frac{b\,e^{cz}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)$$

01.20.21.4257.01

$$\int \frac{\sinh(c\,z)}{(a+b\cosh(c\,z))^n}\,dz == -\frac{(a+b\cosh(c\,z))^{1-n}}{b\,c\,(n-1)}$$

Involving $\frac{\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4258.01

$$\int \frac{\sinh(d\,z)}{a+b\cosh^2(c\,z)}\,dz == \frac{1}{2}\left(\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d)}\left(e^{(2\,c-d)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-$$
$$\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d)}\left(e^{(2\,c+d)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)$$

Involving $\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.4259.01

$$\int \frac{\sinh(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz == \frac{1}{2}\left(\frac{1}{2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-d)}\right.$$
$$\left(e^{(2\,c-d)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(1-\frac{d}{2\,c},\,1;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\;a-2\,b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{d}{2\,c},\,2;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.$$
$$\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\;a+2\,b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(1-\frac{d}{2\,c},\,2;\,2-\frac{d}{2\,c};\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)-$$
$$\frac{1}{2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c+d)}\left(e^{(2\,c+d)\,z}\left(-(2\,a+b)\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}\;-b\right)\right.\right.$$
$${}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+$$
$$(-2\,a-b)\left(2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{d}{2\,c}+1,\,1;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+$$
$$2\sqrt{a}\left(\left(-2\,a^{3/2}+2\sqrt{a+b}\;a-2\,b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(\frac{d}{2\,c}+1,\,2;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.$$
$$\left.\left.\left.\left(2\,a^{3/2}+2\sqrt{a+b}\;a+2\,b\sqrt{a}\;+b\sqrt{a+b}\right){}_2F_1\left(\frac{d}{2\,c}+1,\,2;\,\frac{d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\right)$$

Involving $\frac{\cosh(e\,z)\sinh(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.4260.01

$$\int \frac{\cosh(e\,z)\sinh(d\,z)}{a+b\cosh(c\,z)}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\,(c+d-e)}\left(e^{(c+d-e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d+e)}\left(e^{(c+d+e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+e}{c},\,1;\,\frac{d+e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d-e)}\left(e^{(c-d-e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-e}{c},\,1;\,\frac{-d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d+e)}\left(e^{(c-d+e)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\cosh(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.4261.01

$$\int \frac{\cosh(e\,z)\sinh(d\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-e)}\left(e^{(c+d-e)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c+d-e}{c},\,1;\,\frac{d-e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-e}{c},\,2;\,\frac{d-e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.\right.\right.$$

$$ {}_2F_1\left(\frac{c+d-e}{c},\, 2;\, \frac{d-e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\Bigg) - a\sqrt{a^2-b^2}$$

$$\left({}_2F_1\left(\frac{c+d-e}{c},\, 2;\, \frac{d-e}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(\frac{c+d-e}{c},\, 2;\, \frac{d-e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+e)}\left(e^{(c+d+e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+e}{c},\, 1;\, \frac{d+e}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c+d+e}{c},\, 1;\, \frac{d+e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+e}{c},\, 2;\, \frac{d+e}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c+d+e}{c},\, 2;\, \frac{d+e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d+e}{c},\, 2;\, \frac{d+e}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{c+d+e}{c},\, 2;\, \frac{d+e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-e)}\left(e^{(c-d-e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e}{c},\, 1;\, \frac{-d-e}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c-d-e}{c},\, 1;\, \frac{-d-e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-e}{c},\, 2;\, \frac{-d-e}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c-d-e}{c},\, 2;\, \frac{-d-e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d-e}{c},\, 2;\, \frac{-d-e}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{c-d-e}{c},\, 2;\, \frac{-d-e}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+e)}\left(e^{(c-d+e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+e}{c},\, 1;\, \frac{e-d}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\,-a\right){}_2F_1\left(\frac{c-d+e}{c},\,1;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)-{}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}$$

$$\left({}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\,-a}\right)+{}_2F_1\left(\frac{c-d+e}{c},\,2;\,\frac{e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\cosh(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4262.01

$$\int\frac{\cosh(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}\,dz==$$

$$\frac{1}{4}\left(\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d-e)}\left(e^{(2\,c-d-e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{-d-e}{2\,c}+1,\,1;\,\frac{-d-e}{2\,c}+2;\right.\right.\right.\right.$$

$$\left.\left.\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{-d-e}{2\,c}+1,\,1;\,\frac{-d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)+\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d+e)}$$

$$\left(e^{(2\,c-d+e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{e-d}{2\,c}+1,\,1;\,\frac{e-d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$

$$\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{e-d}{2\,c}+1,\,1;\,\frac{e-d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-$$

$$\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d-e)}\left(e^{(2\,c+d-e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{d-e}{2\,c}+1,\,1;\,\frac{d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{d-e}{2\,c}+1,\,1;\,\frac{d-e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d+e)}$$

$$\left(e^{(2\,c+d+e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{d+e}{2\,c}+1,\,1;\,\frac{d+e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$

$$\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{d+e}{2\,c}+1,\,1;\,\frac{d+e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\Bigg)\Bigg)$$

Involving $\cosh(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.4263.01

$$\int \frac{\cosh(e\,z)\sinh(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}\left(\left(e^{(2c-d-e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e}{2c}+1,1;\frac{-d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e}{2c}+1,1;\frac{-d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d-e}{2c}+1,2;\frac{-d-e}{2c}+\right.\right.$$
$$\left.\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)\right.$$
$$\left.\left.{}_2F_1\left(\frac{-d-e}{2c}+1,2;\frac{-d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-d-e)\right)+$$
$$\left(e^{(2c-d+e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{e-d}{2c}+1,1;\frac{e-d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{e-d}{2c}+1,1;\frac{e-d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{e-d}{2c}+1,2;\frac{e-d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{e-d}{2c}+1,2;\frac{e-d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-d+e)\right)-$$
$$\left(e^{(2c+d-e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-e}{2c}+1,1;\frac{d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-e}{2c}+1,1;\frac{d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d-e}{2c}+1,2;\frac{d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{d-e}{2c}+1,2;\frac{d-e}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c+d-e)\right)-$$
$$\left(e^{(2c+d+e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+e}{2c}+1,1;\frac{d+e}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+e}{2c}+1,\,1;\,\frac{d+e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}$$
$$\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d+e}{2c}+1,\,2;\,\frac{d+e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{d+e}{2c}+1,\,2;\,\frac{d+e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c+d+e)\right)$$

Involving rational functions of sinh

Involving $(a\sinh(ez)+b\cosh(ez))^{-n}$

01.20.21.4264.01

$$\int\frac{1}{a\sinh(ez)+b\cosh(ez)}\,dz==\frac{2}{\sqrt{b-a}\,\sqrt{a+b}\,e}\tan^{-1}\left(\frac{a+b\tanh\left(\frac{ez}{2}\right)}{\sqrt{b-a}\,\sqrt{a+b}}\right)$$

01.20.21.4265.01

$$\int\frac{1}{\sinh(ez)+\cosh(ez)}\,dz==\frac{\sinh(ez)-\cosh(ez)}{e}$$

01.20.21.4266.01

$$\int\frac{1}{\sinh(ez)-\cosh(ez)}\,dz==-\frac{\cosh(ez)+\sinh(ez)}{e}$$

01.20.21.4267.01

$$\int\frac{1}{(a\sinh(ez)+b\cosh(ez))^2}\,dz==\frac{\sinh(ez)}{e\cosh(ez)\,b^2+a\,e\sinh(ez)\,b}$$

Involving $\sinh(dz)\,(a\sinh(ez)+b\cosh(ez))^{-n}$

01.20.21.4268.01

$$\int\frac{\sinh(dz)}{a\sinh(ez)+b\cosh(ez)}\,dz==$$
$$\frac{1}{a-b}\left(\frac{e^{(e-d)z}}{e-d}\,{}_2F_1\left(\frac{e-d}{2e},\,1;\,\frac{3e-d}{2e};\,\frac{(a+b)\,e^{2ez}}{a-b}\right)-\frac{e^{(d+e)z}}{d+e}\,{}_2F_1\left(\frac{d+e}{2e},\,1;\,\frac{d+3e}{2e};\,\frac{(a+b)\,e^{2ez}}{a-b}\right)\right)$$

01.20.21.4269.01

$$\int\frac{\sinh(ez)}{a\sinh(ez)+b\cosh(ez)}\,dz==\frac{a\,ez-b\log(b\cosh(ez)+a\sinh(ez))}{a^2\,e-b^2\,e}$$

01.20.21.4270.01

$$\int\frac{\sinh(dz)}{(a\sinh(ez)+b\cosh(ez))^2}\,dz==$$
$$\frac{2}{(a-b)^2}\left(\frac{e^{(d+2e)z}}{d+2e}\,{}_2F_1\left(\frac{d}{2e}+1,\,2;\,\frac{d}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{a-b}\right)-\frac{e^{(2e-d)z}}{2e-d}\,{}_2F_1\left(1-\frac{d}{2e},\,2;\,2-\frac{d}{2e};\,\frac{(a+b)\,e^{2ez}}{a-b}\right)\right)$$

Involving $\cosh(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^{-n}$

01.20.21.4271.01

$$\int \frac{\cosh(d\,z)}{a\sinh(e\,z)+b\cosh(e\,z)}\,dz == -\frac{1}{a-b}\left(\frac{e^{(e-d)\,z}}{e-d}\,{}_2F_1\left(\frac{e-d}{2\,e},\,1;\,\frac{3\,e-d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)+\frac{e^{(d+e)\,z}}{d+e}\,{}_2F_1\left(\frac{d+e}{2\,e},\,1;\,\frac{d+3\,e}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)$$

01.20.21.4272.01

$$\int \frac{\cosh(e\,z)}{a\sinh(e\,z)+b\cosh(e\,z)}\,dz == \frac{b\,e\,z-a\log(b\cosh(e\,z)+a\sinh(e\,z))}{b^2\,e-a^2\,e}$$

01.20.21.4273.01

$$\int \frac{A\sinh(e\,z)+B\cosh(e\,z)}{a\sinh(e\,z)+b\cosh(e\,z)}\,dz == \frac{(a\,A-b\,B)\,e\,z+(a\,B-A\,b)\log(b\cosh(e\,z)+a\sinh(e\,z))}{\left(a^2-b^2\right)e}$$

01.20.21.4274.01

$$\int \frac{A+B\sinh(e\,z)+C\cosh(e\,z)}{a\sinh(e\,z)+b\cosh(e\,z)}\,dz == -\frac{1}{(b-a)^{3/2}\,(a+b)\,e}\left(2\,A\,(a-b)\,\sqrt{a+b}\,\tanh^{-1}\left(\frac{a+b\tanh\left(\frac{e\,z}{2}\right)}{\sqrt{b-a}\,\sqrt{a+b}}\right)+\sqrt{b-a}\,\left((a\,B-b\,C)\,e\,z+(a\,C-b\,B)\log(b\cosh(e\,z)+a\sinh(e\,z))\right)\right)$$

01.20.21.4275.01

$$\int \frac{\cosh(d\,z)}{(a\sinh(e\,z)+b\cosh(e\,z))^2}\,dz == \frac{2}{(a-b)^2}\left(\frac{e^{(d+2\,e)\,z}}{d+2\,e}\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)+\frac{e^{(2\,e-d)\,z}}{2\,e-d}\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)$$

Involving $(a+b\sinh(e\,z)+c\cosh(e\,z))^{-n}$

01.20.21.4276.01

$$\int \frac{1}{a+b\sinh(e\,z)+c\cosh(e\,z)}\,dz == \frac{2}{\sqrt{-a^2-b^2+c^2}\;e}\tanh^{-1}\left(\frac{b+(c-a)\tanh\left(\frac{e\,z}{2}\right)}{\sqrt{-a^2-b^2+c^2}}\right)$$

01.20.21.4277.01

$$\int \frac{A+B\sinh(e\,z)+C\cosh(e\,z)}{a+b\sinh(e\,z)+c\cosh(e\,z)}\,dz == \frac{1}{(c-b)\,(b+c)}\left((c\,C-b\,B)\,z+\frac{2\left(-A\,b^2+a\,B\,b+A\,c^2-a\,c\,C\right)}{\sqrt{-a^2-b^2+c^2}\;e}\tanh^{-1}\left(\frac{b+(c-a)\tanh\left(\frac{e\,z}{2}\right)}{\sqrt{-a^2-b^2+c^2}}\right)+\frac{(B\,c-b\,C)\log(a+c\cosh(e\,z)+b\sinh(e\,z))}{e}\right)$$

01.20.21.4278.01

$$\int \frac{A + B \sinh(e z) + C \cosh(e z)}{b \sinh(e z) + c \cosh(e z)} \, dz == -\frac{1}{(c-b)^{3/2} (b+c) e}$$
$$\left(2 A (b-c) \sqrt{b+c} \, \tan^{-1}\left(\frac{b + c \tanh\left(\frac{e z}{2}\right)}{\sqrt{c-b} \sqrt{b+c}}\right) + \sqrt{c-b} \, ((b B - c C) e z + (b C - B c) \log(c \cosh(e z) + b \sinh(e z)))\right)$$

01.20.21.4279.01

$$\int \frac{A + B \sinh(e z) + C \cosh(e z)}{a + b \sinh(e z) + b \cosh(e z)} \, dz == \frac{1}{4 a^2 b e} e^{-e z}$$
$$\left(2 a b (B - C) + e^{e z}\left(\left((B + C) a^2 + 2 A b a + b^2 (B - C)\right) e z + 2 \left((B + C) a^2 - 2 A b a + b^2 (C - B)\right) \log\left(e^{-\frac{e z}{2}} (a + b e^{e z})\right)\right)\right)$$

01.20.21.4280.01

$$\int \frac{A + B \sinh(e z) + C \cosh(e z)}{a + b \sinh(e z) - b \cosh(e z)} \, dz ==$$
$$\frac{1}{4 a^2 b e}\left(2 a b e^{e z} (B + C) + \left((B - C) a^2 + 2 A b a + b^2 (B + C)\right) e z + 2 \left((C - B) a^2 + 2 A b a + b^2 (B + C)\right) \log\left(e^{-\frac{e z}{2}} (a e^{e z} - b)\right)\right)$$

01.20.21.4281.01

$$\int \frac{1}{(a + b \sinh(e z) + c \cosh(e z))^2} \, dz ==$$
$$\frac{1}{e}\left(\frac{a b + (b - c) (b + c) \sinh(e z)}{c \left(a^2 + b^2 - c^2\right) (a + c \cosh(e z) + b \sinh(e z))} - \frac{2 a}{\left(-a^2 - b^2 + c^2\right)^{3/2}} \tan^{-1}\left(\frac{b + (c - a) \tanh\left(\frac{e z}{2}\right)}{\sqrt{-a^2 - b^2 + c^2}}\right)\right)$$

01.20.21.4282.01

$$\int \frac{A + C\cosh(z) + B\sinh(z)}{(a + c\cosh(z) + b\sinh(z))\,(\alpha + \beta\,\mathrm{Sinh}(z) + \gamma\,\mathrm{Cosh}(z))}\,dz ==$$

$$\left(2\left(\left(-a\,b\,B + A\left(b^2 - c^2\right) + a\,c\,C\right)\alpha + \left(B\,a^2 - B\,c^2 - a\,A\,b + b\,c\,C\right)\beta + \left(-C\,a^2 + A\,c\,a + b\,B\,c - b^2\,C\right)\gamma\right)\right.$$

$$\left.\tan^{-1}\left(\frac{b + (c - a)\tanh\left(\frac{z}{2}\right)}{\sqrt{-a^2 - b^2 + c^2}}\right)\right)\Bigg/$$

$$\left(\sqrt{-a^2 - b^2 + c^2}\,\left(\left(b^2 - c^2\right)\alpha^2 + (2\,a\,c\,\gamma - 2\,a\,b\,\beta)\,\alpha + \left(a^2 - c^2\right)\beta^2 - \left(a^2 + b^2\right)\gamma^2 + 2\,b\,c\,\beta\,\gamma\right)\right) +$$

$$\left(2\left((b\,B - c\,C)\,\alpha^2 + ((-A\,b - a\,B)\,\beta + (A\,c + a\,C)\,\gamma)\,\alpha + (a\,A - c\,C)\,\beta^2 - (a\,A + b\,B)\,\gamma^2 + (B\,c + b\,C)\,\beta\,\gamma\right)\right.$$

$$\left.\tan^{-1}\left(\frac{\beta + (\gamma - \alpha)\tanh\left(\frac{z}{2}\right)}{\sqrt{-\alpha^2 - \beta^2 + \gamma^2}}\right)\right)\Bigg/$$

$$\left(\sqrt{-\alpha^2 - \beta^2 + \gamma^2}\,\left(\left(b^2 - c^2\right)\alpha^2 + (2\,a\,c\,\gamma - 2\,a\,b\,\beta)\,\alpha + \left(a^2 - c^2\right)\beta^2 - \left(a^2 + b^2\right)\gamma^2 + 2\,b\,c\,\beta\,\gamma\right)\right) +$$

$$\frac{((B\,c - b\,C)\,\alpha + (a\,C - A\,c)\,\beta + (A\,b - a\,B)\,\gamma)\log(a + c\cosh(z) + b\sinh(z))}{\left(c^2 - b^2\right)\alpha^2 + 2\,a\,(b\,\beta - c\,\gamma)\,\alpha + \left(c^2 - a^2\right)\beta^2 + \left(a^2 + b^2\right)\gamma^2 - 2\,b\,c\,\beta\,\gamma} -$$

$$\frac{((B\,c - b\,C)\,\alpha + (a\,C - A\,c)\,\beta + (A\,b - a\,B)\,\gamma)\log(\alpha + \gamma\cosh(z) + \beta\sinh(z))}{\left(c^2 - b^2\right)\alpha^2 + 2\,a\,(b\,\beta - c\,\gamma)\,\alpha + \left(c^2 - a^2\right)\beta^2 + \left(a^2 + b^2\right)\gamma^2 - 2\,b\,c\,\beta\,\gamma}$$

Involving $\sinh(d\,z)\,(a + b\sinh(e\,z) + c\cosh(e\,z))^{-n}$

01.20.21.4283.01

$$\int \frac{\sinh(d\,z)}{a + b\sinh(e\,z) + c\cosh(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(\left(e^{(e-d)\,z}\left(\left(a + \sqrt{a^2 + b^2 - c^2}\right){}_2F_1\left(\frac{e - d}{e}, 1; 2 - \frac{d}{e}; \frac{(b + c)\,e^{e\,z}}{\sqrt{a^2 + b^2 - c^2} - a}\right) + \left(\sqrt{a^2 + b^2 - c^2} - a\right)\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{e - d}{e}, 1; 2 - \frac{d}{e}; -\frac{(b + c)\,e^{e\,z}}{a + \sqrt{a^2 + b^2 - c^2}}\right)\right)\right)\Bigg/\left((b - c)\sqrt{a^2 + b^2 - c^2}\,(e - d)\right) -$$

$$\left(e^{(d+e)\,z}\left(\left(a + \sqrt{a^2 + b^2 - c^2}\right){}_2F_1\left(\frac{d + e}{e}, 1; \frac{d}{e} + 2; \frac{(b + c)\,e^{e\,z}}{\sqrt{a^2 + b^2 - c^2} - a}\right) + \left(\sqrt{a^2 + b^2 - c^2} - a\right)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{d + e}{e}, 1; \frac{d}{e} + 2; -\frac{(b + c)\,e^{e\,z}}{a + \sqrt{a^2 + b^2 - c^2}}\right)\right)\Bigg/\left((b - c)\sqrt{a^2 + b^2 - c^2}\,(d + e)\right)$$

01.20.21.4284.01

$$\int \frac{\sinh(d\,z)}{(a+b\sinh(e\,z)+c\cosh(e\,z))^2}\,dz ==$$

$$\frac{1}{2}\left(\left(e^{(d+e)\,z}\left({}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.\right.$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e}{e},\,1;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right)$$

$${}_2F_1\left(\frac{d+e}{e},\,1;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+b^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-$$

$$c^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$\left.\left.\left.c^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(d+e)\right)-$$

$$\left(e^{(e-d)\,z}\left({}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-d}{e},\,1;\,2-\frac{d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right)$$

$$ {}_2F_1\left(\frac{e-d}{e},\, 1;\, 2-\frac{d}{e};\, \frac{(b+c)\, e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+b^2\,{}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, \frac{(b+c)\, e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)- $$

$$ c^2\,{}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, \frac{(b+c)\, e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, -\frac{(b+c)\, e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+ $$

$$ c^2\,{}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, -\frac{(b+c)\, e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e-d)\right)\Bigg) $$

Involving $\cosh(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{-n}$

01.20.21.4285.01

$$ \int \frac{\cosh(d\,z)}{a+b\sinh(e\,z)+c\cosh(e\,z)}\,dz == $$

$$ \frac{1}{2}\Bigg(-\Bigg(e^{(e-d)\,z}\Bigg(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-d}{e},\, 1;\, 2-\frac{d}{e};\, \frac{(b+c)\, e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+\left(\sqrt{a^2+b^2-c^2}\;-a\right) $$

$$ {}_2F_1\left(\frac{e-d}{e},\, 1;\, 2-\frac{d}{e};\, -\frac{(b+c)\, e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\sqrt{a^2+b^2-c^2}\;(e-d)\right)- $$

$$ \Bigg(e^{(d+e)\,z}\Bigg(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e}{e},\, 1;\, \frac{d}{e}+2;\, \frac{(b+c)\, e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+\left(\sqrt{a^2+b^2-c^2}\;-a\right) $$

$$ {}_2F_1\left(\frac{d+e}{e},\, 1;\, \frac{d}{e}+2;\, -\frac{(b+c)\, e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\sqrt{a^2+b^2-c^2}\;(d+e)\right)\Bigg) $$

01.20.21.4286.01

$$ \int \frac{\cosh(d\,z)}{(a+b\sinh(e\,z)+c\cosh(e\,z))^2}\,dz == $$

$$ \frac{1}{2}\Bigg(\Bigg(e^{(e-d)\,z}\Bigg({}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, \frac{(b+c)\, e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, -\frac{(b+c)\, e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+ $$

$$ \left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-d}{e},\, 1;\, 2-\frac{d}{e};\, -\frac{(b+c)\, e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+ $$

$$ \sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, \frac{(b+c)\, e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+ $$

$$ \sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-d}{e},\, 2;\, 2-\frac{d}{e};\, -\frac{(b+c)\, e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right) $$

$$
{}_2F_1\left(\frac{e-d}{e},\,1;\,2-\frac{d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+b^2\,{}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-
$$

$$
c^2\,{}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+
$$

$$
c^2\,{}_2F_1\left(\frac{e-d}{e},\,2;\,2-\frac{d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e-d)\right)+
$$

$$
\left(e^{(d+e)\,z}\left({}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.
$$

$$
\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e}{e},\,1;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+
$$

$$
\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+
$$

$$
\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right)
$$

$$
{}_2F_1\left(\frac{d+e}{e},\,1;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+b^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-
$$

$$
c^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+
$$

$$
\left.\left.c^2\,{}_2F_1\left(\frac{d+e}{e},\,2;\,\frac{d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(d+e)\right)\right)
$$

Involving $\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)^{-n}\right)$

01.20.21.4287.01

$$
\int\frac{1}{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\,dz==\frac{1}{\sqrt{a}\;\sqrt{b}\;e}\tan^{-1}\left(\frac{\sqrt{a}\;\tanh(e\,z)}{\sqrt{b}}\right)
$$

01.20.21.4288.01

$$
\int\frac{1}{\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^2}\,dz==\frac{1}{2\,a^{3/2}\,b^{3/2}\,e}\left((a-b)\tan^{-1}\left(\frac{\sqrt{a}\;\tanh(e\,z)}{\sqrt{b}}\right)+\frac{\sqrt{a}\;\sqrt{b}\;(a+b)\sinh(2\,e\,z)}{-a+b+(a+b)\cosh(2\,e\,z)}\right)
$$

01.20.21.4289.01

$$\int \frac{1}{\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^3} dz == \frac{1}{8 a^{5/2} b^{5/2} e} \left(\left(3 a^2 - 2 b a + 3 b^2\right) \tan^{-1}\left(\frac{\sqrt{a} \tanh(e z)}{\sqrt{b}} \right) + \left(\sqrt{a} \sqrt{b} (a+b) (3 (a-b) (a+b) \cosh(2 e z) - (a-3 b) (3 a-b)) \sinh(2 e z) \right) \Big/ (-a+b+(a+b) \cosh(2 e z))^2 \right)$$

Involving $\sinh(d z) \left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{-n}$

01.20.21.4290.01

$$\int \frac{\sinh(d z)}{a \sinh^2(e z) + b \cosh^2(e z)} dz == \frac{1}{2} \left(\frac{1}{\sqrt{a} \sqrt{b} (a+b) (2 e - d)} \left(i e^{(2e-d)z} \left(\left(\sqrt{a} + i \sqrt{b}\right)^2 {}_2F_1\left(1 - \frac{d}{2e}, 1; 2 - \frac{d}{2e}; \frac{(a+b) e^{2ez}}{\left(\sqrt{a} - i \sqrt{b}\right)^2}\right) - \left(\sqrt{a} - i \sqrt{b}\right)^2 {}_2F_1\left(1 - \frac{d}{2e}, 1; 2 - \frac{d}{2e}; \frac{(a+b) e^{2ez}}{\left(\sqrt{a} + i \sqrt{b}\right)^2}\right) \right) \right) - \frac{1}{\sqrt{a} \sqrt{b} (a+b) (d+2e)} \left(i e^{(d+2e)z} \left(\left(\sqrt{a} + i \sqrt{b}\right)^2 {}_2F_1\left(\frac{d}{2e} + 1, 1; \frac{d}{2e} + 2; \frac{(a+b) e^{2ez}}{\left(\sqrt{a} - i \sqrt{b}\right)^2}\right) - \left(\sqrt{a} - i \sqrt{b}\right)^2 {}_2F_1\left(\frac{d}{2e} + 1, 1; \frac{d}{2e} + 2; \frac{(a+b) e^{2ez}}{\left(\sqrt{a} + i \sqrt{b}\right)^2}\right) \right) \right) \right)$$

01.20.21.4291.01

$$\int \frac{\sinh(d\,z)}{\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(2\,e-d)}\left(i\,e^{(2\,e-d)\,z}\left((a-b)\,{}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\left(\sqrt{a}-i\sqrt{b}\right)^2\right.\right.\right.$$

$$\left.\left.(a-b)\,{}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-2\,i\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a}+i\sqrt{b}\right)^2+\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)-$$

$$\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(d+2\,e)}\left(i\,e^{(d+2\,e)\,z}\left((a-b)\,{}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\right.\right.$$

$$\left.\left.\left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-\right.\right.$$

$$\left.\left.2\,i\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2+\right.\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)\right)$$

Involving $e^{p\,z}\cosh(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{-n}$

01.20.21.4292.01

$$\int \frac{\cosh(d\,z)}{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{\sqrt{a}\,\sqrt{b}\,(a+b)(2\,e-d)}\left(i\,e^{(2\,e-d)\,z}\left(\left(\sqrt{a}+i\,\sqrt{b}\right)^2{}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\,\sqrt{b}\right)^2}\right)-\right.\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a}-i\,\sqrt{b}\right)^2{}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\,\sqrt{b}\right)^2}\right)\right)\right)-$$

$$\frac{1}{\sqrt{a}\,\sqrt{b}\,(a+b)(d+2\,e)}\left(i\,e^{(d+2\,e)\,z}\left(\left(\sqrt{a}+i\,\sqrt{b}\right)^2{}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\,\sqrt{b}\right)^2}\right)-\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a}-i\,\sqrt{b}\right)^2{}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\,\sqrt{b}\right)^2}\right)\right)\right)\right)$$

01.20.21.4293.01

$$\int \frac{\cosh(d\,z)}{\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(2\,e-d)}\left(i\,e^{(2\,e-d)\,z}\left((a-b)\,{}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\right.\right.\right.$$

$$\left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-$$

$$2\,i\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2+$$

$$\left.\left.\left.\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)-$$

$$\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(d+2\,e)}\left(i\,e^{(d+2\,e)\,z}\left((a-b)\,{}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\right.\right.$$

$$\left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-$$

$$2\,i\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2+$$

$$\left.\left.\left.\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)\right)$$

Involving $\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4294.01

$$\int \frac{1}{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\,dz == \frac{1}{\sqrt{b-a}\,\sqrt{a+c}\,e}\tan^{-1}\left(\frac{\sqrt{b-a}\,\tanh(e\,z)}{\sqrt{a+c}}\right)$$

01.20.21.4295.01

$$\int \frac{1}{\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$
$$-\frac{1}{2\,(a-b)\,(a+c)\,e}\left(\frac{(-2\,a+b-c)}{\sqrt{b-a}\ \sqrt{a+c}}\tan^{-1}\left(\frac{\sqrt{b-a}\ \tanh(e\,z)}{\sqrt{a+c}}\right)+\frac{(b+c)\sinh(2\,e\,z)}{2\,a-b+c+(b+c)\cosh(2\,e\,z)}\right)$$

01.20.21.4296.01

$$\int \frac{1}{\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^3}\,dz == -\frac{1}{8\,(a-b)^2\,(a+c)^2\,e}$$
$$\left(\left(\frac{3}{2}\,(2\,a-b+c)\sinh(4\,e\,z)\,(b+c)^2+(4\,a-3\,b+c)\,(4\,a-b+3\,c)\sinh(2\,e\,z)\,(b+c)\right)\Big/(2\,a-b+c+(b+c)\cosh(2\,e\,z))^2-\right.$$
$$\left.\left(\left(8\,a^2-8\,b\,a+8\,c\,a+3\,b^2+3\,c^2-2\,b\,c\right)\tan^{-1}\left(\frac{\sqrt{b-a}\ \tanh(e\,z)}{\sqrt{a+c}}\right)\right)\Big/\left(\sqrt{b-a}\ \sqrt{a+c}\right)\right)$$

Involving $\sinh(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4297.01

$$\int \frac{\sinh(d\,z)}{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\,dz ==$$
$$\frac{1}{2}\left(\left(e^{(d+2\,e)\,z}\left(\left(2\,a-b+c+2\sqrt{(a-b)\,(a+c)}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)\Big/$$
$$\left(\sqrt{(a-b)\,(a+c)}\ (b+c)\,(d+2\,e)\right)-\left(e^{(2\,e-d)\,z}\left(\left(2\,a-b+c+2\sqrt{(a-b)\,(a+c)}\right)\right.\right.$$
$${}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)+\left(-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}\right)$$
$$\left.\left.{}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a-b)\,(a+c)}\ (b+c)\,(2\,e-d)\right)\Big)$$

01.20.21.4298.01

$$\int \frac{\sinh(d\,z)}{\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\frac{1}{2\left((a-b)(a+c)\right)^{3/2}(2e-d)}\left((b+c)\,e^{(2e-d)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(1-\frac{d}{2e},\,2;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.$$

$$\left.\left.\left.\frac{{}_2F_1\left(1-\frac{d}{2e},\,2;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.$$

$$\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)-$$

$$\frac{1}{2\left((a-b)(a+c)\right)^{3/2}(d+2e)}\left((b+c)\,e^{(d+2e)z}\left(2\sqrt{(a-b)(a+c)}\right.\right.$$

$$\left.\left(\frac{{}_2F_1\left(\frac{d}{2e}+1,\,2;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\frac{{}_2F_1\left(\frac{d}{2e}+1,\,2;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.$$

$$\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)$$

Involving $\cosh(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4299.01

$$\int \frac{\cosh(d\,z)}{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(\left(e^{(d+2e)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/$$

$$\left(\sqrt{(a-b)(a+c)}\;(b+c)(d+2e)\right)+\left(e^{(2e-d)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right)\right.\right.$$

$${}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right)$$

$$\left.\left.{}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a-b)(a+c)}\;(b+c)(2e-d)\right)$$

01.20.21.4300.01

$$\int \frac{\cosh(d\,z)}{\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left(\left((b+c)\,e^{(2e-d)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(1-\frac{d}{2e},\,2;\,2-\frac{d}{2e};\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{{}_2F_1\left(1-\frac{d}{2e},\,2;\,2-\frac{d}{2e};\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Bigg/$$

$$\left(2\left((a-b)(a+c)\right)^{3/2}(2e-d)\right)-\frac{1}{2\left((a-b)(a+c)\right)^{3/2}(d+2e)}\left((b+c)\,e^{(d+2e)z}\left(2\sqrt{(a-b)(a+c)}\right.\right.$$

$$\left(\frac{{}_2F_1\left(\frac{d}{2e}+1,\,2;\,\frac{d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\frac{{}_2F_1\left(\frac{d}{2e}+1,\,2;\,\frac{d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+$$

$$\frac{(2a-b+c)\,{}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)$$

Involving $\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4301.01

$$\int \frac{1}{a \sinh^2(e\,z) + b \sinh(2\,e\,z) + c \cosh^2(e\,z)}\,dz == \frac{1}{\sqrt{a\,c - b^2}\;e} \tan^{-1}\left(\frac{b + a \tanh(e\,z)}{\sqrt{a\,c - b^2}}\right)$$

01.20.21.4302.01

$$\int \frac{C \cosh^2(z) + A \sinh^2(z) + \delta + B \sinh(2\,z)}{c \cosh^2(z) + a \sinh^2(z) + b \sinh(2\,z)}\,dz == \frac{1}{(a - 2\,b + c)\,(a + 2\,b + c)}\left((-4\,b\,B + a\,(A + C) + c\,(A + C))\,z + \frac{1}{\sqrt{a\,c - b^2}}\left(\left((C + \delta)\,a^2 + (-2\,b\,B + c\,C + 2\,c\,\delta)\,a + 2\,b\,B\,c + A\left(2\,b^2 - c\,(a + c)\right) - 2\,b^2\,C - 4\,b^2\,\delta + c^2\,\delta\right)\tan^{-1}\left(\frac{b + a \tanh(z)}{\sqrt{a\,c - b^2}}\right)\right) + (-A\,b - C\,b + a\,B + B\,c)\log(-a + c + (a + c)\cosh(2\,z) + 2\,b \sinh(2\,z))\right)$$

01.20.21.4303.01

$$\int \frac{C \cosh^2(z) + A \sinh^2(z) + B \sinh(2\,z)}{a \sinh^2(z) + b \sinh(2\,z) + c \cosh^2(z)}\,dz == \frac{1}{(a - 2\,b + c)\,(a + 2\,b + c)}\left((-4\,b\,B + a\,(A + C) + c\,(A + C))\,z + \frac{1}{\sqrt{a\,c - b^2}}\left(\left(C\,a^2 - 2\,b\,B\,a + c\,C\,a + 2\,b\,B\,c + A\left(2\,b^2 - c\,(a + c)\right) - 2\,b^2\,C\right)\right.\right.$$
$$\left.\left.\tan^{-1}\left(\frac{b + a \tanh(z)}{\sqrt{a\,c - b^2}}\right) + (-A\,b - C\,b + a\,B + B\,c)\log(-a + c + (a + c)\cosh(2\,z) + 2\,b \sinh(2\,z))\right)\right)$$

01.20.21.4304.01

$$\int \frac{1}{\left(a \sinh^2(e\,z) + b \sinh(2\,e\,z) + c \cosh^2(e\,z)\right)^2}\,dz ==$$
$$\frac{1}{2\,e}\left(\frac{a - c}{\left(a\,c - b^2\right)^{3/2}} \tan^{-1}\left(\frac{b + a \tanh(e\,z)}{\sqrt{a\,c - b^2}}\right) + \frac{2\,b\,(a - c) + \left(a^2 + 2\,c\,a - 4\,b^2 + c^2\right)\sinh(2\,e\,z)}{(a + c)\left(a\,c - b^2\right)(-a + c + (a + c)\cosh(2\,e\,z) + 2\,b \sinh(2\,e\,z))}\right)$$

Involving $\sinh(d\,z)\left(a \sinh^2(e\,z) + b \sinh(2\,e\,z) + c \cosh^2(e\,z)\right)^{-n}$

01.20.21.4305.01

$$\int \frac{\sinh(d\,z)}{a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(\left((a+2\,b+c)\,e^{(2\,e-d)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(2\,e-d)\right)-\left((a+2\,b+c)\,e^{(d+2\,e)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(d+2\,e)\right)\right)$$

01.20.21.4306.01

$$\int \frac{\sinh(d\,z)}{\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\left((a+2\,b+c)\,e^{(d+2\,e)\,z}\left(4\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)b^2-4\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)b^2+(a-c)\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-2\,a\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+2\,c\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(d+2\,e)\right)-\Bigg(\Bigg((a+2\,b+c)\,e^{(2\,e-d)\,z}$$

$$\left(4\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-4\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+\right.$$

$$(a-c)\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\,\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+2\,c\,\sqrt{b^2-a\,c}$$

$${}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left.\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e-d)\right)\right)$$

Involving $\cosh(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4307.01

$$\int \frac{\cosh(d\,z)}{a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(-\left((a+2\,b+c)\,e^{(2\,e-d)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(2\,e-d)\right)-\left((a+2\,b+c)\,e^{(d+2\,e)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(d+2\,e)\right)\right)$$

01.20.21.4308.01

$$\int \frac{\cosh(d\,z)}{\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\left((a+2\,b+c)\,e^{(d+2\,e)\,z}\left(4\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)b^2-4\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)b^2+(a-c)\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d}{2\,e}+1,\,1;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-2\,a\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+2\,c\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d}{2\,e}+1,\,2;\,\frac{d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(d+2\,e)\right)+\Bigg(\Bigg((a+2\,b+c)\,e^{(2\,e-d)\,z}$$

$$\left(4\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-4\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+\right.$$

$$(a-c)\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\,\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1-\frac{d}{2\,e},\,1;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+2\,c\,\sqrt{b^2-a\,c}$$

$${}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{d}{2\,e},\,2;\,2-\frac{d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left.\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e-d)\right)\right)$$

Involving $\frac{1}{f(z)+b\cosh^2(z)}$

01.20.21.4309.01

$$\int\frac{1}{a\sinh^2(z)+b\sinh(z)\cosh(z)+c\cosh^2(z)}\,dz==\frac{2}{\sqrt{4\,a\,c-b^2}}\tan^{-1}\left(\frac{b+2\,a\tanh(z)}{\sqrt{4\,a\,c-b^2}}\right)$$

01.20.21.4310.01

$$\int \frac{\cosh^3(z) - \sinh^3(z)}{\cosh^3(z) + \sinh^3(z)}\, dz ==$$
$$\frac{1}{18}(\sinh(z) - \cosh(z))\left(\left(8\sqrt{3}\,\tan^{-1}\left(\frac{1 - 2\tanh(z)}{\sqrt{3}}\right) + 3\right)\cosh(z) + \left(8\sqrt{3}\,\tan^{-1}\left(\frac{1 - 2\tanh(z)}{\sqrt{3}}\right) - 3\right)\sinh(z)\right)$$

Involving algebraic functions of the direct function and hyperbolic functions

Involving sinh

Involving $\sinh(d\,z)\,(a + b\cosh(c\,z))^{\beta}$

01.20.21.4311.01

$$\int \sinh(d\,z)\,(a + b\cosh(c\,z))^{\beta}\, dz == \frac{1}{2\left(d^2 - c^2\,\beta^2\right)} e^{-d\,z}\left(\frac{e^{c\,z}\,b}{a - \sqrt{a^2 - b^2}} + 1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a + \sqrt{a^2 - b^2}} + 1\right)^{-\beta}$$
$$\left(a + \frac{1}{2}\,b\,e^{-c\,z}\left(1 + e^{2\,c\,z}\right)\right)^{\beta}\left((d - c\,\beta)\,F_1\left(-\frac{d + c\,\beta}{c}; -\beta, -\beta; -\frac{d}{c} - \beta + 1; -\frac{b\,e^{c\,z}}{a + \sqrt{a^2 - b^2}}, \frac{b\,e^{c\,z}}{\sqrt{a^2 - b^2} - a}\right) +\right.$$
$$\left. e^{2\,d\,z}\,(d + c\,\beta)\,F_1\left(\frac{d}{c} - \beta; -\beta, -\beta; \frac{d}{c} - \beta + 1; -\frac{b\,e^{c\,z}}{a + \sqrt{a^2 - b^2}}, \frac{b\,e^{c\,z}}{\sqrt{a^2 - b^2} - a}\right)\right)$$

01.20.21.4312.01

$$\int \sinh(c\,z)\,(a + b\cosh(c\,z))^{\beta}\, dz == \frac{(a + b\cosh(c\,z))^{\beta+1}}{b\,c\,(\beta + 1)}$$

01.20.21.4313.01

$$\int \sinh(c\,z)\sqrt{a + b\cosh(c\,z)}\, dz == \frac{2\,(a + b\cosh(c\,z))^{3/2}}{3\,b\,c}$$

01.20.21.4314.01

$$\int \frac{\sinh(c\,z)}{\sqrt{a + b\cosh(c\,z)}}\, dz == \frac{2\sqrt{a + b\cosh(c\,z)}}{b\,c}$$

01.20.21.4315.01

$$\int \frac{\sinh(c\,z)}{(a + b\cosh(c\,z))^{3/2}}\, dz == -\frac{2}{b\,c\sqrt{a + b\cosh(c\,z)}}$$

01.20.21.4316.01

$$\int \sqrt{(a+b\cosh(2cz))^5}\,\sinh(cz)\,dz == \frac{1}{32c}\left(\sqrt{(a+b\cosh(2cz))^5}\left(\frac{5\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(cz)+\sqrt{a+b\cosh(2cz)}\right)(a-b)^3}{\sqrt{b}\,(a+b\cosh(2cz))^{5/2}}+\left(2\cosh(cz)\left(33a^2-40ba+19b^2+2b(13a-5b)\cosh(2cz)+4b^2\cosh(4cz)\right)\right)\Big/\left(3(a+b\cosh(2cz))^2\right)\right)\right)$$

01.20.21.4317.01

$$\int \sinh(cz)\,(a+b\cosh(2cz))^{3/2}\,dz == \frac{1}{16c}\left(\frac{3\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(cz)+\sqrt{a+b\cosh(2cz)}\right)(a-b)^2}{\sqrt{b}}+2\cosh(cz)\sqrt{a+b\cosh(2cz)}\,(5a-3b+2b\cosh(2cz))\right)$$

01.20.21.4318.01

$$\int \sinh(cz)\sqrt{(a+b\cosh(2cz))^3}\,dz == \frac{\sqrt{(a+b\cosh(2cz))^3}}{16c}\left(\frac{3\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(cz)+\sqrt{a+b\cosh(2cz)}\right)(a-b)^2}{\sqrt{b}\,(a+b\cosh(2cz))^{3/2}}+\frac{2\cosh(cz)(5a-3b+2b\cosh(2cz))}{a+b\cosh(2cz)}\right)$$

01.20.21.4319.01

$$\int \sinh(cz)\sqrt{a+b\cosh(2cz)}\,dz == \frac{1}{4\sqrt{b}\,c}\left(2\sqrt{b}\,\sqrt{a+b\cosh(2cz)}\,\cosh(cz)+\sqrt{2}\,(a-b)\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(cz)+\sqrt{a+b\cosh(2cz)}\right)\right)$$

01.20.21.4320.01

$$\int \frac{\sinh(cz)}{\sqrt{a+b\cosh(2cz)}}\,dz == \frac{\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(cz)+\sqrt{a+b\cosh(2cz)}\right)}{\sqrt{2}\,\sqrt{b}\,c}$$

01.20.21.4321.01

$$\int \frac{\sinh(cz)}{(a+b\cosh(2cz))^{3/2}}\,dz == \frac{\cosh(cz)}{(a-b)\,c\sqrt{a+b\cosh(2cz)}}$$

01.20.21.4322.01

$$\int \frac{\sinh(cz)}{\sqrt{(a+b\cosh(2cz))^3}}\,dz == \frac{\cosh(cz)\,(a+b\cosh(2cz))}{(a-b)\,c\sqrt{(a+b\cosh(2cz))^3}}$$

01.20.21.4323.01

$$\int \frac{\sinh(cz)}{\sqrt{(a+b\cosh(2cz))^5}}\,dz == \frac{\cosh(cz)\,(a+b\cosh(2cz))\,(3a-b+2b\cosh(2cz))}{3(a-b)^2\,c\sqrt{(a+b\cosh(2cz))^5}}$$

01.20.21.4324.01

$$\int \frac{\sinh(c\,z)}{\sqrt{(a+b\cosh(2\,c\,z))^7}}\,dz == \left(\cosh(c\,z)\,(a+b\cosh(2\,c\,z))\left(15\,a^2-10\,b\,a+7\,b^2+4\,(5\,a-b)\,b\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\right)\Big/ \left(15\,(a-b)^3\,c\,\sqrt{(a+b\cosh(2\,c\,z))^7}\right)$$

01.20.21.4325.01

$$\int \frac{\sinh(5\,c\,z)}{\sqrt{(a+b\cosh(2\,c\,z))^5}}\,dz == \frac{1}{3\,b^{5/2}\,c\,\sqrt{(a+b\cosh(2\,c\,z))^5}}\left(6\sqrt{2}\,(a+b\cosh(2\,c\,z))^{5/2}\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)-\frac{1}{(a-b)^2}\left(\sqrt{b}\,\cosh(c\,z)\,(a+b\cosh(2\,c\,z))\left(12\,a^3-20\,b\,a^2+7\,b^2\,a-b^3+2\,b\left(8\,a^2-13\,b\,a+4\,b^2\right)\cosh(2\,c\,z)\right)\right)\right)$$

Involving $\sinh^n(c\,z)\,(a+b\cosh(2\,c\,z))^\beta$

01.20.21.4326.01

$$\int \sinh^2(c\,z)\,(a+b\cosh(2\,c\,z))^{3/2}\,dz == \left(-2\,i\left(3\,a^3-17\,b\,a^2-11\,b^2\,a+9\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+2\,i\left(3\,a^3-5\,b\,a^2-3\,b^2\,a+5\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+b\left(12\,a^2-10\,b\,a+3\,b^2+2\,(9\,a-5\,b)\,b\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(60\,b\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4327.01

$$\int \sinh^3(c\,z)\,(a+b\cosh(2\,c\,z))^{3/2}\,dz == \frac{1}{64\,c}\left(\frac{1}{3\,b}\left(2\cosh(c\,z)\,\sqrt{a+b\cosh(2\,c\,z)}\,\left(3\,a^2-52\,b\,a+37\,b^2+2\,(7\,a-11\,b)\,b\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\right)-\frac{1}{b^{3/2}}\left(\sqrt{2}\,(a-b)^2\,(a+11\,b)\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)\right)$$

01.20.21.4328.01

$$\int \sinh^4(c\,z)\,(a+b\cosh(2\,c\,z))^{3/2}\,dz == \frac{1}{280\,b^2\,c}\left(\sqrt{a+b\cosh(2\,c\,z)}\right.$$

$$\left(\frac{1}{\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}}\left(4\,i\left(\left(a^3+7\,b\,a^2-37\,b^2\,a+21\,b^3\right)E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-\left(a^3+6\,b\,a^2-17\,b^2\,a+10\,b^3\right)F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)\right)\right)+\right.$$

$$\left.\left.b\left(2\,a^2-56\,b\,a+45\,b^2+4\,(4\,a-7\,b)\,b\cosh(2\,c\,z)+5\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\right)$$

01.20.21.4329.01

$$\int \sinh^2(c\,z)\,\sqrt{a+b\cosh(2\,c\,z)}\;dz ==$$

$$\left(-2\,i\left(a^2-2\,b\,a-3\,b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+2\,i\left(a^2-b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.2\,b\,(a+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(12\,b\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4330.01

$$\int \sinh^3(c\,z)\,\sqrt{a+b\cosh(2\,c\,z)}\;dz == \frac{1}{32\,c}\left(\frac{2\cosh(c\,z)\,\sqrt{a+b\cosh(2\,c\,z)}\;(a-7\,b+2\,b\cosh(2\,c\,z))}{b}+\right.$$

$$\left.\frac{1}{b^{3/2}}\left(\sqrt{2}\;(b-a)\,(a+7\,b)\log\left(\sqrt{2}\;\sqrt{b}\;\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)\right)$$

01.20.21.4331.01

$$\int \sinh^4(c\,z)\,\sqrt{a+b\cosh(2\,c\,z)}\;dz == \left(8\,i\left(a^3+6\,b\,a^2-7\,b^2\,a-12\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-\right.$$

$$8\,i\left(a^3+5\,b\,a^2-b^2\,a-5\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+$$

$$\left.2\,b\left(2\,a^2-20\,b\,a+3\,b^2+4\,(2\,a-5\,b)\,b\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4332.01

$$\int \frac{\sinh^2(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == -\frac{i\,\sqrt{a+b\cosh(2\,c\,z)}\,\left(E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)\right)}{2\,b\,c\,\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}}$$

01.20.21.4333.01

$$\int \frac{\sinh^3(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{8\,b^{3/2}\,c}\left(2\,\sqrt{b}\,\cosh(c\,z)\,\sqrt{a+b\cosh(2\,c\,z)}\,-\sqrt{2}\,(a+3\,b)\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)$$

01.20.21.4334.01

$$\int \frac{\sinh^4(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \left(2\,i\left(a^2+4\,b\,a+3\,b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-2\,i\left(a^2+3\,b\,a+2\,b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+b\,(a+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(12\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4335.01

$$\int \frac{\sinh^2(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \left(i\,(a+b)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-i\,(a-b)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+b\sinh(2\,c\,z)\right)\Big/\left(2\,(a-b)\,b\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4336.01

$$\int \frac{\sinh^3(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \frac{1}{4\,b^{3/2}\,c}\left(\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)-\frac{2\,\sqrt{b}\,(a+b)\cosh(c\,z)}{(a-b)\,\sqrt{a+b\cosh(2\,c\,z)}}\right)$$

01.20.21.4337.01

$$\int \frac{\sinh^4(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == -\left(i\,(a+b)\left(2\,a\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-2\,(a-b)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-i\,b\sinh(2\,c\,z)\right)\right)\Big/\left(4\,(a-b)\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

Involving $\sinh^m(c\,z)\cosh^m(c\,z)\,(a+b\cosh(2\,c\,z))^\beta$

01.20.21.4338.01

$$\int \sinh(c\,z)\cosh^2(c\,z)\,(a+b\cosh(2\,c\,z))^{3/2}\,dz == \frac{1}{192\,b^{3/2}\,c}$$
$$\left(-3\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^3+9\sqrt{2}\,b\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^2-\right.$$
$$9\sqrt{2}\,b^2\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a+2\,b^{3/2}\,(7\,a+3\,b)\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(3\,c\,z)+$$
$$4\,b^{5/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(5\,c\,z)+3\sqrt{2}\,b^3\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)+$$
$$\left.2\sqrt{b}\,\left(3\,a^2+15\,b\,a+2\,b^2\right)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4339.01

$$\int \sinh^2(c\,z)\cosh(c\,z)\,(a+b\cosh(2\,c\,z))^{3/2}\,dz ==$$
$$\frac{1}{192\,b^{3/2}\,c}\left(2\sqrt{b}\,\sqrt{a+b\cosh(2\,c\,z)}\,\left(3\,a^2-8\,b\,a+b^2+2\,(7\,a-b)\,b\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\sinh(c\,z)-\right.$$
$$\left.3\sqrt{2}\,(a+b)^3\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)\right)$$

01.20.21.4340.01

$$\int \sinh(c\,z)\cosh^2(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\,dz ==$$
$$\frac{1}{32\,b^{3/2}\,c}\left(-\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)(a-b)^2+2\,b^{3/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(3\,c\,z)+\right.$$
$$\left.2\sqrt{b}\,(a+2\,b)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4341.01

$$\int \sinh(c\,z)\cosh^3(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\,dz ==$$
$$\frac{1}{240\,b^2\,c\sqrt{a+b\cosh(2\,c\,z)}}\left(8\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\,a^3-8\,a^3+20\,b\,a^2+8\,b^2\,a-6\,b^2\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\,a+\right.$$
$$\left.10\,b^3+b\left(-4\,a^2+40\,b\,a+9\,b^2\right)\cosh(2\,c\,z)+2\,b^2\,(4\,a+5\,b)\cosh(4\,c\,z)+3\,b^3\cosh(6\,c\,z)\right)$$

01.20.21.4342.01

$$\int \sinh(c\,z)\cosh^4(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\,dz == \frac{1}{384\,b^{5/2}\,c}$$
$$\left(3\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^3-9\sqrt{2}\,b\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^2+\right.$$
$$9\sqrt{2}\,b^2\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a+2\,b^{3/2}\,(a+9\,b)\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(3\,c\,z)+$$
$$4\,b^{5/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(5\,c\,z)-3\sqrt{2}\,b^3\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)+$$
$$\left.2\sqrt{b}\,\left(-3\,a^2+9\,b\,a+14\,b^2\right)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4343.01

$$\int \sinh^2(c\,z)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;dz ==$$

$$\frac{1}{32\,b^{3/2}\,c}\left(2\sqrt{b}\;\sqrt{a+b\cosh(2\,c\,z)}\;(a-b+2\,b\cosh(2\,c\,z))\sinh(c\,z)-\sqrt{2}\;(a+b)^2\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)\right)$$

01.20.21.4344.01

$$\int \sinh^2(c\,z)\cosh^2(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;dz ==$$

$$\left(8\,i\left(a^3+b\,a^2+3\,b^2\,a+3\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-8\,i\,a\left(a^2-b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.2\,b\left(2\,a^2+8\,b\cosh(2\,c\,z)\,a+3\,b^2+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4345.01

$$\int \sinh^2(c\,z)\cosh^3(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;dz == \frac{1}{384\,b^{5/2}\,c}\left(3\sqrt{2}\;(a-3\,b)\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)(a+b)^2+\right.$$

$$\left.2\sqrt{b}\;\sqrt{a+b\cosh(2\,c\,z)}\;\left(-3\,a^2+4\,b\,a-5\,b^2+2\,b\,(a+5\,b)\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.4346.01

$$\int \sinh^2(c\,z)\cosh^4(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;dz ==$$

$$\left(-8\,i\left(4\,a^4-3\,b\,a^3-15\,b^2\,a^2-29\,b^3\,a-21\,b^4\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$8\,i\left(4\,a^4-7\,b\,a^3-9\,b^2\,a^2+7\,b^3\,a+5\,b^4\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+$$

$$b\left(-16\,a^3+28\,b\,a^2-4\,b^2\,a+42\,b^3+b\left(-4\,a^2+112\,b\,a+5\,b^2\right)\cosh(2\,c\,z)+\right.$$

$$\left.\left.6\,b^2\,(6\,a+7\,b)\cosh(4\,c\,z)+15\,b^3\cosh(6\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(3360\,b^3\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4347.01

$$\int \sinh^3(c\,z)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;dz ==$$

$$\left(8\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\;a^3-8\,a^3-20\,b\,a^2+8\,b^2\,a-6\,b^2\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\;a-10\,b^3+\right.$$

$$\left.b\left(-4\,a^2-40\,b\,a+9\,b^2\right)\cosh(2\,c\,z)+2\,(4\,a-5\,b)\,b^2\cosh(4\,c\,z)+3\,b^3\cosh(6\,c\,z)\right)\Big/\left(240\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4348.01

$$\int \sinh^3(c\,z)\cosh^2(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;dz == \frac{1}{384\,b^{5/2}\,c}$$
$$\left(3\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^3+3\sqrt{2}\,b\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^2-\right.$$
$$15\sqrt{2}\,b^2\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a+2\,(a-3\,b)\,b^{3/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(3\,c\,z)+$$
$$4\,b^{5/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(5\,c\,z)+9\sqrt{2}\,b^3\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)-$$
$$\left.2\sqrt{b}\,\left(3\,a^2+3\,b\,a+10\,b^2\right)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4349.01

$$\int \sinh^4(c\,z)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;dz == \frac{1}{384\,b^{5/2}\,c}\left(3\sqrt{2}\,\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)(a+b)^3+\right.$$
$$\left.2\sqrt{b}\,\sqrt{a+b\cosh(2\,c\,z)}\,\left(-3\,a^2-8\,b\,a+7\,b^2+2\,(a-7\,b)\,b\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)$$

01.20.21.4350.01

$$\int \frac{\sinh(c\,z)\cosh^2(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz ==$$
$$\frac{1}{8\,b^{3/2}\,c}\left(2\sqrt{b}\,\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(c\,z)+\sqrt{2}\,(b-a)\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)$$

01.20.21.4351.01

$$\int \frac{\sinh(c\,z)\cosh^3(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz ==$$
$$\left(b^2\cosh^2(2\,c\,z)-(a-3\,b)\,b\cosh(2\,c\,z)+a\left(3\,b+2\,a\left(\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}-1\right)\right)\right)\Big/\left(12\,b^2\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4352.01

$$\int \frac{\sinh(c\,z)\cosh^4(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{64\,b^{5/2}\,c}\left(3\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)(a-b)^2+\right.$$
$$\left.2\,b^{3/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(3\,c\,z)-6\,(a-2\,b)\sqrt{b}\,\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4353.01

$$\int \frac{\sinh^2(c\,z)\cosh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{8\,b^{3/2}\,c}\left(2\sqrt{b}\,\sqrt{a+b\cosh(2\,c\,z)}\,\sinh(c\,z)-\sqrt{2}\,(a+b)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)\right)$$

01.20.21.4354.01

$$\int \frac{\sinh^2(c\,z)\cosh^2(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz ==$$

$$\left(4\,i\,a\,(a+b)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-4\,i\left(a^2-b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.2\,b\,(a+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(24\,b^2\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4355.01

$$\int \frac{\sinh^2(c\,z)\cosh^3(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{64\,b^{5/2}\,c}$$

$$\left(\sqrt{2}\,\left(3\,a^2-2\,b\,a-5\,b^2\right)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)+2\sqrt{b}\,\sqrt{a+b\cosh(2\,c\,z)}\,(-3\,a+3\,b+2\,b\cosh(2\,c\,z))\sinh(c\,z)\right)$$

01.20.21.4356.01

$$\int \frac{\sinh^2(c\,z)\cosh^4(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \left(-4\,i\left(4\,a^3-b\,a^2-8\,b^2\,a-3\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$4\,i\left(4\,a^3-5\,b\,a^2-4\,b^2\,a+5\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+$$

$$\left.b\left(-8\,a^2+10\,b\,a+3\,b^2-2\,(a-5\,b)\,b\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,b^3\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4357.01

$$\int \frac{\sinh^3(c\,z)\cosh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz ==$$

$$\left(b^2\cosh^2(2\,c\,z)-b\,(a+3\,b)\cosh(2\,c\,z)+a\left(2\,a\left(\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\;-1\right)-3\,b\right)\right)\Big/\left(12\,b^2\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4358.01

$$\int \frac{\sinh^3(c\,z)\cosh^2(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{64\,b^{5/2}\,c}\left(2\sqrt{a+b\cosh(2\,c\,z)}\;\cosh(3\,c\,z)\,b^{3/2}-\right.$$

$$\left.2\,(3\,a+2\,b)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\;\sqrt{b}\;+\sqrt{2}\,\left(3\,a^2+2\,b\,a-5\,b^2\right)\log\left(\sqrt{2}\;\sqrt{b}\;\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)$$

01.20.21.4359.01

$$\int \frac{\sinh^3(c\,z)\cosh^3(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \left(-32\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\;a^3+32\,a^3-62\,b^2\,a-2\,b^2\cosh(4\,c\,z)\,a+\right.$$

$$\left.9\,b^2\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\;a+b\left(16\,a^2-51\,b^2\right)\cosh(2\,c\,z)+3\,b^3\cosh(6\,c\,z)\right)\Big/\left(480\,b^3\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4360.01

$$\int \frac{\sinh^3(c\,z)\cosh^4(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \frac{1}{768\,b^{7/2}\,c}$$

$$\left(-15\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^3+9\sqrt{2}\,b\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a^2+\right.$$

$$27\sqrt{2}\,b^2\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)a-2\,(5\,a-3\,b)\,b^{3/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(3\,c\,z)+$$

$$4\,b^{5/2}\sqrt{a+b\cosh(2\,c\,z)}\,\cosh(5\,c\,z)-21\sqrt{2}\,b^3\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)-$$

$$\left.2\sqrt{b}\,\left(-15\,a^2+9\,b\,a+22\,b^2\right)\cosh(c\,z)\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4361.01

$$\int \frac{\sinh^4(c\,z)\cosh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz ==$$

$$\frac{1}{64\,b^{5/2}\,c}\left(3\sqrt{2}\,\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)(a+b)^2+2\sqrt{b}\,\sqrt{a+b\cosh(2\,c\,z)}\,(-3\,a-5\,b+2\,b\cosh(2\,c\,z))\sinh(c\,z)\right)$$

01.20.21.4362.01

$$\int \frac{\sinh^4(c\,z)\cosh^2(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz == \left(-4\,i\left(4\,a^3+9\,b\,a^2+2\,b^2\,a-3\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$4\,i\left(4\,a^3+5\,b\,a^2-4\,b^2\,a-5\,b^3\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+$$

$$\left.b\left(-8\,a^2-10\,b\,a+3\,b^2-2\,b\,(a+5\,b)\cosh(2\,c\,z)+3\,b^2\cosh(4\,c\,z)\right)\sinh(2\,c\,z)\right)\Big/\left(240\,b^3\,c\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4363.01

$$\int \frac{\sinh^4(c\,z)\cosh^3(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\,dz ==$$

$$\frac{1}{768\,b^{7/2}\,c}\left(2\sqrt{b}\,\sqrt{a+b\cosh(2\,c\,z)}\,\left(15\,a^2+4\,b\,a-23\,b^2-2\,b\,(5\,a+b)\cosh(2\,c\,z)+4\,b^2\cosh(4\,c\,z)\right)\sinh(c\,z)-\right.$$

$$\left.3\sqrt{2}\,(5\,a-7\,b)\,(a+b)^2\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)\right)$$

01.20.21.4364.01

$$\int \frac{\sinh(c\,z)\cosh^2(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \frac{1}{4\,b^{3/2}\,c}\left(\sqrt{2}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)-\frac{2\sqrt{b}\,\cosh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)$$

01.20.21.4365.01

$$\int \frac{\sinh(c\,z)\cosh^3(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \frac{\cosh(2\,c\,z)\,b-b-a\left(\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\,-2\right)}{4\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}}$$

01.20.21.4366.01

$$\int \frac{\sinh(c\,z)\cosh^4(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \left(\cosh(3\,c\,z)\,b^{3/2}-3\,(b-2\,a)\cosh(c\,z)\,\sqrt{b}\,+ 3\sqrt{2}\,(b-a)\sqrt{a+b\cosh(2\,c\,z)}\,\log\left(\sqrt{2}\,\sqrt{b}\,\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)\Big/\left(16\,b^{5/2}\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4367.01

$$\int \frac{\sinh^2(c\,z)\cosh(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \frac{\sqrt{2}\,\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)-\frac{2\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}}{4\,b^{3/2}\,c}$$

01.20.21.4368.01

$$\int \frac{\sinh^2(c\,z)\cosh^2(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \left(-2\,i\,(a+b)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+2\,i\,a\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\,F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-b\sinh(2\,c\,z)\right)\Big/\left(4\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4369.01

$$\int \frac{\sinh^2(c\,z)\cosh^3(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \left(2\sqrt{b}\,(3\,a-2\,b+b\cosh(2\,c\,z))\sinh(c\,z)-\sqrt{2}\,(3\,a-b)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)\sqrt{a+b\cosh(2\,c\,z)}\right)\Big/\left(16\,b^{5/2}\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4370.01

$$\int \frac{\sinh^2(c\,z)\cosh^4(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz ==$$

$$\left(2\,i\left(4\,a^2+b\,a-3\,b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-2\,i\left(4\,a^2-3\,b\,a-b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.b\,(4\,a-3\,b+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(24\,b^3\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4371.01

$$\int \frac{\sinh^3(c\,z)\cosh(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \frac{\cosh(2\,c\,z)\,b+b-a\left(\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\;-2\right)}{4\,b^2\,c\,\sqrt{a+b\cosh(2\,c\,z)}}$$

01.20.21.4372.01

$$\int \frac{\sinh^3(c\,z)\cosh^2(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \left(\cosh(3\,c\,z)\,b^{3/2}+(6\,a+5\,b)\cosh(c\,z)\,\sqrt{b}\;-\right.$$

$$\left.\sqrt{2}\;(3\,a+b)\,\sqrt{a+b\cosh(2\,c\,z)}\;\log\left(\sqrt{2}\;\sqrt{b}\;\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)\Big/\left(16\,b^{5/2}\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4373.01

$$\int \frac{\sinh^3(c\,z)\cosh^3(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz ==$$

$$\left(\left(5\,\sqrt{\frac{b\cosh(2\,c\,z)}{a}+1}\;-8\right)a^2-4\,b\cosh(2\,c\,z)\,a+3\,b^2+b^2\cosh^2(2\,c\,z)\right)\Big/\left(24\,b^3\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4374.01

$$\int \frac{\sinh^3(c\,z)\cosh^4(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz ==$$

$$\left(\cosh(5\,c\,z)\,b^{5/2}-9\,\sqrt{2}\;\sqrt{a+b\cosh(2\,c\,z)}\;\log\left(\sqrt{2}\;\sqrt{b}\;\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)b^2+(2\,b-5\,a)\cosh(3\,c\,z)\,b^{3/2}-\right.$$

$$6\,\sqrt{2}\;a\,\sqrt{a+b\cosh(2\,c\,z)}\;\log\left(\sqrt{2}\;\sqrt{b}\;\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)b+\left(-30\,a^2-3\,b\,a+19\,b^2\right)\cosh(c\,z)\,\sqrt{b}\;+$$

$$\left.15\,\sqrt{2}\;a^2\,\sqrt{a+b\cosh(2\,c\,z)}\;\log\left(\sqrt{2}\;\sqrt{b}\;\cosh(c\,z)+\sqrt{a+b\cosh(2\,c\,z)}\right)\right)\Big/\left(128\,b^{7/2}\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4375.01

$$\int \frac{\sinh^4(c\,z)\cosh(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz ==$$

$$\left(2\,\sqrt{b}\;(3\,a+2\,b+b\cosh(2\,c\,z))\sinh(c\,z)-3\,\sqrt{2}\;(a+b)\tanh^{-1}\left(\frac{\sqrt{2}\;\sqrt{b}\;\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)\sqrt{a+b\cosh(2\,c\,z)}\right)\Big/$$

$$\left(16\,b^{5/2}\,c\,\sqrt{a+b\cosh(2\,c\,z)}\right)$$

01.20.21.4376.01

$$\int \frac{\sinh^4(c\,z)\cosh^2(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz ==$$

$$\left(2\,i\left(4\,a^2+7\,b\,a+3\,b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;E\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)-2\,i\left(4\,a^2+3\,b\,a-b^2\right)\sqrt{\frac{a+b\cosh(2\,c\,z)}{a+b}}\;F\left(i\,c\,z\,\middle|\,\frac{2\,b}{a+b}\right)+\right.$$

$$\left.b\,(4\,a+3\,b+b\cosh(2\,c\,z))\sinh(2\,c\,z)\right)\Big/\left(24\,b^3\,c\,\sqrt{a+b\cosh(2\,c\,z)}\,\right)$$

01.20.21.4377.01

$$\int \frac{\sinh^4(c\,z)\cosh^3(c\,z)}{(a+b\cosh(2\,c\,z))^{3/2}}\,dz == \left(3\,\sqrt{2}\,\left(5\,a^2+2\,b\,a-3\,b^2\right)\tanh^{-1}\left(\frac{\sqrt{2}\,\sqrt{b}\,\sinh(c\,z)}{\sqrt{a+b\cosh(2\,c\,z)}}\right)\sqrt{a+b\cosh(2\,c\,z)}\;-\right.$$

$$\left.2\,\sqrt{b}\,\left(15\,a^2+b\,a-9\,b^2+b\,(5\,a+b)\cosh(2\,c\,z)-b^2\cosh(4\,c\,z)\right)\sinh(c\,z)\right)\Big/\left(128\,b^{7/2}\,c\,\sqrt{a+b\cosh(2\,c\,z)}\,\right)$$

Involving $\cosh(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.4378.01

$$\int \cosh(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz ==$$

$$\frac{1}{4}\left(-\frac{1}{-d-e-c\,\beta}\left(e^{(-d-e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.\right.$$

$$\left.F_1\left(\frac{-d-e-c\,\beta}{c};-\beta,-\beta;\frac{-d-e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)\right)+$$

$$\frac{1}{d-e-c\,\beta}\left(e^{(d-e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{d-e-c\,\beta}{c};-\beta,-\beta;\frac{d-e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)\right)-$$

$$\frac{1}{-d+e-c\,\beta}\left(e^{(e-d)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{-d+e-c\,\beta}{c};-\beta,-\beta;\frac{-d+e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)\right)+$$

$$\frac{1}{d+e-c\,\beta}\left(e^{(d+e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{d+e-c\,\beta}{c};-\beta,-\beta;\frac{d+e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}-2\,a}\right)\right)\right)$$

Involving $f(z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.4379.01

$$\int \frac{\sinh(e\,z)\,\sqrt{a+b\cosh(e\,z)}}{p+q\cosh(e\,z)}\,dz == \frac{1}{e}\left(\frac{2\,\sqrt{a+b\cosh(e\,z)}}{q}-\frac{2\,\sqrt{a\,q-b\,p}}{q^{3/2}}\tanh^{-1}\left(\frac{\sqrt{q}\,\sqrt{a+b\cosh(e\,z)}}{\sqrt{a\,q-b\,p}}\right)\right)$$

Involving $\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.4380.01

$$\int \sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz == \frac{1}{\left(-1+e^{2\,d\,z}\right)\left(d^2-4\,c^2\,\beta^2\right)}\left(\left(\left(\frac{2\,e^{2\,c\,z}\,b}{2\,a+b-2\,\sqrt{a\,(a+b)}}+2\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\,\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left((d-2\,c\,\beta)\,F_1\left(-\frac{d+2\,c\,\beta}{2\,c};-\beta,\right.\right.\right.\right.$$
$$\left.\left.-\beta;-\frac{d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)+e^{2\,d\,z}\,(d+2\,c\,\beta)\,F_1\left(\frac{d}{2\,c}-\beta;-\beta,\right.$$
$$\left.\left.\left.\left.-\beta;\frac{d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\,\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\,\sqrt{a\,(a+b)}}\right)\right)\left(2\,a+b+b\cosh(2\,c\,z)\right)^{\beta}\sinh(d\,z)\right)$$

01.20.21.4381.01

$$\int \sinh(2\,c\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz == \frac{\left(b\cosh^2(c\,z)+a\right)^{\beta}\left(2\,a+b+b\cosh(2\,c\,z)\right)}{2\,b\,c\,(\beta+1)}$$

01.20.21.4382.01

$$\int \frac{\sinh(c\,z)}{\sqrt{a+b\cosh^2(c\,z)}}\,dz == \frac{\log\left(2\left(\sqrt{b}\,\cosh(c\,z)+\sqrt{b\cosh^2(c\,z)+a}\right)\right)}{\sqrt{b}\,c}$$

01.20.21.4383.01

$$\int \frac{\sinh(c\,z)}{\sqrt{a-\cosh^2(c\,z)}}\,dz == \frac{1}{c}\tan^{-1}\left(\frac{\cosh(c\,z)}{\sqrt{a-\cosh^2(c\,z)}}\right)$$

Involving $\cosh(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.4384.01

$$\int \cosh(e\,z)\sinh(d\,z)\left(b\cosh^2(c\,z)+a\right)^{\beta}\,dz == \frac{1}{c}\left(2^{-2\,(\beta+1)}\,c\,e^{-(d+e)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}+1\right)^{-\beta}\left(b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+4\,a\right)^{\beta}\right.$$
$$\left(\frac{e^{2\,d\,z}}{d-e-2\,c\,\beta}F_1\left(\frac{d-e-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{d-e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b},-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.$$
$$\frac{e^{2\,(d+e)\,z}}{d+e-2\,c\,\beta}F_1\left(\frac{d+e-2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{d+e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b},-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$\frac{e^{2\,e\,z}}{d-e+2\,c\,\beta}F_1\left(-\frac{d-e+2\,c\,\beta}{2\,c};-\beta,-\beta;\frac{e-d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b},-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$\frac{1}{d+e+2\,c\,\beta}F_1\left(-\frac{d+e+2\,c\,\beta}{2\,c};-\beta,-\beta;-\frac{d+e+2\,c\,(\beta-1)}{2\,c};\right.$$
$$\left.\left.\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b},-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)$$

Involving $f(z)\left(a+b\cosh^n(c\,z)\right)^\beta$

01.20.21.4385.01

$$\int \sinh(z)\cosh^{n-1}(z)\left((b\cosh^n(z)+a)^{\frac{1}{c}}\right)^r dz == \frac{c\,(b\cosh^n(z)+a)\left((b\cosh^n(z)+a)^{\frac{1}{c}}\right)^r}{b\,n\,(c+r)}$$

Involving rational functions of sinh

Involving $f(z)\,(a+b\cosh(c\,z))^\beta$

01.20.21.4386.01

$$\int \frac{\sqrt{a+b\cosh(2\,e\,z)}}{c+d\sinh(e\,z)}\,dz == \frac{1}{d\,e}\left(\frac{\sqrt{-2\,b\,c^2-a\,d^2-b\,d^2}\,\tan^{-1}\left(\frac{\sqrt{-2\,b\,c^2-a\,d^2-b\,d^2}\,\cosh(e\,z)}{\sqrt{c^2+d^2}\,\sqrt{a+b\cosh(2\,e\,z)}}\right)}{\sqrt{c^2+d^2}}+\right.$$

$$\left.\left(i\sqrt{\frac{a+b\cosh(2\,e\,z)}{a+b}}\left(2\,b\,F\left(i\,e\,z\,\middle|\,\frac{2\,b}{a+b}\right)c^2+\left(-2\,b\,c^2-(a+b)\,d^2\right)\Pi\left(-\frac{d^2}{c^2};\,i\,e\,z\,\middle|\,\frac{2\,b}{a+b}\right)\right)\right)\Big/\right.$$

$$\left.\left(c\,d\sqrt{a+b\cosh(2\,e\,z)}\right)+\sqrt{2}\,\sqrt{b\cosh^2(e\,z)}\,\log\left(\sqrt{a+b\cosh(2\,e\,z)}+\sqrt{\cosh(2\,e\,z)\,b+b}\right)\operatorname{sech}(e\,z)\right)$$

01.20.21.4387.01

$$\int \frac{1}{(c+d\sinh(e\,z))\sqrt{a+b\cosh(2\,e\,z)}}\,dz == \frac{1}{d\,e\sqrt{a+b\cosh(2\,e\,z)}}\sqrt{\frac{a+b\cosh(2\,e\,z)}{a+b}}$$

$$\left(-\frac{1}{\sqrt{\frac{c^2}{d^2}+1}\,\sqrt{\frac{2\,b\,c^2}{(a+b)\,d^2}+1}}\tanh^{-1}\left(\frac{\sqrt{\frac{2\,b\,c^2}{(a+b)\,d^2}+1}\,\cosh(e\,z)}{\sqrt{\frac{c^2}{d^2}+1}\,\sqrt{\frac{a+b\cosh(2\,e\,z)}{a+b}}}\right)-\frac{i\,d\,\Pi\left(-\frac{d^2}{c^2};\,i\,e\,z\,\middle|\,\frac{2\,b}{a+b}\right)}{c}\right)$$

01.20.21.4388.01

$$\int \frac{\cosh(e\,z)}{(c\cosh(e\,z)+d\sinh(e\,z))\sqrt{a+b\cosh(2\,e\,z)}}\,dz == -\frac{1}{e}\left(i\left(\frac{i\,d\tanh^{-1}\left(\frac{\sqrt{c^2-d^2}\,\sqrt{a+b\cosh(2\,e\,z)}}{\sqrt{(a-b)\,c^2-(a+b)\,d^2}}\right)}{\sqrt{c^2-d^2}\,\sqrt{(a-b)\,c^2-(a+b)\,d^2}}+\right.\right.$$

$$\left.\left.\left(\sqrt{\frac{a+b\cosh(2\,e\,z)}{a+b}}\left(c^2\,F\left(i\,e\,z\,\middle|\,\frac{2\,b}{a+b}\right)-d^2\,\Pi\left(1-\frac{d^2}{c^2};\,i\,e\,z\,\middle|\,\frac{2\,b}{a+b}\right)\right)\right)\Big/\left(\left(c^3-c\,d^2\right)\sqrt{a+b\cosh(2\,e\,z)}\right)\right)\right)$$

Involving algebraic functions of sinh

Involving $(a \sinh(e z) + b \cosh(e z))^{\beta}$

01.20.21.4389.01

$$\int (a \sinh(e z) + b \cosh(e z))^{\beta} \, dz == -\frac{2^{-\beta} \left(e^{-e z} \left(a \left(-1 + e^{2 e z}\right) + b \left(1 + e^{2 e z}\right)\right)\right)^{\beta}}{e \beta} \left(\frac{e^{2 e z} (a + b)}{b - a} + 1\right)^{-\beta} {}_2F_1\left(-\frac{\beta}{2}, -\beta; \frac{2 - \beta}{2}; \frac{(a + b) e^{2 e z}}{a - b}\right)$$

01.20.21.4390.01

$$\int \sqrt{a \sinh(e z) + b \cosh(e z)} \, dz == \left(a \left(a^2 - b^2\right) {}_2F_1\left(-\frac{1}{2}, -\frac{1}{4}; \frac{3}{4}; \cosh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right) \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) + \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)} \left(2 \sqrt{1 - \frac{a^2}{b^2}} \cosh(e z) b^3 + 2 \left(a^2 - b^2\right) \cosh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) b + a \left(2 \sqrt{1 - \frac{a^2}{b^2}} \sinh(e z) b^2 + \left(b^2 - a^2\right) \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right)\right)\right) \Big/ \left(a \sqrt{1 - \frac{a^2}{b^2}} \, b e \sqrt{b \cosh(e z) + a \sinh(e z)} \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)}\right)$$

01.20.21.4391.01

$$\int \frac{1}{\sqrt{a \sinh(e z) + b \cosh(e z)}} \, dz == \frac{1}{a \sqrt{1 - \frac{b^2}{a^2}} \, e} \left(2 \sqrt{\cosh^2\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right)} \, {}_2F_1\left(\frac{1}{4}, \frac{1}{2}; \frac{5}{4}; -\sinh^2\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right)\right) \operatorname{sech}\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right) \sqrt{b \cosh(e z) + a \sinh(e z)}\right)$$

01.20.21.4392.01

$$\int \frac{1}{(a \sinh(e z) + b \cosh(e z))^{3/2}} \, dz == \left(a \, {}_2F_1\left(-\frac{1}{2}, -\frac{1}{4}; \frac{3}{4}; \cosh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right) \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) - \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)} \left(2 b \sqrt{1 - \frac{a^2}{b^2}} \cosh(e z) - 2 b \cosh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) + a \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right)\right) \Big/ \left(a \sqrt{1 - \frac{a^2}{b^2}} \, b e \sqrt{b \cosh(e z) + a \sinh(e z)} \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)}\right)$$

01.20.21.4393.01

$$\int \frac{1}{\sqrt{(a \sinh(e z) + b \cosh(e z))^3}}\, dz ==$$

$$\left((b \cosh(e z) + a \sinh(e z)) \left(a\, {}_2F_1\left(-\frac{1}{2}, -\frac{1}{4}; \frac{3}{4}; \cosh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right) \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) - \right.\right.$$

$$\left.\left. \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)} \left(2 b \sqrt{1 - \frac{a^2}{b^2}} \cosh(e z) - 2 b \cosh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) + a \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right)\right)\right) \Big/$$

$$\left(a \sqrt{1 - \frac{a^2}{b^2}}\ b e \sqrt{(b \cosh(e z) + a \sinh(e z))^3}\ \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)}\right)$$

01.20.21.4394.01

$$\int \frac{1}{(a \sinh(e z) + b \cosh(e z))^{5/2}}\, dz ==$$

$$-\left(2 \left(a \sqrt{1 - \frac{b^2}{a^2}}\ \sqrt{\cosh^2\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right)}\ {}_2F_1\left(\frac{1}{4}, \frac{1}{2}; \frac{5}{4}; -\sinh^2\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right)\right) \operatorname{sech}\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right) (b \cosh(e z) + \right.\right.$$

$$\left.\left. a \sinh(e z))^2 + \left(a^2 - b^2\right) (a \cosh(e z) + b \sinh(e z))\right)\right) \Big/ \left(3 (a - b)^2 (a + b)^2 e (b \cosh(e z) + a \sinh(e z))^{3/2}\right)$$

01.20.21.4395.01

$$\int \frac{1}{\sqrt{(a \sinh(e z) + b \cosh(e z))^5}}\, dz == \left(2 \operatorname{sech}\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right) (b \cosh(e z) + a \sinh(e z)) \right.$$

$$\left. \left(\sqrt{\cosh^2\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right)}\ {}_2F_1\left(\frac{1}{4}, \frac{1}{2}; \frac{5}{4}; -\sinh^2\left(e z + \tanh^{-1}\left(\frac{b}{a}\right)\right)\right) (b \cosh(e z) + a \sinh(e z))^2 + \right.\right.$$

$$\left.\left. (a \cosh(e z) + b \sinh(e z))^2\right)\right) \Big/ \left(3 a (b - a) (a + b) \sqrt{1 - \frac{b^2}{a^2}}\ e \sqrt{(b \cosh(e z) + a \sinh(e z))^5}\right)$$

01.20.21.4396.01

$$\int \frac{\sinh(e z)}{\sqrt{a \sinh(e z) + b \cosh(e z)}}\, dz == \left(a\, {}_2F_1\left(-\frac{1}{2}, -\frac{1}{4}; \frac{3}{4}; \cosh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right) \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) + \right.$$

$$\left. \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)} \left(2 b \cosh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right) - a \sinh\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)\right)\right) \Big/$$

$$\left(\sqrt{1 - \frac{a^2}{b^2}}\ b e \sqrt{b \cosh(e z) + a \sinh(e z)}\ \sqrt{-\sinh^2\left(e z + \tanh^{-1}\left(\frac{a}{b}\right)\right)}\right)$$

01.20.21.4397.01

$$\int \frac{\cosh(e\,z)}{\sqrt{a\sinh(e\,z)+b\cosh(e\,z)}}\,dz ==$$

$$\left(\sqrt{-\sinh^2\left(e\,z+\tanh^{-1}\left(\frac{a}{b}\right)\right)}\left(2\,b\sqrt{1-\frac{a^2}{b^2}}\,\cosh(e\,z)-2\,b\cosh\left(e\,z+\tanh^{-1}\left(\frac{a}{b}\right)\right)+2\,a\sqrt{1-\frac{a^2}{b^2}}\,\sinh(e\,z)+\right.\right.$$

$$\left.\left.a\sinh\left(e\,z+\tanh^{-1}\left(\frac{a}{b}\right)\right)\right)-a\,{}_2F_1\left(-\frac{1}{2},-\frac{1}{4};\frac{3}{4};\cosh^2\left(e\,z+\tanh^{-1}\left(\frac{a}{b}\right)\right)\right)\sinh\left(e\,z+\tanh^{-1}\left(\frac{a}{b}\right)\right)\right)\Big/$$

$$\left(a\sqrt{1-\frac{a^2}{b^2}}\;e\sqrt{b\cosh(e\,z)+a\sinh(e\,z)}\;\sqrt{-\sinh^2\left(e\,z+\tanh^{-1}\left(\frac{a}{b}\right)\right)}\right)$$

01.20.21.4398.01

$$\int \frac{\sinh(e\,z)}{(a\sinh(e\,z)+b\cosh(e\,z))^{3/2}}\,dz ==$$

$$-2\left(\sqrt{1-\frac{b^2}{a^2}}\;b+\sqrt{\cosh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\;{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-\sinh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right)\operatorname{sech}\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right.$$

$$\left.(b\cosh(e\,z)+a\sinh(e\,z))\right)\Big/\left((b-a)(a+b)\sqrt{1-\frac{b^2}{a^2}}\;e\sqrt{b\cosh(e\,z)+a\sinh(e\,z)}\right)$$

01.20.21.4399.01

$$\int \frac{\sinh(e\,z)}{\sqrt{(a\sinh(e\,z)+b\cosh(e\,z))^3}}\,dz == \left(2\operatorname{sech}\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)(b\cosh(e\,z)+a\sinh(e\,z))\right.$$

$$\left(a\sqrt{\cosh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\;{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-\sinh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right)(b\cosh(e\,z)+a\sinh(e\,z))+\right.$$

$$\left.\left.b\,(a\cosh(e\,z)+b\sinh(e\,z))\right)\right)\Big/\left(a\,(a-b)\,(a+b)\sqrt{1-\frac{b^2}{a^2}}\;e\sqrt{(b\cosh(e\,z)+a\sinh(e\,z))^3}\right)$$

01.20.21.4400.01

$$\int \frac{\cosh(e\,z)}{(a\sinh(e\,z)+b\cosh(e\,z))^{3/2}}\,dz ==$$

$$-2\operatorname{sech}\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\left(b\sqrt{\cosh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\;{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-\sinh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right)(b\cosh(e\,z)+a\sinh(e\,z))+\right.$$

$$\left.a\,(a\cosh(e\,z)+b\sinh(e\,z))\right)\Big/\left(a\,(a-b)\,(a+b)\sqrt{1-\frac{b^2}{a^2}}\;e\sqrt{b\cosh(e\,z)+a\sinh(e\,z)}\right)$$

01.20.21.4401.01

$$\int \frac{\cosh(e\,z)}{\sqrt{(a\sinh(e\,z)+b\cosh(e\,z))^3}}\,dz == 2\,\text{sech}\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)(b\cosh(e\,z)+a\sinh(e\,z))$$
$$\left(b\sqrt{\cosh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\;{}_2F_1\left(\frac{1}{4},\frac{1}{2};\frac{5}{4};-\sinh^2\left(e\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right)(b\cosh(e\,z)+a\sinh(e\,z))+\right.$$
$$\left.a\,(a\cosh(e\,z)+b\sinh(e\,z))\right)\Big/\left(a\,(b-a)\,(a+b)\sqrt{1-\frac{b^2}{a^2}}\;e\sqrt{(b\cosh(e\,z)+a\sinh(e\,z))^3}\right)$$

Involving $\sinh(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^\beta$

01.20.21.4402.01

$$\int \sinh(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^\beta\,dz == \frac{1}{2}\left(\frac{1}{d+e\,\beta}\left(2^{-\beta}\,e^{-d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\right.\right.$$
$$\left.\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^\beta\;{}_2F_1\left(\frac{-d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(-\frac{d}{e}-\beta+2\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\Bigg)-$$
$$\left.\frac{2^{-\beta}\,e^{d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^\beta}{e\,\beta-d}\;{}_2F_1\left(\frac{d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(\frac{d}{e}-\beta+2\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)$$

Involving $\cosh(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^\beta$

01.20.21.4403.01

$$\int \cosh(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^\beta\,dz ==$$
$$\frac{1}{2}\left(-\frac{1}{d+e\,\beta}\left(2^{-\beta}\,e^{-d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^\beta\;{}_2F_1\right.\right.$$
$$\left.\left(\frac{-d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(-\frac{d}{e}-\beta+2\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)-$$
$$\left.\frac{2^{-\beta}\,e^{d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^\beta}{e\,\beta-d}\;{}_2F_1\left(\frac{d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(\frac{d}{e}-\beta+2\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)$$

Involving $(a+b\sinh(e\,z)+c\cosh(e\,z))^\beta$

01.20.21.4404.01

$$\int (a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}\,dz ==$$

$$-\frac{1}{e\,\beta}\left(2^{-\beta}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.$$

$$\left.F_1\left(-\beta;-\beta,-\beta;1-\beta;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)$$

01.20.21.4405.01

$$\int (a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}\,(A+B\sinh(e\,z)+C\cosh(e\,z))\,dz ==$$

$$-\frac{1}{b\,e}\left(C\,(a+c\cosh(e\,z)+b\sinh(e\,z))^{\beta}\left(-\frac{(a+c\cosh(e\,z)+b\sinh(e\,z))\,b^2}{\left(b^2-c^2\right)(\beta+1)}+\frac{c\cosh\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)}{\sqrt{1-\frac{c^2}{b^2}}}-\right.\right.$$

$$\left.\left(c\,F_1\left(\beta;-\frac{1}{2},-\frac{1}{2};\beta+1;\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+b\sqrt{1-\frac{c^2}{b^2}}\,i},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}\right)\cosh\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\right)\Big/$$

$$\left.\left(\sqrt{1-\frac{c^2}{b^2}}\sqrt{-\frac{c\cosh(e\,z)+b\left(-i\sqrt{1-\frac{c^2}{b^2}}+\sinh(e\,z)\right)}{a+b\sqrt{1-\frac{c^2}{b^2}}\,i}}\sqrt{-\frac{b\sqrt{1-\frac{c^2}{b^2}}\left(i+\sinh\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\right)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}}\right)\right)-$$

$$\frac{1}{e}\left(B\,(a+c\cosh(e\,z)+b\sinh(e\,z))^{\beta}\left(\frac{b\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)}{\sqrt{1-\frac{b^2}{c^2}}\,c}-\frac{c\,(a+c\cosh(e\,z)+b\sinh(e\,z))}{\left(c^2-b^2\right)(\beta+1)}\right)\right)+$$

$$\left(b\,B\,F_1\left(\beta;-\frac{1}{2},-\frac{1}{2};\beta+1;\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-\sqrt{1-\frac{b^2}{c^2}}\,c}\right)\right.$$

$$\left.\left.(a+c\cosh(e\,z)+b\sinh(e\,z))^{\beta}\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)\right)\Big/\right.$$

$$\left(\sqrt{1-\frac{b^2}{c^2}}\;c\,e\sqrt{\frac{\sqrt{1-\frac{b^2}{c^2}}\;c\left(\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+1\right)}{\sqrt{1-\frac{b^2}{c^2}}\;c-a}}\sqrt{\frac{-\cosh(e\,z)\,c+\sqrt{1-\frac{b^2}{c^2}}\;c-b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}}}\right)+$$

$$\frac{1}{b\sqrt{1-\frac{c^2}{b^2}}\;e\,(\beta+1)}\left(A\,F_1\left(\beta+1;\frac{1}{2},\frac{1}{2};\beta+2;\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+b\sqrt{1-\frac{c^2}{b^2}}\;i},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}\right)\right.$$

$$\left.\operatorname{sech}\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)(a+c\cosh(e\,z)+b\sinh(e\,z))^{\beta+1}\right.$$

$$\left.\sqrt{-\frac{c\cosh(e\,z)+b\left(-i\sqrt{1-\frac{c^2}{b^2}}+\sinh(e\,z)\right)}{a+b\sqrt{1-\frac{c^2}{b^2}}\;i}}\sqrt{-\frac{b\sqrt{1-\frac{c^2}{b^2}}\;\left(i+\sinh\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\right)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}}\right)$$

01.20.21.4406.01

$$\int\sqrt{a+b\sinh(e\,z)+c\cosh(e\,z)}\;dz==$$

$$\left(b\left(b^2-c^2\right)\sqrt{1-\frac{c^2}{b^2}}\;F_1\left(-\frac{1}{2};-\frac{1}{2},-\frac{1}{2};\frac{1}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+\sqrt{1-\frac{b^2}{c^2}}\;c},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-\sqrt{1-\frac{b^2}{c^2}}\;c}\right)\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+\right.$$

$$\left.\sqrt{\frac{\left(b^2-c\left(\sqrt{1-\frac{b^2}{c^2}}\;a+c\right)\right)\left(\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+1\right)}{a^2+b^2-c^2}}\right.$$

$$\left.\sqrt{\left(\frac{1}{a^2+b^2-c^2}\left(b^2-\left(a-\sqrt{1-\frac{b^2}{c^2}}\;c\right)\sinh(e\,z)\,b-c^2+a\sqrt{1-\frac{b^2}{c^2}}\;c+c\left(\sqrt{1-\frac{b^2}{c^2}}\;c-a\right)\cosh(e\,z)\right)\right)}\right.$$

$$\left.\left(2\,a\sqrt{1-\frac{b^2}{c^2}}\;c\,F_1\left(\frac{1}{2};\frac{1}{2},\frac{1}{2};\frac{3}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+i\,b\sqrt{1-\frac{c^2}{b^2}}},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}\right)\right.\right.$$

$$\left.\left.\operatorname{sech}\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\sqrt{\left(-\frac{1}{a^2+b^2-c^2}\right.}\right.\right.$$

$$\left(-b^2+\left(a-i\,b\sqrt{1-\frac{c^2}{b^2}}\right)\sinh(e\,z)\,b-i\,a\sqrt{1-\frac{c^2}{b^2}}\;b+c^2+c\left(a-i\,b\sqrt{1-\frac{c^2}{b^2}}\right)\cosh(e\,z)\right)$$

$$\sqrt{\left(\frac{1}{a^2+b^2-c^2}\left(\left(\left(b^2-i\,a\sqrt{1-\frac{c^2}{b^2}}\;b-c^2\right)\left(\cosh\left(\frac{1}{2}\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\right)-i\sinh\left(\frac{1}{2}\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\right)\right)^2\right)\right.\right.}$$

$$(a+c\cosh(e\,z)+b\sinh(e\,z))+\sqrt{1-\frac{c^2}{b^2}}\left(2\sqrt{1-\frac{b^2}{c^2}}\;\cosh(e\,z)\,c^3+\right.$$

$$\left.\left.\left.2\left(b^2-c^2\right)\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)c+b\left(2\sqrt{1-\frac{b^2}{c^2}}\;\sinh(e\,z)\,c^2+\left(c^2-b^2\right)\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)\right)\right)\right)\Bigg/$$

$$\left(b\sqrt{1-\frac{b^2}{c^2}}\;c\sqrt{1-\frac{c^2}{b^2}}\;e\sqrt{\frac{\sqrt{1-\frac{b^2}{c^2}}\;c\left(\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+1\right)}{\sqrt{1-\frac{b^2}{c^2}}\;c-a}}\sqrt{\frac{-\cosh(e\,z)\,c+\sqrt{1-\frac{b^2}{c^2}}\;c-b\sinh(e\,z)}{a+\sqrt{1-\frac{b^2}{c^2}}\;c}}\right.$$

$$\left.\sqrt{a+c\cosh(e\,z)+b\sinh(e\,z)}\right)$$

01.20.21.4407.01

$$\int\frac{1}{\sqrt{a+b\sinh(e\,z)+c\cosh(e\,z)}}\,dz==$$

$$\frac{1}{b\sqrt{1-\frac{c^2}{b^2}}\;e}\left(2F_1\left(\frac{1}{2};\frac{1}{2},\frac{1}{2};\frac{3}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+i\,b\sqrt{1-\frac{c^2}{b^2}}},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}\right)\operatorname{sech}\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\right.$$

$$\left.\sqrt{a+c\cosh(e\,z)+b\sinh(e\,z)}\sqrt{-\frac{c\cosh(e\,z)+b\left(\sinh(e\,z)-i\sqrt{1-\frac{c^2}{b^2}}\right)}{a+i\,b\sqrt{1-\frac{c^2}{b^2}}}}\sqrt{-\frac{b\sqrt{1-\frac{c^2}{b^2}}\;\left(\sinh\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)+i\right)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}}\right)$$

01.20.21.4408.01

$$\int \frac{1}{(a+b\sinh(e\,z)+c\cosh(e\,z))^{3/2}}\,dz == \left(\frac{\left(c\,(2\,a+b\sinh(e\,z))-\left(b^2-2\,c^2\right)\cosh(e\,z)\right)b}{c^2-b^2}+\right.$$

$$\frac{1}{b\sqrt{1-\frac{c^2}{b^2}}}\left(2\,a\,F_1\left(\frac{1}{2};\frac{1}{2},\frac{1}{2};\frac{3}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+b\sqrt{1-\frac{c^2}{b^2}}\;i},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}\right)\right.$$

$$\operatorname{sech}\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)(a+c\cosh(e\,z)+b\sinh(e\,z))\sqrt{-\frac{c\cosh(e\,z)+b\left(-i\sqrt{1-\frac{c^2}{b^2}}+\sinh(e\,z)\right)}{a+b\sqrt{1-\frac{c^2}{b^2}}\;i}}$$

$$\left.\sqrt{-\frac{b\sqrt{1-\frac{c^2}{b^2}}\left(i+\sinh\left(e\,z+\tanh^{-1}\left(\frac{c}{b}\right)\right)\right)}{a-i\,b\sqrt{1-\frac{c^2}{b^2}}}}\right)+\left(b^2\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)\right)\Big/$$

$$\left(\sqrt{1-\frac{b^2}{c^2}}\;c\sqrt{\frac{\sqrt{1-\frac{b^2}{c^2}}\;c\left(\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+1\right)}{\sqrt{1-\frac{b^2}{c^2}}\;c-a}}\sqrt{\frac{-\cosh(e\,z)\,c+\sqrt{1-\frac{b^2}{c^2}}\;c-b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}}}\right)$$

$$F_1\left(-\frac{1}{2};-\frac{1}{2},-\frac{1}{2};\frac{1}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-\sqrt{1-\frac{b^2}{c^2}}\;c}\right)-$$

$$\left(c\left(2\,a\sqrt{1-\frac{b^2}{c^2}}\;c^2+2\left(c^2-b^2\right)\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)c+b\left(b^2-c^2\right)\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)\right)\right)\Big/$$

$$\left(b\sqrt{1-\frac{b^2}{c^2}}\left(c^2-b^2\right)\right)-\left(c\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)\right)\Big/$$

$$\left(\sqrt{1-\frac{b^2}{c^2}}\ \sqrt{\frac{\sqrt{1-\frac{b^2}{c^2}}\ c\left(\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+1\right)}{\sqrt{1-\frac{b^2}{c^2}}\ c-a}}\ \sqrt{\frac{-\cosh(e\,z)\,c+\sqrt{1-\frac{b^2}{c^2}}\ c-b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}}}\right)$$

$$F_1\left(-\frac{1}{2};-\frac{1}{2},-\frac{1}{2};\frac{1}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-\sqrt{1-\frac{b^2}{c^2}}\ c}\right)+$$

$$\frac{2\left(a\,c+\left(c^2-b^2\right)\cosh(e\,z)\right)}{b}\Bigg/\left(\left(a^2+b^2-c^2\right)e\sqrt{a+c\cosh(e\,z)+b\sinh(e\,z)}\right)$$

01.20.21.4409.01

$$\int\frac{\sinh(e\,z)}{\sqrt{a+b\sinh(e\,z)+c\cosh(e\,z)}}\,dz==\left(\frac{2\,(a+c\cosh(e\,z)+b\sinh(e\,z))\,c^2}{c^2-b^2}+\left(b\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)\right)\right)\Big/$$

$$\left(\sqrt{1-\frac{b^2}{c^2}}\ \sqrt{\frac{\sqrt{1-\frac{b^2}{c^2}}\ c\left(\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+1\right)}{\sqrt{1-\frac{b^2}{c^2}}\ c-a}}\ \sqrt{\frac{-\cosh(e\,z)\,c+\sqrt{1-\frac{b^2}{c^2}}\ c-b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}}}\right)$$

$$F_1\left(-\frac{1}{2};-\frac{1}{2},-\frac{1}{2};\frac{1}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-\sqrt{1-\frac{b^2}{c^2}}\ c}\right)-$$

$$\frac{b\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)}{\sqrt{1-\frac{b^2}{c^2}}}\Bigg/\left(c\,e\sqrt{a+c\cosh(e\,z)+b\sinh(e\,z)}\right)$$

01.20.21.4410.01

$$\int \frac{\cosh(e\,z)}{\sqrt{a+b\sinh(e\,z)+c\cosh(e\,z)}}\,dz ==$$

$$\left(\frac{2\,(a+c\cosh(e\,z)+b\sinh(e\,z))}{b}+\frac{c\left(c\,(2\,a+b\sinh(e\,z))-\left(b^2-2\,c^2\right)\cosh(e\,z)\right)}{b^3-b\,c^2}-\sinh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)\right)\Big/$$

$$\left(\sqrt{1-\frac{b^2}{c^2}}\,\sqrt{\frac{\sqrt{1-\frac{b^2}{c^2}}\;c\left(\cosh\left(e\,z+\tanh^{-1}\left(\frac{b}{c}\right)\right)+1\right)}{\sqrt{1-\frac{b^2}{c^2}}\;c-a}}\,\sqrt{\frac{-\cosh(e\,z)\,c+\sqrt{1-\frac{b^2}{c^2}}\;c-b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}}}\right)$$

$$F_1\left(-\frac{1}{2};-\frac{1}{2},-\frac{1}{2};\frac{1}{2};\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a+c\sqrt{1-\frac{b^2}{c^2}}},\frac{a+c\cosh(e\,z)+b\sinh(e\,z)}{a-\sqrt{1-\frac{b^2}{c^2}}\;c}\right)\Big/\left(e\sqrt{a+c\cosh(e\,z)+b\sinh(e\,z)}\right)$$

Involving $\sinh(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}$

01.20.21.4411.01

$$\int \sinh(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}\,dz ==$$

$$\frac{1}{2}\left(\frac{1}{d+e\,\beta}\left(2^{-\beta}\,e^{-d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.\right.$$

$$\left.F_1\left(-\frac{d}{e}-\beta;-\beta,-\beta;-\frac{d}{e}-\beta+1;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)-$$

$$\frac{1}{e\,\beta-d}\left(2^{-\beta}\,e^{d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{d}{e}-\beta;-\beta,-\beta;\frac{d}{e}-\beta+1;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)\right)$$

Involving $\cosh(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}$

01.20.21.4412.01

$$\int \cosh(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{e\,\beta-d}\left(2^{-\beta}\,e^{d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.\right.$$

$$\left.F_1\left(\frac{d}{e}-\beta;-\beta,-\beta;\frac{d}{e}-\beta+1;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)\right)-$$

$$\frac{1}{d+e\,\beta}\left(2^{-\beta}\,e^{-d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(-\frac{d}{e}-\beta;-\beta,-\beta;-\frac{d}{e}-\beta+1;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)\right)\right)$$

Involving $\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4413.01

$$\int\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$-\frac{1}{e\,\beta}\left(2^{-2\,\beta-1}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.$$

$$\left.F_1\left(-\beta;-\beta,-\beta;1-\beta;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)$$

01.20.21.4414.01

$$\int\left(b\cosh^2(e\,z)+a\sinh^2(e\,z)\right)^{5/2}\,dz == \left(\sqrt{2}\;(a+b)\,(-a+b+(a+b)\cosh(2\,e\,z))\,(11\,(b-a)+3\,(a+b)\cosh(2\,e\,z))\sinh(2\,e\,z)+\right.$$

$$8\,(\cosh(e\,z)+1)\sqrt{\frac{-a+b+(a+b)\cosh(2\,e\,z)}{(\cosh(e\,z)+1)^2}}$$

$$\left(\frac{1}{a+b}\left(8\,a^3+b\,a^2+b^2\,a+8\,b^3\right)\left(\left(2\,i\,b\left(a-2\sqrt{a+b}\;\sqrt{a}+b\right)\sqrt{\frac{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}{b}}\right.\right.\right.$$

$$F\left(i \sinh^{-1}\left(\sqrt{\frac{2a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,\tanh\left(\frac{ez}{2}\right)\right)\middle|\frac{2a+2\sqrt{a+b}\,\sqrt{a}+b}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)$$

$$\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a-2\sqrt{a+b}\,\sqrt{a}+b}+1}\,\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a+2\sqrt{a+b}\,\sqrt{a}+b}+1}\,-\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$(-a+b+(a+b)\cosh(2ez))\,\mathrm{sech}^2\left(\frac{ez}{2}\right)\tanh\left(\frac{ez}{2}\right)\Bigg)\Bigg/\left(2\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right)-$$

$$ib\sqrt{\frac{2a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,E\left(i \sinh^{-1}\left(\sqrt{\frac{2a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,\tanh\left(\frac{ez}{2}\right)\right)\middle|\right.$$

$$\left.\frac{2a+2\sqrt{a+b}\,\sqrt{a}+b}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a-2\sqrt{a+b}\,\sqrt{a}+b}+1}\,\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a+2\sqrt{a+b}\,\sqrt{a}+b}+1}\Bigg)-$$

$$\frac{i\left(-8a^3+7ba^2-7b^2a+8b^3\right)}{\sqrt{\frac{2a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}}F\left(i \sinh^{-1}\left(\sqrt{\frac{2a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,\tanh\left(\frac{ez}{2}\right)\right)\middle|\right.$$

$$\left.\left.\frac{2a+2\sqrt{a+b}\,\sqrt{a}+b}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a-2\sqrt{a+b}\,\sqrt{a}+b}+1}\,\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a+2\sqrt{a+b}\,\sqrt{a}+b}+1}\right)\Bigg/$$

$$\left.\sqrt{4a\tanh^2\left(\frac{ez}{2}\right)+b\left(\tanh^2\left(\frac{ez}{2}\right)+1\right)^2}\right)\Bigg/\left(120e\sqrt{-a+b+(a+b)\cosh(2ez)}\right)$$

01.20.21.4415.01

$$\int \left(a \sinh^2(e\,z) + b \cosh^2(e\,z)\right)^{3/2} dz ==$$

$$\left((a+b)\,(-a+b+(a+b)\cosh(2\,e\,z))\sinh(2\,e\,z) + \left(4\sqrt{2}\,(\cosh(e\,z)+1)\sqrt{\frac{-a+b+(a+b)\cosh(2\,e\,z)}{(\cosh(e\,z)+1)^2}}\right.\right.$$

$$\left((b-a)\left(\left(2\,i\,b\left(a-2\sqrt{a+b}\,\sqrt{a}+b\right)\sqrt{\frac{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\right.\right.\right.$$

$$F\left(i\sinh^{-1}\left(\sqrt{\frac{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,\tanh\left(\frac{e\,z}{2}\right)\right)\middle|\,\frac{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)$$

$$\sqrt{\frac{b\tanh^2\left(\frac{e\,z}{2}\right)}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}+1}\,\sqrt{\frac{b\tanh^2\left(\frac{e\,z}{2}\right)}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}+1}-\left(-2\,a+2\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$\left.(-a+b+(a+b)\cosh(2\,e\,z))\,\mathrm{sech}^2\left(\frac{e\,z}{2}\right)\tanh\left(\frac{e\,z}{2}\right)\right)\Big/\left(2\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right)-$$

$$i\,b\sqrt{\frac{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,E\left(i\sinh^{-1}\left(\sqrt{\frac{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,\tanh\left(\frac{e\,z}{2}\right)\right)\right|$$

$$\left.\left.\left.\frac{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\sqrt{\frac{b\tanh^2\left(\frac{e\,z}{2}\right)}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}+1}\,\sqrt{\frac{b\tanh^2\left(\frac{e\,z}{2}\right)}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}+1}\right)-\right.$$

$$\frac{i\left(a^2-b\,a+b^2\right)}{\sqrt{\frac{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}}F\left(i\sinh^{-1}\left(\sqrt{\frac{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}{b}}\,\tanh\left(\frac{e\,z}{2}\right)\right)\middle|\,\frac{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)$$

$$\left.\left.\sqrt{\frac{b\tanh^2\left(\frac{e\,z}{2}\right)}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}+1}\,\sqrt{\frac{b\tanh^2\left(\frac{e\,z}{2}\right)}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}+1}\right)\right)\Big/$$

$$\left.\sqrt{4\,a\tanh^2\left(\frac{e\,z}{2}\right)+b\left(\tanh^2\left(\frac{e\,z}{2}\right)+1\right)^2}\right)\Big/\left(6\sqrt{2}\,e\sqrt{-a+b+(a+b)\cosh(2\,e\,z)}\right)$$

01.20.21.4416.01

$$\int \sqrt{a \sinh^2(e\,z) + b \cosh^2(e\,z)}\; dz == -(\cosh(e\,z)+1)\sqrt{\frac{-a+b+(a+b)\cosh(2\,e\,z)}{(\cosh(e\,z)+1)^2}}$$

$$\left(\frac{1}{2\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right)}\left(\left(-2\,a+2\sqrt{a+b}\;\sqrt{a}-b\right)(-a+b+(a+b)\cosh(2\,e\,z))\tanh\left(\frac{e\,z}{2}\right)\operatorname{sech}^2\left(\frac{e\,z}{2}\right)+\right.\right.$$

$$4\sqrt{a}\;b\left(\sqrt{a+b}-\sqrt{a}\right)i\sqrt{\frac{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}{b}}$$

$$\sqrt{\frac{\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right)\tanh^2\left(\frac{e\,z}{2}\right)+b}{b}}\;\sqrt{\frac{\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right)\tanh^2\left(\frac{e\,z}{2}\right)+b}{b}}$$

$$F\left(i\sinh^{-1}\left(\sqrt{\frac{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}{b}}\;\tanh\left(\frac{e\,z}{2}\right)\right)\middle|\frac{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)+$$

$$b\,i\sqrt{\frac{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}{b}}\;\sqrt{\frac{\left(2\,a+2\sqrt{a+b}\;\sqrt{a}+b\right)\tanh^2\left(\frac{e\,z}{2}\right)+b}{b}}$$

$$\sqrt{\frac{\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right)\tanh^2\left(\frac{e\,z}{2}\right)+b}{b}}$$

$$\left.E\left(i\sinh^{-1}\left(\sqrt{\frac{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}{b}}\;\tanh\left(\frac{e\,z}{2}\right)\right)\middle|\frac{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\Big/$$

$$\left.\left(e\sqrt{-a+b+(a+b)\cosh(2\,e\,z)}\;\sqrt{4\,a\tanh^2\left(\frac{e\,z}{2}\right)+b\left(\tanh^2\left(\frac{e\,z}{2}\right)+1\right)^2}\right)\right)$$

01.20.21.4417.01

$$\int \frac{1}{\sqrt{a \sinh^2(e z) + b \cosh^2(e z)}}\, dz == -2 i (\cosh(e z) + 1) \sqrt{\frac{-a + b + (a + b) \cosh(2 e z)}{(\cosh(e z) + 1)^2}}$$
$$F\left(i \sinh^{-1}\left(\sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}}\ \tanh\left(\frac{e z}{2}\right)\right) \middle| \frac{2 a + 2 \sqrt{a + b}\ \sqrt{a}\ + b}{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}\right)$$
$$\sqrt{\frac{b \tanh^2\left(\frac{e z}{2}\right)}{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b} + 1}\ \sqrt{\frac{b \tanh^2\left(\frac{e z}{2}\right)}{2 a + 2 \sqrt{a + b}\ \sqrt{a}\ + b} + 1}\ \Big/$$
$$\left(\sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}}\ e \sqrt{-a + b + (a + b) \cosh(2 e z)}\ \sqrt{4 a \tanh^2\left(\frac{e z}{2}\right) + b \left(\tanh^2\left(\frac{e z}{2}\right) + 1\right)^2}\right)$$

01.20.21.4418.01

$$\int \frac{1}{\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{3/2}} dz ==$$

$$\left(\sqrt{2}\ a \sinh(2 e z) + \sqrt{2}\ b \sinh(2 e z) + \left(2 (\cosh(e z) + 1) \sqrt{\frac{-a + b + (a + b) \cosh(2 e z)}{(\cosh(e z) + 1)^2}} \left(\left(\left(-2 a + 2 \sqrt{a + b}\ \sqrt{a}\ - b\right)\right.\right.\right.\right.$$

$$(-a + b + (a + b) \cosh(2 e z)) \tanh\left(\frac{e z}{2}\right) \operatorname{sech}^2\left(\frac{e z}{2}\right) + 4 \sqrt{a} \sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}}$$

$$\sqrt{\frac{\left(2 a + 2 \sqrt{a + b}\ \sqrt{a}\ + b\right) \tanh^2\left(\frac{e z}{2}\right) + b}{b}} \sqrt{\frac{\left(2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b\right) \tanh^2\left(\frac{e z}{2}\right) + b}{b}}\ b$$

$$\left(\sqrt{a + b}\ - \sqrt{a}\right) i F\left(i \sinh^{-1}\left(\sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}} \tanh\left(\frac{e z}{2}\right)\right) \middle| \frac{2 a + 2 \sqrt{a + b}\ \sqrt{a}\ + b}{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}\right)\Bigg) \Bigg/$$

$$\left(2 \left(2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b\right)\right) + \sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}} \sqrt{\frac{\left(2 a + 2 \sqrt{a + b}\ \sqrt{a}\ + b\right) \tanh^2\left(\frac{e z}{2}\right) + b}{b}}$$

$$\sqrt{\frac{\left(2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b\right) \tanh^2\left(\frac{e z}{2}\right) + b}{b}}\ b\, i$$

$$E\left(i \sinh^{-1}\left(\sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}} \tanh\left(\frac{e z}{2}\right)\right) \middle| \frac{2 a + 2 \sqrt{a + b}\ \sqrt{a}\ + b}{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}\right)\Bigg)\Bigg)\Bigg) \Bigg/$$

$$\left(\sqrt{4 a \tanh^2\left(\frac{e z}{2}\right) + b \left(\tanh^2\left(\frac{e z}{2}\right) + 1\right)^2}\right) \Bigg/ \left(2 a b e \sqrt{-a + b + (a + b) \cosh(2 e z)}\right)$$

01.20.21.4419.01

$$\int \frac{1}{\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{5/2}} dz ==$$

$$\left(2 (\cosh(e z) + 1)^3 \left((b - a) \left(\left(\left(2 i b \left(a - 2 \sqrt{a + b}\ \sqrt{a}\ + b\right)\right.\right.\right.\right.\right.$$

$$\sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}} F\left(i \sinh^{-1}\left(\sqrt{\frac{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}{b}} \tanh\left(\frac{e z}{2}\right)\right) \middle| \frac{2 a + 2 \sqrt{a + b}\ \sqrt{a}\ + b}{2 a - 2 \sqrt{a + b}\ \sqrt{a}\ + b}\right)\right.$$

$$\sqrt{\frac{b\tanh^2\left(\frac{e z}{2}\right)}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}+1}\ \sqrt{\frac{b\tanh^2\left(\frac{e z}{2}\right)}{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}+1}\ -\left(-2a+2\sqrt{a+b}\ \sqrt{a}\ -b\right)$$

$$(-a+b+(a+b)\cosh(2ez))\operatorname{sech}^2\left(\frac{ez}{2}\right)\tanh\left(\frac{ez}{2}\right)\Bigg/\left(2\left(2a-2\sqrt{a+b}\ \sqrt{a}\ +b\right)\right)-$$

$$i b\sqrt{\frac{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}{b}}\ E\left(i\sinh^{-1}\left(\sqrt{\frac{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}{b}}\ \tanh\left(\frac{ez}{2}\right)\right)\middle|\right.$$

$$\left.\frac{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}\right)\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}+1}\ \sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}+1}\Bigg)-$$

$$\frac{i\left(a^2-b a+b^2\right)}{\sqrt{\frac{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}{b}}}F\left(i\sinh^{-1}\left(\sqrt{\frac{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}{b}}\ \tanh\left(\frac{ez}{2}\right)\right)\middle|\frac{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}\right)$$

$$\left.\sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a-2\sqrt{a+b}\ \sqrt{a}\ +b}+1}\ \sqrt{\frac{b\tanh^2\left(\frac{ez}{2}\right)}{2a+2\sqrt{a+b}\ \sqrt{a}\ +b}+1}\right)$$

$$\left(\frac{-a+b+(a+b)\cosh(2ez)}{(\cosh(ez)+1)^2}\right)^{3/2}\Bigg/\sqrt{4a\tanh^2\left(\frac{ez}{2}\right)+b\left(\tanh^2\left(\frac{ez}{2}\right)+1\right)^2}\ +$$

$$\sqrt{2}\ (a+b)\left(-a^2+3ba-b^2+\left(a^2-b^2\right)\cosh(2ez)\right)$$

$$\sinh(2ez)\Bigg/\Big(3$$

$$a^2 b^2 e\,(-a+b+(a+b)\cosh(2ez))^{3/2}\Big)$$

01.20.21.4420.01

$$\int\sinh(ez)\left(a\sinh^2(ez)+b\cosh^2(ez)\right)^{\beta}dz==\frac{\cosh(ez)\ \left((a+b)\sinh^2(ez)+b\right)^{\beta+1}}{2ae(\beta+1)\sqrt{\frac{(a+b)\cosh^2(ez)}{a}}}{}_2F_1\left(\beta+1,\ \frac{1}{2};\ \beta+2;\ -\frac{(a+b)\sinh^2(ez)+b}{a}\right)$$

01.20.21.4421.01

$$\int \sinh(e\,z)\sqrt{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\;dz == \frac{\cosh(e\,z)}{2\,e\sqrt{\frac{(a+b)\cosh^2(e\,z)}{a}}\;\sqrt{(a+b)\sinh^2(e\,z)+b}}$$

$$\left(\sqrt{\frac{(a+b)\cosh^2(e\,z)}{a}}\;\left((a+b)\sinh^2(e\,z)+b\right)-\sqrt{a}\;\sinh^{-1}\left(\frac{\sqrt{(a+b)\sinh^2(e\,z)+b}}{\sqrt{a}}\right)\sqrt{(a+b)\sinh^2(e\,z)+b}\right)$$

01.20.21.4422.01

$$\int \frac{\sinh(e\,z)}{\sqrt{a\sinh^2(e\,z)+b\cosh^2(e\,z)}}\,dz ==$$

$$\left(\cosh(e\,z)\log\left(\sqrt{2}\;\sqrt{(a+b)\cosh^2(e\,z)}+\sqrt{-a+b+(a+b)\cosh(2\,e\,z)}\right)\right)\Big/\left(e\sqrt{(a+b)\cosh^2(e\,z)}\right)$$

01.20.21.4423.01

$$\int \cosh(e\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$-\frac{\left((a+b)\cosh^2(e\,z)-a\right)\sinh(e\,z)\left(b\cosh^2(e\,z)+a\sinh^2(e\,z)\right)^{\beta}}{2\,b\,e\,(\beta+1)\sqrt{-\frac{(a+b)\sinh^2(e\,z)}{b}}}\;{}_2F_1\left(\beta+1,\;\frac{1}{2};\;\beta+2;\;\frac{(a+b)\cosh^2(e\,z)-a}{b}\right)$$

01.20.21.4424.01

$$\int \cosh(e\,z)\sqrt{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\;dz ==$$

$$\frac{\operatorname{csch}(e\,z)}{4\sqrt{2}\;(a+b)\,e}\left(\cosh(2\,e\,z)\sqrt{-a+b+(a+b)\cosh(2\,e\,z)}\;(a+b)-(a+b)\sqrt{-a+b+(a+b)\cosh(2\,e\,z)}+\right.$$

$$\left.2\sqrt{2}\;b\log\left(\sqrt{-a+b+(a+b)\cosh(2\,e\,z)}+\sqrt{2}\;\sqrt{(a+b)\sinh^2(e\,z)}\right)\sqrt{(a+b)\sinh^2(e\,z)}\right)$$

01.20.21.4425.01

$$\int \frac{\cosh(e\,z)}{\sqrt{a\sinh^2(e\,z)+b\cosh^2(e\,z)}}\,dz ==$$

$$\left(\log\left(\sqrt{-a+b+(a+b)\cosh(2\,e\,z)}+\sqrt{2}\;\sqrt{(a+b)\sinh^2(e\,z)}\right)\sinh(e\,z)\right)\Big/\left(e\sqrt{(a+b)\sinh^2(e\,z)}\right)$$

01.20.21.4426.01

$$\int \sinh(2\,z)\left(\left(a\cosh^2(z)+b\sinh^2(z)\right)^{\frac{1}{n}}\right)^{r}\,dz == \frac{n\,(a-b+(a+b)\cosh(2\,z))\left(\left(a\cosh^2(z)+b\sinh^2(z)\right)^{\frac{1}{n}}\right)^{r}}{2\,(a+b)\,(n+r)}$$

Involving $\sinh(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4427.01

$$\int \sinh(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{2}\left(\frac{1}{d+2\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(-\frac{d}{2\,e}-\beta;-\beta,-\beta;-\frac{d}{2\,e}-\beta+1;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)-$$
$$\frac{1}{2\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{d}{2\,e}-\beta;-\beta,-\beta;\frac{d}{2\,e}-\beta+1;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)\right)$$

Involving $\cosh(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4428.01

$$\int \cosh(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{2\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{d}{2\,e}-\beta;-\beta,-\beta;\frac{d}{2\,e}-\beta+1;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)-$$
$$\frac{1}{d+2\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(-\frac{d}{2\,e}-\beta;-\beta,-\beta;-\frac{d}{2\,e}-\beta+1;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)\right)$$

Involving $\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4429.01

$$\int\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}\,dz == \frac{\sqrt{\cosh^2(e\,z)}\,\left((b+c)\sinh^2(e\,z)+a+c\right)^{\beta}\tanh(e\,z)}{e}$$
$$\left(\frac{(b+c)\sinh^2(e\,z)}{a+c}+1\right)^{-\beta}F_1\left(\frac{1}{2};\frac{1}{2},-\beta;\frac{3}{2};-\sinh^2(e\,z),-\frac{(b+c)\sinh^2(e\,z)}{a+c}\right)$$

01.20.21.4430.01

$$\int \sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\;dz ==$$

$$-\frac{i\cosh(e\,z)}{e\sqrt{\cosh^2(e\,z)}\;\sqrt{\frac{(b+c)\sinh^2(e\,z)+a+c}{a+c}}}E\left(i\sinh^{-1}(\sinh(e\,z))\,\middle|\,\frac{b+c}{a+c}\right)\sqrt{(b+c)\sinh^2(e\,z)+a+c}$$

01.20.21.4431.01

$$\int \frac{1}{\sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}}\,dz ==$$

$$-\frac{i\cosh(e\,z)}{e\sqrt{\cosh^2(e\,z)}\;\sqrt{(b+c)\sinh^2(e\,z)+a+c}}F\left(i\sinh^{-1}(\sinh(e\,z))\,\middle|\,\frac{b+c}{a+c}\right)\sqrt{\frac{(b+c)\sinh^2(e\,z)+a+c}{a+c}}$$

01.20.21.4432.01

$$\int \sinh(e\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}dz ==$$

$$\frac{\cosh(e\,z)\left((b+c)\cosh^2(e\,z)+a-b\right)^{\beta}}{e}\left(\frac{(b+c)\cosh^2(e\,z)}{a-b}+1\right)^{-\beta}{}_2F_1\left(\frac{1}{2},\,-\beta;\,\frac{3}{2};\,-\frac{(b+c)\cosh^2(e\,z)}{a-b}\right)$$

01.20.21.4433.01

$$\int \sinh(e\,z)\sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\;dz == \frac{1}{2\,e}\left(\sqrt{c\cosh^2(e\,z)+b\sinh^2(e\,z)+a}\;\cosh(e\,z)+\right.$$

$$\left.\frac{1}{\sqrt{b+c}}\left((a-b)\log\left(2\left(\sqrt{b+c}\;\cosh(e\,z)+\sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\right)\right)\right)\right)$$

01.20.21.4434.01

$$\int \frac{\sinh(e\,z)}{\sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}}\,dz == \frac{\log\left(2\left(\sqrt{b+c}\;\cosh(e\,z)+\sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\right)\right)}{\sqrt{b+c}\;e}$$

01.20.21.4435.01

$$\int \cosh(e\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}dz ==$$

$$\frac{\sinh(e\,z)\left((b+c)\sinh^2(e\,z)+a+c\right)^{\beta}}{e}\left(\frac{(b+c)\sinh^2(e\,z)}{a+c}+1\right)^{-\beta}{}_2F_1\left(\frac{1}{2},\,-\beta;\,\frac{3}{2};\,-\frac{(b+c)\sinh^2(e\,z)}{a+c}\right)$$

01.20.21.4436.01

$$\int \cosh(e\,z)\sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\;dz ==$$

$$\frac{1}{2\sqrt{b+c}\;e}\left((a+c)\log\left(2\left(\sqrt{b+c}\;\sinh(e\,z)+\sqrt{(b+c)\sinh^2(e\,z)+a+c}\right)\right)+\sqrt{b+c}\;\sinh(e\,z)\sqrt{(b+c)\sinh^2(e\,z)+a+c}\right)$$

01.20.21.4437.01

$$\int \frac{\cosh(e\,z)}{\sqrt{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}}\,dz == \frac{\log\left(2\left(\sqrt{b+c}\,\sinh(e\,z)+\sqrt{(b+c)\sinh^2(e\,z)+a+c}\right)\right)}{\sqrt{b+c}\,e}$$

Involving $\sinh(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4438.01

$$\int \sinh(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{2}\left(\frac{1}{d+2\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$F_1\left(-\frac{d}{2\,e}-\beta;-\beta,-\beta;-\frac{d}{2\,e}-\beta+1;\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)\Bigg)-$$
$$\frac{1}{2\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(\frac{d}{2\,e}-\beta;-\beta,-\beta;\frac{d}{2\,e}-\beta+1;\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)$$

Involving $\cosh(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4439.01

$$\int \cosh(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{2\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$F_1\left(\frac{d}{2\,e}-\beta;-\beta,-\beta;\frac{d}{2\,e}-\beta+1;\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)\Bigg)-$$
$$\frac{1}{d+2\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{d}{2\,e}-\beta;-\beta,-\beta;-\frac{d}{2\,e}-\beta+1;\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)$$

Involving $\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^\beta$

01.20.21.4440.01

$$\int \left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^\beta dz == -\frac{1}{e \beta}\left(2^{-2\beta-1}\left(1 - \frac{(a+2b+c)\, e^{2ez}}{a - c + 2\sqrt{b^2 - a c}}\right)^{-\beta}\right.$$
$$\left(\frac{e^{2ez}(a+2b+c)}{-a+c+2\sqrt{b^2-ac}} + 1\right)^{-\beta}\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2 + \left(1+e^{2ez}\right)\left(2b\left(-1+e^{2ez}\right) + c\left(1+e^{2ez}\right)\right)\right)\right)^\beta$$
$$\left.F_1\left(-\beta; -\beta, -\beta; 1-\beta; -\frac{(a+2b+c)\, e^{2ez}}{-a+c+2\sqrt{b^2-ac}}, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)\right)$$

Involving $\sinh(d z)\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^\beta$

01.20.21.4441.01

$$\int \sinh(d z)\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^\beta dz ==$$
$$\frac{1}{2}\left(\frac{1}{d + 2 e \beta}\left(4^{-\beta} e^{-dz}\left(1 - \frac{(a+2b+c)\, e^{2ez}}{a - c + 2\sqrt{b^2 - a c}}\right)^{-\beta}\left(\frac{e^{2ez}(a+2b+c)}{-a+c+2\sqrt{b^2-ac}} + 1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2 + \left(1+e^{2ez}\right)\left(2b\left(-1+e^{2ez}\right) + c\left(1+e^{2ez}\right)\right)\right)\right)^\beta$$
$$\left.F_1\left(-\frac{d}{2e} - \beta; -\beta, -\beta; -\frac{d}{2e} - \beta + 1; -\frac{(a+2b+c)\, e^{2ez}}{-a+c+2\sqrt{b^2-ac}}, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)\right) -$$
$$\frac{1}{2e\beta - d}\left(4^{-\beta} e^{dz}\left(1 - \frac{(a+2b+c)\, e^{2ez}}{a - c + 2\sqrt{b^2 - a c}}\right)^{-\beta}\left(\frac{e^{2ez}(a+2b+c)}{-a+c+2\sqrt{b^2-ac}} + 1\right)^{-\beta}\right.$$
$$\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2 + \left(1+e^{2ez}\right)\left(2b\left(-1+e^{2ez}\right) + c\left(1+e^{2ez}\right)\right)\right)\right)^\beta$$
$$\left.\left.F_1\left(\frac{d}{2e} - \beta; -\beta, -\beta; \frac{d}{2e} - \beta + 1; -\frac{(a+2b+c)\, e^{2ez}}{-a+c+2\sqrt{b^2-ac}}, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)\right)\right)$$

Involving $\cosh(d z)\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^\beta$

01.20.21.4442.01

$$\int \cosh(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{\beta}dz ==$$

$$\frac{1}{2}\left(-\frac{1}{2\,e\,\beta-d}\left(4^{-\beta}\,e^{d\,z}\left(1-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+2\,b+c)}{-a+c+2\sqrt{b^2-a\,c}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+\left(1+e^{2\,e\,z}\right)\left(2\,b\left(-1+e^{2\,e\,z}\right)+c\left(1+e^{2\,e\,z}\right)\right)\right)\right)^{\beta}$$
$$\left.F_1\left(\frac{d}{2\,e}-\beta;-\beta,-\beta;\frac{d}{2\,e}-\beta+1;-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{-a+c+2\sqrt{b^2-a\,c}},\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)\right)-$$
$$\frac{1}{d+2\,e\,\beta}\left(4^{-\beta}\,e^{-d\,z}\left(1-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+2\,b+c)}{-a+c+2\sqrt{b^2-a\,c}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+\left(1+e^{2\,e\,z}\right)\left(2\,b\left(-1+e^{2\,e\,z}\right)+c\left(1+e^{2\,e\,z}\right)\right)\right)\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{d}{2\,e}-\beta;-\beta,-\beta;-\frac{d}{2\,e}-\beta+1;-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{-a+c+2\sqrt{b^2-a\,c}},\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)\right)\right)$$

Involving functions of the direct function, hyperbolic and a power functions

Involving powers of the direct function, hyperbolic and a power functions

Involving sinh and power

Involving $z^{\alpha-1}\sinh(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.4443.01

$$\int z^{\alpha-1}\sinh(c\,z)\cosh^{\nu}(a\,z)\,dz == -2^{-\nu-1}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}((c\,z)^{\alpha}\,\Gamma(\alpha,-c\,z)-(-c\,z)^{\alpha}\,\Gamma(\alpha,c\,z))\,(1-\nu \bmod 2)\left(-c^2\,z^2\right)^{-\alpha}-$$
$$2^{-\nu-1}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}((-c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,((c+a\,(\nu-2\,s))\,z)^{-\alpha}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{-\alpha}\binom{\nu}{s}$$
$$\left(\left(((c+2\,a\,s-a\,\nu)\,z)^{\alpha}\,\Gamma(\alpha,(-c-2\,a\,s+a\,\nu)\,z)\,((c+a\,(\nu-2\,s))\,z)^{\alpha}-((-c-2\,a\,s+a\,\nu)\,z)^{\alpha}\,\Gamma(\alpha,(c+2\,a\,s-a\,\nu)\,z)\right.\right.$$
$$\left.((c+a\,(\nu-2\,s))\,z)^{\alpha}-\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{\alpha}\,\Gamma(\alpha,(c+a\,(\nu-2\,s))\,z)\right)((-c+2\,a\,s-a\,\nu)\,z)^{\alpha}+$$
$$\left.((c+a\,(\nu-2\,s))\,z)^{\alpha}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{\alpha}\,\Gamma(\alpha,(-c+2\,a\,s-a\,\nu)\,z)\right)/;\,\nu\in\mathbb{N}^{+}$$

01.20.21.4444.01

$$\int z^n \sinh(c\,z)\cosh^\nu(a\,z)\,dz == \frac{1}{2}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^\nu(a\,z)\,n!$$
$$\left(e^{c\,z}\sum_{p=0}^{n}\frac{(-1)^p\,z^{n-p}\,(c-a\,\nu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(\frac{c-a\,\nu}{2\,a},\ldots,\frac{c-a\,\nu}{2\,a},-\nu;\frac{c-a\,\nu}{2\,a}+1,\ldots,\frac{c-a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)-e^{-c\,z}\right.$$
$$\left.\sum_{p=0}^{n}\frac{(-1)^p\,z^{n-p}\,(-c-a\,\nu)^{-p-1}}{(n-p)!}\,{}_{p+2}F_{p+1}\left(\frac{-c-a\,\nu}{2\,a},\ldots,\frac{-c-a\,\nu}{2\,a},-\nu;\frac{-c-a\,\nu}{2\,a}+1,\ldots,\frac{-c-a\,\nu}{2\,a}+1;-e^{2\,a\,z}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh(c\,z+d)\cosh^\nu(a\,z)$

01.20.21.4445.01

$$\int z^{\alpha-1}\sinh(d+c\,z)\cosh^\nu(a\,z)\,dz == 2^{-\nu-1}\,z^\alpha\binom{\nu}{\frac{\nu}{2}}\left(e^{-d}\,(-c\,z)^\alpha\,\Gamma(\alpha,c\,z)-e^{d}\,(c\,z)^\alpha\,\Gamma(\alpha,-c\,z)\right)(1-\nu\bmod 2)\left(-c^2\,z^2\right)^{-\alpha}+$$
$$2^{-\nu-1}\,z^\alpha\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}((-c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,((c+a\,(\nu-2\,s))\,z)^{-\alpha}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{-\alpha}\binom{\nu}{s}\left(((-c+2\,a\,s-a\,\nu)\,z)^\alpha\right.$$
$$\left(-e^{d}\,((c+2\,a\,s-a\,\nu)\,z)^\alpha\,\Gamma(\alpha,(-c-2\,a\,s+a\,\nu)\,z)\,((c+a\,(\nu-2\,s))\,z)^\alpha+e^{-d}\,((-c-2\,a\,s+a\,\nu)\,z)^\alpha\right.$$
$$\left.\Gamma(\alpha,(c+2\,a\,s-a\,\nu)\,z)\,((c+a\,(\nu-2\,s))\,z)^\alpha+e^{-d}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^\alpha\Gamma(\alpha,(c+a\,(\nu-2\,s))\,z)\right)-$$
$$\left.e^{d}\,((c+a\,(\nu-2\,s))\,z)^\alpha\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^\alpha\Gamma(\alpha,(-c+2\,a\,s-a\,\nu)\,z)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4446.01

$$\int z^n\sinh(d+c\,z)\cosh^\nu(a\,z)\,dz == \frac{1}{2}\,e^{-d-c\,z}\left(1+e^{-2\,a\,z}\right)^{-\nu}\cosh^\nu(a\,z)\,n!$$
$$\left(e^{2\,d+2\,c\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c+a\,\nu}{2\,a},\ldots,-\frac{c+a\,\nu}{2\,a},-\nu;1-\frac{c+a\,\nu}{2\,a},\ldots,1-\frac{c+a\,\nu}{2\,a};-e^{-2\,a\,z}\right)-\right.$$
$$\left.\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-c)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{c-a\,\nu}{2\,a},\ldots,\frac{c-a\,\nu}{2\,a},-\nu;\frac{c-a\,\nu}{2\,a}+1,\ldots,\frac{c-a\,\nu}{2\,a}+1;-e^{-2\,a\,z}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh(c\,z)\cosh^\nu(a\,z+b)$

01.20.21.4447.01

$$\int z^{\alpha-1}\sinh(c\,z)\cosh^\nu(b+a\,z)\,dz == 2^{-\nu-1}\,z^\alpha\binom{\nu}{\frac{\nu}{2}}((-c\,z)^\alpha\,\Gamma(\alpha,c\,z)-(c\,z)^\alpha\,\Gamma(\alpha,-c\,z))\,(1-\nu\bmod 2)\left(-c^2\,z^2\right)^{-\alpha}+$$
$$2^{-\nu-1}\,z^\alpha\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}((-c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,((c+a\,(\nu-2\,s))\,z)^{-\alpha}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{-\alpha}\binom{\nu}{s}\left(((-c+2\,a\,s-a\,\nu)\,z)^\alpha\right.$$
$$\left(-e^{b\,(2\,s-\nu)}\,((c+2\,a\,s-a\,\nu)\,z)^\alpha\,\Gamma(\alpha,(-c-2\,a\,s+a\,\nu)\,z)\,((c+a\,(\nu-2\,s))\,z)^\alpha+e^{b\,\nu-2\,b\,s}\,((-c-2\,a\,s+a\,\nu)\,z)^\alpha\right.$$
$$\left.\Gamma(\alpha,(c+2\,a\,s-a\,\nu)\,z)\,((c+a\,(\nu-2\,s))\,z)^\alpha+e^{b\,(2\,s-\nu)}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^\alpha\Gamma(\alpha,(c+a\,(\nu-2\,s))\,z)\right)-$$
$$\left.e^{b\,\nu-2\,b\,s}\,((c+a\,(\nu-2\,s))\,z)^\alpha\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^\alpha\Gamma(\alpha,(-c+2\,a\,s-a\,\nu)\,z)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4448.01

$$\int z^n \sinh(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{2}\,e^{-c\,z}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\,n!$$
$$\left(e^{2\,c\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c+a\,\nu}{2\,a},\ldots,-\frac{c+a\,\nu}{2\,a},-\nu;1-\frac{c+a\,\nu}{2\,a},\ldots,1-\frac{c+a\,\nu}{2\,a};-e^{-2\,(b+a\,z)}\right)-\right.$$
$$\left.\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-c)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{c-a\,\nu}{2\,a},\ldots,\frac{c-a\,\nu}{2\,a},-\nu;\frac{c-a\,\nu}{2\,a}+1,\ldots,\frac{c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\sinh(c\,z+d)\cosh^{\nu}(a\,z+b)$

01.20.21.4449.01

$$\int z^{\alpha-1}\sinh(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == 2^{-\nu-1}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}\left(e^{-d}\,(-c\,z)^{\alpha}\,\Gamma(\alpha,c\,z)-e^{d}\,(c\,z)^{\alpha}\,\Gamma(\alpha,-c\,z)\right)(1-\nu\bmod 2)\left(-c^2\,z^2\right)^{-\alpha}+$$
$$2^{-\nu-1}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}((-c+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,((c+a\,(\nu-2\,s))\,z)^{-\alpha}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{-\alpha}\binom{\nu}{s}$$
$$\left(((-c+2\,a\,s-a\,\nu)\,z)^{\alpha}\left(-e^{d+b\,(2\,s-\nu)}\,((c+2\,a\,s-a\,\nu)\,z)^{\alpha}\,\Gamma(\alpha,(-c-2\,a\,s+a\,\nu)\,z)\,((c+a\,(\nu-2\,s))\,z)^{\alpha}+\right.\right.$$
$$e^{-d-2\,b\,s+b\,\nu}\,((-c-2\,a\,s+a\,\nu)\,z)^{\alpha}\,\Gamma(\alpha,(c+2\,a\,s-a\,\nu)\,z)\,((c+a\,(\nu-2\,s))\,z)^{\alpha}+$$
$$e^{b\,(2\,s-\nu)-d}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{\alpha}\,\Gamma(\alpha,(c+a\,(\nu-2\,s))\,z)\Big)-$$
$$\left.e^{d-2\,b\,s+b\,\nu}\,((c+a\,(\nu-2\,s))\,z)^{\alpha}\left(-(-c-2\,a\,s+a\,\nu)^2\,z^2\right)^{\alpha}\,\Gamma(\alpha,(-c+2\,a\,s-a\,\nu)\,z)\right)/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4450.01

$$\int z^n \sinh(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{1}{2}\,e^{-d-c\,z}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\,n!$$
$$\left(e^{2\,d+2\,c\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(c+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c+a\,\nu}{2\,a},\ldots,-\frac{c+a\,\nu}{2\,a},-\nu;1-\frac{c+a\,\nu}{2\,a},\ldots,1-\frac{c+a\,\nu}{2\,a};-e^{-2\,(b+a\,z)}\right)-\right.$$
$$\left.\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu-c)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{c-a\,\nu}{2\,a},\ldots,\frac{c-a\,\nu}{2\,a},-\nu;\frac{c-a\,\nu}{2\,a}+1,\ldots,\frac{c-a\,\nu}{2\,a}+1;-e^{-2\,(b+a\,z)}\right)\right)/;\ n\in\mathbb{N}$$

Involving $z^n\sinh\left(b\,z^r\right)\cosh^{\nu}(c\,z)$

01.20.21.4451.01

$$\int z^n \sinh\left(b\,z^2\right) \cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-\nu-2}\left(\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{\frac{c^2(\nu-2s)^2}{4b}} \binom{\nu}{s}\left(\sum_{q=0}^{n}(-1)^{n+1}\,2^{q-n}\,(c\,(\nu-2\,s))^{n-q}\,(2\,c\,s-c\,\nu-2\,b\,z)^{q+1}\left(\frac{(c\,(\nu-2\,s)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.\right.$$

$$\left.\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,c\,s+c\,\nu+2\,b\,z)^2}{4\,b}\right)+(-1)^{n+1}\sum_{q=0}^{n}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(-2\,c\,s+c\,\nu-2\,b\,z)^{q+1}\right.$$

$$\left.\left(\frac{(-2\,c\,s+c\,\nu-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,c\,s+c\,\nu-2\,b\,z)^2}{4\,b}\right)+\right.$$

$$e^{-\frac{c^2(\nu-2s)^2}{2b}}\sum_{q=0}^{n}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(2\,c\,s-c\,\nu-2\,b\,z)\,(c\,(\nu-2\,s)+2\,b\,z)^{q}\left(-\frac{(c\,(\nu-2\,s)+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,c\,s+c\,\nu+2\,b\,z)^2}{4\,b}\right)-e^{-\frac{c^2(\nu-2s)^2}{2b}}\sum_{q=0}^{n}2^{q-n}\,(c\,(\nu-2\,s))^{n-q}\right.$$

$$\left.\left.\left.\left(-\frac{(-2\,c\,s+c\,\nu-2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}(c\,(2\,s-\nu)+2\,b\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,c\,s+c\,\nu-2\,b\,z)^2}{4\,b}\right)\right)\right)\right.$$

$$b^{-n-1}+z^{n+1}\left(-b^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{\nu}{\frac{\nu}{2}}\left(\left(b\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-b\,z^2\right)-\left(-b\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,b\,z^2\right)\right)$$

$$\left.(\nu \bmod 2-1)\right)\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.4452.01

$$\int z^n \sinh\left(b\,\sqrt{z}\right)\cosh^{\nu}(c\,z)\,dz ==$$

$$2^{-\nu-2}\left(4\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2\,(n+1),\,-b\,\sqrt{z}\right)-\Gamma\left(2\,(n+1),\,b\,\sqrt{z}\right)\right)(\nu \bmod 2-1)\,b^{-2\,n-2}+4^{-n}\,c^{-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{b^2}{c\,(8\,s-4\,\nu)}}(\nu-2\,s)^{-2\,n-2}\binom{\nu}{s}\right.$$

$$\left.\left(-e^{\frac{b^2}{4\,c\,s-2\,c\,\nu}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(-b)^{-h-k+2\,n}\left(\frac{\left(b+2\,c\,(2\,s-\nu)\,\sqrt{z}\right)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-h-k-1)}\left(2\,c\,(\nu-2\,s)\,\sqrt{z}-b\right)^{h+k}\right.\right.$$

$$\left.\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,c\,(2\,s-\nu)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b+2\,c\,(2\,s-\nu)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,\nu)}\right)-\right.$$

$$2\,c\,(2\,s-v)\sqrt{\frac{\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)+$$

$$e^{\frac{b^2}{4\,c\,s-2\,c\,v}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+$$

$$2\,c\sqrt{\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(b\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\,(2\,s-v)$$

$$\sqrt{-\frac{\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)-$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(2\,c\,(2\,s-v)\,\sqrt{z}\;-b\right)^{h+k}\left(-\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)-2\,c\,(v-2\,s)$$

$$\sqrt{-\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Big/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(b z^r + e) \cosh^v(c z)$

01.20.21.4453.01

$$\int z^n \sinh\left(b z^2 + e\right) \cosh^v(c z)\, dz ==$$

$$2^{-v-2}\left(\left(\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{\frac{c^2 (v-2s)^2 - 4be}{4b}} \binom{v}{s}\left(\left(-1\right)^{n+1} \sum_{q=0}^{n} 2^{q-n} \left(c\left(v-2s\right)\right)^{n-q} \left(2cs - cv - 2bz\right)^{q+1} \left(\frac{\left(c\left(v-2s\right)+2bz\right)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}\right.\right.\right.$$

$$\Gamma\left(\frac{q+1}{2}, \frac{\left(-2cs+cv+2bz\right)^2}{4b}\right) + \left(-1\right)^{n+1} \sum_{q=0}^{n} \left(c\left(s-\frac{v}{2}\right)\right)^{n-q} \left(-2cs+cv-2bz\right)^{q+1}$$

$$\left(\frac{\left(-2cs+cv-2bz\right)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{\left(-2cs+cv-2bz\right)^2}{4b}\right) +$$

$$e^{2e - \frac{c^2 (v-2s)^2}{2b}} \sum_{q=0}^{n} \left(c\left(s-\frac{v}{2}\right)\right)^{n-q} \left(2cs - cv - 2bz\right) \left(c\left(v-2s\right)+2bz\right)^q \left(-\frac{\left(c\left(v-2s\right)+2bz\right)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{\left(-2cs+cv+2bz\right)^2}{4b}\right) - e^{2e - \frac{c^2 (v-2s)^2}{2b}} \sum_{q=0}^{n} 2^{q-n} \left(c\left(v-2s\right)\right)^{n-q}$$

$$\left.\left.\left.\left(-\frac{\left(-2cs+cv-2bz\right)^2}{b}\right)^{\frac{1}{2}(-q-1)} \left(c\left(2s-v\right)+2bz\right)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{\left(-2cs+cv-2bz\right)^2}{4b}\right)\right)\right)\right.$$

$$b^{-n-1} + e^{-e} z^{n+1} \left(-b^2 z^4\right)^{\frac{1}{2}(-n-1)} \binom{v}{\frac{v}{2}} \left(e^{2e} \left(bz^2\right)^{\frac{n+1}{2}} \Gamma\left(\frac{n+1}{2}, -bz^2\right) - \left(-bz^2\right)^{\frac{n+1}{2}} \Gamma\left(\frac{n+1}{2}, bz^2\right)\right)$$

$$\left.(v \bmod 2 - 1)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.4454.01

$$\int z^n \sinh\left(\sqrt{z}\ b + e\right) \cosh^v(c z)\, dz ==$$

$$2^{-v-2}\left(4 e^{-e} \binom{v}{\frac{v}{2}} \left(e^{2e}\, \Gamma\left(2\left(n+1\right), -b\sqrt{z}\right) - \Gamma\left(2\left(n+1\right), b\sqrt{z}\right)\right) (v \bmod 2 - 1)\, b^{-2n-2} + 4^{-n} c^{-2n-2} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-\frac{b^2 + 4ce(2s-v)}{c(8s-4v)}}\right.$$

$$\left(v-2s\right)^{-2n-2} \binom{v}{s} \left(-e^{\frac{b^2}{4cs-2cv}} \sum_{k=0}^{n} \sum_{h=0}^{k} \left(-1\right)^{k-h} 4^k \left(-b\right)^{-h-k+2n} \left(\frac{\left(b + 2c\left(2s-v\right)\sqrt{z}\right)^2}{c\left(2s-v\right)}\right)^{\frac{1}{2}(-h-k-1)} \left(2c\left(v-2s\right)\sqrt{z}\ -\right.\right.$$

$$b\Big)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b+2c(2s-v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)-\right.$$

$$\left.2c(2s-v)\sqrt{\frac{\left(b+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)+$$

$$e^{\frac{b^2}{4cs-2cv}+2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2c(v-2s)\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)+\right.$$

$$\left.2c\sqrt{\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}}\ (v-2s)\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)+$$

$$e^{2e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2c(2s-v)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2c(2s-v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)+\right.$$

$$\left.2c(2s-v)\sqrt{-\frac{\left(b+2c(2s-v)\sqrt{z}\right)^2}{c(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)-$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(2c(2s-v)\sqrt{z}-b\right)^{h+k}\left(-\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)-2c(v-2s)\right.$$

$$\left.\sqrt{\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}}\ \left(\qquad\qquad\frac{\left(b+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)\right)\Big)\Big)$$

Involving $z^n \sinh(b z^r + d z) \cosh^v(c z)$

01.20.21.4455.01

$$\int z^n \sinh\left(b z^2 + d z\right) \cosh^v(c z)\, dz ==$$

$$2^{-v-2}\left(b^{-n-1} e^{-\frac{d^2}{4b}} \binom{v}{\frac{v}{2}} (v \bmod 2 - 1)\left(\sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2 b z)^{q+1}\left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b}\right) - e^{\frac{d^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2 b z)^{q+1}\left(\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d+2bz)^2}{4b}\right)\right) + b^{-n-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{\frac{d^2 - 2c(2s+v)d + c^2(v-2s)^2}{4b}} \binom{v}{s}\left((-1)^{n+1} e^{\frac{2cds}{b}} \sum_{q=0}^{n} 2^{q-n} (d + 2cs - cv)^{n-q} (-d - 2cs + cv - 2bz)^{q+1}\left(\frac{(-d-2cs+cv-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-d-2cs+cv-2bz)^2}{4b}\right) - e^{\frac{cdv}{b}}\left((-1)^n \sum_{q=0}^{n} 2^{q-n} (d - 2cs + cv)^{n-q} (-d + 2cs - cv - 2bz)^{q+1}\left(\frac{(d + c(v-2s) + 2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d-2cs+cv+2bz)^2}{4b}\right) + e^{-\frac{(d-2cs+cv)^2}{2b}} \sum_{q=0}^{n}\left(-\frac{d}{2} + cs - \frac{cv}{2}\right)^{n-q}\left(-\frac{(d-2cs+cv+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} (d + c(v-2s) + 2bz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-2cs+cv+2bz)^2}{4b}\right) + e^{-\frac{d^2+c^2(v-2s)^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-d - 2cs + cv)^{n-q}\left(-\frac{(-d-2cs+cv-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} (d + 2cs - cv + 2bz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-d-2cs+cv-2bz)^2}{4b}\right)\right)\right)\Big/; n \in \mathbb{N} \wedge v \in \mathbb{N}^+$$

01.20.21.4456.01

$$\int z^n \sinh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}(c\,z)\,dz == 2^{-\nu-2}\left(4^{-n}\,d^{-2\,n-2}\,e^{-\frac{b^2}{4\,d}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2 - 1)\right.$$

$$\left(e^{\frac{b^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-b-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\right.\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right) - 2\,d\sqrt{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg) -$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right) + 2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\Bigg) -$$

$$4^{-n}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{b^2}{4\,d+8\,c\,s-4\,c\,\nu}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(\frac{\left(b+2\,(d+2\,c\,s-c\,\nu)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left(2\,(-d-2\,c\,s+c\,\nu)\,\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d+2\,c\,s-c\,\nu)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.\left.\frac{\left(b+2\,(d+2\,c\,s-c\,\nu)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,\nu}\right) - 2\,(d+2\,c\,s-c\,\nu)\sqrt{\left(\frac{\left(b+2\,(d+2\,c\,s-c\,\nu)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,\nu}\right)}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,(d+2\,c\,s-c\,\nu)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,\nu}\right)\right)\right)(-d-2\,c\,s+c\,\nu)^{-2\,(n+1)} + e^{-\frac{b^2}{4\,(d-2\,c\,s+c\,\nu)}}$$

$$\left(-(d-2\,c\,s+c\,\nu)^2\right)^{-2\,n-1}\left((-d+2\,c\,s-c\,\nu)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d-2\,c\,s+c\,\nu)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(-\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)+2\sqrt{\left(-\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)}$$

$$\left.(d-2\,c\,s+c\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)\right)-$$

$$e^{\frac{b^2}{2\,(d-2\,c\,s+c\,v)}}\,(d-2\,c\,s+c\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-b-2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)-2\,(d-2\,c\,s+c\,v)\right.$$

$$\left.\sqrt{\left(\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)}\,\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)\right)-$$

$$e^{-\frac{b^2}{4\,d+8\,c\,s-4\,c\,v}}\,(d+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,v}\right)+2\sqrt{\left(-\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,v}\right)}$$

$$\left.\left.(d+2\,c\,s-c\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,v}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

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$$\int z^n \sinh\left(b z^2 + d z + e\right) \cosh^{\nu}(c z)\, dz == 2^{-\nu-2}$$

$$\left(e^{-\frac{d^2}{4b}-e} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1)\ b^{-n-1} \left(e^{2e} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz)^{q+1} \left(-\frac{(d+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b} \right) - \right.\right.$$

$$e^{\frac{d^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d+2bz)^{q+1} \left(\frac{(d+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d+2bz)^2}{4b} \right) +$$

$$b^{-n-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{\frac{d^2-2c(2s+\nu)d+c^2(\nu-2s)^2-4be}{4b}} \binom{\nu}{s} \left((-1)^{n+1} e^{\frac{2cds}{b}} \sum_{q=0}^{n} 2^{q-n} (d+2cs-c\nu)^{n-q} (-d-2cs+c\nu-2bz)^{q+1} \right.$$

$$\left(\frac{(-d-2cs+c\nu-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-d-2cs+c\nu-2bz)^2}{4b} \right) -$$

$$e^{\frac{cd\nu}{b}} \left((-1)^n \sum_{q=0}^{n} 2^{q-n} (d-2cs+c\nu)^{n-q} (-d+2cs-c\nu-2bz)^{q+1} \left(\frac{(d+c(\nu-2s)+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d-2cs+c\nu+2bz)^2}{4b} \right) +$$

$$e^{2e-\frac{(d-2cs+c\nu)^2}{2b}} \sum_{q=0}^{n} \left(-\frac{d}{2} + cs - \frac{c\nu}{2} \right)^{n-q} \left(-\frac{(d-2cs+c\nu+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$(d+c(\nu-2s)+2bz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-2cs+c\nu+2bz)^2}{4b} \right) +$$

$$e^{-\frac{d^2}{2b}+2e-\frac{c^2(\nu-2s)^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-d-2cs+c\nu)^{n-q} \left(-\frac{(-d-2cs+c\nu-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\left.(d+2cs-c\nu+2bz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-d-2cs+c\nu-2bz)^2}{4b} \right) \right) \right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

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$$\int z^n \sinh\left(\sqrt{z}\ b + e + d z\right) \cosh^{\nu}(c z)\, dz == 2^{-\nu-2} \left(4^{-n} d^{-2n-2} e^{-\frac{b^2+4de}{4d}} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \right.$$

$$\left(e^{\frac{b^2}{2d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b)^{-h-k+2n} \left(-b - 2d\sqrt{z} \right)^{h+k} \left(\frac{\left(b + 2d\sqrt{z} \right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b + 2d\sqrt{z} \right) \Gamma\left(\right. \right. \right. \right.$$

$$\frac{1}{2}(h+k+1),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\Bigg)-2\,d\sqrt{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)-$$

$$4^{-n}\,e^{e}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-2\,e}\Bigg(e^{\frac{b^2}{4\,d+8\,c\,s-4\,c\,v}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(-d-2\,c\,s+c\,v)\,\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.$$

$$\left.\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,v}\right)-2\,(d+2\,c\,s-c\,v)\sqrt{\left(\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,v}\right)}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,v}\right)\Bigg)\Bigg)(-d-2\,c\,s+c\,v)^{-2\,(n+1)}+$$

$$e^{-\frac{b^2}{4\,(d-2\,c\,s+c\,v)}}\left(-(d-2\,c\,s+c\,v)^2\right)^{-2\,n-1}\Bigg(e^{2\,e}\,(-d+2\,c\,s-c\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}$$

$$\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(b\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)+$$

$$2\sqrt{\left(-\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)}\,(d-2\,c\,s+c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.-\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)\Bigg)-e^{\frac{b^2}{2\,(d-2\,c\,s+c\,v)}}\,(d-2\,c\,s+c\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-b)^{-h-k+2\,n}\left(-b-2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)-$$

$$2\,(d-2\,c\,s+c\,v)\sqrt{\left(\frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{d-2\,c\,s+c\,v}\right)}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b+2\,(d-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,c\,s+c\,v)}\right)\right)\Bigg)\Bigg)-$$

$$e^{-\frac{b^2}{4\,d+8\,c\,s-4\,c\,v}}\,(d+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,v}\right)+2\sqrt{\left(-\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{d+2\,c\,s-c\,v}\right)}$$

$$\left.\left.(d+2\,c\,s-c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(b+2\,(d+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,d+8\,c\,s-4\,c\,v}\right)\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r\right) \cosh^v(f\,z+g)$

01.20.21.4459.01

$$\int z^n \sinh\left(b\,z^2\right) \cosh^{\nu}(g+f\,z)\,dz ==$$

$$2^{-\nu-2}\left(z^{n+1}\left(-b^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{\nu}{\frac{\nu}{2}}\left(\left(b\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-b\,z^2\right)-\left(-b\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,b\,z^2\right)\right)(\nu \bmod 2-1)-\right.$$

$$b^{-n-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{\frac{f^2(\nu-2s)^2-4bg(2s+\nu)}{4b}}\binom{\nu}{s}\left((-1)^n e^{4gs}\sum_{q=0}^{n}2^{q-n}(f(\nu-2s))^{n-q}(2fs-f\nu-2bz)^{q+1}\right.$$

$$\left(\frac{(f(\nu-2s)+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2fs+f\nu+2bz)^2}{4b}\right)+$$

$$(-1)^n e^{2g\nu}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)\right)^{n-q}(-2fs+f\nu-2bz)^{q+1}\left(\frac{(-2fs+f\nu-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\,\frac{(-2fs+f\nu-2bz)^2}{4b}\right)-e^{-\frac{f^2(\nu-2s)^2}{2b}+2g\nu}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)\right)^{n-q}(2fs-f\nu-2bz)$$

$$(f(\nu-2s)+2bz)^q\left(-\frac{(f(\nu-2s)+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2fs+f\nu+2bz)^2}{4b}\right)+$$

$$e^{-\frac{f^2(\nu-2s)^2}{2b}+4gs}\sum_{q=0}^{n}2^{q-n}(f(\nu-2s))^{n-q}\left(-\frac{(-2fs+f\nu-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}(f(2s-\nu)+2bz)^{q+1}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2fs+f\nu-2bz)^2}{4b}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4460.01

$$\int z^n \sinh\left(\sqrt{z}\;b\right)\cosh^{\nu}(g+f\,z)\,dz == 2^{-\nu-2}$$

$$\left(4\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2(n+1),\,-b\sqrt{z}\right)-\Gamma\left(2(n+1),\,b\sqrt{z}\right)\right)(\nu \bmod 2-1)\,b^{-2n-2}+4^{-n}f^{-2n-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{b^2+4f(2s-\nu)g(2s+\nu)}{f(8s-4\nu)}}(\nu-2s)^{-2n-2}\right.$$

$$\binom{\nu}{s}\left(-e^{\frac{b^2}{4fs-2f\nu}+2g\nu}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(\frac{\left(b+2f(2s-\nu)\sqrt{z}\right)^2}{f(2s-\nu)}\right)^{\frac{1}{2}(-h-k-1)}\left(2f(\nu-2s)\sqrt{z}-b\right)^{h+k}\right.$$

$$\left.\left.\binom{k}{h}\binom{n}{k}\left(b\left(b+2f(2s-\nu)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b+2f(2s-\nu)\sqrt{z}\right)^2}{f(8s-4\nu)}\right)-\right.\right.\right.$$

$$2\,f\,(2\,s-v)\sqrt{\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\Bigg)+$$

$$e^{\frac{b^2}{4\,f\,s-2\,f\,v}+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$2\,f\sqrt{\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\Bigg)+$$

$$e^{4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$2\,f\,(2\,s-v)\sqrt{-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\Bigg)-$$

$$e^{4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(2\,f\,(2\,s-v)\,\sqrt{z}\;-b\right)^{h+k}\left(-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)-2\,f\,(v-2\,s)$$

$$\sqrt{-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(b z^r + e) \cosh^v(f z + g)$

01.20.21.4461.01

$$\int z^n \sinh\left(b z^2 + e\right) \cosh^v(g + f z)\, dz ==$$

$$2^{-v-2}\left(e^{-e} z^{n+1} \left(-b^2 z^4\right)^{\frac{1}{2}(-n-1)} \binom{v}{\frac{v}{2}}\left(e^{2e} \left(b z^2\right)^{\frac{n+1}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) - \left(-b z^2\right)^{\frac{n+1}{2}} \Gamma\left(\frac{n+1}{2}, b z^2\right)\right)(v \bmod 2 - 1) -\right.$$

$$b^{-n-1} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{\frac{f^2 (v-2s)^2 - 4b(e+g(2s+v))}{4b}} \binom{v}{s}\left((-1)^n e^{4gs} \sum_{q=0}^{n} 2^{q-n} (f(v-2s))^{n-q} (2fs - fv - 2bz)^{q+1}\right.$$

$$\left(\frac{(f(v-2s)+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2fs+fv+2bz)^2}{4b}\right) +$$

$$(-1)^n e^{2gv} \sum_{q=0}^{n} \left(f\left(s - \frac{v}{2}\right)\right)^{n-q} (-2fs + fv - 2bz)^{q+1} \left(\frac{(-2fs+fv-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(-2fs+fv-2bz)^2}{4b}\right) - e^{-\frac{f^2(v-2s)^2}{2b} + 2e + 2gv} \sum_{q=0}^{n} \left(f\left(s - \frac{v}{2}\right)\right)^{n-q} (2fs - fv - 2bz)$$

$$(f(v-2s)+2bz)^q \left(-\frac{(f(v-2s)+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2fs+fv+2bz)^2}{4b}\right) +$$

$$e^{-\frac{f^2(v-2s)^2}{2b} + 2e + 4gs} \sum_{q=0}^{n} 2^{q-n} (f(v-2s))^{n-q} \left(-\frac{(-2fs+fv-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} (f(2s-v) + 2bz)^{q+1}$$

$$\left.\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2fs+fv-2bz)^2}{4b}\right)\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.4462.01

$$\int z^n \sinh\left(\sqrt{z}\, b + e\right) \cosh^v(g + f z)\, dz ==$$

$$2^{-v-2}\left(4 e^{-e} \binom{v}{\frac{v}{2}}\left(e^{2e} \Gamma\left(2(n+1), -b\sqrt{z}\right) - \Gamma\left(2(n+1), b\sqrt{z}\right)\right)(v \bmod 2 - 1)\, b^{-2n-2} + 4^{-n} f^{-2n-2} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-\frac{b^2 + 4f(2s-v)(e+g(2s+v))}{f(8s-4v)}}\right.$$

$$(v-2s)^{-2n-2} \binom{v}{s}\left(-e^{\frac{b^2}{4fs-2fv} + 2gv} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b)^{-h-k+2n} \left(\frac{\left(b + 2f(2s-v)\sqrt{z}\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)} \left(2f(v-2s)\right.\right.$$

$$\left(\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)-\right.$$

$$\left.2\,f\,(2\,s-v)\sqrt{\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{b^2}{4\,f\,s-2\,f\,v}+2\,e+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+\right.$$

$$\left.2\,f\sqrt{\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)+$$

$$e^{2\,e+4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+\right.$$

$$\left.2\,f\,(2\,s-v)\sqrt{-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)-$$

$$e^{4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(2\,f\,(2\,s-v)\,\sqrt{z}-b\right)^{h+k}\left(-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)-2\,f\,(v-2\,s)\right.$$

$$\left.\sqrt{\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}\;\left(\frac{1}{}\right.\right.\left.\left.\left(b+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2\right)\right)\right)$$

Involving $z^n \sinh(b z^r + d z) \cosh^v(f z + g)$

01.20.21.4463.01

$$\int z^n \sinh\left(b z^2 + d z\right) \cosh^v(g + f z)\, dz ==$$

$$2^{-v-2}\left(e^{-\frac{d^2}{4b}}\binom{v}{\frac{v}{2}}(v \bmod 2 - 1)\, b^{-n-1}\left(\sum_{q=0}^{n} 2^{q-n}(-d)^{n-q}(d+2bz)^{q+1}\left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b}\right) - e^{\frac{d^2}{2b}}\sum_{q=0}^{n} 2^{q-n}(-d)^{n-q}(d+2bz)^{q+1}\left(\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(d+2bz)^2}{4b}\right)\right) + b^{-n-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{\frac{d^2-2f(2s+v)d+f^2(v-2s)^2-4b(2gs+gv)}{4b}}\binom{v}{s}\left((-1)^{n+1} e^{\frac{2dfs}{b}+2gv}\sum_{q=0}^{n} 2^{q-n}(d+2fs-fv)^{n-q}(-d-2fs+fv-2bz)^{q+1}\left(\frac{(-d-2fs+fv-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(-d-2fs+fv-2bz)^2}{4b}\right) - e^{\frac{dfv}{b}}\left((-1)^n e^{4gs}\sum_{q=0}^{n} 2^{q-n}(d-2fs+fv)^{n-q}(-d+2fs-fv-2bz)^{q+1}\left(\frac{(d+f(v-2s)+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, \frac{(d-2fs+fv+2bz)^2}{4b}\right) + e^{2gv-\frac{(d-2fs+fv)^2}{2b}}\sum_{q=0}^{n}\left(-\frac{d}{2}+fs-\frac{fv}{2}\right)^{n-q}\left(-\frac{(d-2fs+fv+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}(d+f(v-2s)+2bz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(d-2fs+fv+2bz)^2}{4b}\right) + e^{-\frac{d^2}{2b}+4gs-\frac{f^2(v-2s)^2}{2b}}\sum_{q=0}^{n} 2^{q-n}(-d-2fs+fv)^{n-q}\left(-\frac{(-d-2fs+fv-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}(d+2fs-fv+2bz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(-d-2fs+fv-2bz)^2}{4b}\right)\right)\right)\Big/; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.4464.01

$$\int z^n \sinh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}(g + f\,z)\,dz ==$$

$$2^{-\nu-2}\left(-4^{-n}\,e^{-\frac{b^2}{4d}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2 - 1)\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2n}\left(b + 2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(b + 2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) + \right.$$

$$\left.2\sqrt{-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right) - e^{\frac{b^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}$$

$$\left(-b - 2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b + 2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) - \right.$$

$$\left.\left.\left.2\,d\sqrt{\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2n-2} - $$

$$4^{-n}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{2gs-g\nu}\binom{\nu}{s}\left(e^{\frac{b^2}{4d+8fs-4f\nu}+2g(\nu-2s)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2n}\left(\frac{\left(b + 2\,(d + 2\,f\,s - f\,\nu)\,\sqrt{z}\right)^2}{d + 2\,f\,s - f\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left(2\,(-d - 2\,f\,s + f\,\nu)\,\sqrt{z} - b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b + 2\,(d + 2\,f\,s - f\,\nu)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b + 2\,(d + 2\,f\,s - f\,\nu)\,\sqrt{z}\right)^2}{4\,d + 8\,f\,s - 4\,f\,\nu}\right) - 2\,(d + 2\,f\,s - f\,\nu)$$

$$\left.\left.\left.\sqrt{\frac{\left(b + 2\,(d + 2\,f\,s - f\,\nu)\,\sqrt{z}\right)^2}{d + 2\,f\,s - f\,\nu}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b + 2\,(d + 2\,f\,s - f\,\nu)\,\sqrt{z}\right)^2}{4\,d + 8\,f\,s - 4\,f\,\nu}\right)\right)\right)$$

$$(-d - 2\,f\,s + f\,\nu)^{-2(n+1)} + e^{-\frac{b^2}{4(d-2fs+f\nu)}-4gs}\left(-(d - 2\,f\,s + f\,\nu)^2\right)^{-2n-1}$$

$$\left(e^{2 g v} (-d+2 f s-f v)^{2 n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2 n} \left(b+2 (d-2 f s+f v) \sqrt{z}\right)^{h+k}\right.$$

$$\left(-\frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{d-2 f s+f v}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b+2 (d-2 f s+f v) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{4 (d-2 f s+f v)}\right)+2 (d-2 f s+f v)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{4 (d-2 f s+f v)}\right) \sqrt{-\frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{d-2 f s+f v}}\right)\right)-$$

$$e^{\frac{b^2}{2 (d-2 f s+f v)}+4 g s} (d-2 f s+f v)^{2 n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b)^{-h-k+2 n} \left(-b-2 (d-2 f s+f v) \sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{d-2 f s+f v}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b+2 (d-2 f s+f v) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{4 (d-2 f s+f v)}\right)-2 (d-2 f s+f v)$$

$$\left.\left.\sqrt{\frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{d-2 f s+f v}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b+2 (d-2 f s+f v) \sqrt{z}\right)^2}{4 (d-2 f s+f v)}\right)\right)\right)-$$

$$e^{-\frac{b^2}{4 d+8 f s-4 f v}} (d+2 f s-f v)^{-2 (n+1)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k b^{-h-k+2 n} \left(b+2 (d+2 f s-f v) \sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2 (d+2 f s-f v) \sqrt{z}\right)^2}{d+2 f s-f v}\right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b+2 (d+2 f s-f v) \sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b+2 (d+2 f s-f v) \sqrt{z}\right)^2}{4 d+8 f s-4 f v}\right)+2 \sqrt{-\frac{\left(b+2 (d+2 f s-f v) \sqrt{z}\right)^2}{d+2 f s-f v}}$$

$$\left.\left.\left(1 \quad \left(b+2 (d+2 f s-f v) \sqrt{z}\right)^2\right)\right)\right)$$

Involving $z^n \sinh(b z^r + d z + e) \cosh^v(f z + g)$

01.20.21.4465.01

$$\int z^n \sinh\left(b z^2 + d z + e\right) \cosh^v(g + f z)\, dz == 2^{-v-2}$$

$$\left(e^{-\frac{d^2}{4b}-e} \binom{v}{\frac{v}{2}} (v \bmod 2 - 1)\, b^{-n-1} \left(e^{2e} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2bz)^{q+1} \left(-\frac{(d+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d+2bz)^2}{4b} \right) - \right.\right.$$

$$\left. e^{\frac{d^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (d + 2bz)^{q+1} \left(\frac{(d+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d+2bz)^2}{4b} \right) \right) +$$

$$b^{-n-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{\frac{d^2 - 2f(2s+v)d + f^2(v-2s)^2 - 4b(e+2gs+gv)}{4b}} \binom{v}{s} \left((-1)^{n+1} e^{\frac{2dfs}{b}+2gv} \sum_{q=0}^{n} 2^{q-n} (d + 2fs - fv)^{n-q} (-d - 2fs + fv - 2bz)^{q+1} \right.$$

$$\left(\frac{(-d-2fs+fv-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-d-2fs+fv-2bz)^2}{4b} \right) -$$

$$e^{\frac{dfv}{b}} \left(-(-1)^{n+1} e^{4gs} \sum_{q=0}^{n} 2^{q-n} (d - 2fs + fv)^{n-q} (-d + 2fs - fv - 2bz)^{q+1} \right.$$

$$\left(\frac{(d + f(v-2s) + 2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(d-2fs+fv+2bz)^2}{4b} \right) +$$

$$e^{-\frac{(d-2fs+fv)^2}{2b}+2e+2gv} \sum_{q=0}^{n} \left(-\frac{d}{2} + fs - \frac{fv}{2} \right)^{n-q} \left(-\frac{(d-2fs+fv+2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$(d + f(v-2s) + 2bz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(d-2fs+fv+2bz)^2}{4b} \right) +$$

$$e^{-\frac{d^2}{2b}+2e+4gs-\frac{f^2(v-2s)^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-d - 2fs + fv)^{n-q} \left(-\frac{(-d-2fs+fv-2bz)^2}{b} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\left. (d + 2fs - fv + 2bz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-d-2fs+fv-2bz)^2}{4b} \right) \right) \right) \right) \Big/ ; n \in \mathbb{N} \wedge v \in \mathbb{N}^+$$

01.20.21.4466.01

$$\int z^n \sinh\left(\sqrt{z}\ b+e+d\,z\right)\cosh^{\nu}(g+f\,z)\,dz ==$$

$$2^{-\nu-2}\left(-4^{-n}\,e^{-\frac{b^2+4\,d\,e}{4\,d}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)-e^{\frac{b^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}$$

$$\left(-b-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.\left.\left.2\,d\sqrt{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)d^{-2\,n-2}-4^{-n}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{e+2\,g\,s-g\,\nu}\binom{\nu}{s}\left(e^{-2\,e}\left(e^{\frac{b^2}{4\,d+8\,f\,s-4\,f\,\nu}+2\,g\,(\nu-2\,s)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(\frac{\left(b+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.\right.$$

$$\left(2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.\frac{\left(b+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,\nu}\right)-2\,(d+2\,f\,s-f\,\nu)\sqrt{\frac{\left(b+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,\nu}}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,\nu}\right)\right)\right)(-d-2\,f\,s+f\,\nu)^{-2\,(n+1)}+$$

$$e^{-\frac{b^2}{4(d-2fs+fv)}-4gs}\left(-(d-2fs+fv)^2\right)^{-2n-1}\left(e^{2e+2gv}(-d+2fs-fv)^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\right.$$

$$4^k b^{-h-k+2n}\left(b+2(d-2fs+fv)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{d-2fs+fv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left(b\left(b+2(d-2fs+fv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{4(d-2fs+fv)}\right)+\right.$$

$$2\sqrt{-\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{d-2fs+fv}}\,(d-2fs+fv)$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{4(d-2fs+fv)}\right)\right)-e^{\frac{b^2}{2(d-2fs+fv)}+4gs}$$

$$(d-2fs+fv)^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(-b-2(d-2fs+fv)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{d-2fs+fv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\left(b+2(d-2fs+fv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{4(d-2fs+fv)}\right)-\right.$$

$$2(d-2fs+fv)\sqrt{\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{d-2fs+fv}}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+2(d-2fs+fv)\sqrt{z}\right)^2}{4(d-2fs+fv)}\right)\right)\right)\right)-$$

$$e^{-\frac{b^2}{4d+8fs-4fv}}(d+2fs-fv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2(d+2fs-fv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)+2\sqrt{-\frac{\left(b+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}$$

$$\left.\left.(d+2\,f\,s-f\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(b\,z)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.4467.01

$$\int z^n \sinh(b\,z)\cosh^{\nu}\left(c\,z^2\right)dz==$$

$$2^{-\nu-2}\left(2\,b^{-n-1}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,\,-b\,z)+\Gamma(n+1,\,b\,z)\right)(1-\nu\bmod 2)-c^{-n-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{b^2}{c\,(8\,s-4\,\nu)}}\,(\nu-2\,s)^{-n-1}\binom{\nu}{s}\left(-e^{\frac{b^2}{c\,(4\,s-2\,\nu)}}\right.\right.$$

$$\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\left(\frac{\left(b+4\,c\,s\,z-2\,c\,\nu\,z\right)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\left(2\,c\,(\nu-2\,s)\,z-b\right)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{\left(b+4\,c\,s\,z-2\,c\,\nu\,z\right)^2}{c\,(8\,s-4\,\nu)}\right)-$$

$$e^{\frac{b^2}{4\,c\,s-2\,c\,\nu}}\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\left(-b+4\,c\,s\,z-2\,c\,\nu\,z\right)\left(b+2\,c\,(\nu-2\,s)\,z\right)^q\left(\frac{\left(b+2\,c\,(\nu-2\,s)\,z\right)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\frac{\left(b-4\,c\,s\,z+2\,c\,\nu\,z\right)^2}{8\,c\,s-4\,c\,\nu}\right)+(-1)^n\sum_{q=0}^{n}2^{q-n}\,b^{n-q}\left(-b+4\,c\,s\,z-2\,c\,\nu\,z\right)^{q+1}\left(-\frac{\left(b+2\,c\,(\nu-2\,s)\,z\right)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{\left(b-4\,c\,s\,z+2\,c\,\nu\,z\right)^2}{8\,c\,s-4\,c\,\nu}\right)-(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-b)^{n-q}\left(b+4\,c\,s\,z-2\,c\,\nu\,z\right)^{q+1}$$

$$\left.\left.\left(-\frac{\left(b+4\,c\,s\,z-2\,c\,\nu\,z\right)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{\left(b+4\,c\,s\,z-2\,c\,\nu\,z\right)^2}{8\,c\,s-4\,c\,\nu}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4468.01

$$\int z^n \sinh(b\,z)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz==$$

$$-2^{-\nu-2}\left(2\,b^{-n-1}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,\,-b\,z)+\Gamma(n+1,\,b\,z)\right)(\nu\bmod 2-1)-4^{-n}\,b^{-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,b}}\binom{\nu}{s}\right.$$

$$\left(-e^{\frac{c^2 (v-2 s)^2}{2 b}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c (v-2 s))^{-h-k+2 n} \left(c (v-2 s) - 2 b \sqrt{z}\right)^{h+k} \left(\frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c (2 s-v)\left(2 \sqrt{z}\ b + c (2 s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{4 b}\right) -$$

$$\left.2 b \sqrt{\frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{4 b}\right)\right) -$$

$$e^{\frac{c^2 (v-2 s)^2}{2 b}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c (2 s-v))^{-h-k+2 n} \left(c (2 s-v) - 2 b \sqrt{z}\right)^{h+k} \left(\frac{\left(2 \sqrt{z}\ b + c (v-2 s)\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c (2 s-v)\left(c (2 s-v) - 2 b \sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(2 \sqrt{z}\ b + c (v-2 s)\right)^2}{4 b}\right) -$$

$$\left.2 b \sqrt{\frac{\left(2 \sqrt{z}\ b + c (v-2 s)\right)^2}{b}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(2 \sqrt{z}\ b + c (v-2 s)\right)^2}{4 b}\right)\right) +$$

$$\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c (2 s-v))^{-h-k+2 n} \left(2 \sqrt{z}\ b + c (2 s-v)\right)^{h+k} \left(-\frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c (2 s-v)\left(2 \sqrt{z}\ b + c (2 s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{4 b}\right) + 2\right.$$

$$\left.\sqrt{-\frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{b}}\ b\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(2 \sqrt{z}\ b + c (2 s-v)\right)^2}{4 b}\right)\right) +$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,\sqrt{z}\;b+c\,(v-2\,s)\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\;b+c\,(v-2\,s)\right)^{2}}{b}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,b\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,\sqrt{z}\;b+c\,(v-2\,s)\right)^{2}}{4\,b}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(2\,\sqrt{z}\;b+c\,(v-2\,s)\right)^{2}}{b}}\;b\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(2\,\sqrt{z}\;b+c\,(v-2\,s)\right)^{2}}{4\,b}\right)\right)\Bigg)\Bigg)\Bigg

01.20.21.4470.01

$$\int z^n \sinh(e+d\,z)\cosh^{\nu}\left(c\sqrt{z}\right)dz ==$$

$$-2^{-\nu-2}\left(2\,d^{-n-1}\,e^{-e}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,e^{2\,e}\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(\nu \bmod 2-1)-4^{-n}\,d^{-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,d}-e}\binom{\nu}{s}\right.$$

$$\left(-e^{\frac{c^2\,(\nu-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,s))^{-h-k+2\,n}\left(c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-\nu)\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,d\sqrt{\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{4\,d}\right)\right)-$$

$$e^{\frac{c^2\,(\nu-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-\nu))^{-h-k+2\,n}\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,\sqrt{z}\;d+c\,(\nu-2\,s)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-\nu)\left(c\,(2\,s-\nu)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,\sqrt{z}\;d+c\,(\nu-2\,s)\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,d\sqrt{\frac{\left(2\,\sqrt{z}\;d+c\,(\nu-2\,s)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,\sqrt{z}\;d+c\,(\nu-2\,s)\right)^2}{4\,d}\right)\right)+$$

$$e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-\nu))^{-h-k+2\,n}\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^{h+k}\left(-\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-\nu)\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{4\,d}\right)+\right.$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\,d+c\,(2\,s-v)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\sqrt{z}\,d+c\,(2\,s-v)\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\sqrt{z}\,d+c\,(v-2\,s)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\,d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\sqrt{z}\,d+c\,(v-2\,s)\right)^2}{4\,d}\right)+$$

$$2\sqrt{-\frac{\left(2\sqrt{z}\,d+c\,(v-2\,s)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(2\sqrt{z}\,d+c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh(b\,z^r)\cosh^{\nu}(c\,z^r)$

01.20.21.4471.01

$$\int z^{\alpha-1}\sinh(b\,z^r)\cosh^{\nu}(c\,z^r)\,dz==$$

$$2^{-\nu-1}\,z^{\alpha}\Bigg(\frac{\binom{\nu}{\frac{\nu}{2}}\left((-b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-b\,z^r\right)-(b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,b\,z^r\right)\right)(\nu\bmod 2-1)}{r}-\frac{1}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,s+c\,\nu)\,z^r\right)$$

$$((-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}-((b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b-2\,c\,s+c\,\nu)\,z^r\right)+\;((-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,s-c\,\nu)\,z^r\right)-\;((b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b+2\,c\,s-c\,\nu)\,z^r\right)\Bigg)\Bigg)\Bigg/;\;\nu\in\mathbb{N}^+$$

01.20.21.4472.01

$$\int z^n \sinh\left(b\,z^2\right) \cosh^{\nu}\left(c\,z^2\right) dz == 2^{-\nu-2}\, z^{n+1} \left(\binom{\nu}{\frac{\nu}{2}} \left(\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -b\,z^2\right) - \left(b\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b\,z^2\right) \right) (\nu \bmod 2 - 1) - \right.$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\Gamma\left(\frac{n+1}{2}, (-b-2\,c\,s+c\,\nu)\,z^2\right) \left((-b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)} - \left((b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)} \right.$$

$$\Gamma\left(\frac{n+1}{2}, (b-2\,c\,s+c\,\nu)\,z^2\right) + \left((-b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+2\,c\,s-c\,\nu)\,z^2\right) -$$

$$\left. \left. \left((b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b+2\,c\,s-c\,\nu)\,z^2\right) \right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4473.01

$$\int z^n \sinh\left(b\,\sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\ c\right) dz == 2^{-\nu-1} \left(2\,b^{-2\,n-2} \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2\,(n+1), -b\,\sqrt{z}\right) - \Gamma\left(2\,(n+1), b\,\sqrt{z}\right) \right) (\nu \bmod 2 - 1) - \right.$$

$$2 \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\Gamma\left(2\,(n+1), (-b-2\,c\,s+c\,\nu)\,\sqrt{z}\right) (-b-2\,c\,s+c\,\nu)^{-2\,(n+1)} + (-b+2\,c\,s-c\,\nu)^{-2\,(n+1)} \right.$$

$$\Gamma\left(2\,(n+1), (-b+2\,c\,s-c\,\nu)\,\sqrt{z}\right) - (b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (b+2\,c\,s-c\,\nu)\,\sqrt{z}\right) -$$

$$\left. \left. (b+c\,(\nu-2\,s))^{-2\,(n+1)}\, \Gamma\left(2\,(n+1), (b+c\,(\nu-2\,s))\,\sqrt{z}\right) \right) \right) /;\ n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

Involving $z^{\alpha-1} \sinh\left(b\,z^r + e\right) \cosh^{\nu}\left(c\,z^r\right)$

01.20.21.4474.01

$$\int z^{\alpha-1} \sinh(b\,z^r + e) \cosh^{\nu}(c\,z^r)\, dz == 2^{-\nu-1}\, z^{\alpha}$$

$$\left(\frac{ \binom{\nu}{\frac{\nu}{2}} \left(e^{e} \left(-b\,z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, -b\,z^r\right) - e^{-e} \left(b\,z^r\right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, b\,z^r\right) \right) (\nu \bmod 2 - 1) }{r} - \frac{1}{r} e^{-e} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{2\,e} \Gamma\left(\frac{\alpha}{r}, (-b-2\,c\,s+c\,\nu)\,z^r\right) \right. \right.$$

$$\left((-b-2\,c\,s+c\,\nu)\,z^r \right)^{-\frac{\alpha}{r}} - \left((b-2\,c\,s+c\,\nu)\,z^r \right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (b-2\,c\,s+c\,\nu)\,z^r\right) + e^{2\,e} \left((-b+2\,c\,s-c\,\nu)\,z^r \right)^{-\frac{\alpha}{r}}$$

$$\left. \left. \Gamma\left(\frac{\alpha}{r}, (-b+2\,c\,s-c\,\nu)\,z^r\right) - \left((b+2\,c\,s-c\,\nu)\,z^r \right)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (b+2\,c\,s-c\,\nu)\,z^r\right) \right) \right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.4475.01

$$\int z^n \sinh\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$2^{-\nu-2}\,z^{n+1}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e}\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,-b\,z^2\right)-e^{-e}\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,b\,z^2\right)\right)(\nu \bmod 2-1)-\right.$$

$$e^{-e}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2e}\,\Gamma\left(\frac{n+1}{2},\,(-b-2\,c\,s+c\,\nu)\,z^2\right)\left((-b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}-\left((b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},\,(b-2\,c\,s+c\,\nu)\,z^2\right)+e^{2e}\left((-b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-b+2\,c\,s-c\,\nu)\,z^2\right)-$$

$$\left.\left.\left((b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(b+2\,c\,s-c\,\nu)\,z^2\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.4476.01

$$\int z^n \sinh\left(\sqrt{z}\;b+e\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz == 2^{-\nu-1}\left(2\,b^{-2\,n-2}\,e^{-e}\binom{\nu}{\frac{\nu}{2}}\left(e^{2e}\,\Gamma\left(2\,(n+1),\,-b\,\sqrt{z}\right)-\Gamma\left(2\,(n+1),\,b\,\sqrt{z}\right)\right)(\nu \bmod 2-1)-\right.$$

$$2\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e}\,\Gamma\left(2\,(n+1),\,(-b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)(-b-2\,c\,s+c\,\nu)^{-2\,(n+1)}+e^{e}\,(-b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\,(-b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-e^{-e}\,(b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-$$

$$\left.\left.e^{-e}\,(b+c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(b+c\,(\nu-2\,s))\,\sqrt{z}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

Involving $z^n \sinh\left(b\,z^r+d\,z\right)\cosh^{\nu}\left(c\,z^r\right)$

01.20.21.4477.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$2^{-\nu-2}\left(e^{-\frac{d^2}{4b}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-\right.\right.$$

$$e^{\frac{d^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2\,b\,z)^{q+1}\left(\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,b\,z)^2}{4\,b}\right)\right)b^{-n-1}+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\left(-\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}(2\,(-b-2\,c\,s+c\,\nu)\,z-d)^{q+1}\right.\right.$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)\right)(-b-2\,c\,s+c\,\nu)^{-n-1}-\right.$$

$$e^{\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}}(b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2\,(b+2\,c\,s-c\,\nu)\,z)^{q+1}\left(\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)-e^{\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}}(b+c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}$$

$$(d+2\,(b+c\,(\nu-2\,s))\,z)^{q+1}\left(\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)+$$

$$e^{-\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}}(-b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}(-d-2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4478.01

$$\int z^n \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz == 2^{-2\,n-\nu-2}\,d^{-2\,n-2}\left(e^{-\frac{b^2}{4d}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\right.$$

$$\left(e^{\frac{b^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-b-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\right.\right.\right.$$

$$\frac{1}{2}(h+k+1),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\Bigg)-2\,d\,\sqrt{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{4\,d}}\binom{v}{s}\Bigg(-e^{\frac{b^2+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-2\,c\,s+c\,v)^{-h-k+2\,n}$$

$$\left(-b+c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2$$

$$d\,\sqrt{\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(-b+c\,(2\,s-v)-2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d$$

$$\sqrt{\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{\frac{b\,c\,(v-2\,s)}{d}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-2\,c\,s+c\,v)^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+$$

$$2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\Bigg)\Bigg/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.4479.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$2^{-\nu-2}\left(e^{-\frac{d^2}{4b}-e}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(e^{2e}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2bz)^{q+1}\left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2bz)^2}{4b}\right)-\right.\right.$$

$$\left.e^{\frac{d^2}{2b}}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2bz)^{q+1}\left(\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2bz)^2}{4b}\right)\right)b^{-n-1}+$$

$$e^{-e}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{d^2}{-4b-8cs+4cv}}\left(\sum_{q=0}^{n}2^{q-n}d^{n-q}\left(-\frac{(d+2(b+2cs-cv)z)^2}{-b-2cs+cv}\right)^{\frac{1}{2}(-q-1)}(2(-b-2cs+cv)z-d)^{q+1}\right.\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2(b+2cs-cv)z)^2}{-4b-8cs+4cv}\right)\right)(-b-2cs+cv)^{-n-1}-$$

$$e^{-\frac{d^2}{-4b-8cs+4cv}+2e}(b+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2(b+2cs-cv)z)^{q+1}$$

$$\left(\frac{(d+2(b+2cs-cv)z)^2}{-b-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2(b+2cs-cv)z)^2}{-4b-8cs+4cv}\right)-$$

$$e^{-\frac{d^2}{-4b+8cs-4cv}+2e}(b+c(v-2s))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2(b+c(v-2s))z)^{q+1}$$

$$\left(\frac{(d+2(b+c(v-2s))z)^2}{-b+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2(b+c(v-2s))z)^2}{-4b+8cs-4cv}\right)+$$

$$e^{-\frac{d^2}{-4b+8cs-4cv}}(-b+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}d^{n-q}(-d-2bz+4csz-2cvz)^{q+1}$$

$$\left.\left.\left(-\frac{(d+2(b+c(v-2s))z)^2}{-b+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2(b+c(v-2s))z)^2}{-4b+8cs-4cv}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4480.01

$$\int z^n \sinh\left(\sqrt{z}\;b+e+d\,z\right)\cosh^{\nu}\left(c\sqrt{z}\right)dz == 2^{-2n-\nu-2}\,d^{-2n-2}\left(e^{-\frac{b^2+4de}{4d}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\right.$$

$$\left(e^{\frac{b^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(-b-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2d\sqrt{z}\right)\Gamma\left(\right.\right.\right.$$

$$\frac{1}{2}(h+k+1),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\Bigg)-2\,d\,\sqrt{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-e-\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{4\,d}}\binom{v}{s}\Bigg(-e^{\frac{b^2+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-2\,c\,s+c\,v)^{-h-k+2\,n}$$

$$\left(-b+c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2$$

$$d\,\sqrt{\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(-b+c\,(2\,s-v)-2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d$$

$$\sqrt{\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{2\,e+\frac{b\,c\,(v-2\,s)}{d}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-2\,c\,s+c\,v)^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}$$

$$d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(d\,z)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4481.01

$$\int z^n \sinh(d\,z)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$2^{-\nu-2}\left(2\,d^{-n-1}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)-c^{-n-1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{\frac{4\,c\,(2\,s-\nu)\,(2\,g\,s-g\,\nu)-d^2}{c\,(8\,s-4\,\nu)}}(\nu-2\,s)^{-n-1}\right.$$

$$\binom{\nu}{s}\left(-e^{\frac{d^2}{c\,(4\,s-2\,\nu)}+2\,g\,(\nu-2\,s)}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\left(\frac{(d+4\,c\,s\,z-2\,c\,\nu\,z)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}(2\,c\,(\nu-2\,s)\,z-d)^{q+1}\binom{n}{q}\right.$$

$$\Gamma\left(\frac{q+1}{2},\,\frac{(d+4\,c\,s\,z-2\,c\,\nu\,z)^2}{c\,(8\,s-4\,\nu)}\right)-e^{\frac{d^2}{4\,c\,s-2\,c\,\nu}+2\,g\,(\nu-2\,s)}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(-d+4\,c\,s\,z-2\,c\,\nu\,z)$$

$$(d+2\,c\,(\nu-2\,s)\,z)^q\left(\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)+$$

$$(-1)^n\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}\left(-\frac{(d+2\,c\,(\nu-2\,s)\,z)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\,-\frac{(d-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)-(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(d+4\,c\,s\,z-2\,c\,\nu\,z)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+4\,c\,s\,z-2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4482.01

$$\int z^n \sinh(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz ==$$

$$-2^{-\nu-2}\left(2\,d^{-n-1}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(\nu \bmod 2-1)-4^{-n}\,d^{-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,d}-2\,g\,s-g\,\nu}\binom{\nu}{s}\right.$$

$$\left(-e^{\frac{c^2\,(\nu-2\,s)^2}{2\,d}+2\,g\,\nu}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,s))^{-h-k+2\,n}\left(c\,(\nu-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-\nu)\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-\nu)\right)^2}{4\,d}\right)-\right.$$

$$2\,d\,\sqrt{\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{\frac{c^2\,(v-2\,s)^2}{2\,d}+4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)-$$

$$2\,d\,\sqrt{\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg

Involving $z^n \sinh(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4483.01

$$\int z^n \sinh(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz ==$$

$$2^{-v-2}\left(2\,d^{-n-1}\,e^{-e}\binom{v}{\frac{v}{2}}\left((-1)^n\,e^{2\,e}\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-v \bmod 2)-c^{-n-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{\frac{4\,c\,(2\,s-v)\,(e+2\,g\,s-g\,v)-d^2}{c\,(8\,s-4\,v)}}(v-2\,s)^{-n-1}\right.$$

$$\binom{v}{s}\left(-e^{\frac{d^2}{c\,(4\,s-2\,v)}-2\,e+2\,g\,(v-2\,s)}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\left(\frac{(d+4\,c\,s\,z-2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}(2\,c\,(v-2\,s)\,z-d)^{q+1}\binom{n}{q}\right.$$

$$\Gamma\left(\frac{q+1}{2},\,\frac{(d+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(8\,s-4\,v)}\right)-e^{\frac{d^2}{4\,c\,s-2\,c\,v}+2\,g\,(v-2\,s)}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(-d+4\,c\,s\,z-2\,c\,v\,z)$$

$$(d+2\,c\,(v-2\,s)\,z)^q\left(\frac{(d+2\,c\,(v-2\,s)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)+$$

$$(-1)^n\,e^{-2\,e}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\left(-\frac{(d+2\,c\,(v-2\,s)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\,-\frac{(d-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)-(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(d+4\,c\,s\,z-2\,c\,v\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(d+4\,c\,s\,z-2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d+4\,c\,s\,z-2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.4484.01

$$\int z^n \sinh(e+d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz ==$$

$$-2^{-v-2}\left(2\,d^{-n-1}\,e^{-e}\binom{v}{\frac{v}{2}}\left((-1)^n\,e^{2\,e}\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(v \bmod 2-1)-4^{-n}\,d^{-2\,n-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{c^2\,(v-2\,s)^2}{4\,d}-e-2\,g\,s-g\,v}\binom{v}{s}\right.$$

$$\left(-e^{\frac{c^2\,(v-2\,s)^2}{2\,d}+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,\sqrt{z}\;d+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{4\,d}\right)-\right.$$

$$2\,d\,\sqrt{\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{\frac{c^2\,(v-2\,s)^2}{2\,d}+4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)-$$

$$2\,d\,\sqrt{\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e+4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{d}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\sqrt{z}\;d+c\,(2\,s-v)\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^{h+k}\left(-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)+$$

$$2\,\sqrt{-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(2\sqrt{z}\;d+c\,(v-2\,s)\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg

Involving $z^{\alpha-1}\sinh(b\,z^r)\cosh^{\nu}(c\,z^r+g)$

01.20.21.4485.01

$$\int z^{\alpha-1}\sinh(b\,z^r)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$2^{-\nu-1}\,z^{\alpha}\left(\frac{\binom{\nu}{\frac{\nu}{2}}\left((-b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},-b\,z^r\right)-(b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},b\,z^r\right)\right)(\nu \bmod 2-1)}{r}-\frac{1}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{2\,g\,s-g\,\nu}\binom{\nu}{s}\left(\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)\right.\right.$$

$$((-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}-((b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+e^{2\,g\,\nu-4\,g\,s}\,((-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)-e^{2\,g\,(\nu-2\,s)}\,((b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)\Big/;\ \nu\in\mathbb{N}^+$$

01.20.21.4486.01

$$\int z^n\sinh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$2^{-\nu-2}\,z^{n+1}\left(\binom{\nu}{\frac{\nu}{2}}\left(\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},-b\,z^2\right)-\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},b\,z^2\right)\right)(\nu \bmod 2-1)-\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{2\,g\,s-g\,\nu}\binom{\nu}{s}\left(\Gamma\left(\frac{n+1}{2},(-b-2\,c\,s+c\,\nu)\,z^2\right)\left((-b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}-\left((b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},(b-2\,c\,s+c\,\nu)\,z^2\right)+e^{-4\,g\,s+2\,g\,\nu}\left((-b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(-b+2\,c\,s-c\,\nu)\,z^2\right)-$$

$$\left.\left.e^{2\,g\,(\nu-2\,s)}\left((b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(b+2\,c\,s-c\,\nu)\,z^2\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4487.01

$$\int z^n\sinh\left(b\,\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz == 2^{-\nu-1}\left(2\,b^{-2\,n-2}\binom{\nu}{\frac{\nu}{2}}\left(\Gamma\left(2\,(n+1),-b\,\sqrt{z}\right)-\Gamma\left(2\,(n+1),b\,\sqrt{z}\right)\right)(\nu \bmod 2-1)-\right.$$

$$2\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{2\,g\,s-g\,\nu}\,\Gamma\left(2\,(n+1),(-b-2\,c\,s+c\,\nu)\,\sqrt{z}\right)(-b-2\,c\,s+c\,\nu)^{-2\,(n+1)}+e^{g\,(\nu-2\,s)}\,(-b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),(-b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-e^{g\,\nu-2\,g\,s}\,(b+2\,c\,s-c\,\nu)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(b+2\,c\,s-c\,\nu)\,\sqrt{z}\right)-$$

$$\left.\left.e^{2\,g\,s-g\,\nu}\,(b+c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(b+c\,(\nu-2\,s))\,\sqrt{z}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh(b\,z^r+e)\cosh^{\nu}(c\,z^r+g)$

01.20.21.4488.01

$$\int z^{\alpha-1}\sinh(b\,z^r+e)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$2^{-\nu-1}\,z^{\alpha}\left(\frac{\binom{\nu}{\frac{\nu}{2}}\left(e^{e}\,(-b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},-b\,z^r\right)-e^{-e}\,(b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},b\,z^r\right)\right)(\nu \bmod 2-1)}{r}-\frac{1}{r}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-e+2\,g\,s-g\,\nu}\binom{\nu}{s}\right.$$

$$\left(e^{2\,e}\,\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,s+c\,\nu)\,z^r\right)((-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}-((b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b-2\,c\,s+c\,\nu)\,z^r\right)+\right.$$

$$e^{2\,e-4\,g\,s+2\,g\,\nu}\,((-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,s-c\,\nu)\,z^r\right)-$$

$$\left.\left.e^{2\,g\,(\nu-2\,s)}\,((b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right/;\ \nu\in\mathbb{N}^+$$

01.20.21.4489.01

$$\int z^{n}\sinh\left(b\,z^2+e\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$2^{-\nu-2}\,z^{n+1}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e}\left(-b\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},-b\,z^2\right)-e^{-e}\left(b\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},b\,z^2\right)\right)(\nu \bmod 2-1)-\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-e+2\,g\,s-g\,\nu}\binom{\nu}{s}\left(e^{2\,e}\,\Gamma\left(\frac{n+1}{2},(-b-2\,c\,s+c\,\nu)\,z^2\right)\left((-b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}-\left((b-2\,c\,s+c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},(b-2\,c\,s+c\,\nu)\,z^2\right)+e^{2\,e-4\,g\,s+2\,g\,\nu}\left((-b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(-b+2\,c\,s-c\,\nu)\,z^2\right)-$$

$$\left.\left.e^{2\,g\,(\nu-2\,s)}\left((b+2\,c\,s-c\,\nu)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(b+2\,c\,s-c\,\nu)\,z^2\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4490.01

$$\int z^n \sinh\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz ==$$

$$2^{-v-1}\left(2\,b^{-2n-2}\,e^{-e}\binom{v}{\frac{v}{2}}\left(e^{2e}\,\Gamma\left(2\,(n+1),\,-b\,\sqrt{z}\right)-\Gamma\left(2\,(n+1),\,b\,\sqrt{z}\right)\right)(v \bmod 2-1)-\right.$$

$$2\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e+2gs-gv}\,\Gamma\left(2\,(n+1),\,(-b-2cs+cv)\,\sqrt{z}\right)(-b-2cs+cv)^{-2(n+1)}+e^{e+g(v-2s)}\,(-b+2cs-cv)^{-2(n+1)}\right.$$

$$\left.\Gamma\left(2\,(n+1),\,(-b+2cs-cv)\,\sqrt{z}\right)-e^{-e-2gs+gv}\,(b+2cs-cv)^{-2(n+1)}\,\Gamma\left(2\,(n+1),\,(b+2cs-cv)\,\sqrt{z}\right)-\right.$$

$$\left.\left.e^{-e+2gs-gv}\,(b+c\,(v-2s))^{-2(n+1)}\,\Gamma\left(2\,(n+1),\,(b+c\,(v-2s))\,\sqrt{z}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4491.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$2^{-\nu-2}\left(e^{-\frac{d^2}{4b}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-\right.\right.$$

$$e^{\frac{d^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2\,b\,z)^{q+1}\left(\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,b\,z)^2}{4\,b}\right)\right)b^{-n-1}+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{2\,g\,s-g\,\nu}\binom{\nu}{s}\left(e^{2\,g\,(\nu-2\,s)-\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}}\left(\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\left(-\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.(2\,(-b-2\,c\,s+c\,\nu)\,z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)\right)(-b-2\,c\,s+c\,\nu)^{-n-1}-$$

$$e^{\frac{d^2}{-4\,b-8\,c\,s+4\,c\,\nu}}(b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2\,(b+2\,c\,s-c\,\nu)\,z)^{q+1}\left(\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,(b+2\,c\,s-c\,\nu)\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)-e^{\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}+2\,g\,(\nu-2\,s)}(b+c\,(\nu-2\,s))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}$$

$$(d+2\,(b+c\,(\nu-2\,s))\,z)^{q+1}\left(\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)+$$

$$e^{-\frac{d^2}{-4\,b+8\,c\,s-4\,c\,\nu}}(-b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}(-d-2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,(b+c\,(\nu-2\,s))\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4492.01

$$\int z^n \sinh\left(\sqrt{z}\;b+d\,z\right)\cosh^{\nu}\left(\sqrt{z}\;c+g\right)dz == 2^{-2\,n-\nu-2}\,d^{-2\,n-2}\left(e^{-\frac{b^2}{4\,d}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\right.$$

$$\left(e^{\frac{b^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-b-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\right.\right.\right.$$

$$\frac{1}{2}(h+k+1),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\Bigg)-2\,d\,\sqrt{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-g\,(2\,s+v)-\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{4\,d}}\binom{v}{s}\Bigg(-e^{2\,g\,v+\frac{b^2+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-2\,c\,s+c\,v)^{-h-k+2\,n}$$

$$\left(-b+c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2$$

$$d\,\sqrt{\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{4\,g\,s+\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(-b+c\,(2\,s-v)-2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d$$

$$\sqrt{\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{4\,g\,s+\frac{b\,c\,(v-2\,s)}{d}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-2\,c\,s+c\,v)^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}$$

$$d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg)\;/;\;n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+g\right)$

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$$\int z^n \sinh\left(b z^2+d z+e\right)\cosh^{\nu}\left(c z^2+g\right)dz ==$$

$$2^{-\nu-2}\left(e^{-\frac{d^2}{4b}-e}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\left(e^{2e}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2bz)^{q+1}\left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2bz)^2}{4b}\right)-\right.\right.$$

$$\left.e^{\frac{d^2}{2b}}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2bz)^{q+1}\left(\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2bz)^2}{4b}\right)\right)b^{-n-1}+$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-e+2gs-g\nu}\binom{\nu}{s}\left(e^{2g(\nu-2s)-\frac{d^2}{-4b-8cs+4c\nu}}\left(\sum_{q=0}^{n}2^{q-n}d^{n-q}\left(-\frac{(d+2(b+2cs-c\nu)z)^2}{-b-2cs+c\nu}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\left.(2(-b-2cs+c\nu)z-d)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2(b+2cs-c\nu)z)^2}{-4b-8cs+4c\nu}\right)\right)(-b-2cs+c\nu)^{-n-1}-$$

$$e^{\frac{d^2}{-4b-8cs+4c\nu}+2e}(b+2cs-c\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2(b+2cs-c\nu)z)^{q+1}$$

$$\left(\frac{(d+2(b+2cs-c\nu)z)^2}{-b-2cs+c\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2(b+2cs-c\nu)z)^2}{-4b-8cs+4c\nu}\right)-$$

$$e^{\frac{d^2}{-4b+8cs-4c\nu}+2e+2g(\nu-2s)}(b+c(\nu-2s))^{-n-1}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(d+2(b+c(\nu-2s))z)^{q+1}$$

$$\left(\frac{(d+2(b+c(\nu-2s))z)^2}{-b+2cs-c\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2(b+c(\nu-2s))z)^2}{-4b+8cs-4c\nu}\right)+$$

$$e^{-\frac{d^2}{-4b+8cs-4c\nu}}(-b+2cs-c\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}d^{n-q}(-d-2bz+4csz-2c\nu z)^{q+1}$$

$$\left.\left.\left.\left(-\frac{(d+2(b+c(\nu-2s))z)^2}{-b+2cs-c\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2(b+c(\nu-2s))z)^2}{-4b+8cs-4c\nu}\right)\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

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$$\int z^n \sinh\left(\sqrt{z}\ b+e+d z\right)\cosh^{\nu}\left(\sqrt{z}\ c+g\right)dz == 2^{-2n-\nu-2}d^{-2n-2}\left(e^{-\frac{b^2+4de}{4d}}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\right.$$

$$\left(e^{\frac{b^2}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(-b-2d\sqrt{z}\right)^{h+k}\left(\frac{\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\left(b+2d\sqrt{z}\right)\Gamma\left(\right.\right.\right.$$

$$\frac{1}{2}(h+k+1),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\Bigg)-2\,d\,\sqrt{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}\,4^k\,b^{-h-k+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\,\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)+$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-e-g\,(2\,s+v)-\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{4\,d}}\binom{v}{s}\Bigg(-e^{2\,g\,v+\frac{b^2+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b-2\,c\,s+c\,v)^{-h-k+2\,n}$$

$$\left(-b+c\,(v-2\,s)-2\,d\,\sqrt{z}\right)^{h+k}\left(\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2$$

$$d\,\sqrt{\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)-$$

$$e^{4\,g\,s+\frac{b^2+2\,c\,(v-2\,s)\,b+c^2\,(v-2\,s)^2}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(-b+c\,(2\,s-v)-2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-2\,d$$

$$\sqrt{\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+e^{2\,e+4\,g\,s+\frac{b\,c\,(v-2\,s)}{d}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2\,c\,s-c\,v)^{-h-k+2\,n}\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+2\,c\,s-c\,v)\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2$$

$$\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c\,(2\,s-v)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)+$$

$$e^{2\,e+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b-2\,c\,s+c\,v)^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((b-2\,c\,s+c\,v)\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{d}}$$

$$d\,\Gamma\left(\frac{1}{2}\,(h+k+2),\;-\frac{\left(b+c\,(v-2\,s)+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\Bigg)\Bigg)\Bigg

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$$\int z^n \sinh(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(2\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(c\,(\nu-2\,s))^{-n-1}\right.$$

$$\left(-e^{-\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}}(-1)^n\sum_{q=0}^{n}2^{q-n}\,(d+f\,(\nu-2\,s))^{n-q}\,((2\,s-\nu)\,(f+2\,c\,z)-d)^{q+1}\left(-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(8\,s-4\,\nu)}\right)-$$

$$e^{-\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}}(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))\,(d+(2\,s-\nu)\,(f+2\,c\,z))^q$$

$$\left(-\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d-(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,\nu)}\right)+$$

$$e^{\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}}\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}\left(\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)-$$

$$e^{\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)-\frac{d}{2}\right)^{n-q}\left(\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}(d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

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$$\int z^n \sinh(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-\nu-2}\left(2\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+\right.$$

$$4^{-n}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,s))^{-h-k+2\,n}\left(\frac{\left(c\,(2\,s-\nu)+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left.\left(c\,(\nu-2\,s)+2\,(-d-2\,f\,s+f\,\nu)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-\nu)\left(c\,(2\,s-\nu)+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c(2s-v)+2(d+2fs-fv)\sqrt{z}\right)^2}{4d+8fs-4fv}\right)-$$

$$2(d+2fs-fv)\sqrt{\frac{\left(c(2s-v)+2(d+2fs-fv)\sqrt{z}\right)^2}{d+2fs-fv}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c(2s-v)+2(d+2fs-fv)\sqrt{z}\right)^2}{4d+8fs-4fv}\right)\right)\Bigg)$$

$$(-d-2fs+fv)^{-2(n+1)}+e^{-\frac{c^2(v-2s)^2}{-4d+8fs-4fv}}\left(-(d-2fs+fv)^2\right)^{-2n-1}$$

$$\Bigg(\Bigg((d-2fs+fv)^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(2s-v))^{-h-k+2n}\left(c(2s-v)-2(d-2fs+fv)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c(v-2s)+2(d-2fs+fv)\sqrt{z}\right)^2}{d-2fs+fv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(c(v-2s)\left(c(v-2s)+\right.$$

$$\left.2(d-2fs+fv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c(v-2s)+2(d-2fs+fv)\sqrt{z}\right)^2}{4(d-2fs+fv)}\right)-$$

$$2(d-2fs+fv)\sqrt{\frac{\left(c(v-2s)+2(d-2fs+fv)\sqrt{z}\right)^2}{d-2fs+fv}}\ \Gamma\Bigg(\frac{1}{2}(h+k+2),$$

$$\left.\frac{\left(c(v-2s)+2(d-2fs+fv)\sqrt{z}\right)^2}{4(d-2fs+fv)}\right)\Bigg)-e^{\frac{c^2(v-2s)^2}{-2d+4fs-2fv}}(-d+2fs-fv)^{2n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(v-2s))^{-h-k+2n}\left(c(v-2s)+2(d-2fs+fv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c(v-2s)+2(d-2fs+fv)\sqrt{z}\right)^2}{d-2fs+fv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(c(v-2s)\left(c(v-2s)+\right.$$

$$\left.2(d-2fs+fv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c(v-2s)+2(d-2fs+fv)\sqrt{z}\right)^2}{4(d-2fs+fv)}\right)-$$

$$2\,(-d+2\,f\,s-f\,v)\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)\Bigg)\Bigg)+e^{-\frac{c^2\,(v-2\,s)^2}{4\,d+8\,f\,s-4\,f\,v}}$$

$$(d+2\,f\,s-f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)$$

$$\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)+$$

$$2\sqrt{-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}\;(d+2\,f\,s-f\,v)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.4497.01

$$\int z^n \sinh(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(2\,e^{-e}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,e^{2\,e}\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+e^{-e}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(c\,(\nu-2\,s))^{-n-1}\right.$$

$$\left(-e^{-\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}}(-1)^n\sum_{q=0}^{n}2^{q-n}\,(d+f\,(\nu-2\,s))^{n-q}\,((2\,s-\nu)\,(f+2\,c\,z)-d)^{q+1}\left(-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(8\,s-4\,\nu)}\right)-e^{2\,e-\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}}(-1)^n$$

$$\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))\,(d+(2\,s-\nu)\,(f+2\,c\,z))^q$$

$$\left(-\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d-(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,\nu)}\right)+$$

$$e^{\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}}\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}\left(\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)-$$

$$e^{\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}+2\,e}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)-\frac{d}{2}\right)^{n-q}\left(\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4498.01

$$\int z^n \sinh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+f\,z\right)dz == 2^{-\nu-2}\left(2\,e^{-e}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,e^{2\,e}\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+\right.$$

$$4^{-n}\,e^{e}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-\nu))^{-h-k+2\,n}\left(c\,(2\,s-\nu)+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left.\left.\left(-\frac{\left(c\,(2\,s-\nu)+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right.\right.$$

$$\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)+2\sqrt{-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}$$

$$\left.(d+2\,f\,s-f\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\right)\Bigg)$$

$$(d+2\,f\,s-f\,v)^{-2\,(n+1)}+e^{-2\,e}\left(e^{-\frac{c^2\,(v-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,v}}\left(-(d-2\,f\,s+f\,v)^2\right)^{-2\,n-1}\left((d-2\,f\,s+f\,v)^{2\,n}\right.\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d-\right.\right.$$

$$\left.2\,f\,s+f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)-$$

$$2\,(d-2\,f\,s+f\,v)\sqrt{\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)\right)-$$

$$e^{2\left(\frac{c^2\,(v-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,v}+e\right)}(-d+2\,f\,s-f\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)-$$

$$2\,(-d+2\,f\,s-f\,v)\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)\right)-e^{\frac{c^2\,(v-2\,s)^2}{4\,d+8\,f\,s-4\,f\,v}}\,(-d-2\,f\,s+f\,v)^{-2\,(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\left(c\,(v-2\,s)+2\,(-d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)+\right.\right.$$

$$2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\Big)\,\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)-$$

$$2\,(d+2\,f\,s-f\,v)\sqrt{\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.\left.\left.\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r\right) \cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.4499.01

$$\int z^n \sinh\left(b z^2\right) \cosh^{\nu}\left(c z^2 + f z\right) dz ==$$

$$-2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} \left(\left(-b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -b z^2\right) - \left(b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b z^2\right)\right) (1 - \nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{-\frac{(f\nu-2fs)^2}{-4b-8cs+4c\nu}} \left(\sum_{q=0}^{n} 2^{q-n} (2fs - f\nu)^{n-q} (-2fs - 4czs + f\nu - 2bz + 2c\nu z)^{q+1} \right.\right.$$

$$\left(-\frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-b - 2cs + c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left. \Gamma\left(\frac{q+1}{2}, -\frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-4b - 8cs + 4c\nu}\right) \right) (-b - 2cs + c\nu)^{-n-1} +$$

$$e^{\frac{(f\nu-2fs)^2}{-4b-8cs+4c\nu}} (b + 2cs - c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (f\nu - 2fs)^{n-q} (2fs + 4czs - f\nu + 2bz - 2c\nu z)^{q+1}$$

$$\left(\frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-b - 2cs + c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-4b - 8cs + 4c\nu}\right) +$$

$$e^{\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}} (b - 2cs + c\nu)^{-n-1} \sum_{q=0}^{n} \left(f\left(s - \frac{\nu}{2}\right)\right)^{n-q} (f(\nu - 2s) + 2(b - 2cs + c\nu)z)^{q+1}$$

$$\left(-\frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{b - 2cs + c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{-4b + 8cs - 4c\nu}\right) -$$

$$e^{-\frac{(f\nu-2fs)^2}{-4b+8cs-4c\nu}} (-b + 2cs - c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (f\nu - 2fs)^{n-q} (2fs + 4czs - f\nu - 2bz - 2c\nu z)^{q+1}$$

$$\left(-\frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{-b + 2cs - c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \Gamma\left(\frac{q+1}{2}, -\frac{(f(\nu-2s) + 2(b-2cs+c\nu)z)^2}{-4b + 8cs - 4c\nu}\right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4500.01

$$\int z^n \sinh\left(b \sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\ c + f z\right) dz ==$$

$$2^{-\nu-2} \left(-4 \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2(n+1), -b\sqrt{z}\right) - \Gamma\left(2(n+1), b\sqrt{z}\right)\right) (1 - \nu \bmod 2)\, b^{-2(n+1)} - 2^{-2n} f^{-2(n+1)} \right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(e^{\frac{(b+2cs-cv)^2}{f(8s-4v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b-2cs+cv)^{-h-k+2n}\left(-b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}\right.$$

$$\left(\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)-\right.$$

$$\left.2f(2s-v)\sqrt{\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\right)+$$

$$e^{-\frac{(b+c(v-2s))^2}{f(8s-4v)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b+2cs-cv)^{-h-k+2n}\left(-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(\left(2s-v\right)\left(c+2f\sqrt{z}\right)-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)-2f(v-2s)$$

$$\left.\left.\sqrt{-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\right)-\right.$$

$$e^{\frac{(b+c(v-2s))^2}{f(4s-2v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+c(v-2s))^{-h-k+2n}\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+2f\sqrt{\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)-$$

$$e^{-\frac{(b+2cs-cv)^2}{f(8s-4v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2cs-cv)^{-h-k+2n}\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+$$

$$2f(2s-v)\sqrt{-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(b\,z^r+e)\cosh^v(c\,z^r+f\,z)$

01.20.21.4501.01

$$\int z^n \sinh\left(b z^2+e\right) \cosh^v\left(c z^2+f z\right) dz ==$$

$$-2^{-v-2} e^{-e} \binom{v}{\frac{v}{2}} \left(e^{2e} \left(-b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -b z^2\right) - \left(b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b z^2\right)\right) (1-v \bmod 2)\, z^{n+1} -$$

$$2^{-v-2} e^{e} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(-e^{-\frac{(f v-2 f s)^2}{-4 b-8 c s+4 c v}-2 e} \left(\sum_{q=0}^{n} 2^{q-n} (2 f s-f v)^{n-q} \right.\right.$$

$$(-2 f s-4 c z s+f v-2 b z+2 c v z)^{q+1} \left(-\frac{(-2 f s-4 c z s+f v-2 b z+2 c v z)^2}{-b-2 c s+c v} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2 f s-4 c z s+f v-2 b z+2 c v z)^2}{-4 b-8 c s+4 c v}\right) \right) (-b-2 c s+c v)^{-n-1} +$$

$$e^{\frac{(f v-2 f s)^2}{-4 b-8 c s+4 c v}} (b+2 c s-c v)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (f v-2 f s)^{n-q} (2 f s+4 c z s-f v+2 b z-2 c v z)^{q+1}$$

$$\left(\frac{(-2 f s-4 c z s+f v-2 b z+2 c v z)^2}{-b-2 c s+c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2 f s-4 c z s+f v-2 b z+2 c v z)^2}{-4 b-8 c s+4 c v}\right) +$$

$$e^{\frac{(f v-2 f s)^2}{-4 b+8 c s-4 c v}} (b-2 c s+c v)^{-n-1} \sum_{q=0}^{n} \left(f\left(s-\frac{v}{2}\right)\right)^{n-q} (f (v-2 s)+2 (b-2 c s+c v) z)^{q+1}$$

$$\left(-\frac{(f (v-2 s)+2 (b-2 c s+c v) z)^2}{b-2 c s+c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f (v-2 s)+2 (b-2 c s+c v) z)^2}{-4 b+8 c s-4 c v}\right) -$$

$$e^{-\frac{(f v-2 f s)^2}{-4 b+8 c s-4 c v}-2 e} (-b+2 c s-c v)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (f v-2 f s)^{n-q} (2 f s+4 c z s-f v-2 b z-2 c v z)^{q+1}$$

$$\left(-\frac{(f (v-2 s)+2 (b-2 c s+c v) z)^2}{-b+2 c s-c v} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \Gamma\left(\frac{q+1}{2}, -\frac{(f (v-2 s)+2 (b-2 c s+c v) z)^2}{-4 b+8 c s-4 c v}\right) \right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+$$

01.20.21.4502.01

$$\int z^n \sinh\left(\sqrt{z}\ b+e\right) \cosh^v\left(\sqrt{z}\ c+f z\right) dz ==$$

$$2^{-v-2} \left(-4 e^{-e} \binom{v}{\frac{v}{2}} \left(e^{2e} \Gamma\left(2 (n+1), -b \sqrt{z}\right) - \Gamma\left(2 (n+1), b \sqrt{z}\right)\right) (1-v \bmod 2)\, b^{-2 (n+1)} - \right.$$

$$2^{-2n} f^{-2(n+1)} e^{e} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (v-2s)^{-2(n+1)} \binom{v}{s} \Bigg(e^{\frac{(b+2cs-cv)^2}{f(8s-4v)}-2e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b-2cs+cv)^{-h-k+2n}$$

$$\left(-b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k} \left(\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) -$$

$$2f(2s-v)\sqrt{\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) \Bigg) +$$

$$e^{-\frac{(b+c(v-2s))^2}{f(8s-4v)}} \Bigg(e^{-2e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b+2cs-cv)^{-h-k+2n} \left(-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\left((2s-v)\left(c+2f\sqrt{z}\right)-b\right)^{h+k} \binom{k}{h}\binom{n}{k} \Bigg((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) - 2f(v-2s)$$

$$\sqrt{-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) \Bigg) -$$

$$e^{\frac{(b+c(v-2s))^2}{f(4s-2v)}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c(v-2s))^{-h-k+2n} \left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \Bigg((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+2f\sqrt{\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)-$$

$$e^{-\frac{(b+2cs-cv)^2}{f(8s-4v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2cs-cv)^{-h-k+2n}\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+$$

$$2f(2s-v)\sqrt{-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.4503.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz ==$$

$$-2^{-\nu-2}\,e^{\frac{d^2}{4b}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{-\frac{d^2}{2b}}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{-\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}}\left(\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,\nu)^{n-q}\,(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^{q+1}\right.\right.$$

$$\left(-\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)\right)(-b-2\,c\,s+c\,\nu)^{-n-1}+\right.$$

$$e^{\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}}(b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,\nu)^{n-q}\,(d+2\,f\,s-f\,\nu+2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left(\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)+$$

$$e^{\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}}(b-2\,c\,s+c\,\nu)^{-n-1}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)-\frac{d}{2}\right)^{n-q}(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)-$$

$$e^{-\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}}(-b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d-2\,f\,s+f\,\nu)^{n-q}\,(-d+2\,f\,s-f\,\nu-2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.4504.01

$$\int z^n \sinh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}\left(\sqrt{z}\ c + f\,z\right) dz == 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)\, d^{-2\,n-2}$$

$$\left(e^{-\frac{b^2}{4\,d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b + 2\,d\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b + 2\,d\,\sqrt{z}\right) \right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) + 2\sqrt{-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) -$$

$$e^{\frac{b^2}{4\,d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2\,n} \left(-b - 2\,d\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-b \left(-b - 2\,d\,\sqrt{z}\right) \right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) - 2\,d\sqrt{\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) \right) \right) +$$

$$2^{-2\,n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{-\frac{(c\,(2\,s-\nu)-b)^2}{4\,(f\,(2\,s-\nu)-d)}} \left(f\,(2\,s-\nu)-d\right)^{-2\,n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (c\,(2\,s-\nu)-b)^{-h-k+2\,n} \right.$$

$$\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)-d} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((c\,(2\,s-\nu)-b) \left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right) \Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1), -\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,s-\nu)-d)} \right) +$$

$$2\sqrt{-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)-d}}\ (f\,(2\,s-\nu)-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.-\frac{\left(-b+c\,(2\,s-v)+2\,(f\,(2\,s-v)-d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,s-v)-d)}\right)+e^{-\frac{(b+c\,(2\,s-v))^2}{4\,(d+f\,(2\,s-v))}}\,(d+f\,(2\,s-v))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c\,(2\,s-v))^{-h-k+2\,n}\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+c\,(2\,s-v))\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.\left.-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)+2\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}}\right.$$

$$\left.(d+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)\right)-e^{-\frac{(c\,(v-2\,s)-b)^2}{4\,(f\,(v-2\,s)-d)}}$$

$$(f\,(v-2\,s)-d)^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s)-b)^{-h-k+2\,n}\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((c\,(v-2\,s)-b)\left(-b+c\,(v-2\,s)+\right.\right.$$

$$\left.\left.2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}}\,(f\,(v-2\,s)-d)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.\left.-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)\right)+e^{-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}}\,(d+f\,(v-2\,s))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(b+c\,(v-2\,s))^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+c\,(v-2\,s))\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,s)}}$$

$$\left.\left.(d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,s))}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^{n}\sinh\left(b\,z^{r}+d\,z+e\right)\cosh^{v}\left(c\,z^{r}+f\,z\right)$

01.20.21.4505.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z\right)dz == -2^{-\nu-2}\,e^{\frac{d^2}{4\,b}-e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$(-b)^{-n-1}\left(e^{2\,e-\frac{d^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,b\,z)^2}{4\,b}\right)\right)-$$

$$2^{-\nu-2}\,e^{e}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{-\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}-2\,e}(-b-2\,c\,s+c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,\nu)^{n-q}\right.$$

$$(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^{q+1}\left(-\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)+$$

$$e^{\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}}(b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,\nu)^{n-q}\,(d+2\,f\,s-f\,\nu+2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left(\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)+$$

$$e^{\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}}(b-2\,c\,s+c\,\nu)^{-n-1}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)-\frac{d}{2}\right)^{n-q}(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)-$$

$$e^{-\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}-2\,e}(-b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d-2\,f\,s+f\,\nu)^{n-q}\,(-d+2\,f\,s-f\,\nu-2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)\right)\right/;\, n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.4506.01

$$\int z^n \sinh\left(\sqrt{z}\ b + d\,z + e\right) \cosh^{\nu}\left(\sqrt{z}\ c + f\,z\right) dz == 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)\, d^{-2\,n-2}$$

$$\left(e^{e-\frac{b^2}{4\,d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b + 2\,d\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b + 2\,d\,\sqrt{z}\right) \right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) + 2\sqrt{-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) -$$

$$e^{\frac{b^2}{4\,d}-e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2\,n} \left(-b - 2\,d\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-b \left(-b - 2\,d\,\sqrt{z}\right) \right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) - 2\,d\sqrt{\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) \right) \right) +$$

$$2^{-2\,n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{-\frac{(c\,(2\,s-\nu)-b)^2}{4\,(f\,(2\,s-\nu)-d)}-e} \left(f\,(2\,s-\nu)-d\right)^{-2\,n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (c\,(2\,s-\nu)-b)^{-h-k+2\,n} \right.$$

$$\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)-d} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((c\,(2\,s-\nu)-b) \left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right) \Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\ -\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,s-\nu)-d)} \right) +$$

$$2\sqrt{-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu)-d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu)-d}}\ (f\,(2\,s-\nu)-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$-\frac{\left(-b+c\,(2\,s-v)+2\,(f\,(2\,s-v)-d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,s-v)-d)}\Bigg)\Bigg)+e^{-\frac{(b+c\,(2\,s-v))^2}{4\,(d+f\,(2\,s-v))}+e}\,(d+f\,(2\,s-v))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+c\,(2\,s-v))^{-h-k+2\,n}\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+c\,(2\,s-v))\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(h+k+1),$$

$$-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\Bigg)+2\,\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}}$$

$$(d+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)\Bigg)-e^{-\frac{(c\,(v-2\,s)-b)^2}{4\,(f\,(v-2\,s)-d)}-e}$$

$$(f\,(v-2\,s)-d)^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s)-b)^{-h-k+2\,n}\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((c\,(v-2\,s)-b)\left(-b+c\,(v-2\,s)+\right.$$

$$\left.2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\right)+$$

$$2\,\sqrt{-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{f\,(v-2\,s)-d}}\;(f\,(v-2\,s)-d)\,\Gamma\Bigg(\frac{1}{2}\,(h+k+2),$$

$$-\frac{\left(-b+c\,(v-2\,s)+2\,(f\,(v-2\,s)-d)\,\sqrt{z}\right)^2}{4\,(f\,(v-2\,s)-d)}\Bigg)\Bigg)+e^{-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}+e}\,(d+f\,(v-2\,s))^{-2\,n-2}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(b+c\,(v-2\,s))^{-h-k+2\,n}\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+c\,(v-2\,s))\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,s))}\right)+2\sqrt{-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{d+f\,(v-2\,s)}}$$

$$\left.\left.(d+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b+c\,(v-2\,s)+2\,(d+f\,(v-2\,s))\,\sqrt{z}\right)^{2}}{4\,(d+f\,(v-2\,s))}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^{n}\sinh(d\,z)\cosh^{v}\left(c\,z^{r}+f\,z+g\right)$

01.20.21.4507.01

$$\int z^n \sinh(d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-\nu-2}\left(2\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,-d\,z)+\Gamma(n+1,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{2\,g\,s-g\,\nu}\binom{\nu}{s}(c\,(\nu-2\,s))^{-n-1}\right.$$

$$\left(-e^{-\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}}(-1)^n\sum_{q=0}^{n}2^{q-n}\,(d+f\,(\nu-2\,s))^{n-q}\,((2\,s-\nu)\,(f+2\,c\,z)-d)^{q+1}\left(-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(8\,s-4\,\nu)}\right)-\right.$$

$$e^{-\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}}(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))\,(d+(2\,s-\nu)\,(f+2\,c\,z))^q$$

$$\left(-\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-d-(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,\nu)}\right)+$$

$$e^{\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}+2\,g\,(\nu-2\,s)}\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}$$

$$\left(\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)-$$

$$e^{\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}+2\,g\,(\nu-2\,s)}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)-\frac{d}{2}\right)^{n-q}\left(\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)\right)\right)\Big/;\, n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4508.01

$$\int z^n \sinh(d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz ==$$

$$2^{-\nu-2}\left(2\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,\Gamma(n+1,-d\,z)+\Gamma(n+1,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+4^{-n}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{2\,g\,s-g\,\nu}\binom{\nu}{s}\right.$$

$$\left(-e^{(\nu-2\,s)\left(\frac{(\nu-2\,s)\,c^2}{4\,d+8\,f\,s-4\,f\,\nu}+2\,g\right)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(\nu-2\,s))^{-h-k+2\,n}\left(\frac{\left(c\,(2\,s-\nu)+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\left(c\,(v-2\,s)+2\,(-d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)-$$

$$2\,(d+2\,f\,s-f\,v)\sqrt{\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\right)\right)$$

$$(-d-2\,f\,s+f\,v)^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,v}-4\,g\,s}\left(-(d-2\,f\,s+f\,v)^2\right)^{-2\,n-1}$$

$$\left(e^{4\,g\,s}\,(d-2\,f\,s+f\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+\right.\right.$$

$$\left.2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)-$$

$$2\,(d-2\,f\,s+f\,v)\sqrt{\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)\right)-e^{2\left(\frac{c^2\,(v-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,v}+g\,v\right)}\,(-d+2\,f\,s-f\,v)^{2\,n}\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)-2\,(-d+2\,f\,s-f\,v)\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)\right)+e^{-\frac{c^2\,(v-2\,s)^2}{4\,d+8\,f\,s-4\,f\,v}}$$

$$(d+2\,f\,s-f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)+2\sqrt{-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}\,(d+2\,f\,s-f\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\right)\Big/;\ n\in\mathbb{N}\wedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4509.01

$$\int z^n \sinh(e+d\,z)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-\nu-2}\left(2\,e^{-e}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,e^{2\,e}\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-e+2\,g\,s-g\,\nu}\binom{\nu}{s}(c\,(\nu-2\,s))^{-n-1}\right.$$

$$\left(-e^{-\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}}(-1)^n\sum_{q=0}^{n}2^{q-n}\,(d+f\,(\nu-2\,s))^{n-q}\,((2\,s-\nu)\,(f+2\,c\,z)-d)^{q+1}\left(-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{((2\,s-\nu)\,(f+2\,c\,z)-d)^2}{c\,(8\,s-4\,\nu)}\right)-\right.$$

$$e^{2\,e-\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}}(-1)^n\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))\,(d+(2\,s-\nu)\,(f+2\,c\,z))^q$$

$$\left(-\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-d-(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,\nu)}\right)+$$

$$e^{\frac{(-d-2\,f\,s+f\,\nu)^2}{c\,(8\,s-4\,\nu)}+2\,g\,(\nu-2\,s)}\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,\nu)^{n-q}\,(-d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}$$

$$\left(\frac{(d+(2\,s-\nu)\,(f+2\,c\,z))^2}{c\,(2\,s-\nu)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)-$$

$$e^{\frac{(d+f\,(\nu-2\,s))^2}{c\,(8\,s-4\,\nu)}+2\,e+2\,g\,(\nu-2\,s)}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)-\frac{d}{2}\right)^{n-q}\left(\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.(d-(2\,s-\nu)\,(f+2\,c\,z))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(d-2\,f\,s+f\,\nu-4\,c\,s\,z+2\,c\,\nu\,z)^2}{8\,c\,s-4\,c\,\nu}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4510.01

$$\int z^n \sinh(e+d\,z)\cosh^{\nu}\left(\sqrt{z}\;c+g+f\,z\right)dz == 2^{-\nu-2}\left(2\,e^{-e}\binom{\nu}{\frac{\nu}{2}}\left((-1)^n\,e^{2\,e}\,\Gamma(n+1,\,-d\,z)+\Gamma(n+1,\,d\,z)\right)(1-\nu \bmod 2)\,d^{-n-1}+\right.$$

$$4^{-n}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{e+2\,g\,s-g\,\nu}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,d+8\,f\,s-4\,f\,\nu}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-\nu))^{-h-k+2\,n}\right.\right.$$

$$\left.\left.\left(c\,(2\,s-\nu)+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c\,(2\,s-\nu)+2\,(d+2\,f\,s-f\,\nu)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,\nu}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)+2\sqrt{-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}$$

$$\left.(d+2\,f\,s-f\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\right)\Bigg)$$

$$(d+2\,f\,s-f\,v)^{-2\,(n+1)}+e^{-2\,e}\left(e^{-\frac{c^2\,(v-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,v}-4\,g\,s}\left(-(d-2\,f\,s+f\,v)^2\right)^{-2\,n-1}\right.$$

$$\left(e^{4\,g\,s}\,(d-2\,f\,s+f\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}\right.$$

$$\left(\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d-\right.\right.$$

$$\left.2\,f\,s+f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)-$$

$$2\,(d-2\,f\,s+f\,v)\sqrt{\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)\right)-$$

$$e^{2\left(\frac{c^2\,(v-2\,s)^2}{-4\,d+8\,f\,s-4\,f\,v}+e+g\,v\right)}\,(-d+2\,f\,s-f\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left.\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)-$$

$$2\,(-d+2\,f\,s-f\,v)\sqrt{-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{d-2\,f\,s+f\,v}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}\right)^2}{4\,(d-2\,f\,s+f\,v)}\right)\right)\right)-$$

$$e^{(v-2\,s)\left(\frac{(v-2\,s)\,c^2}{4\,d+8\,f\,s-4\,f\,v}+2\,g\right)}\,(-d-2\,f\,s+f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left(\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}\right)^{\frac{1}{2}(-h-k-1)}\left(c\,(v-2\,s)+2\,(-d-2\,f\,s+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)-$$

$$2\,(d+2\,f\,s-f\,v)\sqrt{\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{d+2\,f\,s-f\,v}}$$

$$\left.\left.\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}\right)^2}{4\,d+8\,f\,s-4\,f\,v}\right)\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r\right) \cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4511.01

$$\int z^n \sinh\left(b z^2\right) \cosh^{\nu}\left(c z^2 + f z + g\right) dz ==$$

$$-2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} \left(\left(-b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -b z^2\right) - \left(b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b z^2\right)\right) (1 - \nu \bmod 2)\, z^{n+1} -$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{g\nu - 2gs} \binom{\nu}{s} \left(-e^{-\frac{(f\nu - 2fs)^2}{-4b - 8cs + 4c\nu}} \left(\sum_{q=0}^{n} 2^{q-n} (2fs - f\nu)^{n-q} \right.\right.$$

$$(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^{q+1} \left(-\frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-b - 2cs + c\nu} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-4b - 8cs + 4c\nu}\right) \right) (-b - 2cs + c\nu)^{-n-1} +$$

$$e^{\frac{(f\nu - 2fs)^2}{-4b - 8cs + 4c\nu} - 2g(\nu - 2s)} (b + 2cs - c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (f\nu - 2fs)^{n-q} (2fs + 4czs - f\nu + 2bz - 2c\nu z)^{q+1}$$

$$\left(\frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-b - 2cs + c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2fs - 4czs + f\nu - 2bz + 2c\nu z)^2}{-4b - 8cs + 4c\nu}\right) +$$

$$e^{\frac{(f\nu - 2fs)^2}{-4b + 8cs - 4c\nu}} (b - 2cs + c\nu)^{-n-1} \sum_{q=0}^{n} \left(f\left(s - \frac{\nu}{2}\right)\right)^{n-q} (f(\nu - 2s) + 2(b - 2cs + c\nu)z)^{q+1}$$

$$\left(-\frac{(f(\nu - 2s) + 2(b - 2cs + c\nu)z)^2}{b - 2cs + c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f(\nu - 2s) + 2(b - 2cs + c\nu)z)^2}{-4b + 8cs - 4c\nu}\right) -$$

$$e^{-\frac{(f\nu - 2fs)^2}{-4b + 8cs - 4c\nu} - 2g(\nu - 2s)} (-b + 2cs - c\nu)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (f\nu - 2fs)^{n-q} (2fs + 4czs - f\nu - 2bz - 2c\nu z)^{q+1}$$

$$\left(-\frac{(f(\nu - 2s) + 2(b - 2cs + c\nu)z)^2}{-b + 2cs - c\nu} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \Gamma\left(\frac{q+1}{2}, -\frac{(f(\nu - 2s) + 2(b - 2cs + c\nu)z)^2}{-4b + 8cs - 4c\nu}\right) \right) /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4512.01

$$\int z^n \sinh\left(b \sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\ c + g + f z\right) dz ==$$

$$2^{-\nu-2} \left(-4 \binom{\nu}{\frac{\nu}{2}} \left(\Gamma\left(2(n+1), -b\sqrt{z}\right) - \Gamma\left(2(n+1), b\sqrt{z}\right)\right) (1 - \nu \bmod 2)\, b^{-2(n+1)} - 2^{-2n} f^{-2(n+1)} \right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{2gs-gv}(v-2s)^{-2(n+1)}\binom{v}{s}\left(e^{\frac{(b+2cs-cv)^2}{f(8s-4v)}+2g(v-2s)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b-2cs+cv)^{-h-k+2n}\left(-b-(2s-v)\right.\right.$$

$$\left.\left(c+2f\sqrt{z}\right)\right)^{h+k}\left(\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)-\right.$$

$$\left.2f(2s-v)\sqrt{\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\,\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\right)+$$

$$e^{-\frac{(b+c(v-2s))^2}{f(8s-4v)}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b+2cs-cv)^{-h-k+2n}\left(-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(\left(2s-v\right)\left(c+2f\sqrt{z}\right)-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)-2f(v-2s)\right.$$

$$\left.\sqrt{-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\right)-$$

$$e^{\frac{(b+c(v-2s))^2}{f(4s-2v)}-4gs+2gv}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+c(v-2s))^{-h-k+2n}\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+2f\sqrt{\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)-$$

$$e^{-\frac{(b+2cs-cv)^2}{f(8s-4v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2cs-cv)^{-h-k+2n}\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+$$

$$2f(2s-v)\sqrt{-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh(b\,z^r+e)\cosh^v(c\,z^r+f\,z+g)$

01.20.21.4513.01

$$\int z^n \sinh\left(b z^2+e\right) \cosh^v\left(c z^2+f z+g\right) dz ==$$

$$-2^{-v-2} e^{-e} \binom{v}{\frac{v}{2}} \left(e^{2e} \left(-b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -b z^2\right) - \left(b z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b z^2\right)\right) (1-v \bmod 2)\, z^{n+1} -$$

$$2^{-v-2} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{e-2gs+gv} \binom{v}{s} \left(-e^{-\frac{(fv-2fs)^2}{-4b-8cs+4cv}-2e} \left(\sum_{q=0}^{n} 2^{q-n} (2fs-fv)^{n-q} \right.\right.$$

$$(-2fs-4czs+fv-2bz+2cvz)^{q+1} \left(-\frac{(-2fs-4czs+fv-2bz+2cvz)^2}{-b-2cs+cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2fs-4czs+fv-2bz+2cvz)^2}{-4b-8cs+4cv}\right)\right) (-b-2cs+cv)^{-n-1} +$$

$$e^{\frac{(fv-2fs)^2}{-4b-8cs+4cv}-2g(v-2s)} (b+2cs-cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (fv-2fs)^{n-q} (2fs+4czs-fv+2bz-2cvz)^{q+1}$$

$$\left(\frac{(-2fs-4czs+fv-2bz+2cvz)^2}{-b-2cs+cv}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2fs-4czs+fv-2bz+2cvz)^2}{-4b-8cs+4cv}\right) +$$

$$e^{\frac{(fv-2fs)^2}{-4b+8cs-4cv}} (b-2cs+cv)^{-n-1} \sum_{q=0}^{n} \left(f\left(s-\frac{v}{2}\right)\right)^{n-q} (f(v-2s)+2(b-2cs+cv)z)^{q+1}$$

$$\left(-\frac{(f(v-2s)+2(b-2cs+cv)z)^2}{b-2cs+cv}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f(v-2s)+2(b-2cs+cv)z)^2}{-4b+8cs-4cv}\right) -$$

$$e^{-\frac{(fv-2fs)^2}{-4b+8cs-4cv}-2e-2g(v-2s)} (-b+2cs-cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (fv-2fs)^{n-q}$$

$$(2fs+4czs-fv-2bz-2cvz)^{q+1} \left(-\frac{(f(v-2s)+2(b-2cs+cv)z)^2}{-b+2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(f(v-2s)+2(b-2cs+cv)z)^2}{-4b+8cs-4cv}\right)\right) /; n \in \mathbb{N} \bigwedge v \in \mathbb{N}^+\right.$$

01.20.21.4514.01

$$\int z^n \sinh\left(\sqrt{z}\ b+e\right) \cosh^v\left(\sqrt{z}\ c+g+f z\right) dz ==$$

$$2^{-v-2} \left(-4 e^{-e} \binom{v}{\frac{v}{2}} \left(e^{2e} \Gamma\left(2(n+1), -b\sqrt{z}\right) - \Gamma\left(2(n+1), b\sqrt{z}\right)\right) (1-v \bmod 2)\, b^{-2(n+1)} -\right.$$

$$2^{-2n} f^{-2(n+1)} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{e+2gs-gv} (v-2s)^{-2(n+1)} \binom{v}{s} \Bigg(e^{\frac{(b+2cs-cv)^2}{f(8s-4v)}-2e+2g(v-2s)} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b-2cs+cv)^{-h-k+2n}$$

$$\left(-b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k} \left(\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right) \Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) -$$

$$2f(2s-v)\sqrt{\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) \Bigg) +$$

$$e^{-\frac{(b+c(v-2s))^2}{f(8s-4v)}} \Bigg(e^{-2e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b+2cs-cv)^{-h-k+2n} \left(-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\left((2s-v)\left(c+2f\sqrt{z}\right)-b\right)^{h+k} \binom{k}{h}\binom{n}{k} \Bigg((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) - 2f(v-2s)$$

$$\sqrt{-\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)} \right) \Bigg) -$$

$$e^{\frac{(b+c(v-2s))^2}{f(4s-2v)}-4gs+2gv} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+c(v-2s))^{-h-k+2n} \left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \Bigg((b+c(v-2s))\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+2f\sqrt{\frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$(v-2s)\,\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)-$$

$$e^{-\frac{(b+2cs-cv)^2}{f(8s-4v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b+2cs-cv)^{-h-k+2n}\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+2cs-cv)\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+$$

$$2f(2s-v)\sqrt{-\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4515.01

$$\int z^n \sinh\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$-2^{-v-2}\,e^{\frac{d^2}{4b}}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\left(e^{-\frac{d^2}{2b}}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,b\,z)^2}{4\,b}\right)\right)(-b)^{-n-1}-$$

$$2^{-v-2}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g\,v-2\,g\,s}\binom{v}{s}\left(-e^{-\frac{(-d-2\,f\,s+f\,v)^2}{-4\,b-8\,c\,s+4\,c\,v}}\left(\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,v)^{n-q}\,(-d-2\,f\,s+f\,v-2\,b\,z-4\,c\,s\,z+2\,c\,v\,z)^{q+1}\right.\right.$$

$$\left(-\frac{(-d-2\,f\,s+f\,v-2\,b\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{-b-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(-d-2\,f\,s+f\,v-2\,b\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{-4\,b-8\,c\,s+4\,c\,v}\right)\right)(-b-2\,c\,s+c\,v)^{-n-1}+\right.$$

$$e^{\frac{(-d-2\,f\,s+f\,v)^2}{-4\,b-8\,c\,s+4\,c\,v}-2\,g\,(v-2\,s)}(b+2\,c\,s-c\,v)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,v)^{n-q}\,(d+2\,f\,s-f\,v+2\,b\,z+4\,c\,s\,z-2\,c\,v\,z)^{q+1}$$

$$\left(\frac{(-d-2\,f\,s+f\,v-2\,b\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{-b-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,f\,s+f\,v-2\,b\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{-4\,b-8\,c\,s+4\,c\,v}\right)+$$

$$e^{\frac{(d-2\,f\,s+f\,v)^2}{-4\,b+8\,c\,s-4\,c\,v}}(b-2\,c\,s+c\,v)^{-n-1}\sum_{q=0}^{n}\left(f\left(s-\frac{v}{2}\right)-\frac{d}{2}\right)^{n-q}(d+f\,(v-2\,s)+2\,(b-2\,c\,s+c\,v)\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(v-2\,s)+2\,(b-2\,c\,s+c\,v)\,z)^2}{b-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f\,(v-2\,s)+2\,(b-2\,c\,s+c\,v)\,z)^2}{-4\,b+8\,c\,s-4\,c\,v}\right)-$$

$$e^{-\frac{(d-2\,f\,s+f\,v)^2}{-4\,b+8\,c\,s-4\,c\,v}-2\,g\,(v-2\,s)}(-b+2\,c\,s-c\,v)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d-2\,f\,s+f\,v)^{n-q}$$

$$(-d+2\,f\,s-f\,v-2\,b\,z+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\left(-\frac{(d+f\,(v-2\,s)+2\,(b-2\,c\,s+c\,v)\,z)^2}{-b+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f\,(v-2\,s)+2\,(b-2\,c\,s+c\,v)\,z)^2}{-4\,b+8\,c\,s-4\,c\,v}\right)\right/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.4516.01

$$\int z^n \sinh\left(\sqrt{z}\ b + d\,z\right) \cosh^{\nu}\left(\sqrt{z}\ c + f\,z + g\right) dz == 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)\, d^{-2\,n-2}$$

$$\left(e^{-\frac{b^2}{4\,d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b + 2\,d\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \right.$$

$$\left. b \left(b + 2\,d\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) + 2\sqrt{-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) \right) -$$

$$e^{\frac{b^2}{4\,d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2\,n} \left(-b - 2\,d\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-b \left(-b - 2\,d\,\sqrt{z}\right) \right.$$

$$\left. \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) - 2\,d\sqrt{\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) \right) +$$

$$2^{-2\,n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{-\frac{(c\,(2\,s-\nu)-b)^2}{4\,(f\,(2\,s-\nu)-d)} + g\,(2\,s-\nu)} \left(f\,(2\,s-\nu) - d\right)^{-2\,n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (c\,(2\,s-\nu) - b)^{-h-k+2\,n} \right.$$

$$\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu) - d} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((c\,(2\,s-\nu) - b) \left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right) \Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\ -\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,s-\nu) - d)}\right) +$$

$$\left. 2\sqrt{-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu) - d}}\ (f\,(2\,s-\nu) - d)\,\Gamma\left(\right. \right)$$

$$\frac{1}{2}(h+k+2),\ -\frac{\left(-b+c(2s-v)+2(f(2s-v)-d)\sqrt{z}\right)^2}{4(f(2s-v)-d)}\Bigg)\Bigg)+$$

$$e^{-\frac{(b+c(2s-v))^2}{4(d+f(2s-v))}+g(2s-v)}(d+f(2s-v))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+c(2s-v))^{-h-k+2n}$$

$$\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{d+f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+c(2s-v))\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.$$

$$\left.-\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{4(d+f(2s-v))}\right)+2\sqrt{-\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{d+f(2s-v)}}$$

$$(d+f(2s-v))\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{4(d+f(2s-v))}\right)\Bigg)-e^{-\frac{(c(v-2s)-b)^2}{4(f(v-2s)-d)}+g(v-2s)}$$

$$(f(v-2s)-d)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(v-2s)-b)^{-h-k+2n}\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{f(v-2s)-d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((c(v-2s)-b)\left(-b+c(v-2s)+\right.$$

$$\left.2(f(v-2s)-d)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{4(f(v-2s)-d)}\right)+$$

$$2\sqrt{-\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{f(v-2s)-d}}\ (f(v-2s)-d)\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.-\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{4(f(v-2s)-d)}\right)\Bigg)+$$

$$e^{-\frac{(b+c(v-2s))^2}{4(d+f(v-2s))}+g(v-2s)}(d+f(v-2s))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+c(v-2s))^{-h-k+2n}$$

$$\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{d+f(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b+c(v-2s))\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{4(d+f(v-2s))}\right)+2\sqrt{-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{d+f(v-2s)}}$$

$$\left.(d+f(v-2s))\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{4(d+f(v-2s))}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh\left(b z^r + d z + e\right) \cosh^v\left(c z^r + f z + g\right)$

01.20.21.4517.01

$$\int z^n \sinh\left(b\,z^2+d\,z+e\right)\cosh^{\nu}\left(c\,z^2+f\,z+g\right)dz == -2^{-\nu-2}\,e^{\frac{d^2}{4\,b}-e}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$(-b)^{-n-1}\left(e^{2\,e-\frac{d^2}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+2\,b\,z)^2}{4\,b}\right)-\right.$$

$$\left.\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(-d-2\,b\,z)^{q+1}\left(\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+2\,b\,z)^2}{4\,b}\right)\right)-$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{e-2\,g\,s+g\,\nu}\binom{\nu}{s}\left(-e^{-\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}-2\,e}(-b-2\,c\,s+c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d+2\,f\,s-f\,\nu)^{n-q}\right.$$

$$(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^{q+1}\left(-\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)+$$

$$e^{\frac{(-d-2\,f\,s+f\,\nu)^2}{-4\,b-8\,c\,s+4\,c\,\nu}-2\,g\,(\nu-2\,s)}(b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(-d-2\,f\,s+f\,\nu)^{n-q}$$

$$(d+2\,f\,s-f\,\nu+2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}\left(\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-d-2\,f\,s+f\,\nu-2\,b\,z-4\,c\,s\,z+2\,c\,\nu\,z)^2}{-4\,b-8\,c\,s+4\,c\,\nu}\right)+$$

$$e^{\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}}(b-2\,c\,s+c\,\nu)^{-n-1}\sum_{q=0}^{n}\left(f\left(s-\frac{\nu}{2}\right)-\frac{d}{2}\right)^{n-q}(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^{q+1}$$

$$\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{b-2\,c\,s+c\,\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)-$$

$$e^{-\frac{(d-2\,f\,s+f\,\nu)^2}{-4\,b+8\,c\,s-4\,c\,\nu}-2\,e-2\,g\,(\nu-2\,s)}(-b+2\,c\,s-c\,\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(d-2\,f\,s+f\,\nu)^{n-q}$$

$$(-d+2\,f\,s-f\,\nu-2\,b\,z+4\,c\,s\,z-2\,c\,\nu\,z)^{q+1}\left(-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-b+2\,c\,s-c\,\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d+f\,(\nu-2\,s)+2\,(b-2\,c\,s+c\,\nu)\,z)^2}{-4\,b+8\,c\,s-4\,c\,\nu}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4518.01

$$\int z^n \sinh\left(\sqrt{z}\ b + d\,z + e\right) \cosh^{\nu}\left(\sqrt{z}\ c + f\,z + g\right) dz == 2^{-2\,n-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)\, d^{-2\,n-2}$$

$$\left(e^{e-\frac{b^2}{4\,d}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, b^{-h-k+2\,n} \left(b + 2\,d\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b \left(b + 2\,d\,\sqrt{z}\right) \right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) + 2\sqrt{-\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b + 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) -$$

$$e^{\frac{b^2}{4\,d}-e} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b)^{-h-k+2\,n} \left(-b - 2\,d\,\sqrt{z}\right)^{h+k} \left(\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(-b \left(-b - 2\,d\,\sqrt{z}\right) \right.$$

$$\left.\left. \Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) - 2\,d\sqrt{\frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(-b - 2\,d\,\sqrt{z}\right)^2}{4\,d}\right) \right) \right) +$$

$$2^{-2\,n-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-e^{-\frac{(c\,(2\,s-\nu)-b)^2}{4\,(f\,(2\,s-\nu)-d)} - e + g\,(2\,s-\nu)} \left(f\,(2\,s-\nu) - d\right)^{-2\,n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, \left(c\,(2\,s-\nu) - b\right)^{-h-k+2\,n} \right.$$

$$\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^{h+k} \left(-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu) - d} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(\left(c\,(2\,s-\nu) - b\right) \left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right) \Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\ -\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^2}{4\,(f\,(2\,s-\nu) - d)} \right) +$$

$$\left. 2\sqrt{-\frac{\left(-b + c\,(2\,s-\nu) + 2\,(f\,(2\,s-\nu) - d)\,\sqrt{z}\right)^2}{f\,(2\,s-\nu) - d}}\ \left(f\,(2\,s-\nu) - d\right) \Gamma\left(\right.\right.$$

$$\frac{1}{2}(h+k+2),\ -\frac{\left(-b+c(2s-v)+2(f(2s-v)-d)\sqrt{z}\right)^2}{4(f(2s-v)-d)}\Bigg)\Bigg)+$$

$$e^{-\frac{(b+c(2s-v))^2}{4(d+f(2s-v))}+e+g(2s-v)}(d+f(2s-v))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+c(2s-v))^{-h-k+2n}$$

$$\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{d+f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+c(2s-v))\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.$$

$$\left.-\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{4(d+f(2s-v))}\right)+2\sqrt{-\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{d+f(2s-v)}}$$

$$(d+f(2s-v))\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+c(2s-v)+2(d+f(2s-v))\sqrt{z}\right)^2}{4(d+f(2s-v))}\right)\Bigg)-$$

$$e^{-\frac{(c(v-2s)-b)^2}{4(f(v-2s)-d)}-e+g(v-2s)}(f(v-2s)-d)^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(v-2s)-b)^{-h-k+2n}$$

$$\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{f(v-2s)-d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((c(v-2s)-b)\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+1),\ -\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{4(f(v-2s)-d)}\Bigg)+$$

$$2\sqrt{-\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{f(v-2s)-d}}\ (f(v-2s)-d)\Gamma\Bigg($$

$$\frac{1}{2}(h+k+2),\ -\frac{\left(-b+c(v-2s)+2(f(v-2s)-d)\sqrt{z}\right)^2}{4(f(v-2s)-d)}\Bigg)\Bigg)+$$

$$e^{-\frac{(b+c(v-2s))^2}{4(d+f(v-2s))}+e+g(v-2s)}(d+f(v-2s))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+c(v-2s))^{-h-k+2n}$$

$$\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{d+f(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b+c(v-2s))\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.$$

$$\left.-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{4(d+f(v-2s))}\right)+2\sqrt{-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{d+f(v-2s)}}$$

$$(d+f(v-2s))\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{4(d+f(v-2s))}\right)\Bigg)\Bigg)\Big/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving powers of sinh and power

Involving $z^{\alpha-1}\sinh^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.4519.01

$$\int z^{\alpha-1} \sinh^m(c\,z) \cosh^\nu(a\,z)\,dz ==$$

$$\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}} \frac{i^m\, 2^{-m-\nu}\, z^\alpha\, (1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha} - 2^{-m-\nu}\, z^\alpha \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \left(-c^2\,(m-2\,k)^2\, z^2\right)^{-\alpha} \binom{m}{k}$$

$$\left((-1)^m\, \Gamma(\alpha,\, c\,(m-2\,k)\,z)\,(c\,(2\,k-m)\,z)^\alpha + (c\,(m-2\,k)\,z)^\alpha\, \Gamma(\alpha,\, c\,(2\,k-m)\,z)\right) - i^m\, 2^{-m-\nu}\, z^\alpha \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(-a^2\,(\nu-2\,s)^2\, z^2\right)^{-\alpha} \binom{\nu}{s} (\Gamma(\alpha,\, a\,(\nu-2\,s)\,z)\,(a\,(2\,s-\nu)\,z)^\alpha + (a\,(\nu-2\,s)\,z)^\alpha\, \Gamma(\alpha,\, a\,(2\,s-\nu)\,z)) - 2^{-m-\nu}\, z^\alpha$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} ((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\, ((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^{-\alpha} \left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^2\, z^2\right)^{-\alpha}$$

$$\binom{\nu}{s} \Big(\Big(((-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z)^\alpha\, \Gamma(\alpha,\, (2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)\,((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^\alpha +$$

$$(-1)^m\, ((2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)^\alpha\, \Gamma(\alpha,\, (-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z)\,((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^\alpha +$$

$$(-1)^m \left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^2\, z^2\right)^\alpha\, \Gamma(\alpha,\, (c\,(m-2\,k)+a\,(\nu-2\,s))\,z)\Big)$$

$$((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)^\alpha + ((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^\alpha \left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^2\, z^2\right)^\alpha$$

$$\Gamma(\alpha,\, (2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)\Big) /;\; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4520.01

$$\int z^n \sinh^\mu(c\,z) \cosh^\nu(a\,z)\,dz == 2^{-\nu} \binom{\nu}{\frac{\nu}{2}} n!\,(1-\nu \bmod 2) \sinh^\mu(c\,z) \left(1-e^{-2\,c\,z}\right)^{-\mu}$$

$$\sum_{p=0}^{n} \frac{(-1)^p\, z^{n-p}\, (c\,\mu)^{-p-1}}{(n-p)!}\, {}_{p+2}F_{p+1}\left(-\frac{\mu}{2}, \ldots, -\frac{\mu}{2}, -\mu; 1-\frac{\mu}{2}, \ldots, 1-\frac{\mu}{2}; e^{-2\,c\,z}\right) + 2^{-\nu}\, n!\, \sinh^\mu(c\,z)$$

$$\left(1-e^{-2\,c\,z}\right)^{-\mu} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \Bigg(e^{a\,(\nu-2\,s)\,z} \sum_{p=0}^{n} \frac{1}{(n-p)!}\, (-1)^p\, z^{n-p}\, (a\,(\nu-2\,s)+c\,\mu)^{-p-1}\, {}_{p+2}F_{p+1}\left(-\frac{-2\,a\,s+a\,\nu+c\,\mu}{2\,c}, \right.$$

$$\left. \ldots, -\frac{-2\,a\,s+a\,\nu+c\,\mu}{2\,c}, -\mu; 1-\frac{-2\,a\,s+a\,\nu+c\,\mu}{2\,c}, \ldots, 1-\frac{-2\,a\,s+a\,\nu+c\,\mu}{2\,c}; e^{-2\,c\,z}\right) +$$

$$e^{-a\,(\nu-2\,s)\,z} \sum_{p=0}^{n} \frac{1}{(n-p)!}\, (-1)^p\, z^{n-p}\, (-a\,(\nu-2\,s)+c\,\mu)^{-p-1}\, {}_{p+2}F_{p+1}\left(-\frac{2\,a\,s-a\,\nu+c\,\mu}{2\,c}, \ldots, \right.$$

$$\left. -\frac{2\,a\,s-a\,\nu+c\,\mu}{2\,c}, -\mu; 1-\frac{2\,a\,s-a\,\nu+c\,\mu}{2\,c}, \ldots, 1-\frac{2\,a\,s-a\,\nu+c\,\mu}{2\,c}; e^{-2\,c\,z}\right)\Bigg) /;\; \nu \in \mathbb{N} \bigwedge n \in \mathbb{N}$$

01.20.21.4521.01

$$\int z^n \sinh^m(c\,z)\cosh^\nu(a\,z)\,dz == -2^{-m}\left(1+e^{-2\,a\,z}\right)^{-\nu}\cosh^\nu(a\,z)\,n!$$

$$\left(i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2\,a\,z}\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,c\,z\,k-c\,m\,z}\binom{m}{k}\left((-1)^m\,e^{4\,k\,c\,z}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(2\,c\,k-c\,m+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a\,\nu-c\,(m-2\,k)}{2\,a},\right.\right.$$

$$\ldots,-\frac{a\,\nu-c\,(m-2\,k)}{2\,a},-\nu;1-\frac{a\,\nu-c\,(m-2\,k)}{2\,a},\ldots,1-\frac{a\,\nu-c\,(m-2\,k)}{2\,a};-e^{-2\,a\,z}\Bigg)+$$

$$e^{2\,c\,z\,m}\sum_{j=0}^{n}\frac{(-1)^j\,z^{n-j}\,(-2\,c\,k+c\,m+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,(m-2\,k)+a\,\nu}{2\,a},\ldots,-\frac{c\,(m-2\,k)+a\,\nu}{2\,a},\right.$$

$$\left.\left.\left.-\nu;1-\frac{c\,(m-2\,k)+a\,\nu}{2\,a},\ldots,1-\frac{c\,(m-2\,k)+a\,\nu}{2\,a};-e^{-2\,a\,z}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^\mu(c\,z+d)\cosh^\nu(a\,z)$

01.20.21.4522.01

$$\int z^{\alpha-1}\sinh^m(d+c\,z)\cosh^\nu(a\,z)\,dz == \frac{i^m\,2^{-m-\nu}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m \bmod 2)\,(1-\nu \bmod 2)}{\alpha}-i^m\,2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$z^\alpha\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-a^2\,(\nu-2\,s)^2\,z^2\right)^{-\alpha}\left(\Gamma(\alpha,a\,(\nu-2\,s)\,z)\,(a\,(2\,s-\nu)\,z)^\alpha+(a\,(\nu-2\,s)\,z)^\alpha\,\Gamma(\alpha,a\,(2\,s-\nu)\,z)\right)-$$

$$i^m\,2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-c^2\,(m-2\,k)^2\,z^2\right)^{-\alpha}$$

$$\left(e^{\frac{i\,m\,\pi}{2}-d\,(m-2\,k)}\,\Gamma(\alpha,c\,(m-2\,k)\,z)\,(c\,(2\,k-m)\,z)^\alpha+(c\,(m-2\,k)\,z)^\alpha\,e^{d\,(m-2\,k)-\frac{i\,m\,\pi}{2}}\,\Gamma(\alpha,c\,(2\,k-m)\,z)\right)-i^m\,2^{-m-\nu}\,z^\alpha$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\left((c\,(m-2\,k)+a\,(\nu-2\,s))\,z\right)^{-\alpha}\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^2\,z^2\right)^{-\alpha}$$

$$\left(\left(((2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)^\alpha\,e^{2\,d\,k-d\,m+\frac{i\,m\,\pi}{2}}\,\Gamma(\alpha,(-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z)\,((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^\alpha+\right.\right.$$

$$\left(\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z\right)^\alpha e^{-d\,(2\,k-m)-\frac{\pi\,i\,m}{2}}\,\Gamma(\alpha,(2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)\right.$$

$$((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^\alpha+\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^2\,z^2\right)^\alpha e^{d\,(2\,k-m)+\frac{i\,m\,\pi}{2}}$$

$$\left.\left.\Gamma(\alpha,(c\,(m-2\,k)+a\,(\nu-2\,s))\,z)\right)((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)^\alpha+((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^\alpha\right.$$

$$\left.\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^2\,z^2\right)^\alpha e^{-2\,d\,k+d\,m-\frac{\pi\,i\,m}{2}}\,\Gamma(\alpha,(2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)\right)/;\,m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4523.01

$$\int z^n \sinh^{\mu}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == -2^{-\nu}\left(1-e^{-2(d+c\,z)}\right)^{-\mu} n!\sinh^{\mu}(d+c\,z)$$

$$\left(\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};e^{-2(d+c\,z)}\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-(2k+\nu)az}\binom{\nu}{k}\left(e^{4kaz}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(2\,a\,k-a\,\nu+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-a(\nu-2k)}{2c},\ldots,\right.\right.$$

$$\left.-\frac{c\,\mu-a(\nu-2k)}{2c},-\mu;1-\frac{c\,\mu-a(\nu-2k)}{2c},\ldots,1-\frac{c\,\mu-a(\nu-2k)}{2c};e^{-2(d+c\,z)}\right)+$$

$$e^{2\nu az}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-2\,a\,k+a\,\nu+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a(\nu-2k)+c\,\mu}{2c},\ldots,-\frac{a(\nu-2k)+c\,\mu}{2c},\right.$$

$$\left.\left.\left.-\mu;1-\frac{a(\nu-2k)+c\,\mu}{2c},\ldots,1-\frac{a(\nu-2k)+c\,\mu}{2c};e^{-2(d+c\,z)}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4524.01

$$\int z^n \sinh^{m}(d+c\,z)\cosh^{\nu}(a\,z)\,dz == -2^{-m}\left(1+e^{-2az}\right)^{-\nu}\cosh^{\nu}(a\,z)\,n!$$

$$\left(i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2az}\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-2dk-2czk-dm-cmz}\binom{m}{k}\left((-1)^m e^{4k(d+cz)}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(2\,c\,k-c\,m+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a\,\nu-c(m-2k)}{2a},\right.\right.$$

$$\ldots,-\frac{a\,\nu-c(m-2k)}{2a},-\nu;1-\frac{a\,\nu-c(m-2k)}{2a},\ldots,1-\frac{a\,\nu-c(m-2k)}{2a};-e^{-2az}\Big)+$$

$$e^{m(2d+2cz)}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-2\,c\,k+c\,m+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c(m-2k)+a\,\nu}{2a},\ldots,-\frac{c(m-2k)+a\,\nu}{2a},\right.$$

$$\left.\left.\left.-\nu;1-\frac{c(m-2k)+a\,\nu}{2a},\ldots,1-\frac{c(m-2k)+a\,\nu}{2a};-e^{-2az}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^{\mu}(c\,z)\cosh^{\nu}(a\,z+b)$

01.20.21.4525.01

$$\int z^{\alpha-1}\sinh^{m}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == \frac{i^{m}\,2^{-m-\nu}\,z^{\alpha}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(1-m\bmod 2)\,(1-\nu\bmod 2)}{\alpha} - i^{m}\,2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,z^{\alpha}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-a^{2}\,(\nu-2\,s)^{2}\,z^{2}\right)^{-\alpha}\left(e^{b\,(2\,s-\nu)}\,\Gamma(\alpha,\,a\,(\nu-2\,s)\,z)\,(a\,(2\,s-\nu)\,z)^{\alpha}+(a\,(\nu-2\,s)\,z)^{\alpha}\,e^{-b\,(2\,s-\nu)}\,\Gamma(\alpha,\,a\,(2\,s-\nu)\,z)\right)-$$

$$2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\,z^{\alpha}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(-c^{2}\,(m-2\,k)^{2}\,z^{2}\right)^{-\alpha}$$

$$\left((-1)^{m}\,\Gamma(\alpha,\,c\,(m-2\,k)\,z)\,(c\,(2\,k-m)\,z)^{\alpha}+(c\,(m-2\,k)\,z)^{\alpha}\,\Gamma(\alpha,\,c\,(2\,k-m)\,z)\right)-2^{-m-\nu}\,z^{\alpha}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)^{-\alpha}\,((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^{-\alpha}\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^{2}\,z^{2}\right)^{-\alpha}$$

$$\left(\left((-1)^{m}\,((2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)^{\alpha}\,e^{b\,\nu-2\,b\,s}\,\Gamma(\alpha,\,(-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z)\,((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^{\alpha}+\right.\right.$$

$$\left.\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z\right)^{\alpha}\,e^{b\,(2\,s-\nu)}\,\Gamma(\alpha,\,(2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)\,((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^{\alpha}+\right.$$

$$\left.\left.(-1)^{m}\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^{2}\,z^{2}\right)^{\alpha}\,e^{b\,(2\,s-\nu)}\,\Gamma(\alpha,\,(c\,(m-2\,k)+a\,(\nu-2\,s))\,z)\right)\right)$$

$$((2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)^{\alpha}+((c\,(m-2\,k)+a\,(\nu-2\,s))\,z)^{\alpha}\left(-(2\,c\,k-c\,m-2\,a\,s+a\,\nu)^{2}\,z^{2}\right)^{\alpha}$$

$$\left.e^{b\,\nu-2\,b\,s}\,\Gamma(\alpha,\,(2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)\right)/;\,m\in\mathbb{N}^{+}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.4526.01

$$\int z^{n}\sinh^{\mu}(c\,z)\cosh^{\nu}(b+a\,z)\,dz == -2^{-\nu}\left(1-e^{-2\,c\,z}\right)^{-\mu}\,n!\,\sinh^{\mu}(c\,z)$$

$$\left(\binom{\nu}{\frac{\nu}{2}}(\nu\bmod 2-1)\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\,\ldots,\,-\frac{\mu}{2},\,-\mu;\,1-\frac{\mu}{2},\,\ldots,\,1-\frac{\mu}{2};\,e^{-2\,c\,z}\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-(2\,k+\nu)\,(b+a\,z)}\binom{\nu}{k}\left(e^{4\,k\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(2\,a\,k-a\,\nu+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\right.$$

$$\left.\left(-\frac{c\,\mu-a\,(\nu-2\,k)}{2\,c},\,\ldots,\,-\frac{c\,\mu-a\,(\nu-2\,k)}{2\,c},\,-\mu;\,1-\frac{c\,\mu-a\,(\nu-2\,k)}{2\,c},\,\ldots,\,1-\frac{c\,\mu-a\,(\nu-2\,k)}{2\,c};\,e^{-2\,c\,z}\right)+\right.$$

$$e^{2\,\nu\,(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-2\,a\,k+a\,\nu+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;\,1-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c},\,\ldots,\,1-\frac{a\,(\nu-2\,k)+c\,\mu}{2\,c};\,e^{-2\,c\,z}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^{+}$$

01.20.21.4527.01

$$\int z^n \sinh^m(c\,z)\cosh^\nu(b+a\,z)\,dz == -2^{-m}\left(1+e^{-2(b+a\,z)}\right)^{-\nu}\cosh^\nu(b+a\,z)\,n!$$

$$\left(i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2(b+a\,z)}\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-2ckz-cmz}\binom{m}{k}\left((-1)^m e^{4kcz}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(2ck-cm+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a\,\nu-c(m-2k)}{2a},\ldots,\right.\right.$$

$$\left.-\frac{a\,\nu-c(m-2k)}{2a},-\nu;1-\frac{a\,\nu-c(m-2k)}{2a},\ldots,1-\frac{a\,\nu-c(m-2k)}{2a};-e^{-2(b+a\,z)}\right)+$$

$$e^{2mcz}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-2ck+cm+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c(m-2k)+a\,\nu}{2a},\ldots,-\frac{c(m-2k)+a\,\nu}{2a},\right.$$

$$\left.\left.\left.-\nu;1-\frac{c(m-2k)+a\,\nu}{2a},\ldots,1-\frac{c(m-2k)+a\,\nu}{2a};-e^{-2(b+a\,z)}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^\mu(c\,z+d)\cosh^\nu(a\,z+b)$

01.20.21.4528.01

$$\int z^{\alpha-1}\sinh^m(d+c\,z)\cosh^\nu(b+a\,z)\,dz == \binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\frac{i^m 2^{-m-\nu}z^\alpha\ (1-m \bmod 2)(1-\nu \bmod 2)}{\alpha}-i^m 2^{-m-\nu}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\,z^\alpha$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-a^2(\nu-2s)^2z^2\right)^{-\alpha}\left(e^{b(2s-\nu)}\Gamma(\alpha,a(\nu-2s)z)(a(2s-\nu)z)^\alpha+(a(\nu-2s)z)^\alpha e^{-b(2s-\nu)}\Gamma(\alpha,a(2s-\nu)z)\right)-$$

$$i^m 2^{-m-\nu}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(-c^2(m-2k)^2z^2\right)^{-\alpha}$$

$$\left(e^{\frac{i m\pi}{2}-d(m-2k)}\Gamma(\alpha,c(m-2k)z)(c(2k-m)z)^\alpha+(c(m-2k)z)^\alpha e^{d(m-2k)-\frac{i m\pi}{2}}\Gamma(\alpha,c(2k-m)z)\right)-$$

$$i^m 2^{-m-\nu}z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}((2ck-cm+2as-a\nu)z)^{-\alpha}((c(m-2k)+a(\nu-2s))z)^{-\alpha}$$

$$\left(-(2ck-cm-2as+a\nu)^2z^2\right)^{-\alpha}\left(\left((2ck-cm-2as+a\nu)z\right)^\alpha e^{2dk-dm-2bs+b\nu+\frac{i m\pi}{2}}\right.$$

$$\Gamma(\alpha,(-2ck+cm+2as-a\nu)z)((c(m-2k)+a(\nu-2s))z)^\alpha+\left(\left(-(2ck-cm-2as+a\nu)z\right)^\alpha\right.$$

$$e^{-d(2k-m)+b(2s-\nu)-\frac{\pi i m}{2}}\Gamma(\alpha,(2ck-cm-2as+a\nu)z)((c(m-2k)+a(\nu-2s))z)^\alpha+$$

$$\left.\left.\left(-(2ck-cm-2as+a\nu)^2z^2\right)^\alpha e^{d(2k-m)+b(2s-\nu)+\frac{i m\pi}{2}}\Gamma(\alpha,(c(m-2k)+a(\nu-2s))z)\right)\right)$$

$$((2ck-cm+2as-a\nu)z)^\alpha+((c(m-2k)+a(\nu-2s))z)^\alpha\left(-(2ck-cm-2as+a\nu)^2z^2\right)^\alpha$$

$$\left.e^{-2dk+dm-2bs+b\nu-\frac{\pi i m}{2}}\Gamma(\alpha,(2ck-cm+2as-a\nu)z)\right)/;\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4529.01

$$\int z^n \sinh^{\mu}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == -2^{-\nu}\left(1-e^{-2(d+c\,z)}\right)^{-\mu} n!\sinh^{\mu}(d+c\,z)$$

$$\left(\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\mu}{2},\ldots,-\frac{\mu}{2},-\mu;1-\frac{\mu}{2},\ldots,1-\frac{\mu}{2};e^{-2(d+c\,z)}\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-(2k+\nu)(b+a\,z)}\binom{\nu}{k}\left(e^{4k(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(2\,a\,k-a\,\nu+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c\,\mu-a(\nu-2k)}{2\,c},\ldots,\right.\right.$$

$$\left.-\frac{c\,\mu-a(\nu-2k)}{2\,c},-\mu;1-\frac{c\,\mu-a(\nu-2k)}{2\,c},\ldots,1-\frac{c\,\mu-a(\nu-2k)}{2\,c};e^{-2(d+c\,z)}\right)+$$

$$e^{2\nu(b+a\,z)}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-2\,a\,k+a\,\nu+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a(\nu-2k)+c\,\mu}{2\,c},\ldots,-\frac{a(\nu-2k)+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;1-\frac{a(\nu-2k)+c\,\mu}{2\,c},\ldots,1-\frac{a(\nu-2k)+c\,\mu}{2\,c};e^{-2(d+c\,z)}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4530.01

$$\int z^n \sinh^{m}(d+c\,z)\cosh^{\nu}(b+a\,z)\,dz == -2^{-m}\left(1+e^{-2(b+a\,z)}\right)^{-\nu}\cosh^{\nu}(b+a\,z)\,n!$$

$$\left(i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{\nu}{2},\ldots,-\frac{\nu}{2},-\nu;1-\frac{\nu}{2},\ldots,1-\frac{\nu}{2};-e^{-2(b+a\,z)}\right)-\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-2dk-2czk-dm-cmz}\binom{m}{k}\left((-1)^m e^{4k(d+c\,z)}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(2\,c\,k-c\,m+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{a\,\nu-c(m-2k)}{2\,a},\right.\right.$$

$$\left.\ldots,-\frac{a\,\nu-c(m-2k)}{2\,a},-\nu;1-\frac{a\,\nu-c(m-2k)}{2\,a},\ldots,1-\frac{a\,\nu-c(m-2k)}{2\,a};-e^{-2(b+a\,z)}\right)+$$

$$e^{m(2d+2cz)}\sum_{j=0}^{n}\frac{(-1)^j z^{n-j}(-2\,c\,k+c\,m+a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{c(m-2k)+a\,\nu}{2\,a},\ldots,-\frac{c(m-2k)+a\,\nu}{2\,a},\right.$$

$$\left.\left.\left.-\nu;1-\frac{c(m-2k)+a\,\nu}{2\,a},\ldots,1-\frac{c(m-2k)+a\,\nu}{2\,a};-e^{-2(b+a\,z)}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b\,z^r)\cosh^{\nu}(c\,z)$

01.20.21.4531.01

$$\int z^n \sinh^m\left(b\,z^2\right) \cosh^v(c\,z)\,dz ==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+z^{n+1}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left(-b^2\,(m-2\,k)^2\,z^4\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},\,b\,(2\,k-m)\,z^2\right)\left(-b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}}+(-1)^m\left(b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-b\,(2\,k-m)\,z^2\right)\right)+$$

$$2\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(c\,(v-2\,s))^{-n-1}\left(\Gamma(n+1,\,c\,(v-2\,s)\,z)-(-1)^n\,\Gamma(n+1,\,c\,(2\,s-v)\,z)\right)+$$

$$b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{c^2\,(v-2\,s)^2}{b\,(8\,k-4\,m)}}\,(m-2\,k)^{-n-1}\binom{v}{s}$$

$$\left(-e^{\frac{c^2\,(v-2\,s)^2}{b\,(4\,k-2\,m)}}\sum_{q=0}^{n}2^{q-n}\,(c\,(v-2\,s))^{n-q}\left(\frac{(-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}(c\,(2\,s-v)+2\,b\,(m-2\,k)\,z)^{q+1}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)+$$

$$e^{\frac{c^2\,(v-2\,s)^2}{4\,b\,k-2\,b\,m}}\sum_{q=0}^{n}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}(2\,c\,s-c\,v+4\,b\,k\,z-2\,b\,m\,z)\,(c\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^q$$

$$\left(\frac{(c\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,c\,s+c\,v-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+$$

$$(-1)^{m+n}\sum_{q=0}^{n}2^{q-n}\,(c\,(v-2\,s))^{n-q}\,(2\,c\,s-c\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(c\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,c\,s+c\,v-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+$$

$$(-1)^{m+n}\sum_{q=0}^{n}\left(c\left(s-\frac{v}{2}\right)\right)^{n-q}(-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4532.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz == 2^{-m-v-1}\left(4\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-2\,(n+1)}\binom{m}{k}\left((-1)^m\,\Gamma\left(2\,(n+1),\,-b\,(2\,k-m)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,b\,(2\,k-m)\,\sqrt{z}\right)\right)\right)b^{-2\,n-2}+$$

$$\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2\,c^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}\left(\Gamma(n+1,\,c\,(v-2\,s)\,z)-(-1)^n\,\Gamma(n+1,\,c\,(2\,s-v)\,z)\right)+$$

$$4^{-n}\,c^{-2\,n-2}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{b^2\,(m-2\,u)^2}{c\,(8\,s-4\,v)}}\,(v-2\,s)^{-2\,n-2}\binom{v}{s}$$

$$\left((-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{4\,c\,s-2\,c\,v}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2\,c\,(v-2\,s)\,\sqrt{z}-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)-2\,c\,(2\,s-v)$$

$$\left.\left.\sqrt{\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,u)^2}{4\,c\,s-2\,c\,v}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$2\,c\,\sqrt{\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ (v-2\,s)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+2\,c\,(2\,s-v)$$

$$\left.\sqrt{-\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$(-1)^m\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(2\,c\,(2\,s-v)\,\sqrt{z}\ -b\,(m-2\,u)\right)^{h+k}$$

$$\left(-\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)-\right.$$

$$2\,c\,(v-2\,s)\,\sqrt{-\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2\right)\right)\right)$$

Involving $z^n \sinh^m(b z^r + e) \cosh^v(c z)$

01.20.21.4533.01

$$\int z^n \sinh^m\left(b\,z^2+e\right)\cosh^\nu(c\,z)\,dz == 2^{-m-\nu-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}(m \bmod 2-1)\,(\nu \bmod 2-1)}{n+1}+\right.$$

$$z^{n+1}\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\left(-b^2\,(m-2\,k)^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{k}$$

$$\left(e^{2\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,b\,(2\,k-m)\,z^2\right)\left(-b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}}+(-1)^m\,e^{4\,e\,k}\left(b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-b\,(2\,k-m)\,z^2\right)\right)+$$

$$2\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(c\,(\nu-2\,s))^{-n-1}\left(\Gamma(n+1,\,c\,(\nu-2\,s)\,z)-(-1)^n\,\Gamma(n+1,\,c\,(2\,s-\nu)\,z)\right)+$$

$$b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{c^2\,(\nu-2\,s)^2+4\,b\,e\,(2\,k-m)\,(2\,k+m)}{b\,(8\,k-4\,m)}}(m-2\,k)^{-n-1}\binom{\nu}{s}$$

$$\left(-e^{\frac{c^2\,(\nu-2\,s)^2}{b\,(4\,k-2\,m)}+2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,(c\,(\nu-2\,s))^{n-q}\left(\frac{(-2\,c\,s+c\,\nu+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(c\,(2\,s-\nu)+2\,b\,(m-2\,k)\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,c\,s+c\,\nu+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)+$$

$$e^{\frac{c^2\,(\nu-2\,s)^2}{4\,b\,k-2\,b\,m}+2\,e\,m}\sum_{q=0}^{n}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(2\,c\,s-c\,\nu+4\,b\,k\,z-2\,b\,m\,z)\,(c\,(\nu-2\,s)+2\,b\,(m-2\,k)\,z)^q$$

$$\left(\frac{(c\,(\nu-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,c\,s+c\,\nu-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+(-1)^{m+n}$$

$$e^{4\,e\,k}\sum_{q=0}^{n}2^{q-n}\,(c\,(\nu-2\,s))^{n-q}\,(2\,c\,s-c\,\nu+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(c\,(\nu-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,c\,s+c\,\nu-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+(-1)^{m+n}\,e^{4\,e\,k}$$

$$\sum_{q=0}^{n}\left(c\left(s-\frac{\nu}{2}\right)\right)^{n-q}(-2\,c\,s+c\,\nu+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(-2\,c\,s+c\,\nu+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,c\,s+c\,\nu+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4534.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v(c\,z)\,dz ==$$

$$2^{-m-v-1}\left(4\binom{v}{\frac{v}{2}}(v \bmod 2-1)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\,(m-2\,k)^{-2\,(n+1)}\binom{m}{k}\left((-1)^m\,e^{4\,e\,k}\,\Gamma\left(2\,(n+1),\,-b\,(2\,k-m)\,\sqrt{z}\right)+\right.\right.\right.$$

$$\left.\left.\left.e^{2\,e\,m}\,\Gamma\left(2\,(n+1),\,b\,(2\,k-m)\,\sqrt{z}\right)\right)\right)b^{-2\,n-2}+\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+$$

$$2\,c^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}\left(\Gamma(n+1,\,c\,(v-2\,s)\,z)-(-1)^n\,\Gamma(n+1,\,c\,(2\,s-v)\,z)\right)+$$

$$4^{-n}\,c^{-2\,n-2}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{b^2\,(m-2\,u)^2+4\,c\,e\,(m+2\,u)\,(2\,s-v)}{c\,(8\,s-4\,v)}}\,(v-2\,s)^{-2\,n-2}\binom{v}{s}$$

$$\left((-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{4\,c\,s-2\,c\,v}+4\,e\,u}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2\,c\,(v-2\,s)\,\sqrt{z}-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)-2\,c\,(2\,s-v)$$

$$\left.\left.\sqrt{\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,u)^2}{4\,c\,s-2\,c\,v}+2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$2\,c\,\sqrt{\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ (v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+e^{2\,e\,m}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$2\,c\,(2\,s-v)\,\sqrt{-\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+(-1)^m\,e^{4\,e\,u}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(2\,c\,(2\,s-v)\,\sqrt{z}\ -b\,(m-2\,u)\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)-\right.$$

$$2\,c\,(v-2\,s)\,\sqrt{-\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)\right)\Big/;\ n\in\mathbb{N}\ \wedge\ m\in\mathbb{N}^+\ \wedge\ v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + d z) \cosh^v(c z)$

01.20.21.4535.01

$$\int z^n \sinh^m\left(b z^2 + d z\right) \cosh^v(c z)\, dz ==$$

$$2^{-m-v-1}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(m-2k)^{-n-1}\binom{v}{s}e^{-\frac{d^2(m-2k)^2+c^2(v-2s)^2+2cd(2k-m)(2s+v)}{b(8k-4m)}}\left((-1)^{m+n}e^{\frac{2dcs}{b}}\right.\right.$$

$$\sum_{q=0}^{n}2^{q-n}(-2dk+dm+2cs-cv)^{n-q}(2dk+4bzk-dm-2cs+cv-2bmz)^{q+1}$$

$$\left(-\frac{(2dk+4bzk-dm-2cs+cv-2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(2dk+4bzk-dm-2cs+cv-2bmz)^2}{8bk-4bm}\right)-$$

$$e^{\frac{dcv}{b}}\left(-(-1)^{m+n}\sum_{q=0}^{n}2^{q-n}(-2dk+dm-2cs+cv)^{n-q}(2dk+4bzk-dm+2cs-cv-2bmz)^{q+1}\right.$$

$$\left(-\frac{(d(m-2k)+2bz(m-2k)+c(v-2s))^2}{b(2k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-2dk-4bzk+dm-2cs+cv+2bmz)^2}{8bk-4bm}\right)+e^{\frac{(-2dk+dm-2cs+cv)^2}{4bk-2bm}}$$

$$\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+cs-\frac{cv}{2}\right)^{n-q}\left(\frac{(-2dk-4bzk+dm-2cs+cv+2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}$$

$$(d(m-2k)+2bz(m-2k)+c(v-2s))^{q+1}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(-2dk-4bzk+dm-2cs+cv+2bmz)^2}{8bk-4bm}\right)+(-1)^{m+m}e^{\frac{(2k-m)d^2}{2b}+\frac{c^2(v-2s)^2}{4bk-2bm}}$$

$$\sum_{q=0}^{n}2^{q-n}(2dk-dm-2cs+cv)^{n-q}\left(\frac{(2dk+4bzk-dm-2cs+cv-2bmz)^2}{2bk-bm}\right)^{\frac{1}{2}(-q-1)}$$

$$(-2dk-4bzk+dm+2cs-cv+2bmz)^{q+1}\binom{n}{q}$$

$$\left.\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(2dk+4bzk-dm-2cs+cv-2bmz)^2}{8bk-4bm}\right)\right)\right)\right)$$

$$b^{-n-1}+\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2$$

$$c^{-n-1}$$

$$i^{-m}$$

$$\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}$$

$$(\Gamma(n+1,\,c\,(v-2\,s)\,z)-(-1)^n\,\Gamma(n+1,\,c\,(2\,s-v)\,z))+$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{d^2\,(m-2\,k)}{4\,b}}\,(b\,(m-2\,k))^{-n-1}\binom{m}{k}$$

$$\left(\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(m-2\,k)^{n+1}\,(d+2\,b\,z)^{q+1}\left(\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$(-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(m-2\,k)^{n+1}\,(d+2\,b\,z)^{q+1}\left(-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)\right)\right]/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sinh^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v(c\,z)\,dz==$$

$$2^{-m-v-1}\left[\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2\,c^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}\,(\Gamma(n+1,\,c\,(v-2\,s)\,z)-(-1)^n\,\Gamma(n+1,\,c\,(2\,s-v)\,z))+\frac{1}{b}\left[\left((-1)^{m+n}\,4^{-n}\,d^{-2\,n-2}\right)\binom{v}{\frac{v}{2}}\right.$$

$$(v \bmod 2-1)\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{n+u}\,e^{-\frac{b^2\,(m-2\,u)}{4\,d}}\,(m-2\,u)^{-2\,(n+1)}\binom{m}{u}\left[e^{\frac{b^2\,(m-2\,u)}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n+1}\right.$$

$$\left(-(m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b(m-2u)\right.$$

$$\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)+(-1)^{m-1}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k$$

$$(b(m-2u))^{-h-k+2n+1}\left((m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)\Bigg)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-(-1)^m e^{\frac{b^2(m-2u)^2}{4dm+8cs-8du-4cv}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b(m-2u))^{-h-k+2n}\right.\right.$$

$$\left(\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)^2\Big/(dm+2cs-2du-cv)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2(-dm-2cs+2du+cv)\sqrt{z}-b(m-2u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(b(m-2u)\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)^2\Big/(4dm+8cs-8du-4cv)\right)-$$

$$2(dm+2cs-2du-cv)\sqrt{\left(\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)^2\Big/\right.}$$

$$\left.(dm+2cs-2du-cv)\right)\Gamma\left(\frac{1}{2}(h+k+2),\left(b(m-2u)+2(dm+2cs-2du-cv)\right.\right.$$

$$\left.\left.\left.\sqrt{z}\right)^2\Big/(4dm+8cs-8du-4cv)\right)\right)\Bigg)(-dm-2cs+2du+cv)^{-2(n+1)}+$$

$$e^{-\frac{b^2 (m-2u)^2}{4(dm-2cs-2du+cv)}} \left(-(dm-2cs-2du+cv)^2\right)^{-2n-1} \left((-1)^m e^{\frac{b^2 (m-2u)^2}{2(dm-2cs-2du+cv)}}\right.$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, (-b(m-2u))^{-h-k+2n} \left(-b(m-2u)-2(dm-2cs-2du+cv)\sqrt{z}\right)^{h+k}\right.$$

$$\left(\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/ (dm-2cs-2du+cv)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/ (4(dm-2cs-2du+cv))\right)-$$

$$2(dm-2cs-2du+cv)\sqrt{\left(\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/\right.}$$

$$\left.\left.\left.(dm-2cs-2du+cv)\right)\Gamma\left(\frac{1}{2}(h+k+2),\right.\right.\right.$$

$$\left.\left.\left.\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/ (4(dm-2cs-2du+cv))\right)\right)\right)$$

$$(dm-2cs-2du+cv)^{2n}+(-dm+2cs+2du-cv)^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k$$

$$(b(m-2u))^{-h-k+2n}\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/ (dm-2cs-2du+cv)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/\right.$$

$$\left.(4(dm-2cs-2du+cv))\right)+2(dm-2cs-2du+cv)\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.-\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/ (4(dm-2cs-2du+cv))\right)$$

$$\left.\sqrt{\left(-\left(b(m-2u)+2(dm-2cs-2du+cv)\sqrt{z}\right)^2 \Big/ (dm-2cs-2du+cv)\right)}\right)-$$

$$e^{-\frac{b^2 (m-2u)^2}{8cs+4d(m-2u)-4cv}}(dm+2cs-2du-cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\, (b(m-2u))^{-h-k+2n}$$

$$\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)^2 \Big/ (dm+2cs-2du-cv)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\left(b(m-2u)+2(dm+2cs-2du-cv)\sqrt{z}\right)^2 \Big/\right.$$

$$(8\,c\,s+4\,d\,(m-2\,u)-4\,c\,v)\Big)+2\,(d\,m+2\,c\,s-2\,d\,u-c\,v)\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$

$$-\Big(b\,(m-2\,u)+2\,(d\,m+2\,c\,s-2\,d\,u-c\,v)\,\sqrt{z}\Big)^2\Big/(8\,c\,s+4\,d\,(m-2\,u)-4\,c\,v)\Big)$$

$$\sqrt{\Big(-\Big(b\,(m-2\,u)+2\,(d\,m+2\,c\,s-2\,d\,u-c\,v)\,\sqrt{z}\Big)^2\Big/}$$

$$(d\,m+2\,c\,s-2\,d\,u-c\,v)\Big)\Big)\Big)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z+e\right)\cosh^v(c\,z)$

01.20.21.4537.01

$$\int z^n \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v(c\,z)\,dz ==$$

$$2^{-m-v-1}\left(\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(m-2\,k)^{-n-1}\binom{v}{s}e^{-\frac{d^2\,(m-2\,k)^2+c^2\,(v-2\,s)^2+4\,b\,(2\,k-m)\,(2\,e\,k+e\,m)+2\,c\,d\,(2\,k-m)\,(2\,s+v)}{b\,(8\,k-4\,m)}}\right.\right.$$

$$\left((-1)^{m+n}\,e^{4\,e\,k+\frac{2\,c\,d\,s}{b}}\sum_{q=0}^{n}2^{q-n}\,(-2\,d\,k+d\,m+2\,c\,s-c\,v)^{n-q}\,(2\,d\,k+4\,b\,z\,k-d\,m-2\,c\,s+c\,v-2\,b\,m\,z)^{q+1}\right.$$

$$\left(-\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,c\,s+c\,v-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,c\,s+c\,v-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)-$$

$$e^{\frac{d\,c\,v}{b}}\left(-(-1)^{m+n}\,e^{4\,e\,k}\sum_{q=0}^{n}2^{q-n}\,(-2\,d\,k+d\,m-2\,c\,s+c\,v)^{n-q}\,(2\,d\,k+4\,b\,z\,k-d\,m+2\,c\,s-\right.$$

$$c\,v-2\,b\,m\,z)^{q+1}\left(-\frac{(d\,(m-2\,k)+2\,b\,z\,(m-2\,k)+c\,(v-2\,s))^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-2\,d\,k-4\,b\,z\,k+d\,m-2\,c\,s+c\,v+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+e^{\frac{(-2\,d\,k+d\,m-2\,c\,s+c\,v)^2}{4\,b\,k-2\,b\,m}+2\,e\,m}$$

$$\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+c\,s-\frac{c\,v}{2}\right)^{n-q}\left(\frac{(-2\,d\,k-4\,b\,z\,k+d\,m-2\,c\,s+c\,v+2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$(d\,(m-2\,k)+2\,b\,z\,(m-2\,k)+c\,(v-2\,s))^{q+1}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(-2\,d\,k-4\,b\,z\,k+d\,m-2\,c\,s+c\,v+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+(-1)^{m+m}\,e^{\frac{(2\,k-m)\,d^2}{2\,b}+\frac{c^2\,(v-2\,s)^2}{4\,b\,k-2\,b\,m}+2\,e\,m}$$

$$\sum_{q=0}^{n} 2^{q-n}\,(2\,d\,k-d\,m-2\,c\,s+c\,v)^{n-q}\left(\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,c\,s+c\,v-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$(-2\,d\,k-4\,b\,z\,k+d\,m+2\,c\,s-c\,v+2\,b\,m\,z)^{q+1}\binom{n}{q}$$

$$\left.\left.\left.\Gamma\left(\frac{q+1}{2}, \frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,c\,s+c\,v-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right)\right)$$

$$b^{-n-1}+\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2$$

$$c^{-n-1}$$

$$i^{-m}$$

$$\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}$$

$$(\Gamma(n+1,\,c\,(v-2\,s)\,z)-(-1)^n\,\Gamma(n+1,\,c\,(2\,s-v)\,z))+$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{(m-2\,k)\,d^2}{4\,b}-e\,(2\,k+m)}\,(b\,(m-2\,k))^{-n-1}\binom{m}{k}$$

$$\left(e^{2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(m-2\,k)^{n+1}\,(d+2\,b\,z)^{q+1}\left(\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)+(-1)^m\,e^{\frac{(m-2\,k)\,d^2}{2\,b}+4\,e\,k}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(m-2\,k)^{n+1}\,(d+2\,b\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2}, -\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)\right)\right/; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4538.01

$$\int z^n \sinh^m\left(\sqrt{z}\, b + e + d\, z\right) \cosh^v(c\, z)\, dz =$$

$$2^{-m-v-1}\left(\frac{2\, i^{-m}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2 - 1)\,(v \bmod 2 - 1)}{n+1} + 2\, c^{-n-1}\, i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2 - 1)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2s)^{-n-1}\left(\Gamma(n+1,\, c\,(v-2s)\,z) - (-1)^n\,\Gamma(n+1,\, c\,(2s-v)\,z)\right) + \frac{1}{b}\left(\left((-1)^{m+n}\, 4^{-n}\, d^{-2n-2}\right)\binom{v}{\frac{v}{2}}\right.$$

$$(v \bmod 2 - 1)\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{n+u}\, e^{-\frac{\left(b^2+4\,d\,e\right)(m-2u)}{4d}}\,(m-2u)^{-2(n+1)}\binom{m}{u}\left(e^{\frac{b^2(m-2u)}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(-b\,(m-2u))^{-h-k+2n+1}\right.$$

$$\left(-(m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\,(m-2u)\right.$$

$$\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\, \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right) - 2d\sqrt{\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\, \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right) + (-1)^{m-1}\, e^{2e(m-2u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\right.$$

$$(b\,(m-2u))^{-h-k+2n+1}\left((m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2u)\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\, -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right) + \right.$$

$$\left.\left.\left.\left.2\sqrt{-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}\; d\,\Gamma\left(\frac{1}{2}(h+k+2),\, -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)\right) -$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e\,m-2\,e\,u}\binom{v}{s}\left(e^{-2\,e\,(m-2\,u)}\left(e^{-\frac{b^2\,(m-2\,u)^2}{4\,(d\,m-2\,c\,s-2\,d\,u+c\,v)}-4\,e\,u}\left(-(d\,m-2\,c\,s-2\,d\,u+c\,v)^2\right)^{-2\,n-1}\right.\right.$$
$$\left(\left(-1\right)^m e^{\frac{b^2\,(m-2\,u)^2}{2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)}+4\,e\,u}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\right.\right.$$
$$\left(-b\,(m-2\,u)-2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)^{h+k}\left(\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-\right.\right.$$
$$\left.\left.2\,d\,u+c\,v)\,\sqrt{z}\right)^2\Big/(d\,m-2\,c\,s-2\,d\,u+c\,v)\right)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(h+k+1),\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)^2\Big/(4\,(d\,m-\right.$$
$$\left.2\,c\,s-2\,d\,u+c\,v))\right)-2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{\left(\left(b\,(m-2\,u)+\right.\right.$$
$$\left.\left.2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)^2\Big/(d\,m-2\,c\,s-2\,d\,u+c\,v)\right)$$
$$\Gamma\left(\frac{1}{2}\,(h+k+2),\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.\left.\left.(4\,(d\,m-2\,c\,s-2\,d\,u+c\,v))\right)\right)\right)(d\,m-2\,c\,s-2\,d\,u+c\,v)^{2\,n}+$$

$$e^{2\,e\,m}\,(-d\,m+2\,c\,s+2\,d\,u-c\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$
$$\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)^{h+k}\left(-\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-\right.\right.$$
$$\left.\left.2\,d\,u+c\,v)\,\sqrt{z}\right)^2\Big/(d\,m-2\,c\,s-2\,d\,u+c\,v)\right)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(h+k+1),-\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d\,m-2\,c\,s-2\,d\,u+c\,v))\right)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)$$
$$\Gamma\left(\frac{1}{2}\,(h+k+2),-\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+c\,v)\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d\,m-2\,c\,s-2\,d\,u+c\,v))\right)\sqrt{\left(-\left(b\,(m-2\,u)+2\,(d\,m-2\,c\,s-2\,d\,u+\right.\right.$$
$$\left.\left.\left.\left.c\,v)\,\sqrt{z}\right)^2\Big/(d\,m-2\,c\,s-2\,d\,u+c\,v)\right)\right)\right)-(-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{4\,d\,m+8\,c\,s-8\,d\,u-4\,c\,v}}$$

$$(-d\,m-2\,c\,s+2\,d\,u+c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}$$
$$\left(\left(b\,(m-2\,u)+2\,(d\,m+2\,c\,s-2\,d\,u-c\,v)\,\sqrt{z}\right)^2\Big/(d\,m+2\,c\,s-2\,d\,u-c\,v)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\left(-d\,m-2\,c\,s+2\,d\,u+c\,v\right)\sqrt{z}-b\left(m-2\,u\right)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(b\left(m-2\,u\right)\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\left(h+k+1\right),\right.\right.$$

$$\left.\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{2}\Big/\left(4\,d\,m+8\,c\,s-8\,d\,u-4\,c\,v\right)\right)-$$

$$2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{\left(\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{2}\Big/\right.}$$

$$\left.\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),\right.$$

$$\left.\left.\left.\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{2}\Big/\left(4\,d\,m+8\,c\,s-8\,d\,u-4\,c\,v\right)\right)\right)\right)-$$

$$e^{-\frac{b^{2}\left(m-2\,u\right)^{2}}{8\,c\,s+4\,d\left(m-2\,u\right)-4\,c\,v}}\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)^{-2\left(n+1\right)}\sum_{k=0}^{n}\sum_{h=0}^{k}\left(-1\right)^{k-h}4^{k}\left(b\left(m-2\,u\right)\right)^{-h-k+2\,n}$$

$$\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{2}\Big/\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\right)^{\frac{1}{2}\left(-h-k-1\right)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\left(m-2\,u\right)\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\left(h+k+1\right),\,-\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.\left(8\,c\,s+4\,d\left(m-2\,u\right)-4\,c\,v\right)\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\Gamma\left(\frac{1}{2}\left(h+k+2\right),\right.$$

$$\left.-\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{2}\Big/\left(8\,c\,s+4\,d\left(m-2\,u\right)-4\,c\,v\right)\right)$$

$$\sqrt{\left(-\left(b\left(m-2\,u\right)+2\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\sqrt{z}\right)^{2}\Big/\right.}$$

$$\left.\left.\left.\left(d\,m+2\,c\,s-2\,d\,u-c\,v\right)\right)\right)\right)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving $z^n \sinh^m\left(b\,z^r\right)\cosh^v\left(f\,z+g\right)$

01.20.21.4539.01

$$\int z^n \sinh^m\left(b\,z^2\right) \cosh^v(g+f\,z)\,dz == 2^{-m-v-1}$$

$$\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1} + z^{n+1}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left(-b^2\,(m-2\,k)^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{k} \right.$$

$$\left(\Gamma\left(\frac{n+1}{2},\,b\,(2\,k-m)\,z^2\right)\left(-b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}} + (-1)^m\left(b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-b\,(2\,k-m)\,z^2\right)\right) + 2\,i^{-m}\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-n-1}\left((-1)^{-n-1}\,e^{g\,(v-2\,s)}\,\Gamma(n+1,\,f\,(2\,s-v)\,z) + e^{2\,g\,s-g\,v}\,\Gamma(n+1,\,f\,(v-2\,s)\,z)\right) +$$

$$b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{f^2\,(v-2\,s)^2+4\,b\,g\,(2\,k-m)\,(2\,s+v)}{b\,(8\,k-4\,m)}}(m-2\,k)^{-n-1}\binom{v}{s}$$

$$\left(-e^{\frac{f^2\,(v-2\,s)^2}{b\,(4\,k-2\,m)}+4\,g\,s}\sum_{q=0}^{n}2^{q-n}\,(f\,(v-2\,s))^{n-q}\left(\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(f\,(2\,s-v)+2\,b\,(m-2\,k)\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right) +$$

$$e^{\frac{f^2\,(v-2\,s)^2}{4\,b\,k-2\,b\,m}+2\,g\,v}\sum_{q=0}^{n}\left(f\left(s-\frac{v}{2}\right)\right)^{n-q}(2\,f\,s-f\,v+4\,b\,k\,z-2\,b\,m\,z)\,(f\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^q$$

$$\left(\frac{(f\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,f\,s+f\,v-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right) + (-1)^{m+n}$$

$$e^{4\,g\,s}\sum_{q=0}^{n}2^{q-n}\,(f\,(v-2\,s))^{n-q}\,(2\,f\,s-f\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(f\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,f\,s+f\,v-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right) + (-1)^{m+n}\,e^{2\,g\,v}$$

$$\sum_{q=0}^{n}\left(f\left(s-\frac{v}{2}\right)\right)^{n-q}(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right) /;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4540.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh^v(g+f\,z)\,dz == 2^{-m-v-1}\left(4\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-2\,(n+1)}\binom{m}{k}\left((-1)^m\,\Gamma\left(2\,(n+1),\,-b\,(2\,k-m)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,b\,(2\,k-m)\,\sqrt{z}\right)\right)\right)b^{-2\,n-2}+$$

$$\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2\,f^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}\left(e^{2\,g\,s-g\,v}\,\Gamma(n+1,\,f\,(v-2\,s)\,z)-e^{g\,(v-2\,s)}\,(-1)^n\,\Gamma(n+1,\,f\,(2\,s-v)\,z)\right)+$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{b^2\,(m-2\,u)^2+4\,f\,g\,(2\,s-v)\,(2\,s+v)}{f\,(8\,s-4\,v)}}\,f^{-2\,n-2}\,(v-2\,s)^{-2\,n-2}\binom{v}{s}$$

$$\left((-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{4\,f\,s-2\,f\,v}+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2\,f\,(v-2\,s)\,\sqrt{z}-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)-2\,f\,(2\,s-v)$$

$$\left.\left.\sqrt{\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)+$$

$$e^{\frac{b^2\,(m-2\,u)^2}{4\,f\,s-2\,f\,v}+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left.\left(\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right)$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+\right.$$

$$2\,f\,\sqrt{\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\ (v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)+e^{4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+2\,f\,(2\,s-v)\,\sqrt{-\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)+$$

$$(-1)^m\,e^{4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(2\,f\,(2\,s-v)\,\sqrt{z}-b\,(m-2\,u)\right)^{h+k}$$

$$\left(-\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)-2\,f\,(v-2\,s)\,\sqrt{-\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}$$

Involving $z^n \sinh^m(b z^r + e) \cosh^v(f z + g)$

01.20.21.4541.01

$$\int z^n \sinh^m\left(b\,z^2+e\right)\cosh^v(f\,z+g)\,dz == 2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+z^{n+1}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\left(-b^2\,(m-2\,k)^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{m}{k}\left(e^{2\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,b\,(2\,k-m)\,z^2\right)\left(-b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}}+\right.$$

$$\left.(-1)^m\,e^{4\,e\,k}\left(b\,(2\,k-m)\,z^2\right)^{\frac{n+1}{2}}\,\Gamma\left(\frac{n+1}{2},\,-b\,(2\,k-m)\,z^2\right)\right)+2\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(f\,(v-2\,s))^{-n-1}\left((-1)^{-n-1}\,e^{g\,(v-2\,s)}\,\Gamma(n+1,\,f\,(2\,s-v)\,z)+e^{2\,g\,s-g\,v}\,\Gamma(n+1,\,f\,(v-2\,s)\,z)\right)+$$

$$b^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{f^2\,(v-2\,s)^2+4\,b\,(2\,k-m)\,(e\,(2\,k+m)+g\,(2\,s+v))}{b\,(8\,k-4\,m)}}\,(m-2\,k)^{-n-1}\binom{v}{s}$$

$$\left(-e^{\frac{f^2\,(v-2\,s)^2}{b\,(4\,k-2\,m)}+2\,e\,m+4\,g\,s}\sum_{q=0}^{n}2^{q-n}\,(f\,(v-2\,s))^{n-q}\left(\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(f\,(2\,s-v)+2\,b\,(m-2\,k)\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)+$$

$$e^{\frac{f^2\,(v-2\,s)^2}{4\,b\,k-2\,b\,m}+2\,e\,m+2\,g\,v}\sum_{q=0}^{n}\left(f\left(s-\frac{v}{2}\right)\right)^{n-q}(2\,f\,s-f\,v+4\,b\,k\,z-2\,b\,m\,z)\,(f\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^q$$

$$\left(\frac{(f\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,f\,s+f\,v-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+$$

$$(-1)^{m+n}\,e^{4\,e\,k+4\,g\,s}\sum_{q=0}^{n}2^{q-n}\,(f\,(v-2\,s))^{n-q}\,(2\,f\,s-f\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(f\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,f\,s+f\,v-4\,b\,k\,z+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+$$

$$(-1)^{m+n}\,e^{4\,e\,k+2\,g\,v}\sum_{q=0}^{n}\left(f\left(s-\frac{v}{2}\right)\right)^{n-q}(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\left.\left.-\frac{(-2\,f\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)\right)\right/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4542.01

$$\int z^n \sinh^m\left(\sqrt{z}\, b+e\right)\cosh^v(f z+g)\, dz ==$$

$$2^{-m-v-1}\left(4\binom{v}{\frac{v}{2}}(v \bmod 2-1)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-2ek-em}(m-2k)^{-2(n+1)}\binom{m}{k}\left((-1)^m e^{4ek}\,\Gamma\left(2(n+1),\,-b(2k-m)\sqrt{z}\right)+\right.\right.\right.$$

$$\left.\left.\left. e^{2em}\,\Gamma\left(2(n+1),\,b(2k-m)\sqrt{z}\right)\right)\right)b^{-2n-2}+\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}+2f^{-n-1}\right.$$

$$i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2s)^{-n-1}\left(e^{2gs-gv}\,\Gamma(n+1,\,f(v-2s)z)-e^{g(v-2s)}(-1)^n\,\Gamma(n+1,\,f(2s-v)z)\right)+$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{b^2(m-2u)^2+4f(2s-v)(e(m+2u)+g(2s+v))}{f(8s-4v)}}f^{-2n-2}(v-2s)^{-2n-2}\binom{v}{s}$$

$$\left((-1)^m e^{\frac{b^2(m-2u)^2}{4fs-2fv}+4eu+2gv}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b(m-2u))^{-h-k+2n}\left(\frac{\left(b(m-2u)+2f(2s-v)\sqrt{z}\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\left(2f(v-2s)\sqrt{z}-b(m-2u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b(m-2u)+2f(2s-v)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(b(m-2u)+2f(2s-v)\sqrt{z}\right)^2}{f(8s-4v)}\right)-2f(2s-v)$$

$$\left.\left.\sqrt{\frac{\left(b(m-2u)+2f(2s-v)\sqrt{z}\right)^2}{f(2s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(b(m-2u)+2f(2s-v)\sqrt{z}\right)^2}{f(8s-4v)}\right)\right)+\right.$$

$$e^{\frac{b^2(m-2u)^2}{4fs-2fv}+2em+2gv}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b(m-2u))^{-h-k+2n}\left(b(m-2u)+2f(v-2s)\sqrt{z}\right)^{h+k}$$

$$\left.\left(\frac{\left(b(m-2u)+2f(v-2s)\sqrt{z}\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\right)$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+\right.$$

$$2\,f\,\sqrt{\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}\ (v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)+e^{2\,e\,m+4\,g\,s}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)+2\,f\,(2\,s-v)\,\sqrt{-\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(b\,(m-2\,u)+2\,f\,(2\,s-v)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)\right)+$$

$$(-1)^m\,e^{4\,g\,s+4\,e\,u}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(2\,f\,(2\,s-v)\,\sqrt{z}-b\,(m-2\,u)\right)^{h+k}$$

$$\left(-\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(8\,s-4\,v)}\right)-2\,f\,(v-2\,s)\,\sqrt{-\frac{\left(b\,(m-2\,u)+2\,f\,(v-2\,s)\,\sqrt{z}\right)^2}{f\,(2\,s-v)}}$$

Involving $z^n \sinh^m(b z^r + d z) \cosh^v(f z + g)$

01.20.21.4543.01

$$\int z^n \sinh^m\left(b z^2 + d z\right) \cosh^v(g + f z)\, dz ==$$

$$2^{-m-v-1}\left(\left(\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (m-2k)^{-n-1} \binom{v}{s} e^{-\frac{d^2 (m-2k)^2 + f^2 (v-2s)^2 + 2 d f (2k-m)(2s+v) + 4 b (2k-m)(2gs+gv)}{b(8k-4m)}}\right.\right.$$

$$\left((-1)^{m+n} e^{\frac{2 d f s}{b} + 2 g v} \sum_{q=0}^{n} 2^{q-n} (-2 d k + d m + 2 f s - f v)^{n-q} (2 d k + 4 b z k - d m - 2 f s + f v - 2 b m z)^{q+1}\right.$$

$$\left(-\frac{(2 d k + 4 b z k - d m - 2 f s + f v - 2 b m z)^2}{2 b k - b m}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(2 d k + 4 b z k - d m - 2 f s + f v - 2 b m z)^2}{8 b k - 4 b m}\right) - e^{\frac{d f v}{b}} \left(e^{\frac{(-2 d k + d m - 2 f s + f v)^2}{4 b k - 2 b m} + 2 g v}\right.$$

$$\sum_{q=0}^{n} \left(\left(k - \frac{m}{2}\right) d + f s - \frac{f v}{2}\right)^{n-q} \left(\frac{(-2 d k - 4 b z k + d m - 2 f s + f v + 2 b m z)^2}{2 b k - b m}\right)^{\frac{1}{2}(-q-1)}$$

$$(d(m-2k) + 2 b z (m-2k) + f(v-2s))^{q+1} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(-2 d k - 4 b z k + d m - 2 f s + f v + 2 b m z)^2}{8 b k - 4 b m}\right) + (-1)^{m+m} e^{\frac{(2k-m) d^2}{2b} + \frac{f^2 (v-2s)^2}{4 b k - 2 b m} + 4 g s}$$

$$\sum_{q=0}^{n} 2^{q-n} (2 d k - d m - 2 f s + f v)^{n-q} \left(\frac{(2 d k + 4 b z k - d m - 2 f s + f v - 2 b m z)^2}{2 b k - b m}\right)^{\frac{1}{2}(-q-1)}$$

$$(-2 d k - 4 b z k + d m + 2 f s - f v + 2 b m z)^{q+1} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(2 d k + 4 b z k - d m - 2 f s + f v - 2 b m z)^2}{8 b k - 4 b m}\right) - (-1)^{m+n} e^{4 g s}$$

$$\sum_{q=0}^{n} 2^{q-n} (-2 d k + d m - 2 f s + f v)^{n-q} (2 d k + 4 b z k - d m + 2 f s - f v - 2 b m z)^{q+1}$$

$$\left(-\frac{(d(m-2k) + 2 b z (m-2k) + f(v-2s))^2}{b(2k-m)}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left.\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(-2 d k - 4 b z k + d m - 2 f s + f v + 2 b m z)^2}{8 b k - 4 b m}\right)\right)\right)\right)$$

$$b^{-n-1}+\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2$$

$$f^{-n-1}$$

$$i^{-m}$$

$$\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}$$

$$\left(e^{2\,g\,s-g\,v}\,\Gamma(n+1,\,f\,(v-2\,s)\,z)-e^{g\,(v-2\,s)}\,(-1)^n\,\Gamma(n+1,\,f\,(2\,s-v)\,z)\right)+$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{d^2\,(m-2\,k)}{4\,b}}\,(b\,(m-2\,k))^{-n-1}\binom{m}{k}$$

$$\left(\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(m-2\,k)^{n+1}\,(d+2\,b\,z)^{q+1}\left(\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)+\right.$$

$$(-1)^m\,e^{\frac{d^2\,(m-2\,k)}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,(-d)^{n-q}\,(m-2\,k)^{n+1}\,(d+2\,b\,z)^{q+1}\left(-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4544.01

$$\int z^n\sinh^m\left(\sqrt{z}\;b+d\,z\right)\cosh^v(g+f\,z)\,dz==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2\,f^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2\,s)^{-n-1}\left(e^{2\,g\,s-g\,v}\,\Gamma(n+1,\,f\,(v-2\,s)\,z)-e^{g\,(v-2\,s)}\,(-1)^n\,\Gamma(n+1,\,f\,(2\,s-v)\,z)\right)+$$

$$\frac{1}{b}\left(\left((-1)^{m+n}\,4^{-n}\,d^{-2\,n-2}\right)\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{n+u}\,e^{-\frac{b^2\,(m-2\,u)}{4\,d}}\,(m-2\,u)^{-2\,(n+1)}\binom{m}{u}\right.$$

$$\left(e^{\frac{b^2 (m-2u)}{2d}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2u))^{-h-k+2n+1}\left(-(m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\right.$$

$$\left(\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b\,(m-2u)\left(b+2d\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)+(-1)^{m-1}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(b\,(m-2u))^{-h-k+2n+1}\left((m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2u)\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)\Bigg)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2gs-gv}\binom{v}{s}\left(-(-1)^m\,e^{\frac{b^2(m-2u)^2}{4dm+8fs-8du-4fv}+2g(v-2s)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2u))^{-h-k+2n}\right.\right.$$

$$\left(\left(b\,(m-2u)+2\,(dm+2fs-2du-fv)\sqrt{z}\right)^2\Big/(dm+2fs-2du-fv)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(-dm-2fs+2du+fv)\sqrt{z}-b\,(m-2u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2u)\left(b\,(m-2u)+2\,(dm+2fs-2du-fv)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.\left(b\,(m-2u)+2\,(dm+2fs-2du-fv)\sqrt{z}\right)^2\Big/(4dm+8fs-8du-4fv)\right)-$$

$$2\,(dm+2fs-2du-fv)\sqrt{\left(b\,(m-2u)+2\,(dm+2fs-2du-fv)\sqrt{z}\right)^2\Big/(dm+}$$

$$2\,f\,s-2\,d\,u-f\,v)\Big)\Gamma\Big(\frac{1}{2}\,(h+k+2),\,\big(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)$$

$$\sqrt{z}\big)^2\Big/\,(4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v)\Big)\Big)\Big)\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)^{-2\,(n+1)}+$$

$$e^{-\frac{b^2\,(m-2\,u)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}-4\,g\,s}\,\big(-(d\,m-2\,f\,s-2\,d\,u+f\,v)^2\big)^{-2\,n-1}\Bigg((-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}+4\,g\,s}$$

$$\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\,\big(-b\,(m-2\,u)-2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^{h+k}$$

$$\Big(\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\Big)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Big(b\,(m-2\,u)\,\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)\,\Gamma\Big(\frac{1}{2}\,(h+k+1),$$

$$\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/\,(4\,(d\,m-2\,f\,s-2\,d\,u+f\,v))\Big)-$$

$$2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{\Big(\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/$$

$$(d\,m-2\,f\,s-2\,d\,u+f\,v)\Big)\Gamma\Big(\frac{1}{2}\,(h+k+2),$$

$$\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/\,(4\,(d\,m-2\,f\,s-2\,d\,u+f\,v))\Big)\Big)\Bigg)$$

$$(d\,m-2\,f\,s-2\,d\,u+f\,v)^{2\,n}+e^{2\,g\,v}\,(-d\,m+2\,f\,s+2\,d\,u-f\,v)^{2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\,\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^{h+k}$$

$$\Big(-\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\Big)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Big(b\,(m-2\,u)\,\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d\,m-2\,f\,s-2\,d\,u+f\,v))\Big)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$

$$-\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/\,(4\,(d\,m-2\,f\,s-2\,d\,u+f\,v))\Big)$$

$$\sqrt{\Big(-\big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\big)^2\Big/\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\Big)}\Big)\Big)-$$

$$e^{-\frac{b^2\,(m-2\,u)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}}\,(d\,m+2\,f\,s-2\,d\,u-f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$

$$\big(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\big)^{h+k}$$

$$\Big(-\big(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\big)^2\Big/\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\Big)^{\frac{1}{2}\,(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v)\right)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$
$$\left.-\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2\Big/(8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v)\right)$$
$$\sqrt{\left(-\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.(d\,m+2\,f\,s-2\,d\,u-f\,v)\right)\right)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z+e\right)\cosh^v(f\,z+g)$

01.20.21.4545.01

$$\int z^n \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v(f\,z+g)\,dz==$$
$$2^{-m-v-1}\left(\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(m-2\,k)^{-n-1}\binom{v}{s}e^{-\frac{d^2\,(m-2\,k)^2+f^2\,(v-2\,s)^2+2\,d\,f\,(2\,k-m)\,(2\,s+v)+4\,b\,(2\,k-m)\,(2\,e\,k+e\,m+2\,g\,s+g\,v)}{b\,(8\,k-4\,m)}}\right.\right.$$
$$\left((-1)^{m+n}\,e^{4\,e\,k+\frac{2\,d\,f\,s}{b}+2\,g\,v}\sum_{q=0}^{n}2^{q-n}\,(-2\,d\,k+d\,m+2\,f\,s-f\,v)^{n-q}\,(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+\right.$$
$$f\,v-2\,b\,m\,z)^{q+1}\left(-\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\Gamma\left(\frac{q+1}{2},-\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)-e^{\frac{d\,f\,v}{b}}\left(e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{4\,b\,k-2\,b\,m}+2\,e\,m+2\,g\,v}\right.$$
$$\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+f\,s-\frac{f\,v}{2}\right)^{n-q}\left(\frac{(-2\,d\,k-4\,b\,z\,k+d\,m-2\,f\,s+f\,v+2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$
$$(d\,(m-2\,k)+2\,b\,z\,(m-2\,k)+f\,(v-2\,s))^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$
$$\left.\left.\left.\frac{(-2\,d\,k-4\,b\,z\,k+d\,m-2\,f\,s+f\,v+2\,b\,m\,z)^2}{8\,b\,k-4\,b\,m}\right)+(-1)^{m+m}\,e^{\frac{(2\,k-m)\,d^2}{2\,b}+\frac{f^2\,(v-2\,s)^2}{4\,b\,k-2\,b\,m}+2\,e\,m+4\,g\,s}\right.\right.$$

$$\sum_{q=0}^{n} 2^{q-n} (2\,d\,k - d\,m - 2\,f\,s + f\,v)^{n-q} \left(\frac{(2\,d\,k + 4\,b\,z\,k - d\,m - 2\,f\,s + f\,v - 2\,b\,m\,z)^2}{2\,b\,k - b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$(-2\,d\,k - 4\,b\,z\,k + d\,m + 2\,f\,s - f\,v + 2\,b\,m\,z)^{q+1} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(2\,d\,k + 4\,b\,z\,k - d\,m - 2\,f\,s + f\,v - 2\,b\,m\,z)^2}{8\,b\,k - 4\,b\,m}\right) - (-1)^{m+n}\, e^{4\,e\,k + 4\,g\,s}$$

$$\sum_{q=0}^{n} 2^{q-n} (-2\,d\,k + d\,m - 2\,f\,s + f\,v)^{n-q} (2\,d\,k + 4\,b\,z\,k - d\,m + 2\,f\,s - f\,v - 2\,b\,m\,z)^{q+1}$$

$$\left(-\frac{(d\,(m-2\,k) + 2\,b\,z\,(m-2\,k) + f\,(v-2\,s))^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left.\left.\Gamma\left(\frac{q+1}{2}, -\frac{(-2\,d\,k - 4\,b\,z\,k + d\,m - 2\,f\,s + f\,v + 2\,b\,m\,z)^2}{8\,b\,k - 4\,b\,m}\right)\right)\right)\right)$$

$$b^{-n-1} + \frac{2\,i^{-m}\, z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (m \bmod 2 - 1)\,(v \bmod 2 - 1)}{n+1} + 2$$

$$f^{-n-1}$$

$$i^{-m}$$

$$\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2 - 1)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} (v - 2\,s)^{-n-1}$$

$$\left(e^{2\,g\,s - g\,v}\,\Gamma(n+1,\ f\,(v-2\,s)\,z) - e^{g\,(v-2\,s)}\,(-1)^n\,\Gamma(n+1,\ f\,(2\,s-v)\,z)\right) +$$

$$\binom{v}{\frac{v}{2}} (v \bmod 2 - 1) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k\, e^{-\frac{(m-2\,k)\,d^2}{4\,b} - e\,(2\,k+m)}\, (b\,(m-2\,k))^{-n-1} \binom{m}{k}$$

$$\left(e^{2\,e\,m} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (m-2\,k)^{n+1} (d + 2\,b\,z)^{q+1}\right.$$

$$\left(\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right) +$$

$$(-1)^m\, e^{\frac{(m-2\,k)\,d^2}{2\,b} + 4\,e\,k} \sum_{q=0}^{n} 2^{q-n} (-d)^{n-q} (m-2\,k)^{n+1} (d+2\,b\,z)^{q+1} \left(-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)\right)\right) \Big/; n \in \mathbb{N} \wedge m \in \mathbb{N}^+ \wedge v \in \mathbb{N}^+$$

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$$\int z^n \sinh^m\left(\sqrt{z}\, b + e + d\, z\right) \cosh^v(g + f\, z)\, dz ==$$

$$2^{-m-v-1}\left(\frac{2\, i^{-m}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2 - 1)(v \bmod 2 - 1)}{n+1} + 2\, f^{-n-1}\, i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2 - 1)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}(v-2s)^{-n-1}\left(e^{2gs-gv}\,\Gamma(n+1,\, f(v-2s)z) - e^{g(v-2s)}(-1)^n\,\Gamma(n+1,\, f(2s-v)z)\right) +$$

$$\frac{1}{b}\left(\left((-1)^{m+n}\, 4^{-n}\, d^{-2n-2}\right)\binom{v}{\frac{v}{2}}(v \bmod 2 - 1)\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{n+u}\, e^{-\frac{\left(b^2+4de\right)(m-2u)}{4d}}(m-2u)^{-2(n+1)}\binom{m}{u}\right.$$

$$\left(e^{\frac{b^2(m-2u)}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\,(-b(m-2u))^{-h-k+2n+1}\left(-(m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\right.$$

$$\left(\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b+2d\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\, \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right) - 2d\sqrt{\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\, \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right) + (-1)^{m-1}\, e^{2e(m-2u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\, 4^k\right.$$

$$(b(m-2u))^{-h-k+2n+1}\left((m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left.\left.\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\, -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right) +\right.\right.$$

$$2\sqrt{-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\Bigg)\Bigg)\Bigg)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e\,m+2\,g\,s-2\,e\,u-g\,v}\binom{v}{s}\Bigg(e^{-2\,e\,(m-2\,u)}\Bigg(e^{-\frac{b^2\,(m-2\,u)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}-4\,g\,s-4\,e\,u}\left(-(d\,m-2\,f\,s-2\,d\,u+f\,v)^2\right)^{-2\,n-1}$$

$$\Bigg((-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}+4\,g\,s+4\,e\,u}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(-b\,(m-2\,u)-2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\right)^{h+k}\Bigg(\left(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\right.$$

$$\left.d\,u+f\,v)\sqrt{z}\right)^2\Big/(d\,m-2\,f\,s-2\,d\,u+f\,v)\Bigg)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(h+k+1),$$

$$\left(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\right)^2\Big/(4\,(d\,m-2\,f\,s-$$

$$2\,d\,u+f\,v))\Bigg)-2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{\Bigg(\left(b\,(m-2\,u)+\right.$$

$$\left.2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\right)^2\Big/(d\,m-2\,f\,s-2\,d\,u+f\,v)\Bigg)$$

$$\Gamma\Bigg(\frac{1}{2}(h+k+2),\left(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\right)^2\Big/$$

$$(4\,(d\,m-2\,f\,s-2\,d\,u+f\,v))\Bigg)\Bigg)\Bigg)(d\,m-2\,f\,s-2\,d\,u+f\,v)^{2\,n}+$$

$$e^{2\,e\,m+2\,g\,v}\,(-d\,m+2\,f\,s+2\,d\,u-f\,v)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\right)^{h+k}\Bigg(-\Bigg(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-$$

$$2\,d\,u+f\,v)\sqrt{z}\Bigg)^2\Big/(d\,m-2\,f\,s-2\,d\,u+f\,v)\Bigg)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\right)$$

$$\Gamma\Bigg(\frac{1}{2}(h+k+1),-\Big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\Big)^2\Big/$$

$$(4\,(d\,m-2\,f\,s-2\,d\,u+f\,v))\Bigg)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)$$

$$\Gamma\Bigg(\frac{1}{2}(h+k+2),-\Big(b\,(m-2\,u)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\Big)^2\Big/$$

$$(4\,(d\,m-2\,f\,s-2\,d\,u+f\,v))\Bigg)\sqrt{\Bigg(-\Big(b\,(m-2\,u)+2$$

$$(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{z}\Big)^2\Big/(d\,m-2\,f\,s-2\,d\,u+f\,v)\Big)\Big)\Big)-$$

$$(-1)^m\,e^{\frac{b^2\,(m-2\,u)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}+2\,g\,(v-2\,s)}\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-b\,(m-2\,u))^{-h-k+2\,n}\left(\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)\sqrt{z}\;-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\;\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)-$$

$$2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)\Bigg)\Bigg)-$$

$$e^{-\frac{b^2\,(m-2\,u)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}}\,(d\,m+2\,f\,s-2\,d\,u-f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.$$

$$-\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\Bigg)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\right)$$

$$\sqrt{-\frac{\left(b\,(m-2\,u)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.4547.01

$$\int z^n \sinh^m(b\,z)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v-1}$$

$$\left(2\binom{v}{\frac{v}{2}}(v \bmod 2-1)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k(m-2k)^{-n-1}\binom{m}{k}\left((-1)^m\,\Gamma(n+1,\,b(m-2k)z)-(-1)^n\,\Gamma(n+1,\,b(2k-m)z)\right)\right)b^{-n-1}+\right.$$

$$\frac{2\,i^{-m}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}+i^{-m}z^{n+1}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(-c^2(v-2s)^2z^4\right)^{\frac{1}{2}(-n-1)}$$

$$\binom{v}{s}\left(\Gamma\left(\frac{n+1}{2},\,c(2s-v)z^2\right)\left(-c(2s-v)z^2\right)^{\frac{n+1}{2}}+\left(c(2s-v)z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c(2s-v)z^2\right)\right)-$$

$$c^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{b^2(m-2k)^2}{c(8s-4v)}}(v-2s)^{-n-1}\binom{v}{s}$$

$$\left((-1)^{m+n}e^{\frac{b^2(m-2k)^2}{c(4s-2v)}}\sum_{q=0}^{n}2^{q-n}(b(m-2k))^{n-q}\left(\frac{(-2bk+bm+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$(b(2k-m)+2c(v-2s)z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2bk+bm+4csz-2cvz)^2}{c(8s-4v)}\right)-$$

$$(-1)^n e^{\frac{b^2(m-2k)^2}{4cs-2cv}}\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)\right)^{n-q}(2bk-bm+4csz-2cvz)(b(m-2k)+2c(v-2s)z)^q$$

$$\left(\frac{(b(m-2k)+2c(v-2s)z)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2bk+bm-4csz+2cvz)^2}{8cs-4cv}\right)-$$

$$(-1)^m\sum_{q=0}^{n}2^{q-n}(b(m-2k))^{n-q}(2bk-bm+4csz-2cvz)^{q+1}\left(-\frac{(b(m-2k)+2c(v-2s)z)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2bk+bm-4csz+2cvz)^2}{8cs-4cv}\right)-$$

$$\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)\right)^{n-q}(-2bk+bm+4csz-2cvz)^{q+1}\left(-\frac{(-2bk+bm+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2bk+bm+4csz-2cvz)^2}{8cs-4cv}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4548.01

$$\int z^n \sinh^m(b\,z)\cosh^v\left(c\,\sqrt{z}\right)dz == 2^{-m-v-1}$$

$$\left(2\binom{v}{\frac{v}{2}}(v \bmod 2-1)\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^m\,\Gamma(n+1,\,b\,(m-2\,k)\,z)-(-1)^n\,\Gamma(n+1,\,b\,(2\,k-m)\,z)\right)\right)b^{-n-1}+\right.$$

$$\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+$$

$$4\,c^{-2\,n-2}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2\,s)^{-2\,(n+1)}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,-c\,(2\,s-v)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(2\,s-v)\,\sqrt{z}\right)\right)+$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{c^2\,(v-2\,s)^2}{4\,b\,(m-2\,u)}}\left(b^2\,(m-2\,u)^2\right)^{-2\,n-1}\binom{v}{s}\left(\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,b\,\sqrt{z}\,(m-2\,u)+\right.\right.\right.$$

$$\left.\left.c\,(2\,s-v)\right)^{h+k}\left(-\frac{\left(2\,b\,\sqrt{z}\,(m-2\,u)+c\,(2\,s-v)\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\right.$$

$$\left.\left(2\,b\,\sqrt{z}\,(m-2\,u)+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(2\,b\,\sqrt{z}\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,b\,(m-2\,u)}\right)+\right.$$

$$2\,b\,(m-2\,u)\sqrt{-\frac{\left(2\,b\,\sqrt{z}\,(m-2\,u)+c\,(2\,s-v)\right)^2}{b\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(2\,b\,\sqrt{z}\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,b\,(m-2\,u)}\right)\right)\right)(-b\,(m-2\,u))^{2\,n}+$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,b\,\sqrt{z}\,(m-2\,u)+c\,(v-2\,s)\right)^{h+k}\right.$$

$$\left.\left(-\frac{\left(2\,b\,\sqrt{z}\,(m-2\,u)+c\,(v-2\,s)\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\right.\right.$$

$$\left(c\,(2\,s-v)-2\,b\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,u)}\right)+$$

$$2\,b\,(m-2\,u)\sqrt{-\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{b\,(m-2\,u)}}\,\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,u)}\right)\right)\Big(-b\,(m-2\,u)\Big)^{2\,n}+(-1)^m\,e^{\frac{c^2\,(v-2\,s)^2}{2\,b\,(m-2\,u)}}$$

$$(b\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)-2\,b\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,b\,(m-2\,u)}\right)-2\,b\,(m-2\,u)$$

$$\left.\sqrt{\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{b\,(m-2\,u)}}\,\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,b\,(m-2\,u)}\right)\right)+$$

$$(-1)^m\,e^{\frac{c^2\,(v-2\,s)^2}{2\,b\,(m-2\,u)}}\,(b\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,b\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,b\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,u)}\right)-\right.$$

$$2\,b\,(m-2\,u)\sqrt{\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{b\,(m-2\,u)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,u)}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z+e)\cosh^v\left(c\,z^r\right)$

01.20.21.4549.01

$$\int z^n \sinh^m(e+d\,z)\cosh^v\left(c\,z^2\right)dz ==$$

$$2^{-m-v-1}\left(-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{4c(2s-v)(em-2ek)-d^2(m-2k)^2}{c(8s-4v)}}(v-2s)^{-n-1}\binom{v}{s}\right.\left((-1)^{m+n}e^{\frac{d^2(m-2k)^2}{c(4s-2v)}+e(4k-2m)}\right.$$

$$\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}\left(\frac{(-2dk+dm+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$(d(2k-m)+2c(v-2s)z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2dk+dm+4csz-2cvz)^2}{c(8s-4v)}\right)-$$

$$(-1)^n e^{\frac{d^2(m-2k)^2}{4cs-2cv}}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(2dk-dm+4csz-2cvz)(d(m-2k)+2c(v-2s)z)^q$$

$$\left(\frac{(d(m-2k)+2c(v-2s)z)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2dk+dm-4csz+2cvz)^2}{8cs-4cv}\right)-$$

$$(-1)^m e^{4ek-2em}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(2dk-dm+4csz-2cvz)^{q+1}$$

$$\left(-\frac{(d(m-2k)+2c(v-2s)z)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2dk+dm-4csz+2cvz)^2}{8cs-4cv}\right)-$$

$$\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(-2dk+dm+4csz-2cvz)^{q+1}\left(-\frac{(-2dk+dm+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2dk+dm+4csz-2cvz)^2}{8cs-4cv}\right)\right)\right)$$

$$c^{-n-1}+\frac{2i^{-m}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)(v\bmod 2-1)}{n+1}+i^{-m}$$

$$z^{n+1}$$

$$\binom{m}{\frac{m}{2}}$$

$$(m\bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(-c^2(v-2s)^2z^4\right)^{\frac{1}{2}(-n-1)}\binom{v}{s}$$

$$\left(\Gamma\left(\frac{n+1}{2},\, c\,(2\,s-v)\,z^2\right)\left(-c\,(2\,s-v)\,z^2\right)^{\frac{n+1}{2}}+\left(c\,(2\,s-v)\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c\,(2\,s-v)\,z^2\right)\right)+$$

$$2\,(-1)^n\,d^{-n-1}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\,(m-2\,k)^{-n-1}\binom{m}{k}$$

$$\left.\left((-1)^{m+n}\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)\right/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4550.01

$$\int z^n\sinh^m(e+d\,z)\cosh^v\left(c\,\sqrt{z}\right)dz == 2^{-m-v-1}\left(2\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^m\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-(-1)^n\,e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)\right)$$

$$d^{-n-1}+\frac{1}{n+1}\left(2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)\right)+$$

$$4\,c^{-2\,n-2}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2\,s)^{-2\,(n+1)}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,-c\,(2\,s-v)\,\sqrt{z}\right)+\Gamma\left(2\,(n+1),\,c\,(2\,s-v)\,\sqrt{z}\right)\right)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,u)}-e\,m-2\,e\,u}\left(-d^2\,(m-2\,u)^2\right)^{-2\,n-1}\binom{v}{s}$$

$$\left(e^{2\,e\,m}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{h+k}\right.\right.$$

$$\left(-\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2\Big/\left(d\,(m-2\,u)\right)\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(2\,s-v)\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2\Big/\right.\right.$$

$$\left.\left.(4\,d\,(m-2\,u))\right)+2\,d\,(m-2\,u)\,\sqrt{\left(-\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2\Big/\left(d\,(m-2\,u)\right)\right)}\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2\Big/\left(4\,d\,(m-2\,u)\right)\right)\right)\Big)\left(-d\,(m-2\,u)\right)^{2\,n}+$$

$$e^{2\,e\,m}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{h+k}\right.$$

$$\left(-\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2\Big/\left(d\,(m-2\,u)\right)\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2\Big/\right.\right.$$

$$(4\,d\,(m-2\,u))\Big)+2\,d\,(m-2\,u)\,\sqrt{\Big(-\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\big)^2\Big/(d\,(m-2\,u))\Big)}$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+2),\,-\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\big)^2\Big/(4\,d\,(m-2\,u))\Big)\Big)\Big)$$

$$(-d\,(m-2\,u))^{2\,n}+(-1)^m\,e^{\frac{c^2\,(v-2\,s)^2}{2\,d\,(m-2\,u)}+4\,e\,u}\,(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}$$
$$\big(c\,(v-2\,s)-2\,d\,(m-2\,u)\,\sqrt{z}\big)^{h+k}\Big(\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\big)^2\Big/(d\,(m-2\,u))\Big)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$
$$\binom{n}{k}\Big(c\,(2\,s-v)\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\big)\,\Gamma\Big(\frac{1}{2}\,(h+k+1),\,\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\big)^2\Big/$$
$$(4\,d\,(m-2\,u))\Big)-2\,d\,(m-2\,u)\,\sqrt{\Big(\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\big)^2\Big/(d\,(m-2\,u))\Big)}$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+2),\,\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\big)^2\Big/(4\,d\,(m-2\,u))\Big)\Big)+(-1)^m\,e^{\frac{c^2\,(v-2\,s)^2}{2\,d\,(m-2\,u)}+4\,e\,u}$$
$$(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\,\big(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\big)^{h+k}$$
$$\Big(\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\big)^2\Big/(d\,(m-2\,u))\Big)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Big(c\,(2\,s-v)\big(c\,(2\,s-v)-$$
$$2\,d\,(m-2\,u)\,\sqrt{z}\big)\,\Gamma\Big(\frac{1}{2}\,(h+k+1),\,\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\big)^2\Big/(4\,d\,(m-2\,u))\Big)-$$
$$2\,d\,(m-2\,u)\,\sqrt{\Big(\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\big)^2\Big/(d\,(m-2\,u))\Big)}\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$\big(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\big)^2\Big/(4\,d\,(m-2\,u))\Big)\Big)\Big)\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^m(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.4551.01

$$\int z^{\alpha-1}\sinh^m(b\,z^r)\cosh^v(c\,z^r)\,dz == 2^{-m-v}\,z^\alpha\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{\alpha}+\frac{1}{r}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},\,b\,(2k-m)\,z^r\right)(b\,(2k-m)\,z^r)^{-\frac{\alpha}{r}}+(-1)^m\,(b\,(m-2k)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,b\,(m-2k)\,z^r\right)\right)+$$

$$\frac{i^{-m}}{r}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,c\,(2s-v)\,z^r\right)(c\,(2s-v)\,z^r)^{-\frac{\alpha}{r}}+(c\,(v-2s)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,(v-2s)\,z^r\right)\right)-$$

$$\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.\left.((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4552.01

$$\int z^n \sinh^m\left(b\,z^2\right) \cosh^v\left(c\,z^2\right) dz ==$$

$$2^{-m-v-1}\, z^{n+1} \left(\frac{2\, i^{-m} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (m \bmod 2 - 1)\, (v \bmod 2 - 1)}{n+1} + \binom{v}{\frac{v}{2}} (v \bmod 2 - 1) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\Gamma\left(\frac{n+1}{2}, b\,(2\,k-m)\,z^2 \right) \right.\right.$$

$$\left. \left(b\,(2\,k-m)\,z^2 \right)^{\frac{1}{2}(-n-1)} + (-1)^m \left(b\,(m-2\,k)\,z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b\,(m-2\,k)\,z^2 \right) \right) + \binom{m}{\frac{m}{2}} i^{-m}\, (m \bmod 2 - 1)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\Gamma\left(\frac{n+1}{2}, c\,(2\,s-v)\,z^2 \right) \left(c\,(2\,s-v)\,z^2 \right)^{\frac{1}{2}(-n-1)} + \left(c\,(v-2\,s)\,z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c\,(v-2\,s)\,z^2 \right) \right) -$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left((-1)^m \Gamma\left(\frac{n+1}{2}, (-2\,b\,k + b\,m - 2\,c\,s + c\,v)\,z^2 \right) \left((-2\,b\,k + b\,m - 2\,c\,s + c\,v)\,z^2 \right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left((2\,b\,k - b\,m - 2\,c\,s + c\,v)\,z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (2\,b\,k - b\,m - 2\,c\,s + c\,v)\,z^2 \right) +$$

$$(-1)^m \left((-2\,b\,k + b\,m + 2\,c\,s - c\,v)\,z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-2\,b\,k + b\,m + 2\,c\,s - c\,v)\,z^2 \right) +$$

$$\left. \left. \left((2\,b\,k - b\,m + 2\,c\,s - c\,v)\,z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (2\,b\,k - b\,m + 2\,c\,s - c\,v)\,z^2 \right) \right) \right) /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4553.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == 2^{-m-v}\left(\frac{z^{n+1}\,i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2\,b^{-2n-2}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2k)^{-2(n+1)}\binom{m}{k}\left(\Gamma\left(2(n+1),\,b(2k-m)\sqrt{z}\right)+(-1)^m\,\Gamma\left(2(n+1),\,b(m-2k)\sqrt{z}\right)\right)+$$

$$2\,i^{-m}\,c^{-2n-2}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(\Gamma\left(2(n+1),\,c(2s-v)\sqrt{z}\right)+\Gamma\left(2(n+1),\,c(v-2s)\sqrt{z}\right)\right)-$$

$$2\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(2(n+1),\,(2bk-bm-2cs+cv)\sqrt{z}\right)\left((2bk-bm-2cs+cv)\sqrt{z}\right)^{-2(n+1)}+\right.$$

$$(-1)^m\left((-2bk+bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(-2bk+bm+2cs-cv)\sqrt{z}\right)+$$

$$\left((2bk-bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(2bk-bm+2cs-cv)\sqrt{z}\right)+$$

$$\left.\left.(-1)^m\left((b(m-2k)+c(v-2s))\sqrt{z}\right)^{-2(n+1)}\right.\right.$$

$$\left.\left.\Gamma\left(2(n+1),\,(b(m-2k)+c(v-2s))\sqrt{z}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r\right)$

01.20.21.4554.01

$$\int z^{\alpha-1}\sinh^m(b\,z^r+e)\cosh^v(c\,z^r)\,dz ==$$

$$2^{-m-v}\,z^\alpha\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{\alpha}+\frac{1}{r}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\right.$$

$$\left(e^{e(m-2k)}\,\Gamma\left(\frac{\alpha}{r},\,b(2k-m)z^r\right)(b(2k-m)z^r)^{-\frac{\alpha}{r}}+(-1)^m e^{2ek-em}\,(b(m-2k)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,b(m-2k)z^r\right)\right)+$$

$$\frac{i^{-m}}{r}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,c(2s-v)z^r\right)(c(2s-v)z^r)^{-\frac{\alpha}{r}}+(c(v-2s)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c(v-2s)z^r\right)\right)-$$

$$\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2ek-em}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm-2cs+cv)z^r\right)((-2bk+bm-2cs+cv)z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{2em-4ek}((2bk-bm-2cs+cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2bk-bm-2cs+cv)z^r\right)+$$

$$(-1)^m((-2bk+bm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm+2cs-cv)z^r\right)+$$

$$\left.\left.e^{2em-4ek}((2bk-bm+2cs-cv)z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2bk-bm+2cs-cv)z^r\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4555.01

$$\int z^n \sinh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2\right)dz == 2^{-m-v-1}\,z^{n+1}\left(\frac{2\,i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+\right.$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e\,(m-2\,k)}\,\Gamma\left(\frac{n+1}{2},\,b\,(2\,k-m)\,z^2\right)\left(b\,(2\,k-m)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$(-1)^m\,e^{2\,e\,k-e\,m}\left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,b\,(m-2\,k)\,z^2\right)\Big)+\binom{m}{\frac{m}{2}}i^{-m}\,(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{n+1}{2},\,c\,(2\,s-v)\,z^2\right)\left(c\,(2\,s-v)\,z^2\right)^{\frac{1}{2}(-n-1)}+\left(c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,c\,(v-2\,s)\,z^2\right)\right)-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k$$

$$\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2\,e\,k-e\,m}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^2\right)\left((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$e^{2\,e\,m-4\,e\,k}\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^2\right)+$$

$$(-1)^m\left((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^2\right)+e^{2\,e\,m-4\,e\,k}$$

$$\left.\left.\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^2\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4556.01

$$\int z^n \sinh^m\left(\sqrt{z}\, b+e\right)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$2^{-m-v}\left(\frac{z^{n+1}\, i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}+2\, b^{-2n-2}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\, e^{2ek-em}(m-2k)^{-2(n+1)}\right.$$

$$\binom{m}{k}\left(e^{2em-4ek}\,\Gamma\left(2(n+1),\, b(2k-m)\sqrt{z}\right)+(-1)^m\,\Gamma\left(2(n+1),\, b(m-2k)\sqrt{z}\right)\right)+2\, i^{-m}\, c^{-2n-2}\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(\Gamma\left(2(n+1),\, c(2s-v)\sqrt{z}\right)+\Gamma\left(2(n+1),\, c(v-2s)\sqrt{z}\right)\right)-2\, z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{em-2ek}\,\Gamma\left(2(n+1),\,(2bk-bm-2cs+cv)\sqrt{z}\right)\left((2bk-bm-2cs+cv)\sqrt{z}\right)^{-2(n+1)}+\right.$$

$$(-1)^m\, e^{2ek-em}\left((-2bk+bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(-2bk+bm+2cs-cv)\sqrt{z}\right)+$$

$$e^{e(m-2k)}\left((2bk-bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(2bk-bm+2cs-cv)\sqrt{z}\right)+$$

$$\left.\left.(-1)^m\, e^{2ek-em}\left((b(m-2k)+c(v-2s))\sqrt{z}\right)^{-2(n+1)}\right.\right.$$

$$\left.\left.\Gamma\left(2(n+1),\,(b(m-2k)+c(v-2s))\sqrt{z}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\, z^r+d\, z\right)\cosh^v\left(c\, z^r\right)$

01.20.21.4557.01

$$\int z^n \sinh^m\left(b\, z^2+d\, z\right)\cosh^v\left(c\, z^2\right)dz ==$$

$$2^{-m-v-1}\left(\frac{2\, i^{-m}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}-z^{n+1}\, i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(-c^2(v-2s)^2 z^4\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\binom{v}{s}\left(\Gamma\left(\frac{n+1}{2},\, c(2s-v)z^2\right)\left(-c(2s-v)z^2\right)^{\frac{n+1}{2}}+\left(c(2s-v)z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\, -c(2s-v)z^2\right)\right)+$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\, e^{-\frac{d^2(m-2k)}{4b}}(b(m-2k))^{-n-1}\binom{m}{k}\left(\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(m-2k)^{n+1}(d+2bz)^{q+1}\right.$$

$$\left.\left.\left(\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2k-m)(d+2bz)^2}{4b}\right)+(-1)^m\, e^{\frac{d^2(m-2k)}{2b}}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}\right.\right.$$

$$(m-2k)^{n+1}(d+2bz)^{q+1}\left(-\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2k-m)(d+2bz)^2}{4b}\right)\Bigg)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}+im\pi}\Bigg(\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d(m-2k)+2(b(m-2k)+c(v-2s))z)^{q+1}$$

$$\left(\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)\Bigg)(b(m-2k)+c(v-2s))^{-n-1}+e^{\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}+im\pi}$$

$$(-2bk+bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d(m-2k)+2(-2bk+bm+2cs-cv)z)^{q+1}$$

$$\left(\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+e^{-\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}}(2bk-bm-2cs+cv)^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}\left(-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}(d(2k-m)+2(2bk-$$

$$bm-2cs+cv)z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{-\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}}(2bk-bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(2dk+4bzk-dm-$$

$$2bmz+4csz-2cvz)^{q+1}\left(-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(c\,\sqrt{z}\right) dz ==$$

$$2^{-m-v-1}\left(\frac{1}{b}\left(4^{-n}\binom{v}{\frac{v}{2}}(v \bmod 2 - 1)\left(\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\, e^{-\frac{b^2\,(m-2\,u)}{4\,d}}\,(m-2\,u)^{-2\,(n+1)}\binom{m}{u}\right.\right.\right.$$

$$\left.\left.\left.(-1)^m\, e^{\frac{b^2\,(m-2\,u)}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\right.\right.\right.$$

$$(-b\,(m-2\,u))^{-h-k+2\,n+1}\left(-(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\right)^{h+k}\left(\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,d\,\sqrt{\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n+1}\left((m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.\left.2\,\sqrt{-\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\right)\Bigg)\Bigg)\Bigg

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\frac{c^2(v-2s)^2}{d(m-2u)}+\frac{(m-2u)b^2+2c(v-2s)b}{d}}{4}}\left(-d^2(m-2u)^2\right)^{-2n-1}\binom{v}{s}$$

$$\left(e^{\frac{bc(v-2s)}{d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(bm+2cs-2bu-cv)^{-h-k+2n}\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((bm+2cs-2bu-cv)\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{4d(m-2u)}\right)+$$

$$2d(m-2u)\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{4d(m-2u)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{d(m-2u)}}\right)\right)(-d(m-2u))^{2n}+$$

$$\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(bm-2cs-2bu+cv)^{-h-k+2n}\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^{h+k}\right.$$

$$\left(-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((bm-2cs-2bu+cv)\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^2}{4d(m-2u)}\right)+$$

$$2\,d\,(m-2\,u)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right.$$

$$\left.\sqrt{-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}\right)\Bigg)(-d\,(m-2\,u))^{2\,n}+$$

$$(-1)^m\,e^{\frac{1}{2}\left(\frac{(m-2\,u)\,b^2}{d}+\frac{c^2\,(v-2\,s)^2}{d\,(m-2\,u)}\right)}(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)^{-h-k+2\,n}$$

$$\left(-b\,(m-2\,u)-2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)\Bigg)+(-1)^m\,e^{\frac{1}{2}\left(\frac{c^2\,(v-2\,s)^2}{d\,(m-2\,u)}+\frac{(m-2\,u)\,b^2+2\,c\,(v-2\,s)\,b}{d}\right)}$$

$$(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m+2\,c\,s+2\,b\,u-c\,v)^{-h-k+2\,n}\left(-b\,(m-2\,u)-2\,d\right.$$

$$\left.\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b\,m-2\,c\,s-2\,b\,u+c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)+c(v-2s)\right)^2}{4d(m-2u)}\right)-$$

$$2d(m-2u)\sqrt{\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)+c(v-2s)\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.\left.\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)+c(v-2s)\right)^2}{4d(m-2u)}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + d z + e)\cosh^v(c z^r)$

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$$\int z^n \sinh^m\left(b z^2+d z+e\right)\cosh^v\left(c z^2\right)dz ==$$

$$2^{-m-v-1}\left(\frac{2 i^{-m} z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}-z^{n+1} i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(-c^2(v-2s)^2 z^4\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\binom{v}{s}\left(\Gamma\left(\frac{n+1}{2},\ c(2s-v)z^2\right)\left(-c(2s-v)z^2\right)^{\frac{n+1}{2}}+\left(c(2s-v)z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\ -c(2s-v)z^2\right)\right)+$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{-\frac{(m-2k)d^2}{4b}-e(2k+m)}(b(m-2k))^{-n-1}\binom{m}{k}$$

$$\left(e^{2em}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(m-2k)^{n+1}(d+2bz)^{q+1}\left(\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.$$

$$\left.\Gamma\left(\frac{q+1}{2},\ \frac{(2k-m)(d+2bz)^2}{4b}\right)+(-1)^m e^{\frac{(m-2k)d^2}{2b}+4ek}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(m-2k)^{n+1}\right.$$

$$\left.(d+2bz)^{q+1}\left(-\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{(2k-m)(d+2bz)^2}{4b}\right)\right)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2ek-em}\binom{v}{s}\left(e^{\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}+2e(m-2k)+im\pi}\left(\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}\right.\right.$$

$$\left.\left.(d(m-2k)+2(b(m-2k)+c(v-2s))z)^{q+1}\left(\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)\Bigg)$$

$$(b(m-2k)+c(v-2s))^{-n-1}+e^{\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}+2e(m-2k)+im\pi}(-2bk+bm+2cs-cv)^{-n-1}$$

$$\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d(m-2k)+2(-2bk+bm+2cs-cv)z)^{q+1}$$

$$\left(\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+e^{-\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}}(2bk-bm-2cs+cv)^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}\left(-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}(d(2k-m)+2(2bk-$$

$$bm-2cs+cv)z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{-\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}}(2bk-bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(2dk+4bzk-dm-$$

$$2bmz+4csz-2cvz)^{q+1}\left(-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sinh^m\left(\sqrt{z}\ b+e+dz\right)\cosh^v\left(c\sqrt{z}\right)dz==$$

$$2^{-m-v-1}\left(\frac{1}{b}\left(4^{-n}\binom{v}{\frac{v}{2}}(v\bmod 2-1)\left(\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u e^{-\frac{\left(b^2+4de\right)(m-2u)}{4d}}(m-2u)^{-2(n+1)}\binom{m}{u}\right.\right.\right.$$

$$\left.\left.\left.(-1)^m e^{\frac{b^2(m-2u)}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b(m-2u))^{-h-k+2n+1}\left(-(m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\right.\right.\right.$$

$$\left(\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b+2d\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)+e^{2e(m-2u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}4^k$$

$$(b(m-2u))^{-h-k+2n+1}\left((m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)d^{-2n-2}\right)+$$

$$\frac{2i^{-m}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}+4c^{-2n-2}i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}$$

$$\left(\Gamma\left(2(n+1),\ -c(2s-v)\sqrt{z}\right)+\Gamma\left(2(n+1),\ c(2s-v)\sqrt{z}\right)\right)+$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e(m-2u)+\frac{1}{4}\left(-\frac{c^2(v-2s)^2}{d(m-2u)}-8em-\frac{(m-2u)b^2+2c(v-2s)b}{d}\right)}\left(d^2(m-2u)^2\right)^{-2n-1}\binom{v}{s}$$

$$\left(e^{2em+\frac{bc(v-2s)}{d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(bm+2cs-2bu-cv)^{-h-k+2n}\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+\right.\right.\right.$$

$$c\,(2\,s-v)\Big)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)$$

$$\left.\sqrt{-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}\right)(-d\,(m-2\,u))^{2\,n}+$$

$$e^{2\,e\,m}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,m-2\,c\,s-2\,b\,u+c\,v)^{-h-k+2\,n}\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{h+k}\right.$$

$$\left(-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b\,m-2\,c\,s-2\,b\,u+c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)$$

$$\left.\sqrt{-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}\right)(-d\,(m-2\,u))^{2\,n}+$$

$$(-1)^m e^{\frac{1}{2}\left(\frac{(m-2u)b^2}{d}+\frac{c^2(v-2s)^2}{d(m-2u)}+8eu\right)}(d(m-2u))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-bm-2cs+2bu+cv)^{-h-k+2n}$$

$$\left(-b(m-2u)-2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^{h+k}$$

$$\left(\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((bm+2cs-2bu-cv)\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{4d(m-2u)}\right)-$$

$$2d(m-2u)\sqrt{\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{d(m-2u)}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{4d(m-2u)}\right)\right)+$$

$$(-1)^m e^{\frac{1}{2}\left(\frac{c^2(v-2s)^2}{d(m-2u)}+8eu+\frac{(m-2u)b^2+2c(v-2s)b}{d}\right)}(d(m-2u))^{2n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k$$

$$(-bm+2cs+2bu-cv)^{-h-k+2n}\left(-b(m-2u)-2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^{h+k}$$

$$\left(\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((bm-2cs-2bu+cv)\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^2}{4d(m-2u)}\right)-$$

$$2d(m-2u)\sqrt{\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\right.$$

Involving $z^n \sinh^m(d\,z) \cosh^v\left(c\,z^r + g\right)$

01.20.21.4561.01

$$\int z^n \sinh^m(d\,z) \cosh^v\left(c\,z^2 + g\right) dz ==$$

$$2^{-m-v-1}\left(-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{\frac{4c(2s-v)(2gs-gv)-d^2(m-2k)^2}{c(8s-4v)}}(v-2s)^{-n-1}\binom{v}{s}\left((-1)^{m+n}\, e^{\frac{d^2(m-2k)^2}{c(4s-2v)}+2g(v-2s)}\right.\right.$$

$$\sum_{q=0}^{n} 2^{q-n}(d(m-2k))^{n-q}\left(\frac{(-2dk+dm+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$(d(2k-m)+2c(v-2s)z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2dk+dm+4csz-2cvz)^2}{c(8s-4v)}\right)-$$

$$(-1)^n\, e^{\frac{d^2(m-2k)^2}{4cs-2cv}+2g(v-2s)}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(2dk-dm+4csz-2cvz)(d(m-2k)+2c(v-2s)z)^q$$

$$\left(\frac{(d(m-2k)+2c(v-2s)z)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2dk+dm-4csz+2cvz)^2}{8cs-4cv}\right)-$$

$$(-1)^m\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(2dk-dm+4csz-2cvz)^{q+1}$$

$$\left(-\frac{(d(m-2k)+2c(v-2s)z)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2dk+dm-4csz+2cvz)^2}{8cs-4cv}\right)-$$

$$\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(-2dk+dm+4csz-2cvz)^{q+1}\left(-\frac{(-2dk+dm+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2dk+dm+4csz-2cvz)^2}{8cs-4cv}\right)\right)\right)$$

$$c^{-n-1}+\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}+i^{-m}$$

$$z^{n+1}$$

$$\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{g(2s-v)}\left(-c^2(v-2s)^2z^4\right)^{\frac{1}{2}(-n-1)}\binom{v}{s}$$

$$\left(e^{2\,g\,(v-2\,s)}\,\Gamma\left(\frac{n+1}{2},\,c\,(2\,s-v)\,z^2\right)\left(-c\,(2\,s-v)\,z^2\right)^{\frac{n+1}{2}}+\left(c\,(2\,s-v)\,z^2\right)^{\frac{n+1}{2}}\,\Gamma\left(\frac{n+1}{2},\,-c\,(2\,s-v)\,z^2\right)\right)+$$

$$2\,d^{-n-1}\binom{v}{\frac{v}{2}}(v\bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-n-1}\binom{m}{k}$$

$$\left.\left((-1)^m\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-(-1)^n\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4562.01

$$\int z^n\sinh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+g\right)dz==2^{-m-v-1}$$

$$\left(2\binom{v}{\frac{v}{2}}(v\bmod 2-1)\,d^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^m\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-(-1)^n\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)+\right.$$

$$\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)\,(v\bmod 2-1)}{n+1}+4\,c^{-2\,n-2}\,i^{-m}\binom{m}{\frac{m}{2}}(m\bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g\,(2\,s-v)}\,(v-2\,s)^{-2\,(n+1)}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,-c\,(2\,s-v)\,\sqrt{z}\right)+e^{2\,g\,(v-2\,s)}\,\Gamma\left(2\,(n+1),\,c\,(2\,s-v)\,\sqrt{z}\right)\right)+$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,u)}-2\,g\,s-g\,v}\left(d^2\,(m-2\,u)^2\right)^{-2\,n-1}\binom{v}{s}$$

$$\left(e^{4\,g\,s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\right.$$

$$\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$-\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\Bigg)\Bigg)(-d\,(m-2\,u))^{2\,n}+$$

$$e^{2\,g\,v}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^{h+k}\right.$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\right.$$

$$\left(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\sqrt{-\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}\,\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)\right)\Bigg)(-d\,(m-2\,u))^{2\,n}+(-1)^m\,e^{\frac{c^2\,(v-2\,s)^2}{2\,d\,(m-2\,u)}+2\,g\,v}$$

$$(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)-2\,d\,(m-2\,u)$$

$$\left.\sqrt{\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}\,\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$(-1)^m\,e^{\frac{c^2\,(v-2\,s)^2}{2\,d\,(m-2\,u)}+4\,g\,s}\,(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}$$

$$\left(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z+e)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4563.01

$$\int z^n\sinh^m(e+d\,z)\cosh^v\left(c\,z^2+g\right)dz==$$

$$2^{-m-v-1}\left(-c^{-n-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+n}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{4\,c\,(2\,s-v)\,(-2\,e\,k+e\,m+2\,g\,s-g\,v)-d^2\,(m-2\,k)^2}{c\,(8\,s-4\,v)}}(v-2\,s)^{-n-1}\binom{v}{s}\right.\left((-1)^{m+n}\right.$$

$$e^{\frac{d^2\,(m-2\,k)^2}{c\,(4\,s-2\,v)}+e\,(4\,k-2\,m)+2\,g\,(v-2\,s)}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\left(\frac{(-2\,d\,k+d\,m+4\,c\,s\,z-2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$(d\,(2\,k-m)+2\,c\,(v-2\,s)\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,d\,k+d\,m+4\,c\,s\,z-2\,c\,v\,z)^2}{c\,(8\,s-4\,v)}\right)-$$

$$(-1)^n\,e^{\frac{d^2\,(m-2\,k)^2}{4\,c\,s-2\,c\,v}+2\,g\,(v-2\,s)}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(2\,d\,k-d\,m+4\,c\,s\,z-2\,c\,v\,z)\,(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^q$$

$$\left(\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(-2\,d\,k+d\,m-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)-$$

$$(-1)^m\,e^{4\,e\,k-2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k))^{n-q}\,(2\,d\,k-d\,m+4\,c\,s\,z-2\,c\,v\,z)^{q+1}$$

$$\left.\left.\left(-\frac{(d\,(m-2\,k)+2\,c\,(v-2\,s)\,z)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(-2\,d\,k+d\,m-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)-\right.\right.$$

$$\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(-2\,d\,k+d\,m+4\,c\,s\,z-2\,c\,v\,z)^{q+1}\left(-\frac{(-2\,d\,k+d\,m+4\,c\,s\,z-2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2\,d\,k+d\,m+4\,c\,s\,z-2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\Bigg)+$$

$$\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g\,(2\,s-v)}\left(-c^2\,(v-2\,s)^2\,z^4\right)^{\frac{1}{2}(-n-1)}\binom{v}{s}$$

$$\left(e^{2\,g\,(v-2\,s)}\,\Gamma\left(\frac{n+1}{2},\,c\,(2\,s-v)\,z^2\right)\left(-c\,(2\,s-v)\,z^2\right)^{\frac{n+1}{2}}+\left(c\,(2\,s-v)\,z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c\,(2\,s-v)\,z^2\right)\right)+$$

$$2\,(-1)^n\,d^{-n-1}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\,(m-2\,k)^{-n-1}\binom{m}{k}$$

$$\left((-1)^{m+n}\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)\Bigg)\,/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4564.01

$$\int z^n\sinh^m(d\,z+e)\cosh^v\left(\sqrt{z}\;c+g\right)dz==2^{-m-v-1}\left(2\binom{v}{\frac{v}{2}}(v \bmod 2-1)\;d^{-n-1}\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^m\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-(-1)^n\,e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)+$$

$$\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+4\,c^{-2\,n-2}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g\,(2\,s-v)}\,(v-2\,s)^{-2\,(n+1)}\binom{v}{s}\left(\Gamma\left(2\,(n+1),\,-c\,(2\,s-v)\,\sqrt{z}\right)+e^{2\,g\,(v-2\,s)}\,\Gamma\left(2\,(n+1),\,c\,(2\,s-v)\,\sqrt{z}\right)\right)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{c^2\,(v-2\,s)^2}{4\,d\,(m-2\,u)}-e\,m-2\,g\,s-2\,e\,u-g\,v}\left(-d^2\,(m-2\,u)^2\right)^{-2\,n-1}\binom{v}{s}$$

$$\left(e^{2\,e\,m+4\,g\,s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(2\,s-v))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{2}}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\right.$$

$$\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{2}}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{2}}{d\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{2}}{4\,d\,(m-2\,u)}\right)\right)\right)(-d\,(m-2\,u))^{2\,n}+$$

$$e^{2\,e\,m+2\,g\,v}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(v-2\,s))^{-h-k+2\,n}\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{h+k}\right.$$

$$\left(-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{2}}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\right.$$

$$\left(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{2}}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\sqrt{-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{2}}{d\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{2}}{4\,d\,(m-2\,u)}\right)\right)\right)(-d\,(m-2\,u))^{2\,n}+(-1)^{m}\,e^{\frac{c^{2}\,(v-2\,s)^{2}}{2\,d\,(m-2\,u)}+4\,e\,u+2\,g\,v}$$

$$(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)-2\,d\,(m-2\,u)$$

$$\left.\sqrt{\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}\,\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$(-1)^m\,e^{\frac{c^2\,(v-2\,s)^2}{2\,d\,(m-2\,u)}+4\,g\,s+4\,e\,u}\,(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}$$

$$\left(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(2\,s-v)\left(c\,(2\,s-v)-2\,d\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)-\right.$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^m(b\,z^r)\cosh^v(c\,z^r+g)$

01.20.21.4565.01

$$\int z^{\alpha-1}\sinh^m(b\,z^r)\cosh^v(c\,z^r+g)\,dz == 2^{-m-v}\,z^\alpha\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{\alpha}+\frac{1}{r}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},\,b\,(2\,k-m)\,z^r\right)(b\,(2\,k-m)\,z^r)^{-\frac{\alpha}{r}}+(-1)^m\,(b\,(m-2\,k)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,b\,(m-2\,k)\,z^r\right)\right)+\frac{i^{-m}}{r}\binom{m}{\frac{m}{2}}$$

$$(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g\,(v-2\,s)}\,\Gamma\left(\frac{\alpha}{r},\,c\,(2\,s-v)\,z^r\right)(c\,(2\,s-v)\,z^r)^{-\frac{\alpha}{r}}+e^{2\,g\,s-g\,v}\,(c\,(v-2\,s)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c\,(v-2\,s)\,z^r\right)\right)-$$

$$\frac{1}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2\,g\,s-g\,v}\binom{v}{s}\left(\right.(-1)^m\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r\right)((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+$$

$$((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^r\right)+$$

$$(-1)^m\,e^{2\,g\,(v-2\,s)}\,((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^r\right)+$$

$$\left.\left.e^{2\,g\,v-4\,g\,s}\,((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^r\right)\right)\right/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4566.01

$$\int z^n \sinh^m\left(b\,z^2\right) \cosh^v\left(c\,z^2+g\right) dz ==$$

$$2^{-m-v-1}\, z^{n+1} \left(\frac{2\, i^{-m} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (m \bmod 2 - 1)\,(v \bmod 2 - 1)}{n+1} + \binom{v}{\frac{v}{2}} (v \bmod 2 - 1) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \right.$$

$$\left(\Gamma\left(\frac{n+1}{2}, b\,(2\,k-m)\,z^2 \right) \left(b\,(2\,k-m)\,z^2\right)^{\frac{1}{2}(-n-1)} + (-1)^m \left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, b\,(m-2\,k)\,z^2 \right) \right) +$$

$$\binom{m}{\frac{m}{2}} i^{-m} (m \bmod 2 - 1) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{g\,(v-2\,s)}\, \Gamma\left(\frac{n+1}{2}, c\,(2\,s-v)\,z^2 \right) \left(c\,(2\,s-v)\,z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. e^{2\,g\,s-g\,v} \left(c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, c\,(v-2\,s)\,z^2 \right) \right) -$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{2\,g\,s-g\,v} \binom{v}{s} \left((-1)^m\, \Gamma\left(\frac{n+1}{2}, (-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^2 \right) \left((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^2 \right) +$$

$$(-1)^m\, e^{2\,g\,(v-2\,s)} \left((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^2 \right) + e^{2\,g\,v-4\,g\,s}$$

$$\left. \left. \left((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^2 \right) \right) \right) /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4567.01

$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-m-v}\left(\frac{z^{n+1}\,i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2\,b^{-2n-2}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2k)^{-2(n+1)}\binom{m}{k}\right.$$

$$\left(\Gamma\left(2(n+1),\,b(2k-m)\sqrt{z}\right)+(-1)^m\,\Gamma\left(2(n+1),\,b(m-2k)\sqrt{z}\right)\right)+2\,i^{-m}\,c^{-2n-2}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(e^{g(v-2s)}\,\Gamma\left(2(n+1),\,c(2s-v)\sqrt{z}\right)+e^{2gs-gv}\,\Gamma\left(2(n+1),\,c(v-2s)\sqrt{z}\right)\right)-2\,z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{2gs-gv}\,\Gamma\left(2(n+1),\,(2bk-bm-2cs+cv)\sqrt{z}\right)\left((2bk-bm-2cs+cv)\sqrt{z}\right)^{-2(n+1)}+\right.$$

$$(-1)^m\,e^{gv-2gs}\left((-2bk+bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(-2bk+bm+2cs-cv)\sqrt{z}\right)+$$

$$e^{g(v-2s)}\left((2bk-bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(2bk-bm+2cs-cv)\sqrt{z}\right)+$$

$$(-1)^m\,e^{2gs-gv}\left((b(m-2k)+c(v-2s))\sqrt{z}\right)^{-2(n+1)}$$

$$\left.\left.\Gamma\left(2(n+1),\,(b(m-2k)+c(v-2s))\sqrt{z}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^{\alpha-1}\sinh^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4568.01

$$\int z^{\alpha-1}\sinh^{m}(b\,z^{r}+e)\cosh^{v}(c\,z^{r}+g)\,dz ==$$

$$2^{-m-v}\,z^{\alpha}\left(\frac{i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{\alpha}+\frac{1}{r}\left(\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\right.\right.$$

$$\left.\left(e^{e(m-2k)}\,\Gamma\left(\frac{\alpha}{r},\,b(2k-m)z^{r}\right)(b(2k-m)z^{r})^{-\frac{\alpha}{r}}+(-1)^{m}\,e^{2ek-em}\,(b(m-2k)z^{r})^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,b(m-2k)z^{r}\right)\right)\right)+$$

$$\frac{1}{r}\left(i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g(v-2s)}\,\Gamma\left(\frac{\alpha}{r},\,c(2s-v)z^{r}\right)(c(2s-v)z^{r})^{-\frac{\alpha}{r}}+\right.\right.$$

$$\left.\left.e^{2gs-gv}\,(c(v-2s)z^{r})^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,c(v-2s)z^{r}\right)\right)\right)-$$

$$\frac{1}{r}\left(\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2ek-em+2gs-gv}\binom{v}{s}\left((-1)^{m}\,\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm-2cs+cv)z^{r}\right)((-2bk+bm-2cs+cv)\right.\right.$$

$$z^{r})^{-\frac{\alpha}{r}}+e^{2em-4ek}\,((2bk-bm-2cs+cv)z^{r})^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2bk-bm-2cs+cv)z^{r}\right)+(-1)^{m}$$

$$e^{2g(v-2s)}\,((-2bk+bm+2cs-cv)z^{r})^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2bk+bm+2cs-cv)z^{r}\right)+e^{-4ek+2em-4gs+2gv}$$

$$\left.\left.((2bk-bm+2cs-cv)z^{r})^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2bk-bm+2cs-cv)z^{r}\right)\right)\right)\Big/;\,m\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

01.20.21.4569.01

$$\int z^n \sinh^m\left(b z^2+e\right)\cosh^v\left(c z^2+g\right) dz == 2^{-m-v-1}\, z^{n+1}$$

$$\left(\frac{2\, i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e\,(m-2\,k)}\,\Gamma\left(\frac{n+1}{2},\, b\,(2\,k-m)\,z^2\right)\left(b\,(2\,k-m)\,z^2\right)^{\frac{1}{2}(-n-1)}+(-1)^m\, e^{2\,e\,k-e\,m}\left(b\,(m-2\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\, b\,(m-2\,k)\,z^2\right)\right)+\binom{m}{\frac{m}{2}}i^{-m}\,(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{g\,(v-2\,s)}\,\Gamma\left(\frac{n+1}{2},\, c\,(2\,s-v)\,z^2\right)\left(c\,(2\,s-v)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{2\,g\,s-g\,v}\left(c\,(v-2\,s)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\, c\,(v-2\,s)\,z^2\right)\right)-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2\,e\,k-e\,m+2\,g\,s-g\,v}\binom{v}{s}\left((-1)^m\,\Gamma\left(\frac{n+1}{2},\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^2\right)\left((-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}+e^{2\,e\,m-4\,e\,k}\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,z^2\right)+(-1)^m\, e^{2\,g\,(v-2\,s)}\left((-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,z^2\right)+e^{-4\,e\,k+2\,e\,m-4\,g\,s+2\,g\,v}\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\,z^2\right)\right)\Big/;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4570.01

$$\int z^n \sinh^m\left(\sqrt{z}\, b+e\right)\cosh^v\left(\sqrt{z}\, c+g\right) dz ==$$

$$2^{-m-v}\left(\frac{z^{n+1}\, i^{-m}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}+2\, b^{-2n-2}\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\, e^{2ek-em}\,(m-2k)^{-2(n+1)}\binom{m}{k}\right.$$

$$\left(e^{2em-4ek}\,\Gamma\left(2(n+1),\, b(2k-m)\sqrt{z}\right)+(-1)^m\,\Gamma\left(2(n+1),\, b(m-2k)\sqrt{z}\right)\right)+2\, i^{-m}\, c^{-2n-2}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(v-2s)^{-2(n+1)}\binom{v}{s}\left(e^{g(v-2s)}\,\Gamma\left(2(n+1),\, c(2s-v)\sqrt{z}\right)+e^{2gs-gv}\,\Gamma\left(2(n+1),\, c(v-2s)\sqrt{z}\right)\right)-$$

$$2\, z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-2ek+em+2gs-gv}\,\Gamma\left(2(n+1),\,(2bk-bm-2cs+cv)\sqrt{z}\right)\right.$$

$$\left((2bk-bm-2cs+cv)\sqrt{z}\right)^{-2(n+1)}+(-1)^m\, e^{2ek-em-2gs+gv}\left((-2bk+bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}$$

$$\Gamma\left(2(n+1),\,(-2bk+bm+2cs-cv)\sqrt{z}\right)+e^{e(m-2k)+g(v-2s)}\left((2bk-bm+2cs-cv)\sqrt{z}\right)^{-2(n+1)}$$

$$\left.\left.\Gamma\left(2(n+1),\,(2bk-bm+2cs-cv)\sqrt{z}\right)+(-1)^m\, e^{2ek-em+2gs-gv}\left((b(m-2k)+c(v-2s))\right.\right.\right.$$

$$\left.\left.\left.\sqrt{z}\right)^{-2(n+1)}\Gamma\left(2(n+1),\,(b(m-2k)+c(v-2s))\sqrt{z}\right)\right)\right/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\, z^r+d\, z\right)\cosh^v\left(c\, z^r+g\right)$

01.20.21.4571.01

$$\int z^n \sinh^m\left(b\, z^2+d\, z\right)\cosh^v\left(c\, z^2+g\right) dz == 2^{-m-v-1}$$

$$\left(\frac{2\, i^{-m}\, z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}-z^{n+1}\, i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g(2s-v)}\left(-c^2(v-2s)^2 z^4\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\binom{v}{s}\left(e^{-2g(2s-v)}\,\Gamma\left(\frac{n+1}{2},\, c(2s-v)z^2\right)\left(-c(2s-v)z^2\right)^{\frac{n+1}{2}}+\left(c(2s-v)z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\, -c(2s-v)z^2\right)\right)+$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\, e^{-\frac{d^2(m-2k)}{4b}}\,(b(m-2k))^{-n-1}\binom{m}{k}\left(\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(m-2k)^{n+1}(d+2bz)^{q+1}\right.$$

$$\left.\left.\left(\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2k-m)(d+2bz)^2}{4b}\right)+(-1)^m\, e^{\frac{d^2(m-2k)}{2b}}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}\right.\right.$$

$$(m-2k)^{n+1}(d+2bz)^{q+1}\left(-\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2k-m)(d+2bz)^2}{4b}\right)\Bigg)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2gs-gv}\binom{v}{s}\Bigg(e^{\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}+2g(v-2s)+im\pi}\left(\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}\right.$$

$$(d(m-2k)+2(b(m-2k)+c(v-2s))z)^{q+1}\left(\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)\right)(b(m-2k)+c(v-2s))^{-n-1}+$$

$$e^{\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}+im\pi}(-2bk+bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d(m-2k)+$$

$$2(-2bk+bm+2cs-cv)z)^{q+1}\left(\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{2g(v-2s)-\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}}(2bk-bm-2cs+cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}$$

$$\left(-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}(d(2k-m)+2(2bk-bm-2cs+cv)$$

$$z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{-\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}}(2bk-bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(2dk+4bzk-dm-$$

$$2bmz+4csz-2cvz)^{q+1}\left(-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4572.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(\sqrt{z}\ c + g\right) dz ==$$

$$2^{-m-v-1}\left(\frac{1}{b}\left(4^{-n}\binom{v}{\frac{v}{2}}(v \bmod 2 - 1)\left(\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\, e^{-\frac{b^2\,(m-2\,u)}{4\,d}}\,(m-2\,u)^{-2\,(n+1)}\binom{m}{u}\left((-1)^m\, e^{\frac{b^2\,(m-2\,u)}{2\,d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\right.\right.\right.\right.$$

$$(-b\,(m-2\,u))^{-h-k+2\,n+1}\left(-(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\right)^{h+k}\left(\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)-\right.$$

$$\left.2\,d\sqrt{\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n+1}\left((m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b\,(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+\right.$$

$$\left.\left.\left.\left.\left.2\sqrt{-\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{(m-2\,u)\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)\right)d^{-2\,n-2}\right)+$$

$$\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2 - 1)\,(v \bmod 2 - 1)}{n+1}+4\,c^{-2\,n-2}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2 - 1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{g\,(2\,s-v)}\,(v-2\,s)^{-2\,(n+1)}\binom{v}{s}$$

$$\left(\Gamma\left(2\,(n+1),\ -c\,(2\,s-v)\,\sqrt{z}\right)+e^{2\,g\,(v-2\,s)}\,\Gamma\left(2\,(n+1),\ c\,(2\,s-v)\,\sqrt{z}\right)\right)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{1}{4}\left(\frac{c^2(v-2s)^2}{d(m-2u)}+\frac{(m-2u)b^2+2c(v-2s)b}{d}\right)-g(2s+v)}\left(-d^2(m-2u)^2\right)^{-2n-1}\binom{v}{s}$$

$$\left(e^{4gs+\frac{bc(v-2s)}{d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(bm+2cs-2bu-cv)^{-h-k+2n}\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+\right.\right.\right.$$

$$\left.\left.\left.c(2s-v)\right)^{h+k}\left(-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\right.\right.$$

$$\binom{k}{h}\binom{n}{k}\left(\left(bm+2cs-2bu-cv\right)\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{4d(m-2u)}\right)+$$

$$2d(m-2u)\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{4d(m-2u)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(2s-v)\right)^2}{d(m-2u)}}\right)\right)(-d(m-2u))^{2n}+$$

$$e^{2gv}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(bm-2cs-2bu+cv)^{-h-k+2n}\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^{h+k}\right.$$

$$\left(-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(\left(bm-2cs-2bu+cv\right)\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+2d\sqrt{z}\,(m-2u)+c(v-2s)\right)^2}{4d(m-2u)}\right)+$$

$$2\,d\,(m-2\,u)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)$$

$$\sqrt{-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}\Bigg)\Bigg)(-d\,(m-2\,u))^{2\,n}+$$

$$(-1)^m\,e^{\frac{1}{2}\left(\frac{(m-2\,u)\,b^2}{d}+\frac{c^2\,(v-2\,s)^2}{d\,(m-2\,u)}+4\,g\,v\right)}(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)^{-h-k+2\,n}$$

$$\left(-b\,(m-2\,u)-2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)\Bigg)+$$

$$(-1)^m\,e^{\frac{1}{2}\left(\frac{c^2\,(v-2\,s)^2}{d\,(m-2\,u)}+8\,g\,s+\frac{(m-2\,u)\,b^2+2\,c\,(v-2\,s)\,b}{d}\right)}(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-b\,m+2\,c\,s+2\,b\,u-c\,v)^{-h-k+2\,n}\left(-b\,(m-2\,u)-2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(2\,s-v)\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b\,m-2\,c\,s-2\,b\,u+c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\,\,(m-2\,u)+c\,(v-2\,s)\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)+c(v-2s)\right)^2}{4d(m-2u)}\right)-$$

$$2d(m-2u)\sqrt{\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)+c(v-2s)\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.\left.\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)+c(v-2s)\right)^2}{4d(m-2u)}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + d z + e) \cosh^v(c z^r + g)$

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$$\int z^n \sinh^m\left(b z^2+d z+e\right)\cosh^v\left(c z^2+g\right)dz == 2^{-m-v-1}$$

$$\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}-z^{n+1}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g(2s-v)}\left(-c^2(v-2s)^2z^4\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\binom{v}{s}\left(e^{-2g(2s-v)}\,\Gamma\left(\frac{n+1}{2},\,c(2s-v)z^2\right)\left(-c(2s-v)z^2\right)^{\frac{n+1}{2}}+\left(c(2s-v)z^2\right)^{\frac{n+1}{2}}\Gamma\left(\frac{n+1}{2},\,-c(2s-v)z^2\right)\right)+$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-\frac{(m-2k)d^2}{4b}-e(2k+m)}\left(b(m-2k)\right)^{-n-1}\binom{m}{k}$$

$$\left(e^{2em}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(m-2k)^{n+1}(d+2bz)^{q+1}\left(\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.$$

$$\Gamma\left(\frac{q+1}{2},\,\frac{(2k-m)(d+2bz)^2}{4b}\right)+(-1)^m\,e^{\frac{(m-2k)d^2}{2b}+4ek}\sum_{q=0}^{n}2^{q-n}(-d)^{n-q}(m-2k)^{n+1}$$

$$(d+2bz)^{q+1}\left(-\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2k-m)(d+2bz)^2}{4b}\right)\Bigg)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2ek-em+2gs-gv}\binom{v}{s}\left(e^{\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}+2e(m-2k)+2g(v-2s)+im\pi}\left(\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}\right.\right.$$

$$\left.\left.(d(m-2k)+2(b(m-2k)+c(v-2s))z)^{q+1}\left(\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)(b(m-2k)+c(v-2s))^{-n-1}+$$

$$e^{\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}+2e(m-2k)+im\pi}(-2bk+bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}\left(d\left(k-\frac{m}{2}\right)\right)^{n-q}(d(m-2k)+$$

$$2(-2bk+bm+2cs-cv)z)^{q+1}\left(\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{2g(v-2s)-\frac{d^2(m-2k)^2}{8bk-4bm-8cs+4cv}}(2bk-bm-2cs+cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}$$

$$\left(-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}(d(2k-m)+2(2bk-bm-2cs+cv)$$

$$z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{-\frac{d^2(m-2k)^2}{8bk-4bm+8cs-4cv}}(2bk-bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(d(m-2k))^{n-q}(2dk+4bzk-dm-$$

$$2bmz+4csz-2cvz)^{q+1}\left(-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+2(b(m-2k)+c(v-2s))z)^2}{8bk-4bm+8cs-4cv}\right)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sinh^m\left(\sqrt{z}\ b+dz+e\right)\cosh^v\left(\sqrt{z}\ c+g\right)dz==$$

$$2^{-m-v-1}\left(\frac{d^{-2n-2}}{b}4^{-n}\binom{v}{\frac{v}{2}}(v\bmod 2-1)\left(\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u e^{-\frac{\left(b^2+4de\right)(m-2u)}{4d}}(m-2u)^{-2(n+1)}\binom{m}{u}\right.\right.$$

$$\left.\left.(-1)^m e^{\frac{b^2(m-2u)}{2d}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b(m-2u))^{-h-k+2n+1}\left(-(m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\right.\right.$$

$$\left(\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b+2d\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)-2d\sqrt{\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)+e^{2e(m-2u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{-h+k+1}4^k$$

$$(b(m-2u))^{-h-k+2n+1}\left((m-2u)\left(b+2d\sqrt{z}\right)\right)^{h+k}\left(-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b(m-2u)\left(b+2d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{(m-2u)\left(b+2d\sqrt{z}\right)^2}{4d}\right)\right)\right)+$$

$$\frac{2i^{-m}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}+4c^{-2n-2}i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g(2s-v)}(v-2s)^{-2(n+1)}\binom{v}{s}$$

$$\left(\Gamma\left(2(n+1),\ -c(2s-v)\sqrt{z}\right)+e^{2g(v-2s)}\Gamma\left(2(n+1),\ c(2s-v)\sqrt{z}\right)\right)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e(m-2u)+\frac{1}{4}\left(-\frac{c^2(v-2s)^2}{d(m-2u)}-8em-\frac{(m-2u)b^2+2c(v-2s)b}{d}\right)-g(2s+v)}\left(-d^2(m-2u)^2\right)^{-2n-1}\binom{v}{s}$$

$$\left(e^{2em+4gs+\frac{bc(v-2s)}{d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(bm+2cs-2bu-cv)^{-h-k+2n}\left(b(m-2u)+2d\sqrt{z}\ (m-2u)+\right.\right.\right.$$

$$c\,(2\,s-v)\Big)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)$$

$$\left.\sqrt{-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}\right)\Big)(-d\,(m-2\,u))^{2\,n}+$$

$$e^{2\,e\,m+2\,g\,v}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,m-2\,c\,s-2\,b\,u+c\,v)^{-h-k+2\,n}\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+\right.\right.$$

$$c\,(v-2\,s)\Big)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,m-2\,c\,s-2\,b\,u+c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)+$$

$$2\,d\,(m-2\,u)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}\right)\right)$$

$$(-d\,(m-2\,u))^{2\,n}+(-1)^m\,e^{\frac{1}{2}\left(\frac{(m-2\,u)\,b^2}{d}+\frac{c^2\,(v-2\,s)^2}{d\,(m-2\,u)}+8\,e\,u+4\,g\,v\right)}\,(d\,(m-2\,u))^{2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)^{-h-k+2\,n}\left(-b\,(m-2\,u)-2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{d\,(m-2\,u)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^2}{4\,d\,(m-2\,u)}\right)\right)+$$

$$(-1)^m\,e^{\frac{1}{2}\left(\frac{c^2\,(v-2\,s)^2}{d\,(m-2\,u)}+8\,g\,s+8\,e\,u+\frac{(m-2\,u)\,b^2+2\,c\,(v-2\,s)\,b}{d}\right)}\,(d\,(m-2\,u))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-b\,m+2\,c\,s+2\,b\,u-c\,v)^{-h-k+2\,n}\left(-b\,(m-2\,u)-2\,d\,\sqrt{z}\;(m-2\,u)+c\,(2\,s-v)\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b\,m-2\,c\,s-2\,b\,u+c\,v)\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{4\,d\,(m-2\,u)}\right)-$$

$$2\,d\,(m-2\,u)\sqrt{\frac{\left(b\,(m-2\,u)+2\,d\,\sqrt{z}\;(m-2\,u)+c\,(v-2\,s)\right)^2}{d\,(m-2\,u)}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

Involving $z^n \sinh^m(d\,z) \cosh^v\left(c\,z^r + f\,z\right)$

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$$\int z^n \sinh^m(d\,z) \cosh^v\left(c\,z^2 + f\,z\right) dz ==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2 - 1)\,(v \bmod 2 - 1)}{n+1} - 2\,(-1)^n\,d^{-n-1}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^{m+n}\,\Gamma(n+1,\,d\,(m-2\,k)\,z) - \Gamma(n+1,\,d\,(2\,k-m)\,z)\right) -$$

$$c^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2 - 1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{\frac{f^2\,(2\,s-v)}{4\,c}}\binom{v}{s}\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\right.$$

$$\left(\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right) + e^{-\frac{f^2\,(2\,s-v)}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}$$

$$\left.(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)\right) -$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{c\,(8\,s-4\,v)}}\left(\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k)+f\,(v-2\,s))^{n-q}\,(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^{q+1}\right.\right.$$

$$\left.\left(-\frac{(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,v)}\right)\right)$$

$$(c\,(2\,s-v))^{-n-1} + e^{i\,m\,\pi-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{c\,(8\,s-4\,v)}}\left(\sum_{q=0}^{n}-2^{q-n}\,(2\,d\,k-d\,m-2\,f\,s+f\,v)^{n-q}\right.$$

$$(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))\,(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^q$$

$$\left.\left(-\frac{(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,v)}\right)\right)$$

$$(c\,(2\,s-v))^{-n-1} - \frac{1}{c\,(2\,s-v)}\left(e^{\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{c\,(8\,s-4\,v)}+i\,m\,\pi}\,(c\,(v-2\,s))^{-n}\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{v}{2}\right)f\right)^{n-q}\right.$$

$$\left(\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}(d\,(m-2\,k)-(2\,s-v)\,(f+2\,c\,z))^{q+1}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\Bigg)-$$

$$\frac{1}{c\,(2\,s-v)}\Bigg(e^{\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{c\,(8\,s-4\,v)}}(c\,(v-2\,s))^{-n}\sum_{q=0}^{n}2^{q-n}\,(-2\,d\,k+d\,m+2\,f\,s-f\,v)^{n-q}$$

$$(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))^{q+1}\left(\frac{(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\Bigg)\Bigg)\Bigg);\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4576.01

$$\int z^n\sinh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$2^{-m-v-1}\Bigg(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)\,(v\bmod 2-1)}{n+1}+2\,d^{-n-1}\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(2\,k-m)^{-n-1}\binom{m}{k}\binom{v}{\frac{v}{2}}$$

$$\left((-1)^{m+n}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)-\frac{1}{c}\Bigg(i^{-m}\Bigg(2^{-2\,n}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m\bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{c^2\,(2\,s-v)}{4\,f}}\,(v-2\,s)^{-2\,n-2}\binom{v}{s}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c\,(2\,s-v)\,(c\,(v-2\,s))^{-h-k+2\,n}\left(-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(h+k+1),$$

$$\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\Bigg)-2\,f\sqrt{\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\Bigg(\frac{1}{2}\,(h+k+2),$$

$$\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\Bigg)\Bigg)+e^{-\frac{c^2\,(2\,s-v)}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n+1}$$

$$\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+$$

$$2\sqrt{-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\Bigg)\Bigg)\Bigg)\Bigg)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\Bigg(e^{-\frac{c^2\,(v-2\,s)^2}{-4\,d\,m+8\,f\,s+8\,d\,u-4\,f\,v}}\left(-(d\,m-2\,f\,s-2\,d\,u+f\,v)^2\right)^{-2\,n-1}$$

$$\Bigg(\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-$$

$$2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{\left(\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\Bigg)\Bigg)$$

$$(d\,m-2\,f\,s-2\,d\,u+f\,v)^{2\,n}+(-1)^m\,e^{\frac{2\,c^2\,(v-2\,s)^2}{-4\,d\,m+8\,f\,s+8\,d\,u-4\,f\,v}}\,(-d\,m+2\,f\,s+2\,d\,u-f\,v)^{2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-$$

$$2\,(-d\,m+2\,f\,s+2\,d\,u-f\,v)\sqrt{\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\Bigg)\Bigg)-$$

$$e^{\frac{c^2\,(v-2\,s)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}}\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left(\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c\,(v-2\,s)+2\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)-$$

$$2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)\Bigg)\Bigg)-$$

$$(-1)^m\,e^{-\frac{c^2\,(v-2\,s)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}}\,(d\,m+2\,f\,s-2\,d\,u-f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}$$

$$\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\right)+$$

$$2\sqrt{-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z\right)$

01.20.21.4577.01

$$\int z^n \sinh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}-2\,(-1)^n\,d^{-n-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^{m+n}\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)-$$

$$c^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{f^2\,(2\,s-v)}{4\,c}}\binom{v}{s}\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)+e^{-\frac{f^2\,(2\,s-v)}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}$$

$$\left.\left(-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)\right)-\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2\,e\,k-e\,m}\binom{v}{s}\left(e^{-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{c\,(8\,s-4\,v)}}\left(\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k)+f\,(v-2\,s))^{n-q}\,(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^{q+1}\right.\right.$$

$$\left.\left(-\frac{(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,v)}\right)\right)$$

$$(c\,(2\,s-v))^{-n-1}+e^{-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{c\,(8\,s-4\,v)}+2\,e\,(m-2\,k)+i\,m\,\pi}\left(\sum_{q=0}^{n}-2^{q-n}\,(2\,d\,k-d\,m-2\,f\,s+f\,v)^{n-q}\right.$$

$$(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))\,(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^q$$

$$\left.\left(-\frac{(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,v)}\right)\right)$$

$$(c\,(2\,s-v))^{-n-1}-\frac{1}{c\,(2\,s-v)}\left(e^{\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{c\,(8\,s-4\,v)}+2\,e\,(m-2\,k)+i\,m\,\pi}\,(c\,(v-2\,s))^{-n}\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{v}{2}\right)f\right)^{n-q}\right.$$

$$\left.\left(\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}(d\,(m-2\,k)-(2\,s-v)\,(f+2\,c\,z))^{q+1}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\Bigg)-$$

$$\frac{1}{c\,(2\,s-v)}\Bigg(e^{\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{c\,(8\,s-4\,v)}}\,(c\,(v-2\,s))^{-n}\sum_{q=0}^{n}2^{q-n}\,(-2\,d\,k+d\,m+2\,f\,s-f\,v)^{n-q}$$

$$(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))^{q+1}\left(\frac{(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4578.01

$$\int z^n\sinh^m(e+d\,z)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz==2^{-m-v-1}$$

$$\Bigg(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)\,(v\bmod 2-1)}{n+1}+2\,d^{-n-1}\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-e\,(2\,k+m)}\,(2\,k-m)^{-n-1}\binom{m}{k}\binom{v}{\frac{v}{2}}$$

$$\left((-1)^{m+n}\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)-\frac{1}{c}\Bigg(i^{-m}\Bigg(2^{-2\,n}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m\bmod 2-1)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{c^2\,(2\,s-v)}{4\,f}}\,(v-2\,s)^{-2\,n-2}\binom{v}{s}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c\,(2\,s-v)\,(c\,(v-2\,s))^{-h-k+2\,n}\left(-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-2\,f\sqrt{\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\Bigg($$

$$\frac{1}{2}(h+k+2),\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\Bigg)\Bigg)+e^{-\frac{c^2\,(2\,s-v)}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(c\,(2\,s-v))^{-h-k+2\,n+1}\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.2\sqrt{-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\Bigg)\Bigg)\Bigg)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e\,m-2\,e\,u}\binom{v}{s}\left(e^{-2\,e\,(m-2\,u)}\left(e^{-\frac{c^2\,(v-2\,s)^2}{-4\,d\,m+8\,f\,s+8\,d\,u-4\,f\,v}-4\,e\,u}\left(-(d\,m-2\,f\,s-2\,d\,u+f\,v)^2\right)^{-2\,n-1}\right.\right.\right.$$

$$\left.\left.\left(e^{4\,e\,u}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left(\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{\left(\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\right)\right)\right)\right)\Bigg)\Bigg)\Bigg)$$

$$(d\,m-2\,f\,s-2\,d\,u+f\,v)^{2\,n}+(-1)^m\,e^{2\left(\frac{c^2\,(v-2\,s)^2}{-4\,d\,m+8\,f\,s+8\,d\,u-4\,f\,v}+e\,m\right)}(-d\,m+2\,f\,s+2\,d\,u-f\,v)^{2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-2\,(-d\,m+2\,f\,s+$$

$$2\,d\,u-f\,v)\sqrt{\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\right)\right)-$$

$$e^{\frac{c^{2}\,(v-2\,s)^{2}}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}}\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left(\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^{2}}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c\,(v-2\,s)+2\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^{2}}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)-$$

$$2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^{2}}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c(2s-v)+2(dm+2fs-2du-fv)\sqrt{z}\right)^2}{4dm+8fs-8du-4fv}\right)\Bigg)\Bigg)-$$

$$(-1)^m e^{-\frac{c^2(v-2s)^2}{8fs+4d(m-2u)-4fv}}(dm+2fs-2du-fv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(2s-v))^{-h-k+2n}$$

$$\left(c(2s-v)+2(dm+2fs-2du-fv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c(2s-v)+2(dm+2fs-2du-fv)\sqrt{z}\right)^2}{dm+2fs-2du-fv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(c(2s-v)\left(c(2s-v)+2(dm+2fs-2du-fv)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c(2s-v)+2(dm+2fs-2du-fv)\sqrt{z}\right)^2}{8fs+4d(m-2u)-4fv}\right)+$$

$$2\sqrt{-\frac{\left(c(2s-v)+2(dm+2fs-2du-fv)\sqrt{z}\right)^2}{dm+2fs-2du-fv}}$$

$$(dm+2fs-2du-fv)\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(c(2s-v)+2(dm+2fs-2du-fv)\sqrt{z}\right)^2}{8fs+4d(m-2u)-4fv}\right)\right)\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r)\cosh^v(c z^r + f z)$

01.20.21.4579.01

$$\int z^n \sinh^m(b z^2)\cosh^v(c z^2+f z)\,dz == \frac{i^m 2^{-m-v} z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},\ -(bm-2bk)z^2\right)\left(-(bm-2bk)z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.(-1)^m\left(-(2bk-bm)z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\ -(2bk-bm)z^2\right)\right)-$$

$$(-1)^n\, i^m\, 2^{-m-v-1}\, c^{-n-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{-\frac{f^2 (2s-v)}{4c}} \binom{v}{s}$$

$$\left(e^{\frac{f^2 (2s-v)}{2c}} \sum_{q=0}^{n} (-1)^q\, 2^{q-n}\, f^{n-q}\, (f+2cz)^{q+1} \left(\frac{(2s-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(2s-v)(f+2cz)^2}{4c} \right) + \right.$$

$$\left. \sum_{q=0}^{n} (-1)^q\, 2^{q-n}\, f^{n-q}\, (f+2cz)^{q+1} \left(-\frac{(2s-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2s-v)(f+2cz)^2}{4c} \right) \right) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}} \left(\sum_{q=0}^{n} \left(f\left(s-\frac{v}{2} \right) \right)^{n-q} (f(v-2s)+2(-2bk+bm-2cs+cv)z)^{q+1} \right.\right.\right.$$

$$\left(-\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{-2bk+bm-2cs+cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left.\left. \Gamma\left(\frac{q+1}{2}, \frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv} \right) \right) (-2bk+bm-2cs+cv)^{-n-1} + \right.$$

$$e^{\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}} (-2bk+bm+2cs-cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n}\, (fv-2fs)^{n-q}\, (2fs+4czs-fv-$$

$$4bkz+2bmz-2cvz)^{q+1} \left(\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{2bk-bm-2cs+cv} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{8bk-4bm-8cs+4cv} \right) + e^{im\pi-\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}}$$

$$(2bk-bm-2cs+cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n}\, (2fs-fv)^{n-q}\, (-2fs-4czs+fv+4bkz-2bmz+2cvz)^{q+1}$$

$$\left(-\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{2bk-bm-2cs+cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{8bk-4bm-8cs+4cv} \right) + e^{im\pi-\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}}$$

$$(2bk-bm+2cs-cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n}\, (fv-2fs)^{n-q}\, (2fs+4czs-fv+4bkz-2bmz-2cvz)^{q+1}$$

$$\left(-\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{2bk-bm+2cs-cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \Gamma\left(\frac{q+1}{2}, -\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv} \right) \right) /;\ n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int z^n \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+f\,z\right)dz ==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)(v \bmod 2-1)}{n+1}-4\,b^{-2(n+1)}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k(m-2k)^{-2(n+1)}\binom{m}{k}\left((-1)^m\,\Gamma\left(2(n+1),\,-b(2k-m)\sqrt{z}\right)+\Gamma\left(2(n+1),\,b(2k-m)\sqrt{z}\right)\right)-\right.$$

$$\frac{1}{c}\left(2^{-2n}\,i^{-m}\,f^{-2(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{c^2(2s-v)}{4f}}(v-2s)^{-2n-2}\binom{v}{s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c\,(2s-v)\right.\right.$$

$$(c(v-2s))^{-h-k+2n}\left(-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}\left(\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c(2s-v)\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)-\right.$$

$$\left.2f\sqrt{\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)+e^{-\frac{c^2(2s-v)}{2f}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c(2s-v))^{-h-k+2n+1}\left((2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}\left(-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c(2s-v)\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right)\right)+2^{-2n}(-1)^m$$

$$f^{-2(n+1)} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} (v-2s)^{-2(n+1)} \binom{v}{s} \left(e^{\frac{(b\,m+2\,c\,s-2\,b\,u-c\,v)^2}{f\,(8\,s-4\,v)}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (-b\,m-2\,c\,s+2\,b\,u+c\,v)^{-h-k+2\,n} \right.$$

$$\left(-b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k} \left(\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)} \right) -$$

$$2\,f\,(2\,s-v) \sqrt{\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)} \right) \right) +$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{f\,(8\,s-4\,v)}} \left((-1)^m\, e^{\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{f\,(4\,s-2\,v)}} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n} \right.$$

$$\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k} \left(\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)} \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)} \right) +$$

$$2\,f \sqrt{\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\ (v-2\,s)\,\Gamma\left(\frac{1}{2}(h+k+2), \right.$$

$$\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\Bigg)\Bigg)+\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-b\,m+2\,c\,s+2\,b\,u-c\,v)^{-h-k+2\,n}\left(-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)-\right.$$

$$\left.(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\Bigg)\Bigg)+(-1)^m\,e^{-\frac{(b\,m+2\,c\,s-2\,b\,u-c\,v)^2}{f\,(8\,s-4\,v)}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,m+2\,c\,s-2\,b\,u-c\,v)^{-h-k+2\,n}\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$2\,f\,(2\,s-v)\sqrt{-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left(\qquad\qquad\qquad

Involving $z^n \sinh^m(b z^r + e) \cosh^v(c z^r + f z)$

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$$\int z^n \sinh^m\left(b z^2 + e\right) \cosh^v\left(c z^2 + f z\right) dz == \frac{i^m 2^{-m-v} z^{n+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{n+1} -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) z^{n+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-e(2k+m)} \binom{m}{k} \left(e^{2em} \Gamma\left(\frac{n+1}{2}, -(bm - 2bk) z^2\right) \left(-(bm - 2bk) z^2\right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. (-1)^m e^{4ek} \left(-(2bk - bm) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -(2bk - bm) z^2\right)\right) -$$

$$(-1)^n i^m 2^{-m-v-1} c^{-n-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{-\frac{f^2(2s-v)}{4c}} \binom{v}{s}$$

$$\left(e^{\frac{f^2(2s-v)}{2c}} \sum_{q=0}^{n} (-1)^q 2^{q-n} f^{n-q} (f + 2cz)^{q+1} \left(\frac{(2s-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(2s-v)(f+2cz)^2}{4c}\right) + \right.$$

$$\left. \sum_{q=0}^{n} (-1)^q 2^{q-n} f^{n-q} (f + 2cz)^{q+1} \left(-\frac{(2s-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2s-v)(f+2cz)^2}{4c}\right)\right) - 2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{em-2ek} \binom{v}{s} \left(e^{\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}} \left(\sum_{q=0}^{n} \left(f\left(s - \frac{v}{2}\right)\right)^{n-q} (f(v-2s) + 2(-2bk + bm - 2cs + cv) z)^{q+1} \right.\right.$$

$$\left(-\frac{(f(v-2s) + 2(-2bk + bm - 2cs + cv) z)^2}{-2bk + bm - 2cs + cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left.\left. \Gamma\left(\frac{q+1}{2}, \frac{(f(v-2s) + 2(-2bk + bm - 2cs + cv) z)^2}{8bk - 4bm + 8cs - 4cv}\right)\right) (-2bk + bm - 2cs + cv)^{-n-1} +$$

$$e^{\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}} (-2bk + bm + 2cs - cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (fv - 2fs)^{n-q} (2fs + 4czs - fv -$$

$$4bkz + 2bmz - 2cvz)^{q+1} \left(\frac{(-2fs - 4czs + fv + 4bkz - 2bmz + 2cvz)^2}{2bk - bm - 2cs + cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(-2fs - 4czs + fv + 4bkz - 2bmz + 2cvz)^2}{8bk - 4bm - 8cs + 4cv}\right) + e^{-\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv} + e(4k-2m) + im\pi}$$

$$(2bk - bm - 2cs + cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (2fs - fv)^{n-q} (-2fs - 4czs + fv + 4bkz - 2bmz + 2cvz)^{q+1}$$

$$\left(-\frac{(-2\,f\,s-4\,c\,z\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z+2\,c\,v\,z)^2}{2\,b\,k-b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(-2\,f\,s-4\,c\,z\,s+f\,v+4\,b\,k\,z-2\,b\,m\,z+2\,c\,v\,z)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}\right)+e^{-\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(4\,k-2\,m)+i\,m\,\pi}$$

$$(2\,b\,k-b\,m+2\,c\,s-c\,v)^{-n-1}\sum_{q=0}^{n}2^{q-n}\,(f\,v-2\,f\,s)^{n-q}\,(2\,f\,s+4\,c\,z\,s-f\,v+4\,b\,k\,z-2\,b\,m\,z-2\,c\,v\,z)^{q+1}$$

$$\left(-\frac{(f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{2\,b\,k-b\,m+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sinh^m\left(\sqrt{z}\;b+e\right)\cosh^v\left(\sqrt{z}\;c+f\,z\right)dz==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)\,(v\bmod 2-1)}{n+1}-4\,b^{-2\,(n+1)}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\right.$$

$$\left.(m-2\,k)^{-2\,(n+1)}\binom{m}{k}\left((-1)^m\,e^{4\,e\,k}\,\Gamma\left(2\,(n+1),\,-b\,(2\,k-m)\,\sqrt{z}\right)+e^{2\,e\,m}\,\Gamma\left(2\,(n+1),\,b\,(2\,k-m)\,\sqrt{z}\right)\right)-\right.$$

$$\frac{1}{c}\left(2^{-2\,n}\,i^{-m}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{\frac{c^2\,(2\,s-v)}{4\,f}}\,(v-2\,s)^{-2\,n-2}\binom{v}{s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c\,(2\,s-v)\right.\right.$$

$$(c\,(v-2\,s))^{-h-k+2\,n}\left(-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.\left.\left.2\,f\sqrt{\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+e^{-\frac{c^2\,(2\,s-v)}{2\,f}}\right.\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(2\,s-v))^{-h-k+2\,n+1}\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^{2}}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^{2}}{4\,f}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^{2}}{f}}\;\;f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^{2}}{4\,f}\right)\right)\right)+$$

$$2^{-2\,n}\,(-1)^{m}\,f^{-2\,(n+1)}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{u}\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e\,m-2\,e\,u}\,(v-2\,s)^{-2\,(n+1)}\binom{v}{s}\left(e^{\frac{(b\,m+2\,c\,s-2\,b\,u-c\,v)^{2}}{f\,(8\,s-4\,v)}-2\,e\,(m-2\,u)}\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)^{-h-k+2\,n}\left(-b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{2}}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\qquad\binom{k}{h}\binom{n}{k}$$

$$\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{2}}{f\,(8\,s-4\,v)}\right)-$$

$$2\,f\,(2\,s-v)\sqrt{\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{2}}{f\,(2\,s-v)}}$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{2}}{f\,(8\,s-4\,v)}\right)\right)+$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^{2}}{f\,(8\,s-4\,v)}}\left((-1)^{m}\,e^{\frac{(b\,(m-2\,u)+c\,(v-2\,s))^{2}}{f\,(4\,s-2\,v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n}\right.$$

$$\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$2\,f\,\sqrt{\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\ (v-2\,s)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\right)+$$

$$e^{-2\,e\,(m-2\,u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m+2\,c\,s+2\,b\,u-c\,v)^{-h-k+2\,n}$$

$$\left(-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)-b\,(m-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\right)\right)+$$

$$(-1)^m\, e^{-\frac{(b\,m+2\,c\,s-2\,b\,u-c\,v)^2}{f\,(8\,s-4\,v)}} \sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,m+2\,c\,s-2\,b\,u-c\,v)^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$2\,f\,(2\,s-v)\sqrt{-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\right)\right)\Big/;\, n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n \sinh^m\left(b\,z^2+d\,z\right)\cosh^v\left(c\,z^2+f\,z\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\,i^m\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{\frac{d^2\,(m-2\,k)}{4\,b}}$$

$$(b\,(2\,k-m))^{-n-1}\binom{m}{k}\left(e^{\frac{d^2\,(2\,k-m)}{2\,b}}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(m-2\,k)^{n+1}\,(-d-2\,b\,z)^{q+1}\left(\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)+e^{i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(m-2\,k)^{n+1}\,(-d-2\,b\,z)^{q+1}$$

$$\left.\left(-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)\right)-$$

$$\frac{1}{c^{n+1}}\left(\left(i^m\,2^{-m-\nu-1}\right)(-1)^n\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}e^{-\frac{f^2(2s-\nu)}{4c}}\binom{\nu}{s}\left(e^{\frac{f^2(2s-\nu)}{2c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2cz)^{q+1}\right.\right.$$

$$\left(\frac{(2s-\nu)(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(2s-\nu)(f+2cz)^2}{4c}\right)+\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}$$

$$\left.\left.(f+2cz)^{q+1}\left(-\frac{(2s-\nu)(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2s-\nu)(f+2cz)^2}{4c}\right)\right)\right)-2^{-m-\nu-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{\frac{(-2dk+dm-2fs+f\nu)^2}{8bk-4bm+8cs-4c\nu}}\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{\nu}{2}\right)f\right)^{n-q}(d(m-2k)+f(\nu-2s)+2(-2bk+bm-\right.$$

$$2cs+c\nu)z)^{q+1}\left(-\frac{(d(m-2k)+f(\nu-2s)+2(-2bk+bm-2cs+c\nu)z)^2}{-2bk+bm-2cs+c\nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(d(m-2k)+f(\nu-2s)+2(-2bk+bm-2cs+c\nu)z)^2}{8bk-4bm+8cs-4c\nu}\right)\right)$$

$$(-2bk+bm-2cs+c\nu)^{-n-1}+e^{\frac{(2dk-dm-2fs+f\nu)^2}{8bk-4bm-8cs+4c\nu}}(-2bk+bm+2cs-c\nu)^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}(2dk-dm-2fs+f\nu)^{n-q}(-2dk-4bzk+dm+2fs-f\nu+2bmz+4csz-2c\nu z)^{q+1}$$

$$\left(\frac{(2dk+4bzk-dm-2fs+f\nu-2bmz-4csz+2c\nu z)^2}{2bk-bm-2cs+c\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(2dk+4bzk-dm-2fs+f\nu-2bmz-4csz+2c\nu z)^2}{8bk-4bm-8cs+4c\nu}\right)+$$

$$e^{im\pi-\frac{(2dk-dm-2fs+f\nu)^2}{8bk-4bm-8cs+4c\nu}}(2bk-bm-2cs+c\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-2dk+dm+2fs-f\nu)^{n-q}$$

$$(2dk+4bzk-dm-2fs+f\nu-2bmz-4csz+2c\nu z)^{q+1}$$

$$\left(-(2dk+4bzk-dm-2fs+f\nu-2bmz-4csz+2c\nu z)^2\Big/(2bk-bm-2cs+c\nu)\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2dk+4bzk-dm-2fs+f\nu-2bmz-4csz+2c\nu z)^2}{8bk-4bm-8cs+4c\nu}\right)+$$

$$e^{im\pi-\frac{(-2dk+dm-2fs+f\nu)^2}{8bk-4bm+8cs-4c\nu}}(2bk-bm+2cs-c\nu)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-2dk+dm-2fs+f\nu)^{n-q}$$

$$(2dk+4bzk-dm+2fs-f\nu-2bmz+4csz-2c\nu z)^{q+1}$$

$$\left(-\frac{(d(m-2k)+f(\nu-2s)+2(-2bk+bm-2cs+c\nu)z)^2}{2bk-bm+2cs-c\nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

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$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(\sqrt{z}\ c + f\,z\right) dz ==$$

$$\frac{2^{-m-v}\, z^{n+1}\, i^m \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} \left((-1)^m\, e^{-\frac{b^2 (2u-m)}{4d}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b\,(2u-m))^{-h-k+2n} \left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{d\,(2u-m)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b\,(2u-m)\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{4d\,(2u-m)} \right) + 2d\,(2u-m)$$

$$\left.\left. \sqrt{-\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{d\,(2u-m)}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{4d\,(2u-m)} \right) \right) \right)$$

$$(d\,(2u-m))^{-2n-2} + e^{-\frac{b^2 (m-2u)}{4d}}\, (d\,(m-2u))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b\,(m-2u))^{-h-k+2n}$$

$$\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^{h+k} \left(-\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{d\,(m-2u)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(b\,(m-2u)\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{4d\,(m-2u)} \right) + \right.$$

$$2d\,(m-2u) \sqrt{-\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{d\,(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \right.$$

$$\left.\left.\left. -\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{4d\,(m-2u)} \right) \right) \right) + 2^{-m-2n-v-1}\, i^m \binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{c^2 (2s-v)}{4f}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c(2s-v))^{-h-k+2n} \left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^{h+k} \right.\right.$$

$$\left(\frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(-c(2s-v)\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) - 2f(2s-v)$$

$$\left.\left.\left. \sqrt{\frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) \right) \right) \right)$$

$$(-f(2s-v))^{-2n-2} + e^{-\frac{c^2(2s-v)}{4f}} (f(2s-v))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c(2s-v))^{-h-k+2n}$$

$$\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^{h+k} \left(-\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left(c(2s-v)\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) + 2f(2s- \right.$$

$$\left. \left. v) \sqrt{-\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) \right) \right) +$$

$$2^{-m-2n-v-1} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left((-1)^m e^{-\frac{(b(2u-m)+c(2s-v))^2}{4(d(2u-m)+f(2s-v))}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b(2u-m)+c(2s-v))^{-h-k+2n} \right.\right.$$

$$\left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right)^2 \Big/ (d(2u-m) + f(2s-v)) \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left((b(2u-m) + c(2s-v))\left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right)^2 \Big/ \right.$$

$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)+2\,(d\,(2\,u-m)+f\,(2\,s-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+2),\,-\big(b\,(2\,u-m)+c\,(2\,s-v)+2\,(d\,(2\,u-m)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(2\,s-v)+2\,(d\,(2\,u-m)+f\,(2\,s-v))$$
$$\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(2\,s-v))\Big)\Big)\Big)(d\,(2\,u-m)+f\,(2\,s-v))^{-2\,n-2}+$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(2\,s-v))^2}{4\,(d\,(m-2\,u)+f\,(2\,s-v))}}\,(d\,(m-2\,u)+f\,(2\,s-v))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(2\,s-v))^{-h-k+2\,n}$$
$$\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(m-2\,u)+c\,(2\,s-v))\,\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)$$
$$\sqrt{\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)}+$$

$$(-1)^m\,e^{-\frac{(b\,(2\,u-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,u-m)+f\,(v-2\,s))}}\,(d\,(2\,u-m)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(2\,u-m)+c\,(v-2\,s))^{-h-k+2\,n}$$
$$\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(2\,u-m)+c\,(v-2\,s))\,\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)$$
$$\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)}+$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,u)+f\,(v-2\,s))}}\,(d\,(m-2\,u)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n}$$
$$\big(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\big)^{h+k}$$

$$\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(\left(b\,(m-2\,u)+c\,(v-2\,s)\right)\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.\left.-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)\right)$$

$$\sqrt{\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z\right)$

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$$\int z^n \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z\right)dz==$$

$$\frac{2^{-m-v}\,z^{n+1}\,i^m\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{\frac{d^2\,(m-2\,k)}{4\,b}-e\,(2\,k+m)}\,(b\,(2\,k-m))^{-n-1}\binom{m}{k}\left(e^{\frac{(2\,k-m)\,d^2}{2\,b}+2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(m-2\,k)^{n+1}\,(-d-2\,b\,z)^{q+1}\right.$$

$$\left(\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)+e^{4\,e\,k+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}$$

$$\left.(m-2\,k)^{n+1}\,(-d-2\,b\,z)^{q+1}\left(-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)\right)-$$

$$\frac{1}{c^{n+1}}\left(\left(i^m\,2^{-m-v-1}\right)(-1)^n\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{f^2\,(2\,s-v)}{4\,c}}\binom{v}{s}\right.$$

$$\left(e^{\frac{f^2\,(2\,s-v)}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\left.\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}e^{e\,m-2\,e\,k}\left(e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\left(\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{v}{2}\right)f\right)^{n-q}\right.\right.$$
$$(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^{q+1}$$
$$\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{-2\,b\,k+b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\right)\right.$$
$$(-2\,b\,k+b\,m-2\,c\,s+c\,v)^{-n-1}+e^{\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}}(-2\,b\,k+b\,m+2\,c\,s-c\,v)^{-n-1}$$
$$\sum_{q=0}^{n}2^{q-n}(2\,d\,k-d\,m-2\,f\,s+f\,v)^{n-q}(-2\,d\,k-4\,b\,z\,k+d\,m+2\,f\,s-f\,v+2\,b\,m\,z+4\,c\,s\,z-2\,c\,v\,z)^{q+1}$$
$$\left(\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{2\,b\,k-b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\Gamma\left(\frac{q+1}{2},\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}\right)+$$
$$e^{-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}+e\,(4\,k-2\,m)+i\,m\,\pi}(2\,b\,k-b\,m-2\,c\,s+c\,v)^{-n-1}$$
$$\sum_{q=0}^{n}2^{q-n}(-2\,d\,k+d\,m+2\,f\,s-f\,v)^{n-q}(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^{q+1}$$
$$\left(-(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2\Big/(2\,b\,k-b\,m-2\,c\,s+c\,v)\right)^{\frac{1}{2}(-q-1)}$$
$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}\right)+$$
$$e^{-\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}+e\,(4\,k-2\,m)+i\,m\,\pi}(2\,b\,k-b\,m+2\,c\,s-c\,v)^{-n-1}$$
$$\sum_{q=0}^{n}2^{q-n}(-2\,d\,k+d\,m-2\,f\,s+f\,v)^{n-q}(2\,d\,k+4\,b\,z\,k-d\,m+2\,f\,s-f\,v-2\,b\,m\,z+4\,c\,s\,z-2\,c\,v\,z)^{q+1}$$
$$\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{2\,b\,k-b\,m+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+f\,z\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\,i^m\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+2^{-m-2n-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\left((-1)^m\,e^{e(2u-m)-\frac{b^2(2u-m)}{4d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b(2u-m))^{-h-k+2n}\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{d(2u-m)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b(2u-m)\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{4d(2u-m)}\right)+2d(2u-m)\right.$$

$$\left.\left.\sqrt{-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{d(2u-m)}}\ \Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{4d(2u-m)}\right)\right)\right)$$

$$(d(2u-m))^{-2n-2}+e^{e(m-2u)-\frac{b^2(m-2u)}{4d}}(d(m-2u))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b(m-2u))^{-h-k+2n}$$

$$\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^{h+k}\left(-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b(m-2u)\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{4d(m-2u)}\right)+\right.$$

$$2d(m-2u)\sqrt{-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{d(m-2u)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{4d(m-2u)}\right)\right)\right)+2^{-m-2n-v-1}\,i^m\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{c^2 (2s-v)}{4f}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-c(2s-v))^{-h-k+2n} \left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^{h+k} \right.\right.$$

$$\left(\frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k} \left(-c(2s-v)\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), \frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) - 2f(2s-v)$$

$$\left.\left.\left. \sqrt{\frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), \frac{\left(-c(2s-v) - 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) \right) \right)$$

$$(-f(2s-v))^{-2n-2} + e^{-\frac{c^2(2s-v)}{4f}} (f(2s-v))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (c(2s-v))^{-h-k+2n}$$

$$\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^{h+k} \left(-\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h}\binom{n}{k}$$

$$\left(c(2s-v)\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) + 2f(2s- \right.$$

$$\left.\left. v) \sqrt{-\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(c(2s-v) + 2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)} \right) \right) \right) +$$

$$2^{-m-2n-v-1} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left((-1)^m e^{e(2u-m) - \frac{(b(2u-m)+c(2s-v))^2}{4(d(2u-m)+f(2s-v))}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b(2u-m) + c(2s-v))^{-h-k+2n} \right.\right.$$

$$\left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right)^2 \Big/ (d(2u-m) + f(2s-v)) \right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k} \left((b(2u-m) + c(2s-v)) \left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\left(b(2u-m) + c(2s-v) + 2(d(2u-m) + f(2s-v))\sqrt{z}\right)^2 \Big/ \right.$$

$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)+2\,(d\,(2\,u-m)+f\,(2\,s-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+2),\,-\big(b\,(2\,u-m)+c\,(2\,s-v)+2\,(d\,(2\,u-m)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(2\,s-v)+$$
$$2\,(d\,(2\,u-m)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(2\,s-v))\Big)}\Big)$$

$$(d\,(2\,u-m)+f\,(2\,s-v))^{-2\,n-2}+e^{e\,(m-2\,u)-\frac{(b\,(m-2\,u)+c\,(2\,s-v))^2}{4\,(d\,(m-2\,u)+f\,(2\,s-v))}}\,(d\,(m-2\,u)+f\,(2\,s-v))^{-2\,n-2}$$
$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(2\,s-v))^{-h-k+2\,n}$$
$$\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(m-2\,u)+c\,(2\,s-v))\,\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)$$
$$\sqrt{\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)}+$$

$$(-1)^m\,e^{e\,(2\,u-m)-\frac{(b\,(2\,u-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,u-m)+f\,(v-2\,s))}}\,(d\,(2\,u-m)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$
$$(b\,(2\,u-m)+c\,(v-2\,s))^{-h-k+2\,n}\,\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(2\,u-m)+c\,(v-2\,s))\,\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)$$
$$\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)}+$$

$$e^{e\,(m-2\,u)-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,u)+f\,(v-2\,s))}}\,(d\,(m-2\,u)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(\left(b\,(m-2\,u)+c\,(v-2\,s)\right)\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)\right)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)\right)$$

$$\sqrt{\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \sinh^m(d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}-2\,(-1)^n\,d^{-n-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^{m+n}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)-$$

$$c^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(4\,c\,g-f^2\right)(2\,s-v)}{4\,c}}\binom{v}{s}\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\right.$$

$$\left(\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)+e^{-\frac{\left(f^2-4\,c\,g\right)(2\,s-v)}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}$$

$$\left.(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2\,g\,s-g\,v}\binom{v}{s}\left(e^{-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{c\,(8\,s-4\,v)}}\left(\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k)+f\,(v-2\,s))^{n-q}\right.\right.\right.$$

$$(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^{q+1}\left(-\frac{(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.-\frac{(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,v)}\right)(c\,(2\,s-v))^{-n-1}+e^{i\,m\,\pi-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{c\,(8\,s-4\,v)}}\left(\sum_{q=0}^{n}-2^{q-n}\right.$$

$$(2\,d\,k-d\,m-2\,f\,s+f\,v)^{n-q}\,(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))\,(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^q$$

$$\left.\left(-\frac{(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))^2}{c\,(8\,s-4\,v)}\right)\right)$$

$$(c\,(2\,s-v))^{-n-1}-\frac{1}{c\,(2\,s-v)}\left(e^{\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{c\,(8\,s-4\,v)}+2\,g\,(v-2\,s)+i\,m\,\pi}\,(c\,(v-2\,s))^{-n}\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{v}{2}\right)f\right)^{n-q}\right.$$

$$\left(\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}(d\,(m-2\,k)-(2\,s-v)\,(f+2\,c\,z))^{q+1}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\right)-$$

$$\frac{1}{c\,(2\,s-v)}\left(e^{\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{c\,(8\,s-4\,v)}+2\,g\,(v-2\,s)}\,(c\,(v-2\,s))^{-n}\sum_{q=0}^{n}2^{q-n}\,(-2\,d\,k+d\,m+2\,f\,s-f\,v)^{n-q}\right.$$

$$(d\,(2\,k-m)-(2\,s-v)\,(f+2\,c\,z))^{q+1}\left(\frac{(d\,(m-2\,k)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,c\,s-4\,c\,v}\right)\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sinh^m(d\,z)\cosh^v\left(\sqrt{z}\;c+f\,z+g\right)dz==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)\,(v\bmod 2-1)}{n+1}+2\,d^{-n-1}\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(2\,k-m)^{-n-1}\right.$$

$$\left.\binom{m}{k}\binom{v}{\frac{v}{2}}\left((-1)^{m+n}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)-\frac{1}{c}\left(i^{-m}\left(2^{-2\,n}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\right.\right.\right.$$

$$(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} e^{-\frac{\left(4fg-c^2\right)(2s-v)}{4f}}(v-2s)^{-2n-2}\binom{v}{s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k c(2s-v)(c(v-2s))^{-h-k+2n}\right.$$

$$\left(-(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}\left(\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c(2s-v)\right.$$

$$\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)-2f\sqrt{\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)+e^{\frac{\left(4fg-c^2\right)(2s-v)}{2f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k\right.$$

$$(c(2s-v))^{-h-k+2n+1}\left((2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}\left(-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c(2s-v)\left(c+2f\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)+\right.$$

$$\left.\left.\left.\left.2\sqrt{-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{f}}\;f\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{(2s-v)\left(c+2f\sqrt{z}\right)^2}{4f}\right)\right)\right)\right)\right)-$$

$$4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2gs-gv}\binom{v}{s}\left(\left(e^{-\frac{c^2(v-2s)^2}{-4dm+8fs+8du-4fv}-4gs}\left(-(dm-2fs-2du+fv)^2\right)^{-2n-1}\right.\right.$$

$$\left(e^{4gs}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(c(2s-v))^{-h-k+2n}\left(c(2s-v)-2(dm-2fs-2du+fv)\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left.\left.\left(\frac{\left(c(v-2s)+2(dm-2fs-2du+fv)\sqrt{z}\right)^2}{dm-2fs-2du+fv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\right.\right.$$

$$\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-$$

$$2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{\left(\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\right)\right)$$

$$(d\,m-2\,f\,s-2\,d\,u+f\,v)^{2\,n}+(-1)^m\,e^{2\left(\frac{c^2\,(v-2\,s)^2}{-4\,d\,m+8\,f\,s+8\,d\,u-4\,f\,v}+g\,v\right)}\,(-d\,m+2\,f\,s+2\,d\,u-f\,v)^{2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)^{\frac{1}{2}\,(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-$$

$$2\,(-d\,m+2\,f\,s+2\,d\,u-f\,v)\,\sqrt{\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\right)\right)-$$

$$e^{(v-2\,s)\left(\frac{(v-2\,s)\,c^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}+2\,g\right)}\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(c\,(v-2\,s))^{-h-k+2\,n}\left(\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c\,(v-2\,s)+2\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)-$$

$$2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)\right)\right)-$$

$$(-1)^m\,e^{-\frac{c^2\,(v-2\,s)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}}\,(d\,m+2\,f\,s-2\,d\,u-f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}$$

$$\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\right)+$$

$$2\sqrt{-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(d\,z+e)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \sinh^m(e+d\,z)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}-2\,(-1)^n\,d^{-n-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\,(m-2\,k)^{-n-1}\binom{m}{k}\left((-1)^{m+n}\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)-$$

$$c^{-n-1}\,i^{-m}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(4\,c\,g-f^2\right)(2\,s-v)}{4\,c}}\binom{v}{s}\left(\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\right.$$

$$\left(\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)+e^{-\frac{\left(f^2-4\,c\,g\right)(2\,s-v)}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}$$

$$\left.(-f)^{n-q}\,(-f-2\,c\,z)^{q+1}\left(-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k+m}\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2\,e\,k-e\,m+2\,g\,s-g\,v}\binom{v}{s}\left(e^{-\frac{(d\,(m-2\,k)+f\,(v-2\,s))^2}{c\,(8\,s-4\,v)}}\left(\sum_{q=0}^{n}2^{q-n}\,(d\,(m-2\,k)+f\,(v-2\,s))^{n-q}\right.\right.$$

$$\left.\left.(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^{q+1}\left(-\frac{(d\,(2\,k-m)+(2\,s-v)\,(f+2\,c\,z))^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-q-1)}\right.\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(2k-m)+(2s-v)(f+2cz))^2}{c(8s-4v)}\right)(c(2s-v))^{-n-1}+$$

$$e^{-\frac{(2dk-dm-2fs+fv)^2}{c(8s-4v)}+2e(m-2k)+im\pi}\left(\sum_{q=0}^{n}-2^{q-n}(2dk-dm-2fs+fv)^{n-q}(d(2k-m)-(2s-v)(f+2cz))\right.$$

$$(d(m-2k)+(2s-v)(f+2cz))^q\left(-\frac{(d(m-2k)+(2s-v)(f+2cz))^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(d(2k-m)-(2s-v)(f+2cz))^2}{c(8s-4v)}\right)\right)(c(2s-v))^{-n-1}-$$

$$\frac{1}{c(2s-v)}\left(e^{\frac{(d(m-2k)+f(v-2s))^2}{c(8s-4v)}+2e(m-2k)+2g(v-2s)+im\pi}(c(v-2s))^{-n}\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{v}{2}\right)f\right)^{n-q}\right.$$

$$\left(\frac{(-2dk+dm-2fs+fv-4csz+2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}(d(m-2k)-(2s-v)(f+2cz))^{q+1}$$

$$\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-2dk+dm-2fs+fv-4csz+2cvz)^2}{8cs-4cv}\right)\right)-$$

$$\frac{1}{c(2s-v)}\left(e^{\frac{(2dk-dm-2fs+fv)^2}{c(8s-4v)}+2g(v-2s)}(c(v-2s))^{-n}\sum_{q=0}^{n}2^{q-n}(-2dk+dm+2fs-fv)^{n-q}\right.$$

$$(d(2k-m)-(2s-v)(f+2cz))^{q+1}\left(\frac{(d(m-2k)+(2s-v)(f+2cz))^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(2dk-dm-2fs+fv-4csz+2cvz)^2}{8cs-4cv}\right)\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sinh^m(dz+e)\cosh^v\left(\sqrt{z}\,c+fz+g\right)dz==$$

$$2^{-m-v-1}\left(\frac{2i^{-m}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)(v\bmod 2-1)}{n+1}+2d^{-n-1}(1-v\bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-e\,(2\,k+m)}\,(2\,k-m)^{-n-1}\binom{m}{k}\binom{v}{\frac{v}{2}}\left((-1)^{m+n}\,e^{4\,e\,k}\,\Gamma(n+1,\,d\,(m-2\,k)\,z)-e^{2\,e\,m}\,\Gamma(n+1,\,d\,(2\,k-m)\,z)\right)-$$

$$\frac{1}{c}\left(i^{-m}\left(2^{-2\,n}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(4\,f\,g-c^2\right)(2\,s-v)}{4\,f}}\,(v-2\,s)^{-2\,n-2}\binom{v}{s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c\,(2\,s-v)\right.\right.\right.$$

$$(c\,(v-2\,s))^{-h-k+2\,n}\left(-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\,\sqrt{\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+$$

$$e^{\frac{\left(4\,f\,g-c^2\right)(2\,s-v)}{2\,f}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n+1}\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+2\sqrt{-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}$$

$$\left.\left.\left.\left.f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\right)\right)-4^{-n}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{m+u}\binom{m}{u}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e\,m+2\,g\,s-2\,e\,u-g\,v}\binom{v}{s}\left(e^{-2\,e\,(m-2\,u)}\left(e^{-\frac{c^2\,(v-2\,s)^2}{-4\,d\,m+8\,f\,s+8\,d\,u-4\,f\,v}-4\,g\,s-4\,e\,u}\left(-(d\,m-2\,f\,s-2\,d\,u+f\,v)^2\right)^{-2\,n-1}\right.\right.\right.$$

$$\left(e^{4 g s+4 e u}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(2\,s-v))^{-h-k+2\,n}\left(c\,(2\,s-v)-2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}\right.\right.$$

$$\left(\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-$$

$$2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\sqrt{\left(\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\right)\right)\right)$$

$$(d\,m-2\,f\,s-2\,d\,u+f\,v)^{2\,n}+(-1)^{m}\,e^{2\left(\frac{c^{2}\,(v-2\,s)^{2}}{-4\,d\,m+8\,f\,s+8\,d\,u-4\,f\,v}+e\,m+g\,v\right)}\,(-d\,m+2\,f\,s+2\,d\,u-f\,v)^{2\,n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^{k}\,(c\,(v-2\,s))^{-h-k+2\,n}\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c\,(v-2\,s)\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)-2\,(-d\,m+2\,f\,s+$$

$$2\,d\,u-f\,v)\sqrt{\left(-\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^{2}}{d\,m-2\,f\,s-2\,d\,u+f\,v}\right)}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(c\,(v-2\,s)+2\,(d\,m-2\,f\,s-2\,d\,u+f\,v)\,\sqrt{z}\right)^2}{4\,(d\,m-2\,f\,s-2\,d\,u+f\,v)}\right)\Bigg)\Bigg)-$$

$$e^{(v-2\,s)\left(\frac{(v-2\,s)\,c^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}+2\,g\right)}\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(c\,(v-2\,s))^{-h-k+2\,n}\left(\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(c\,(v-2\,s)+2\,(-d\,m-2\,f\,s+2\,d\,u+f\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)-$$

$$2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\sqrt{\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{4\,d\,m+8\,f\,s-8\,d\,u-4\,f\,v}\right)\Bigg)\Bigg)-$$

$$(-1)^m\,e^{-\frac{c^2\,(v-2\,s)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}}\,(d\,m+2\,f\,s-2\,d\,u-f\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n}$$

$$\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}$$

$$\binom{n}{k}\Bigg(c\,(2\,s-v)\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\right)+$$

$$2\sqrt{-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{d\,m+2\,f\,s-2\,d\,u-f\,v}}$$

$$(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(c\,(2\,s-v)+2\,(d\,m+2\,f\,s-2\,d\,u-f\,v)\,\sqrt{z}\right)^2}{8\,f\,s+4\,d\,(m-2\,u)-4\,f\,v}\right)\right)\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b\,z^r)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^n \sinh^m\left(b\,z^2\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz == \frac{i^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\Gamma\left(\frac{n+1}{2},\ -(b\,m-2\,b\,k)\,z^2\right)\left(-(b\,m-2\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.(-1)^m\left(-(2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\Gamma\left(\frac{n+1}{2},\ -(2\,b\,k-b\,m)\,z^2\right)\right)-$$

$$(-1)^n\,i^m\,2^{-m-v-1}\,c^{-n-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(f^2-4\,c\,g\right)(2\,s-v)}{4\,c}}\binom{v}{s}$$

$$\left(e^{\frac{\left(f^2-4\,c\,g\right)(2\,s-v)}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ -\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)\right)-2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{g\,v-2\,g\,s}\binom{v}{s}\left(e^{\frac{(f\,v-2\,f\,s)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\left(\sum_{q=0}^{n}\left(f\left(s-\frac{v}{2}\right)\right)^{n-q}(f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^{q+1}\right.\right.$$

$$\left.\left.\left(-\frac{(f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{-2\,b\,k+b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right)\right.$$

$$\Gamma\left(\frac{q+1}{2},\ \frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv}\right)(-2bk+bm-2cs+cv)^{-n-1}+$$

$$e^{\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}-2g(v-2s)}(-2bk+bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(fv-2fs)^{n-q}(2fs+4czs-$$

$$fv-4bkz+2bmz-2cvz)^{q+1}\left(\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\ \frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{8bk-4bm-8cs+4cv}\right)+e^{im\pi-\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}}$$

$$(2bk-bm-2cs+cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(2fs-fv)^{n-q}(-2fs-4czs+fv+4bkz-2bmz+2cvz)^{q+1}$$

$$\left(-\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\ -\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{8bk-4bm-8cs+4cv}\right)+e^{-\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}-2g(v-2s)+im\pi}$$

$$(2bk-bm+2cs-cv)^{-n-1}\sum_{q=0}^{n}2^{q-n}(fv-2fs)^{n-q}(2fs+4czs-fv+4bkz-2bmz-2cvz)^{q+1}$$

$$\left(-\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\ -\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv}\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\sinh^m\left(b\sqrt{z}\right)\cosh^v\left(\sqrt{z}\,c+g+fz\right)dz==$$

$$2^{-m-v-1}\left(\frac{2i^{-m}z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)(v\bmod 2-1)}{n+1}-4b^{-2(n+1)}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\right.$$

$$\left.\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k(m-2k)^{-2(n+1)}\binom{m}{k}\left((-1)^m\Gamma\left(2(n+1),\,-b(2k-m)\sqrt{z}\right)+\Gamma\left(2(n+1),\,b(2k-m)\sqrt{z}\right)\right)-\right.$$

$$\frac{1}{c}\left(2^{-2n}i^{-m}f^{-2(n+1)}\binom{m}{\frac{m}{2}}(m\bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(4fg-c^2\right)(2s-v)}{4f}}(v-2s)^{-2n-2}\binom{v}{s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k c(2s-v)\right.\right.$$

$$(c\,(v-2\,s))^{-h-k+2\,n}\left(-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\,\sqrt{\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+e^{\frac{\left(4\,f\,g-c^2\right)(2\,s-v)}{2\,f}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n+1}\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.2\,\sqrt{-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ -\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)+$$

$$2^{-2\,n}\,(-1)^m\,f^{-2\,(n+1)}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{2\,g\,s-g\,v}\,(v-2\,s)^{-2\,(n+1)}\binom{v}{s}\left(e^{\frac{(b\,m+2\,c\,s-2\,b\,u-c\,v)^2}{f\,(8\,s-4\,v)}+2\,g\,(v-2\,s)}\right.$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)^{-h-k+2\,n}\left(-b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)-\right.$$

$$2\,f\,(2\,s-v)\sqrt{\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{f\,(8\,s-4\,v)}}\left((-1)^m\,e^{\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{f\,(4\,s-2\,v)}-4\,g\,s+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n}\right.$$

$$\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$2\,f\sqrt{\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\ (v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\right)+\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$

$$(-b\,m+2\,c\,s+2\,b\,u-c\,v)^{-h-k+2\,n}\left(-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)-b\,(m-2\,u)\right)^{h+k}\binom{k}{h}\binom{n}{k}\left((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)-\right.\right.$$

$$\left.\left.(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\ -\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)-$$

$$2\,f\,(v-2\,s)\sqrt{-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\right)+(-1)^m\,e^{-\frac{(b\,m+2\,c\,s-2\,b\,u-c\,v)^2}{f\,(8\,s-4\,v)}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,m+2\,c\,s-2\,b\,u-c\,v)^{-h-k+2\,n}\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}$$

$$\left(-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$2\,f\,(2\,s-v)\sqrt{-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\sinh^m\left(b\,z^r+e\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n\sinh^m\left(b\,z^2+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==\frac{i^m\,2^{-m-v}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)}{n+1}-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\,z^{n+1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-e\,(2\,k+m)}\binom{m}{k}\left(e^{2\,e\,m}\,\Gamma\left(\frac{n+1}{2},\,-(b\,m-2\,b\,k)\,z^2\right)\left(-(b\,m-2\,b\,k)\,z^2\right)^{\frac{1}{2}(-n-1)}+\right.$$

$$\left.(-1)^m\,e^{4\,e\,k}\left(-(2\,b\,k-b\,m)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,-(2\,b\,k-b\,m)\,z^2\right)\right)-$$

$$(-1)^n i^m 2^{-m-v-1} c^{-n-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{-\frac{\left(f^2-4cg\right)(2s-v)}{4c}} \binom{v}{s}$$

$$\left(e^{\frac{\left(f^2-4cg\right)(2s-v)}{2c}} \sum_{q=0}^{n} (-1)^q 2^{q-n} f^{n-q} (f+2cz)^{q+1} \left(\frac{(2s-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(2s-v)(f+2cz)^2}{4c} \right) + \right.$$

$$\left. \sum_{q=0}^{n} (-1)^q 2^{q-n} f^{n-q} (f+2cz)^{q+1} \left(-\frac{(2s-v)(f+2cz)^2}{c} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2s-v)(f+2cz)^2}{4c} \right) \right) -$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{-2ek+em-2gs+gv} \binom{v}{s} \left(e^{\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}} \left(\sum_{q=0}^{n} \left(f\left(s-\frac{v}{2}\right) \right)^{n-q} (f(v-2s) + \right. \right.$$

$$2(-2bk+bm-2cs+cv)z)^{q+1} \left(-\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{-2bk+bm-2cs+cv} \right)^{\frac{1}{2}(-q-1)}$$

$$\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv} \right) \right) (-2bk+bm-2cs+cv)^{-n-1} +$$

$$e^{\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}-2g(v-2s)} (-2bk+bm+2cs-cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (fv-2fs)^{n-q} (2fs+4czs-fv-$$

$$4bkz+2bmz-2cvz)^{q+1} \left(\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{2bk-bm-2cs+cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{8bk-4bm-8cs+4cv} \right) + e^{-\frac{(fv-2fs)^2}{8bk-4bm-8cs+4cv}+e(4k-2m)+im\pi}$$

$$(2bk-bm-2cs+cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (2fs-fv)^{n-q} (-2fs-4czs+fv+4bkz-2bmz+2cvz)^{q+1}$$

$$\left(-\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{2bk-bm-2cs+cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(-2fs-4czs+fv+4bkz-2bmz+2cvz)^2}{8bk-4bm-8cs+4cv} \right) + e^{-\frac{(fv-2fs)^2}{8bk-4bm+8cs-4cv}+e(4k-2m)-2g(v-2s)+im\pi}$$

$$(2bk-bm+2cs-cv)^{-n-1} \sum_{q=0}^{n} 2^{q-n} (fv-2fs)^{n-q} (2fs+4czs-fv+4bkz-2bmz-2cvz)^{q+1}$$

$$\left(-\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{2bk-bm+2cs-cv} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv} \right) \right) \right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int z^n \sinh^m\left(\sqrt{z}\ b+e\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-m-v-1}\left(\frac{2\,i^{-m}\,z^{n+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(v \bmod 2-1)}{n+1}-4\,b^{-2\,(n+1)}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{-2\,e\,k-e\,m}\right.$$

$$(m-2\,k)^{-2\,(n+1)}\binom{m}{k}\left((-1)^m\,e^{4\,e\,k}\,\Gamma\left(2\,(n+1),\,-b\,(2\,k-m)\,\sqrt{z}\right)+e^{2\,e\,m}\,\Gamma\left(2\,(n+1),\,b\,(2\,k-m)\,\sqrt{z}\right)\right)-$$

$$\frac{1}{c}\left(2^{-2\,n}\,i^{-m}\,f^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(m \bmod 2-1)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(4\,f\,g-c^2\right)(2\,s-v)}{4\,f}}(v-2\,s)^{-2\,n-2}\binom{v}{s}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,c\,(2\,s-v)\right.\right.$$

$$(c\,(v-2\,s))^{-h-k+2\,n}\left(-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)-\right.$$

$$\left.2\,f\sqrt{\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ \Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)+e^{\frac{\left(4\,f\,g-c^2\right)(2\,s-v)}{2\,f}}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c\,(2\,s-v))^{-h-k+2\,n+1}\left((2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(c\,(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)+\right.$$

$$\left.\left.\left.2\sqrt{-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{f}}\ f\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)^2}{4\,f}\right)\right)\right)\right)+$$

$$2^{-2\,n}\,(-1)^m\,f^{-2\,(n+1)}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e\,m+2\,g\,s-2\,e\,u-g\,v}\,(v-2\,s)^{-2\,(n+1)}\binom{v}{s}$$

$$\left(e^{\frac{(b\,m+2\,c\,s-2\,b\,u-c\,v)^2}{f\,(8\,s-4\,v)}-2\,e\,(m-2\,u)+2\,g\,(v-2\,s)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)^{-h-k+2\,n}\right.$$

$$\left(-b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,m+2\,c\,s-2\,b\,u-c\,v)\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)-$$

$$2\,f\,(2\,s-v)\sqrt{\frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(b\,(m-2\,u)+(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)\right)+$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{f\,(8\,s-4\,v)}}\left((-1)^m\,e^{\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{f\,(4\,s-2\,v)}-4\,g\,s+2\,g\,v}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n}\right.$$

$$\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^{h+k}\left(\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(8\,s-4\,v)}\right)+$$

$$\left.\left.2\,f\,\sqrt{\frac{\left(b\,(m-2\,u)-(2\,s-v)\left(c+2\,f\,\sqrt{z}\right)\right)^2}{f\,(2\,s-v)}}\ (v-2\,s)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b(m-2u)-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+$$

$$e^{-2e(m-2u)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-bm+2cs+2bu-cv)^{-h-k+2n}$$

$$\left(-\frac{\left(b(m-2u)-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\left((2s-v)\left(c+2f\sqrt{z}\right)-b(m-2u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left((b(m-2u)+c(v-2s))\left(b(m-2u)-(2s-v)\left(c+2f\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b(m-2u)-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)-$$

$$2f(v-2s)\sqrt{-\frac{\left(b(m-2u)-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}$$

$$\left.\left.\Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b(m-2u)-(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\right)+$$

$$(-1)^m e^{-\frac{(bm+2cs-2bu-cv)^2}{f(8s-4v)}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(bm+2cs-2bu-cv)^{-h-k+2n}$$

$$\left(b(m-2u)+(2s-v)\left(c+2f\sqrt{z}\right)\right)^{h+k}\left(-\frac{\left(b(m-2u)+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((bm+2cs-2bu-cv)\left(b(m-2u)+(2s-v)\left(c+2f\sqrt{z}\right)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)+$$

$$2f(2s-v)\sqrt{-\frac{\left(b(m-2u)+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(2s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\right.$$

$$\left.\left.\left.-\frac{\left(b(m-2u)+(2s-v)\left(c+2f\sqrt{z}\right)\right)^2}{f(8s-4v)}\right)\right)\right)\Big/;\; n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m(b z^r + d z)\cosh^v(c z^r + f z + g)$

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$$\int z^n \sinh^m\left(b z^2+d z\right)\cosh^v\left(c z^2+f z+g\right)dz ==$$

$$\frac{2^{-m-v}z^{n+1}i^m\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k e^{\frac{d^2(m-2k)}{4b}}$$

$$(b(2k-m))^{-n-1}\binom{m}{k}\left(e^{\frac{d^2(2k-m)}{2b}}\sum_{q=0}^{n}2^{q-n}d^{n-q}(m-2k)^{n+1}(-d-2bz)^{q+1}\left(\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(2k-m)(d+2bz)^2}{4b}\right)+e^{imπ}\sum_{q=0}^{n}2^{q-n}d^{n-q}(m-2k)^{n+1}(-d-2bz)^{q+1}$$

$$\left.\left(-\frac{(2k-m)(d+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2k-m)(d+2bz)^2}{4b}\right)\right)-$$

$$\frac{1}{c^{n+1}}\left(\left(i^m 2^{-m-v-1}\right)(-1)^n\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(f^2-4cg\right)(2s-v)}{4c}}\binom{v}{s}\right.$$

$$\left(e^{\frac{\left(f^2-4cg\right)(2s-v)}{2c}}\sum_{q=0}^{n}(-1)^q 2^{q-n}f^{n-q}(f+2cz)^{q+1}\left(\frac{(2s-v)(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(2s-v)(f+2cz)^2}{4c}\right)+\right.$$

$$\left.\left.\sum_{q=0}^{n}(-1)^q 2^{q-n}f^{n-q}(f+2cz)^{q+1}\left(-\frac{(2s-v)(f+2cz)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2s-v)(f+2cz)^2}{4c}\right)\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}e^{g\,v-2\,g\,s}\left(e^{\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}}\left(\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{v}{2}\right)f\right)^{n-q}\right.\right.$$
$$(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^{q+1}$$
$$\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{-2\,b\,k+b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\left.\left.\Gamma\left(\frac{q+1}{2},\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\right)\right.$$
$$(-2\,b\,k+b\,m-2\,c\,s+c\,v)^{-n-1}+e^{\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}-2\,g\,(v-2\,s)}(-2\,b\,k+b\,m+2\,c\,s-c\,v)^{-n-1}$$
$$\sum_{q=0}^{n}2^{q-n}(2\,d\,k-d\,m-2\,f\,s+f\,v)^{n-q}(-2\,d\,k-4\,b\,z\,k+d\,m+2\,f\,s-f\,v+2\,b\,m\,z+4\,c\,s\,z-2\,c\,v\,z)^{q+1}$$
$$\left(\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{2\,b\,k-b\,m-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\Gamma\left(\frac{q+1}{2},\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}\right)+$$
$$e^{i\,m\,\pi-\frac{(2\,d\,k-d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}}(2\,b\,k-b\,m-2\,c\,s+c\,v)^{-n-1}\sum_{q=0}^{n}2^{q-n}(-2\,d\,k+d\,m+2\,f\,s-f\,v)^{n-q}$$
$$(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^{q+1}$$
$$\left(-(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2\Big/(2\,b\,k-b\,m-2\,c\,s+c\,v)\right)^{\frac{1}{2}(-q-1)}$$
$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2\,d\,k+4\,b\,z\,k-d\,m-2\,f\,s+f\,v-2\,b\,m\,z-4\,c\,s\,z+2\,c\,v\,z)^2}{8\,b\,k-4\,b\,m-8\,c\,s+4\,c\,v}\right)+$$
$$e^{-\frac{(-2\,d\,k+d\,m-2\,f\,s+f\,v)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}-2\,g\,(v-2\,s)+i\,m\,\pi}(2\,b\,k-b\,m+2\,c\,s-c\,v)^{-n-1}$$
$$\sum_{q=0}^{n}2^{q-n}(-2\,d\,k+d\,m-2\,f\,s+f\,v)^{n-q}(2\,d\,k+4\,b\,z\,k-d\,m+2\,f\,s-f\,v-2\,b\,m\,z+4\,c\,s\,z-2\,c\,v\,z)^{q+1}$$
$$\left(-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{2\,b\,k-b\,m+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$
$$\left.\Gamma\left(\frac{q+1}{2},-\frac{(d\,(m-2\,k)+f\,(v-2\,s)+2\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,z)^2}{8\,b\,k-4\,b\,m+8\,c\,s-4\,c\,v}\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n \sinh^m\left(\sqrt{z}\ b + d\,z\right) \cosh^v\left(\sqrt{z}\ c + g + f\,z\right) dz ==$$

$$\frac{2^{-m-v}\, z^{n+1}\, i^m \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\,(1 - v \bmod 2)}{n+1} + 2^{-m-2n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} \left((-1)^m\, e^{-\frac{b^2 (2u-m)}{4d}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b\,(2u-m))^{-h-k+2n} \left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^{h+k} \right.\right.$$

$$\left(-\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{d\,(2u-m)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left(b\,(2u-m)\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right) \right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{4d\,(2u-m)} \right) + 2d\,(2u-m)$$

$$\left.\left. \sqrt{-\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{d\,(2u-m)}}\ \Gamma\left(\frac{1}{2}(h+k+2), -\frac{\left(b\,(2u-m) + 2d\sqrt{z}\ (2u-m)\right)^2}{4d\,(2u-m)} \right) \right) \right)$$

$$(d\,(2u-m))^{-2n-2} + e^{-\frac{b^2 (m-2u)}{4d}}\, (d\,(m-2u))^{-2n-2} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h}\, 4^k\, (b\,(m-2u))^{-h-k+2n}$$

$$\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^{h+k} \left(-\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{d\,(m-2u)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k}$$

$$\left(b\,(m-2u)\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right) \Gamma\left(\frac{1}{2}(h+k+1), -\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{4d\,(m-2u)} \right) + \right.$$

$$2d\,(m-2u) \sqrt{-\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{d\,(m-2u)}}\ \Gamma\left(\right.$$

$$\left.\left.\left. \frac{1}{2}(h+k+2), -\frac{\left(b\,(m-2u) + 2d\sqrt{z}\ (m-2u)\right)^2}{4d\,(m-2u)} \right) \right) \right) +$$

$$2^{-m-2n-v-1}\,i^m\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(2s-v)c^2}{4f}+g(v-2s)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c(2s-v))^{-h-k+2n}\right.\right.$$

$$\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^{h+k}\left(\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c(2s-v)\right.$$

$$\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)-2f(2s-v)$$

$$\left.\left.\sqrt{\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)\right)\right)$$

$$(-f(2s-v))^{-2n-2}+e^{g(2s-v)-\frac{c^2(2s-v)}{4f}}\,(f(2s-v))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c(2s-v))^{-h-k+2n}$$

$$\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^{h+k}\left(-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c(2s-v)\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)+2f(2s-\right.$$

$$\left.v)\sqrt{-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)\right)\Bigg)+$$

$$2^{-m-2n-v-1}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{g(2s-v)-\frac{(b(2u-m)+c(2s-v))^2}{4(d(2u-m)+f(2s-v))}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b(2u-m)+c(2s-v))^{-h-k+2n}\right.\right.$$

$$\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)^2\Big/(d(2u-m)+f(2s-v))\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b(2u-m)+c(2s-v))\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)+2\,(d\,(2\,u-m)+f\,(2\,s-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+2),\,-\big(b\,(2\,u-m)+c\,(2\,s-v)+2\,(d\,(2\,u-m)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(2\,s-v)+$$
$$2\,(d\,(2\,u-m)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(2\,s-v))\Big)}\Big)\Big)$$

$$(d\,(2\,u-m)+f\,(2\,s-v))^{-2\,n-2}+e^{g\,(2\,s-v)-\frac{(b\,(m-2\,u)+c\,(2\,s-v))^2}{4\,(d\,(m-2\,u)+f\,(2\,s-v))}}\,(d\,(m-2\,u)+f\,(2\,s-v))^{-2\,n-2}$$
$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(2\,s-v))^{-h-k+2\,n}$$
$$\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(m-2\,u)+c\,(2\,s-v))\,\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)$$
$$\sqrt{\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)}+$$

$$(-1)^m\,e^{g\,(v-2\,s)-\frac{(b\,(2\,u-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,u-m)+f\,(v-2\,s))}}\,(d\,(2\,u-m)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$
$$(b\,(2\,u-m)+c\,(v-2\,s))^{-h-k+2\,n}\,\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(2\,u-m)+c\,(v-2\,s))\,\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)$$
$$\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)}+$$

$$e^{g\,(v-2\,s)-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,u)+f\,(v-2\,s))}}\,(d\,(m-2\,u)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n}$$

$$\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(\left(b\,(m-2\,u)+c\,(v-2\,s)\right)\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.\left.-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)\right)$$

$$\sqrt{\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)\right);\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n \sinh^m\left(b\,z^r+d\,z+e\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n \sinh^m\left(b\,z^2+d\,z+e\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==$$

$$\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\frac{2^{-m-v}\,z^{n+1}\,i^m\,(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{\frac{d^2\,(m-2\,k)}{4\,b}-e\,(2\,k+m)}\,(b\,(2\,k-m))^{-n-1}\binom{m}{k}\left(e^{\frac{(2\,k-m)\,d^2}{2\,b}+2\,e\,m}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}\,(m-2\,k)^{n+1}\,(-d-2\,b\,z)^{q+1}\right.$$

$$\left(\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)+e^{4\,e\,k+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,d^{n-q}$$

$$\left.(m-2\,k)^{n+1}\,(-d-2\,b\,z)^{q+1}\left(-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,k-m)\,(d+2\,b\,z)^2}{4\,b}\right)\right)-$$

$$\frac{i^m\,2^{-m-v-1}}{c^{n+1}}(-1)^n\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{-\frac{\left(f^2-4\,c\,g\right)(2\,s-v)}{4\,c}}\binom{v}{s}$$

$$\left(e^{\frac{\left(f^2-4\,c\,g\right)(2\,s-v)}{2\,c}}\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)+\right.$$

$$\left.\sum_{q=0}^{n}(-1)^q\,2^{q-n}\,f^{n-q}\,(f+2\,c\,z)^{q+1}\left(-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{c}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(2\,s-v)\,(f+2\,c\,z)^2}{4\,c}\right)\right)-$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}e^{-2ek+em-2gs+gv}\left(e^{\frac{(-2dk+dm-2fs+fv)^2}{8bk-4bm+8cs-4cv}}\right.$$

$$\left(\sum_{q=0}^{n}\left(\left(k-\frac{m}{2}\right)d+\left(s-\frac{v}{2}\right)f\right)^{n-q}(d(m-2k)+f(v-2s)+2(-2bk+bm-2cs+cv)z)^{q+1}\right.$$

$$\left(-\frac{(d(m-2k)+f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{-2bk+bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2},\frac{(d(m-2k)+f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv}\right)\right)$$

$$(-2bk+bm-2cs+cv)^{-n-1}+e^{\frac{(2dk-dm-2fs+fv)^2}{8bk-4bm-8cs+4cv}-2g(v-2s)}(-2bk+bm+2cs-cv)^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}(2dk-dm-2fs+fv)^{n-q}(-2dk-4bzk+dm+2fs-fv+2bmz+4csz-2cvz)^{q+1}$$

$$\left(\frac{(2dk+4bzk-dm-2fs+fv-2bmz-4csz+2cvz)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},\frac{(2dk+4bzk-dm-2fs+fv-2bmz-4csz+2cvz)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{-\frac{(2dk-dm-2fs+fv)^2}{8bk-4bm-8cs+4cv}+e(4k-2m)+im\pi}(2bk-bm-2cs+cv)^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}(-2dk+dm+2fs-fv)^{n-q}(2dk+4bzk-dm-2fs+fv-2bmz-4csz+2cvz)^{q+1}$$

$$\left(-(2dk+4bzk-dm-2fs+fv-2bmz-4csz+2cvz)^2/(2bk-bm-2cs+cv)\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2dk+4bzk-dm-2fs+fv-2bmz-4csz+2cvz)^2}{8bk-4bm-8cs+4cv}\right)+$$

$$e^{-\frac{(-2dk+dm-2fs+fv)^2}{8bk-4bm+8cs-4cv}+e(4k-2m)-2g(v-2s)+im\pi}(2bk-bm+2cs-cv)^{-n-1}$$

$$\sum_{q=0}^{n}2^{q-n}(-2dk+dm-2fs+fv)^{n-q}(2dk+4bzk-dm+2fs-fv-2bmz+4csz-2cvz)^{q+1}$$

$$\left(-\frac{(d(m-2k)+f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{2bk-bm+2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\left.\left.\Gamma\left(\frac{q+1}{2},-\frac{(d(m-2k)+f(v-2s)+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv}\right)\right)/;n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\right.$$

01.20.21.4598.01

$$\int z^n \sinh^m\left(\sqrt{z}\ b+e+d\,z\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$\frac{2^{-m-v}\,z^{n+1}\,i^m\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{n+1}+2^{-m-2n-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\left((-1)^m\,e^{e(2u-m)-\frac{b^2(2u-m)}{4d}}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b(2u-m))^{-h-k+2n}\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^{h+k}\right.\right.$$

$$\left(-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{d(2u-m)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(b(2u-m)\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{4d(2u-m)}\right)+2d(2u-m)\right.$$

$$\left.\left.\sqrt{-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{d(2u-m)}}\ \Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(b(2u-m)+2d\sqrt{z}\ (2u-m)\right)^2}{4d(2u-m)}\right)\right)\right)$$

$$(d(2u-m))^{-2n-2}+e^{e(m-2u)-\frac{b^2(m-2u)}{4d}}(d(m-2u))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b(m-2u))^{-h-k+2n}$$

$$\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^{h+k}\left(-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{d(m-2u)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(b(m-2u)\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{4d(m-2u)}\right)+\right.$$

$$2d(m-2u)\sqrt{-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{d(m-2u)}}\ \Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+k+2),-\frac{\left(b(m-2u)+2d\sqrt{z}\ (m-2u)\right)^2}{4d(m-2u)}\right)\right)\right)+$$

$$2^{-m-2n-v-1}\,i^m\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{\frac{(2s-v)c^2}{4f}+g(v-2s)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-c(2s-v))^{-h-k+2n}\right.\right.$$

$$\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^{h+k}\left(\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(-c(2s-v)\right.$$

$$\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)-2f(2s-v)$$

$$\left.\left.\sqrt{\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,\frac{\left(-c(2s-v)-2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)\right)\right)$$

$$(-f(2s-v))^{-2n-2}+e^{g(2s-v)-\frac{c^2(2s-v)}{4f}}\,(f(2s-v))^{-2n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(c(2s-v))^{-h-k+2n}$$

$$\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^{h+k}\left(-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(c(2s-v)\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)+2f(2s-\right.$$

$$\left.v)\sqrt{-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{f(2s-v)}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(c(2s-v)+2f\sqrt{z}\,(2s-v)\right)^2}{4f(2s-v)}\right)\right)\Bigg)+$$

$$2^{-m-2n-v-1}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\,e^{-\frac{(b(2u-m)+c(2s-v))^2}{4(d(2u-m)+f(2s-v))}+e(2u-m)+g(2s-v)}\left(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\right.\right.$$

$$(b(2u-m)+c(2s-v))^{-h-k+2n}\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)^{h+k}$$

$$\left(-\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)^2\Big/(d(2u-m)+f(2s-v))\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left((b(2u-m)+c(2s-v))\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+1),\,-\left(b(2u-m)+c(2s-v)+2(d(2u-m)+f(2s-v))\sqrt{z}\right)^2\Big/\right.\right.$$

$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)+2\,(d\,(2\,u-m)+f\,(2\,s-v))$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+2),\,-\big(b\,(2\,u-m)+c\,(2\,s-v)+2\,(d\,(2\,u-m)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(2\,s-v)))\Big)\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(2\,s-v)+2\,(d\,(2\,u-m)+f\,(2\,s-v))$$
$$\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(2\,s-v))\Big)\Big)\Big)(d\,(2\,u-m)+f\,(2\,s-v))^{-2\,n-2}+$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(2\,s-v))^2}{4\,(d\,(m-2\,u)+f\,(2\,s-v))}+e\,(m-2\,u)+g\,(2\,s-v)}\,(d\,(m-2\,u)+f\,(2\,s-v))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$
$$(b\,(m-2\,u)+c\,(2\,s-v))^{-h-k+2\,n}\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(m-2\,u)+c\,(2\,s-v))\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(4\,(d\,(m-2\,u)+f\,(2\,s-v)))\Big)$$
$$\sqrt{\Big(-\big(b\,(m-2\,u)+c\,(2\,s-v)+2\,(d\,(m-2\,u)+f\,(2\,s-v))\,\sqrt{z}\big)^2\Big/(d\,(m-2\,u)+f\,(2\,s-v))\Big)}+$$

$$(-1)^m\,e^{-\frac{(b\,(2\,u-m)+c\,(v-2\,s))^2}{4\,(d\,(2\,u-m)+f\,(v-2\,s))}+e\,(2\,u-m)+g\,(v-2\,s)}\,(d\,(2\,u-m)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$
$$(b\,(2\,u-m)+c\,(v-2\,s))^{-h-k+2\,n}\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^{h+k}$$
$$\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(2\,u-m)+c\,(v-2\,s))\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(4\,(d\,(2\,u-m)+f\,(v-2\,s)))\Big)$$
$$\sqrt{\Big(-\big(b\,(2\,u-m)+c\,(v-2\,s)+2\,(d\,(2\,u-m)+f\,(v-2\,s))\,\sqrt{z}\big)^2\Big/(d\,(2\,u-m)+f\,(v-2\,s))\Big)}+$$

$$e^{-\frac{(b\,(m-2\,u)+c\,(v-2\,s))^2}{4\,(d\,(m-2\,u)+f\,(v-2\,s))}+e\,(m-2\,u)+g\,(v-2\,s)}\,(d\,(m-2\,u)+f\,(v-2\,s))^{-2\,n-2}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k$$
$$(b\,(m-2\,u)+c\,(v-2\,s))^{-h-k+2\,n}\big(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\big)^{h+k}$$

$$\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)^{\frac{1}{2}(-h-k-1)}$$
$$\binom{k}{h}\binom{n}{k}\Big((b\,(m-2\,u)+c\,(v-2\,s))\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)$$
$$\Gamma\Big(\frac{1}{2}\,(h+k+1),\,-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/$$
$$\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\Gamma\Big(\frac{1}{2}\,(h+k+2),$$
$$-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(4\,(d\,(m-2\,u)+f\,(v-2\,s))\right)$$
$$\sqrt{\left(-\left(b\,(m-2\,u)+c\,(v-2\,s)+2\,(d\,(m-2\,u)+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\left(d\,(m-2\,u)+f\,(v-2\,s)\right)\right)}\Big)\Big/;\,n\in\mathbb{N}\wedge m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving rational functions of the direct function, hyperbolic and a power functions

Involving sinh and power

Involving $z^n \sinh(c\,z)$

01.20.21.4599.01

$$\int\frac{z\sinh(c\,z)}{(a+b\cosh(c\,z))^2}\,dz==-\frac{z}{b\,c\,(a+b\cosh(c\,z))}-\frac{2}{b\sqrt{b^2-a^2}\;c^2}\tan^{-1}\left(\frac{(a-b)\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)$$

01.20.21.4600.01

$$\int\frac{z\sinh(z)}{(\cosh(z)-1)^2}\,dz==-\frac{1}{2}\operatorname{csch}^2\left(\frac{z}{2}\right)(z+\sinh(z))$$

01.20.21.4601.01

$$\int\frac{z\sinh(z)}{(\cosh(z)+1)^2}\,dz==\frac{1}{2}\operatorname{sech}^2\left(\frac{z}{2}\right)(\sinh(z)-z)$$

Involving rational functions of sinh and power

Involving $z\sinh(2\,c\,z)\,(a\sinh(c\,z)+b\cosh(c\,z))^{-n}$

01.20.21.4602.01

$$\int \frac{z \sinh(2\,c\,z)}{a \sinh(c\,z) + b \cosh(c\,z)}\,dz == \frac{1}{(a+b)\,c^2}$$

$$\left(2\left(\frac{2\,a\,b \tan^{-1}\left(\frac{a+b\tanh\left(\frac{c\,z}{2}\right)}{\sqrt{b^2-a^2}}\right)\tanh^{-1}\left(\frac{b}{a}\right)}{(a-b)\sqrt{b^2-a^2}} + \frac{(a+b\,c\,z)\cosh(c\,z)}{b-a} + \frac{(b+a\,c\,z)\sinh(c\,z)}{a-b} - \frac{1}{(a-b)\sqrt{1-\frac{b^2}{a^2}}}\left(b\left(\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left(\log\left(1-e^{-c\,z-\tanh^{-1}\left(\frac{b}{a}\right)}\right)-\log\left(1+e^{-c\,z-\tanh^{-1}\left(\frac{b}{a}\right)}\right)\right)+\mathrm{Li}_2\left(-e^{-c\,z-\tanh^{-1}\left(\frac{b}{a}\right)}\right)-\mathrm{Li}_2\left(e^{-c\,z-\tanh^{-1}\left(\frac{b}{a}\right)}\right)\right)\right)\right)\right)$$

01.20.21.4603.01

$$\int \frac{z \sinh(2\,c\,z)}{(a \sinh(c\,z) + b \cosh(c\,z))^2}\,dz ==$$

$$\frac{1}{a\,(a+b)}\left(\frac{z^2\,a^2}{a\,b-b^2} + \frac{2\,(a\,c\,z - b\log(b\cosh(c\,z)+a\sinh(c\,z)))\,a^2}{(a-b)^2\,(a+b)\,c^2} + \frac{2\,z\sinh(c\,z)\,a^2}{(b-a)\,c\,(b\cosh(c\,z)+a\sinh(c\,z))} + \right.$$

$$\frac{a^2}{(a-b)\,b\sqrt{1-\frac{b^2}{a^2}}\;c^2}\left(\frac{b}{a\sqrt{1-\frac{b^2}{a^2}}}\left(i\left(-2\,i\,c\log\left(1-e^{-2\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\right)z + c\,\pi\,z - \pi\log\left(1+e^{2\,c\,z}\right)+\pi\log(\cosh(c\,z))\right)+\right.\right.$$

$$\left.\left.2\tanh^{-1}\left(\frac{b}{a}\right)\left(c\,z+\log\left(1-e^{-2\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\right)-\log\left(i\sinh\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right)\right)-\right.$$

$$\left.\left.\mathrm{Li}_2\left(e^{-2\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\right)-c^2\,e^{-\tanh^{-1}\left(\frac{b}{a}\right)}\,z^2\right)-\frac{b}{(b-a)\sqrt{1-\frac{b^2}{a^2}}\;c^2}\right.$$

$$\left(\frac{b}{a\sqrt{1-\frac{b^2}{a^2}}}\left(i\left(-2\,i\,c\log\left(1-e^{-2\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\right)z + c\,\pi\,z - \pi\log\left(1+e^{2\,c\,z}\right)+\pi\log(\cosh(c\,z))\right)+2\tanh^{-1}\left(\frac{b}{a}\right)\right.\right.$$

$$\left.\left.\left(c\,z+\log\left(1-e^{-2\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\right)-\log\left(i\sinh\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)\right)-\mathrm{Li}_2\left(e^{-2\left(c\,z+\tanh^{-1}\left(\frac{b}{a}\right)\right)}\right)-c^2\,e^{-\tanh^{-1}\left(\frac{b}{a}\right)}\,z^2\right)\right)$$

Involving other constructions

01.20.21.4604.01

$$\int \frac{2z+\sinh(2z)}{(\cosh(z)+z\sinh(z))^2}\,dz == \frac{2z\sinh(z)}{\cosh(z)+z\sinh(z)}$$

01.20.21.4605.01

$$\int \frac{z^2}{(\sinh(z)-z\cosh(z))^2}\,dz == \frac{\cosh(z)-z\sinh(z)}{\sinh(z)-z\cosh(z)}$$

Involving functions of the direct function, hyperbolic and exponential functions

Involving powers of the direct function, hyperbolic and exponential functions

Involving sinh and exp

Involving $e^{pz}\sinh(cz)\cosh^{\nu}(az)$

01.20.21.4606.01

$$\int e^{pz}\sinh(cz)\cosh^{\nu}(az)\,dz == \frac{1}{2}i\left(1+e^{2az}\right)^{-\nu}\cosh^{\nu}(az)$$
$$\left(\frac{e^{\frac{i\pi}{2}+(p-c)z}}{p-c-a\nu}\,{}_2F_1\left(\frac{p-c-a\nu}{2a},-\nu;\frac{p-c-a\nu}{2a}+1;-e^{2az}\right)+\frac{e^{-\frac{1}{2}(i\pi)+(p+c)z}}{p+c-a\nu}\,{}_2F_1\left(\frac{p+c-a\nu}{2a},-\nu;\frac{p+c-a\nu}{2a}+1;-e^{2az}\right)\right)$$

01.20.21.4607.01

$$\int e^{pz}\sinh(cz)\cosh^{\nu}(az)\,dz == -2^{-\nu-1}\left(\left(\frac{e^{-(-p-c)z}}{p+c}+\frac{e^{-(c-p)z}}{c-p}\right)\binom{\nu}{\frac{\nu}{2}}(\nu \bmod 2-1)+\right.$$
$$\left.\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(-\frac{e^{-(-p+c-2as+a\nu)z}}{-p+c-2as+a\nu}+\frac{e^{-(-p-c+2as-a\nu)z}}{-p-c+2as-a\nu}-\frac{e^{-(-p+c+2as-a\nu)z}}{-p+c+2as-a\nu}+\frac{e^{-(-p-c-2as+a\nu)z}}{-p-c-2as+a\nu}\right)\binom{\nu}{s}\right)/;\ \nu\in\mathbb{N}^+$$

Involving $e^{pz}\sinh(cz+d)\cosh^{h\nu}(az)$

01.20.21.4608.01

$$\int e^{pz}\sinh(d+cz)\cosh^{\nu}(az)\,dz ==$$
$$\frac{1}{2}e^{d}\left(1+e^{-2az}\right)^{-\nu}\cosh^{\nu}(az)\left(\frac{e^{-2d-cz+pz}}{c-p-a\nu}\,{}_2F_1\left(-\frac{-c+p+a\nu}{2a},-\nu;-\frac{-c+p+a(\nu-2)}{2a};-e^{-2az}\right)+\right.$$
$$\left.\frac{e^{(c+p)z}}{c+p+a\nu}\,{}_2F_1\left(-\frac{c+p+a\nu}{2a},-\nu;-\frac{c+p+a(\nu-2)}{2a};-e^{-2az}\right)\right)$$

01.20.21.4609.01

$$\int e^{p z} \sinh(d + c z) \cosh^{\nu}(a z)\, dz == -2^{-\nu-1} \left(e^{-d} \left(\frac{e^{2 d-(-c-p) z}}{c+p} + \frac{e^{-(c-p) z}}{c-p} \right) \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) + \right.$$

$$\left. e^{-d} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(-\frac{e^{-(c-p-2 a s+a \nu) z}}{c-p-2 a s+a \nu} + \frac{e^{2 d-(-c-p+2 a s-a \nu) z}}{-c-p+2 a s-a \nu} - \frac{e^{-(c-p+2 a s-a \nu) z}}{c-p+2 a s-a \nu} + \frac{e^{2 d-(-c-p-2 a s+a \nu) z}}{-c-p-2 a s+a \nu} \right) \binom{\nu}{s} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z} \sinh(c z) \cosh^{\nu}(a z + b)$

01.20.21.4610.01

$$\int e^{p z} \sinh(c z) \cosh^{\nu}(b + a z)\, dz ==$$

$$\frac{1}{2} \left(1 + e^{-2 (b+a z)}\right)^{-\nu} \cosh^{\nu}(b + a z) \left(\frac{e^{-c z+p z}}{c-p-a \nu} {}_2F_1\left(-\frac{-c+p+a \nu}{2 a}, -\nu; -\frac{-c+p+a (\nu-2)}{2 a}; -e^{-2 (b+a z)} \right) + \right.$$

$$\left. \frac{e^{(c+p) z}}{c+p+a \nu} {}_2F_1\left(-\frac{c+p+a \nu}{2 a}, -\nu; -\frac{c+p+a (\nu-2)}{2 a}; -e^{-2 (b+a z)} \right) \right)$$

01.20.21.4611.01

$$\int e^{p z} \sinh(c z) \cosh^{\nu}(b + a z)\, dz == -2^{-\nu-1} \left(\left(\frac{e^{(c+p) z}}{c+p} + \frac{e^{-(c-p) z}}{c-p} \right) \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) + \right.$$

$$\left. \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2 b s-b \nu} \left(-\frac{e^{4 b s-(c-p-2 a s+a \nu) z}}{c-p-2 a s+a \nu} + \frac{e^{2 b \nu-(-c-p+2 a s-a \nu) z}}{-c-p+2 a s-a \nu} - \frac{e^{2 b \nu-(c-p+2 a s-a \nu) z}}{c-p+2 a s-a \nu} + \frac{e^{4 b s-(-c-p-2 a s+a \nu) z}}{-c-p-2 a s+a \nu} \right) \binom{\nu}{s} \right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \sinh\left(b z^2\right) \cosh^{\nu}(c z)$

01.20.21.4612.01

$$\int e^{p z^2} \sinh\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$\frac{1}{(p-b)(b+p)}\left(2^{-\nu-2}\sqrt{\pi}\binom{\nu}{\frac{\nu}{2}}\left((p-b)\sqrt{b+p}\ \operatorname{erfi}\left(\sqrt{b+p}\ z\right)-\sqrt{p-b}\ (b+p)\operatorname{erfi}\left(\frac{2pz-2bz}{2\sqrt{p-b}}\right)\right)(1-\nu \bmod 2)+\right.$$

$$2^{-\nu-2} i \sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\frac{1}{(p-b)(b+p)}\left(e^{-\frac{c^2(\nu-2s)^2-2i(p-b)\pi}{4(p-b)}}\sqrt{p-b}\ (b+p)\operatorname{erfi}\left(\frac{c(\nu-2s)+2(p-b)z}{2\sqrt{p-b}}\right)+\right.\right.$$

$$\left.e^{-\frac{c^2(\nu-2s)^2+2i(b+p)\pi}{4(b+p)}}(p-b)\sqrt{b+p}\ \operatorname{erfi}\left(\frac{-c(\nu-2s)+2bz+2pz}{2\sqrt{b+p}}\right)\right)+$$

$$\frac{1}{(p-b)(b+p)}\left(e^{-\frac{c^2(\nu-2s)^2-2i(p-b)\pi}{4(p-b)}}\sqrt{p-b}\ (b+p)\operatorname{erfi}\left(\frac{-c(\nu-2s)-2bz+2pz}{2\sqrt{p-b}}\right)+\right.$$

$$\left.\left.\left.e^{-\frac{c^2(\nu-2s)^2+2i(b+p)\pi}{4(b+p)}}(p-b)\sqrt{b+p}\ \operatorname{erfi}\left(\frac{c(\nu-2s)+2(b+p)z}{2\sqrt{b+p}}\right)\right)\right)\right) /;\ \nu\in\mathbb{N}^+$$

01.20.21.4613.01

$$\int e^{p\sqrt{z}} \sinh\left(b\sqrt{z}\right)\cosh^{\nu}(c z)\, dz == \frac{1}{(b-p)^2(b+p)^2}$$

$$\left(2^{1-\nu}e^{p\sqrt{z}}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(b\left(\sqrt{z}\ b^2+2p-p^2\sqrt{z}\right)\cosh\left(b\sqrt{z}\right)+\left(\sqrt{z}\ p^3-p^2-b^2\left(\sqrt{z}\ p+1\right)\right)\sinh\left(b\sqrt{z}\right)\right)\right)+$$

$$2^{-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(e^{\frac{b^2+pb+p^2}{4cs-2c\nu}}\sqrt{\pi}\left(e^{\frac{3b^2+4pb+3p^2}{4c\nu-8cs}}\left(e^{\frac{bp}{2cs-c\nu}}(b-p)\sqrt{c(\nu-2s)}\ \operatorname{erfi}\left(\frac{b-p+2c(\nu-2s)\sqrt{z}}{2\sqrt{c(2s-\nu)}}\right)-\right.\right.\right.\right.$$

$$\left.(b+p)\sqrt{c(\nu-2s)}\ \operatorname{erfi}\left(\frac{b+p-2c(\nu-2s)\sqrt{z}}{2\sqrt{c(2s-\nu)}}\right)+e^{\frac{(b+p)^2}{4cs-2c\nu}}(b+p)\sqrt{c(2s-\nu)}\ \operatorname{erfi}\left(\right.\right.$$

$$\left.\left.\left.\left.\frac{b+p+2c(\nu-2s)\sqrt{z}}{2\sqrt{c(\nu-2s)}}\right)\right)-e^{\frac{b^2+4pb+p^2}{4c\nu-8cs}}(b-p)\sqrt{c(2s-\nu)}\ \operatorname{erfi}\left(\frac{b-p-2c(\nu-2s)\sqrt{z}}{2\sqrt{c(\nu-2s)}}\right)\right)\right)\Bigg/$$

$$\left.\left(c(2s-\nu)\sqrt{-c^2(\nu-2s)^2}\right)+\frac{8e^{p\sqrt{z}}\sinh\left(b\sqrt{z}\right)\sinh(c(2s-\nu)z)}{c(2s-\nu)}\right) /;\ \nu\in\mathbb{N}^+$$

Involving $e^{p z^r}\sinh(b z)\cosh^{\nu}(c z)$

01.20.21.4614.01

$$\int e^{p z^2} \sinh(b z) \cosh^{\nu}(c z)\, dz == \frac{i\, 2^{-\nu-2} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \left(e^{-\frac{b^2-2\pi i p}{4p}} \operatorname{erfi}\left(\frac{2pz-b}{2\sqrt{p}}\right) + e^{-\frac{b^2+2\pi i p}{4p}} \operatorname{erfi}\left(\frac{b+2pz}{2\sqrt{p}}\right)\right)(1-\nu \bmod 2)}{\sqrt{p}} +$$

$$\frac{1}{\sqrt{p}}\left(i\, 2^{-\nu-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(c(\nu-2s)-b)^2-2\pi i p}{4p}} \operatorname{erfi}\left(\frac{-b+c(\nu-2s)+2pz}{2\sqrt{p}}\right) + e^{-\frac{(b+c(\nu-2s))^2+2\pi i p}{4p}} \operatorname{erfi}\left(\frac{b+c(\nu-2s)+2pz}{2\sqrt{p}}\right) + \right.\right.$$

$$\left.\left. e^{-\frac{(-b-c(\nu-2s))^2-2\pi i p}{4p}} \operatorname{erfi}\left(\frac{-b-c(\nu-2s)+2pz}{2\sqrt{p}}\right) + e^{-\frac{(b-c(\nu-2s))^2+2\pi i p}{4p}} \operatorname{erfi}\left(\frac{b-c(\nu-2s)+2pz}{2\sqrt{p}}\right)\right)\right) /;\ \nu \in \mathbb{Z} \wedge \nu > 0$$

01.20.21.4615.01

$$\int e^{p\sqrt{z}} \sinh(b z) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2}\left(\frac{4\, e^{p\sqrt{z}} \cosh(b z)}{b} + \frac{e^{\frac{p^2}{4b}}\, p\sqrt{\pi}\, \operatorname{erfi}\left(\frac{p-2b\sqrt{z}}{2\sqrt{-b}}\right)}{(-b)^{3/2}} + \frac{e^{-\frac{p^2}{4b}-i\pi}\, p\sqrt{\pi}\, \operatorname{erfi}\left(\frac{2\sqrt{z}\, b+p}{2\sqrt{b}}\right)}{b^{3/2}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2) +$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{s} \left(4\, e^{p\sqrt{z}} \left(\frac{\cosh((b+2cs-c\nu)z)}{b+2cs-c\nu} + \frac{\cosh((b+c(\nu-2s))z)}{b+c(\nu-2s)}\right) + \right.$$

$$\frac{e^{-\frac{p^2}{4(c(\nu-2s)-b)}}\, p\sqrt{\pi}\, \operatorname{erfi}\left(\frac{p+2(c(\nu-2s)-b)\sqrt{z}}{2\sqrt{c(\nu-2s)-b}}\right)}{(c(\nu-2s)-b)^{3/2}} + \frac{e^{-\frac{p^2}{4(-b-c(\nu-2s))}}\, p\sqrt{\pi}\, \operatorname{erfi}\left(\frac{p+2(-b-c(\nu-2s))\sqrt{z}}{2\sqrt{-b-c(\nu-2s)}}\right)}{(-b-c(\nu-2s))^{3/2}} -$$

$$\left.\frac{e^{-\frac{p^2}{4(b+c(\nu-2s))}}\, p\sqrt{\pi}\, \operatorname{erfi}\left(\frac{p+2(b+c(\nu-2s))\sqrt{z}}{2\sqrt{b+c(\nu-2s)}}\right)}{(b+c(\nu-2s))^{3/2}} - \frac{e^{-\frac{p^2}{4(b-c(\nu-2s))}}\, p\sqrt{\pi}\, \operatorname{erfi}\left(\frac{p+2(b-c(\nu-2s))\sqrt{z}}{2\sqrt{b-c(\nu-2s)}}\right)}{(b-c(\nu-2s))^{3/2}}\right) /;\ \nu \in \mathbb{N}^+$$

Involving $e^{p z} \sinh(b z^r) \cosh^{\nu}(c z)$

01.20.21.4616.01

$$\int e^{p z} \sinh\left(b z^2\right) \cosh^{\nu}(c z)\, dz ==$$

$$-\frac{i\, 2^{-\nu-2} \sqrt{\pi}}{b} \binom{\nu}{\frac{\nu}{2}} \left(\sqrt{-b}\; e^{\frac{p^2+2\pi i b}{4b}} \operatorname{erfi}\left(\frac{p-2bz}{2\sqrt{-b}}\right) - \sqrt{b}\; e^{-\frac{p^2+2\pi i b}{4b}} \operatorname{erfi}\left(\frac{p+2bz}{2\sqrt{b}}\right)\right) (1-\nu \bmod 2) - \frac{i\, 2^{-\nu-2} \sqrt{\pi}}{b}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\sqrt{-b}\; e^{\frac{(p+c(\nu-2s))^2+2\pi i b}{4b}} \operatorname{erfi}\left(\frac{p+c(\nu-2s)-2bz}{2\sqrt{-b}}\right) + \sqrt{-b}\; e^{\frac{(p-c(\nu-2s))^2+2\pi i b}{4b}} \operatorname{erfi}\left(\frac{p-c(\nu-2s)-2bz}{2\sqrt{-b}}\right) - \right.$$

$$\left. \sqrt{b}\; e^{-\frac{(p+c(\nu-2s))^2+2\pi i b}{4b}} \operatorname{erfi}\left(\frac{p+c(\nu-2s)+2bz}{2\sqrt{b}}\right) - \sqrt{b}\; e^{-\frac{(p-c(\nu-2s))^2+2\pi i b}{4b}} \operatorname{erfi}\left(\frac{p-c(\nu-2s)+2bz}{2\sqrt{b}}\right)\right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.4617.01

$$\int e^{p z} \sinh\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2} \left(\frac{b\, e^{-\frac{b^2}{4p} - i\pi} \sqrt{\pi} \operatorname{erfi}\left(\frac{b+2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} + \frac{b\, e^{-\frac{b^2}{4p}} \sqrt{\pi} \operatorname{erfi}\left(\frac{b-2p\sqrt{z}}{2\sqrt{p}}\right)}{p^{3/2}} + \frac{4\, e^{p z} \sinh\left(b\sqrt{z}\right)}{p} \right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{b\, e^{i\pi - \frac{b^2}{4(p+c(\nu-2s))}} \sqrt{\pi} \operatorname{erfi}\left(\frac{2(p+c(\nu-2s))\sqrt{z} - b}{2\sqrt{p+c(\nu-2s)}}\right)}{(p+c(\nu-2s))^{3/2}} + \frac{b\, e^{-\frac{b^2}{4(p+c(\nu-2s))} - i\pi} \sqrt{\pi} \operatorname{erfi}\left(\frac{b+2(p+c(\nu-2s))\sqrt{z}}{2\sqrt{p+c(\nu-2s)}}\right)}{(p+c(\nu-2s))^{3/2}} + \right.$$

$$\frac{b\, e^{-\frac{b^2}{4(p-c(\nu-2s))}} \sqrt{\pi} \operatorname{erfi}\left(\frac{2(c(\nu-2s)-p)\sqrt{z} - b}{2\sqrt{p-c(\nu-2s)}}\right)}{(p-c(\nu-2s))^{3/2}} + \frac{b\, e^{-\frac{b^2}{4(p-c(\nu-2s))}} \sqrt{\pi} \operatorname{erfi}\left(\frac{b+2(c(\nu-2s)-p)\sqrt{z}}{2\sqrt{p-c(\nu-2s)}}\right)}{(p-c(\nu-2s))^{3/2}} +$$

$$\left. \frac{8\, e^{p z} \sinh\left(b\sqrt{z}\right) (p \cosh(c(2s-\nu)z) + c(\nu-2s)\sinh(c(2s-\nu)z))}{(p+2cs-c\nu)(p+c(\nu-2s))} \right) /;\ \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving $e^{p z} \sinh(b z) \cosh^{\nu}\left(c z^r\right)$

01.20.21.4618.01

$$\int e^{p z} \sinh(b z) \cosh^{\nu}\left(c z^2\right) dz == \frac{i\, 2^{-\nu}\, e^{p z}\, (1 - \nu \bmod 2)\, (i\, b \cosh(b z) - i\, p \sinh(b z))}{(p - b)\, (b + p)} \binom{\nu}{\frac{\nu}{2}} -$$

$$\frac{i\, 2^{-\nu-2} \sqrt{\pi}}{c} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{\nu - 2 s} \left(\binom{\nu}{s} \left(e^{\frac{(p-b)^2 + 2 c i \pi (\nu - 2 s)}{4 c (\nu - 2 s)}} \sqrt{-c (\nu - 2 s)}\ \operatorname{erfi}\left(\frac{-b + p - 2 c (\nu - 2 s) z}{2 \sqrt{-c (\nu - 2 s)}} \right) + \right.\right.$$

$$e^{\frac{(b+p)^2 - 2 i c \pi (\nu - 2 s)}{4 c (\nu - 2 s)}} \sqrt{-c (\nu - 2 s)}\ \operatorname{erfi}\left(\frac{b + p - 2 c (\nu - 2 s) z}{2 \sqrt{-c (\nu - 2 s)}} \right) - e^{-\frac{(p-b)^2 - 2 i c \pi (\nu - 2 s)}{4 c (\nu - 2 s)}} \sqrt{c (\nu - 2 s)}$$

$$\left.\left. \operatorname{erfi}\left(\frac{-b + p + 2 c (\nu - 2 s) z}{2 \sqrt{c (\nu - 2 s)}} \right) - e^{-\frac{(b+p)^2 + 2 c i \pi (\nu - 2 s)}{4 c (\nu - 2 s)}} \sqrt{c (\nu - 2 s)}\ \operatorname{erfi}\left(\frac{b + p + 2 c (\nu - 2 s) z}{2 \sqrt{c (\nu - 2 s)}} \right) \right) \right) /;\ \nu \in \mathbb{N}^+$$

01.20.21.4619.01

$$\int e^{p z} \sinh(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz == 2^{-\nu-1} \left(\frac{e^{(b+p) z}}{b + p} - \frac{e^{(p-b) z}}{p - b} \right) \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) +$$

$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(- \frac{4\, e^{(p-b) z} \cosh\left(c (2 s - \nu) \sqrt{z}\right)}{p - b} + \frac{4\, e^{(b+p) z} \cosh\left(c (2 s - \nu) \sqrt{z}\right)}{b + p} + \right.$$

$$\frac{c\, e^{-\frac{c^2 (\nu - 2 s)^2}{4 (p-b)} - i \pi} \sqrt{\pi}\ (\nu - 2 s) \operatorname{erfi}\left(\frac{2 (p-b) \sqrt{z} - c (\nu - 2 s)}{2 \sqrt{p-b}} \right)}{(p - b)^{3/2}} + \frac{c\, e^{-\frac{(c\nu - 2 c s)^2}{4 (b+p)}} \sqrt{\pi}\ (2 s - \nu) \operatorname{erfi}\left(\frac{2 (b+p) \sqrt{z} - c (2 s - \nu)}{2 \sqrt{b+p}} \right)}{(b + p)^{3/2}} -$$

$$\left. \frac{c\, e^{-\frac{(c\nu - 2 c s)^2}{4 (p-b)}} \sqrt{\pi}\ (2 s - \nu) \operatorname{erfi}\left(\frac{2 (p-b) \sqrt{z} - c (2 s - \nu)}{2 \sqrt{p-b}} \right)}{(p - b)^{3/2}} - \frac{c\, e^{i \pi - \frac{(2 c s - c \nu)^2}{4 (b+p)}} \sqrt{\pi}\ (\nu - 2 s) \operatorname{erfi}\left(\frac{2 (b+p) \sqrt{z} - c (\nu - 2 s)}{2 \sqrt{b+p}} \right)}{(b + p)^{3/2}} \right) /;\ \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \sinh(b z) \cosh^{\nu}\left(c z^r\right)$

01.20.21.4620.01

$$\int e^{p z^2} \sinh(b z) \cosh^{\nu}\left(c z^2\right) dz == \frac{i 2^{-\nu-2} \sqrt{\pi} \binom{\nu}{\frac{\nu}{2}} \left(e^{-\frac{b^2-2 i \pi p}{4 p}} \operatorname{erfi}\left(\frac{2 p z-b}{2 \sqrt{p}}\right)+e^{-\frac{b^2+2 i \pi p}{4 p}} \operatorname{erfi}\left(\frac{b+2 p z}{2 \sqrt{p}}\right)\right)(1-\nu \bmod 2)}{\sqrt{p}} +$$

$$2^{-\nu-2} i \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\left(e^{-\frac{b^2-2 i \pi (p+c (\nu-2 s))}{4 (p+c (\nu-2 s))}} \sqrt{p+c (\nu-2 s)}\ (p-c (\nu-2 s)) \operatorname{erfi}\left(\frac{2 (p+c (\nu-2 s)) z-b}{2 \sqrt{p+c (\nu-2 s)}}\right)+e^{-\frac{b^2+2 i \pi (p-c (\nu-2 s))}{4 (p-c (\nu-2 s))}}\right.\right.$$

$$\left.(p+c (\nu-2 s)) \sqrt{p-c (\nu-2 s)}\ \operatorname{erfi}\left(\frac{b+2 p z-2 c (\nu-2 s) z}{2 \sqrt{p-c (\nu-2 s)}}\right)\right) \Big/ ((p-c (\nu-2 s)) (p+c (\nu-2 s))) +$$

$$\left(e^{-\frac{b^2+2 i \pi (p+c (\nu-2 s))}{4 (p+c (\nu-2 s))}} \sqrt{p+c (\nu-2 s)}\ (p-c (\nu-2 s)) \operatorname{erfi}\left(\frac{b+2 (p+c (\nu-2 s)) z}{2 \sqrt{p+c (\nu-2 s)}}\right)+e^{-\frac{b^2-2 i \pi (p-c (\nu-2 s))}{4 (p-c (\nu-2 s))}} (p+c (\nu-2 s))\right.$$

$$\left.\left.\sqrt{p-c (\nu-2 s)}\ \operatorname{erfi}\left(\frac{-b+2 p z-2 c (\nu-2 s) z}{2 \sqrt{p-c (\nu-2 s)}}\right)\right) \Big/ ((p-c (\nu-2 s)) (p+c (\nu-2 s)))\right) /; \nu \in \mathbb{Z} \wedge \nu > 0$$

01.20.21.4621.01

$$\int e^{p \sqrt{z}} \sinh(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-1} \left(\frac{2 e^{p \sqrt{z}} \cosh(b z)}{b}+\frac{e^{\frac{p^2}{4 b}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p-2 b \sqrt{z}}{2 \sqrt{-b}}\right)}{2 (-b)^{3/2}}-\frac{e^{-\frac{p^2}{4 b}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{2 \sqrt{z}\ b+p}{2 \sqrt{b}}\right)}{2 b^{3/2}}\right) \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) +$$

$$2^{-\nu-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{e^{b z} \left(e^{(p-c (\nu-2 s)) \sqrt{z}}+e^{(p+c (\nu-2 s)) \sqrt{z}}\right) \left(1+e^{-2 b z}\right)}{b}+\frac{e^{\frac{(p+c (\nu-2 s))^2}{4 b}} \sqrt{\pi}\ (p+c (\nu-2 s)) \operatorname{erfi}\left(\frac{-2 \sqrt{z}\ b+p+c (\nu-2 s)}{2 \sqrt{-b}}\right)}{2 (-b)^{3/2}}+\right.$$

$$\frac{e^{\frac{(p-c (\nu-2 s))^2}{4 b}} \sqrt{\pi}\ (p-c (\nu-2 s)) \operatorname{erfi}\left(\frac{-2 \sqrt{z}\ b+p-c (\nu-2 s)}{2 \sqrt{-b}}\right)}{2 (-b)^{3/2}}-\frac{e^{-\frac{(p+c (\nu-2 s))^2}{4 b}} \sqrt{\pi}\ (p+c (\nu-2 s)) \operatorname{erfi}\left(\frac{2 \sqrt{z}\ b+p+c (\nu-2 s)}{2 \sqrt{b}}\right)}{2 b^{3/2}}-$$

$$\left.\frac{e^{-\frac{(p-c (\nu-2 s))^2}{4 b}} \sqrt{\pi}\ (p-c (\nu-2 s)) \operatorname{erfi}\left(\frac{2 \sqrt{z}\ b+p-c (\nu-2 s)}{2 \sqrt{b}}\right)}{2 b^{3/2}}\right) /; \nu \in \mathbb{N}^+$$

Involving $e^{p z} \sinh\left(b z^r\right) \cosh^{\nu}\left(c z^r\right)$

01.20.21.4622.01

$$\int e^{p z} \sinh\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$i\, 2^{-\nu-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\left(e^{-\frac{p^2-2 i \pi (c (\nu-2 s)-b)}{4 (c (\nu-2 s)-b)}} \sqrt{c (\nu-2 s)-b}\ (b-c (\nu-2 s)) \operatorname{erfi}\left(\frac{p+2 (c (\nu-2 s)-b) z}{2 \sqrt{c (\nu-2 s)-b}} \right) + e^{-\frac{p^2+2 i \pi (b-c (\nu-2 s))}{4 (b-c (\nu-2 s))}} \right.\right.$$
$$\left.\left. (c (\nu-2 s)-b) \sqrt{b-c (\nu-2 s)}\ \operatorname{erfi}\left(\frac{p-2 (c (\nu-2 s)-b) z}{2 \sqrt{b-c (\nu-2 s)}} \right) \right) \Big/ ((b-c (\nu-2 s)) (c (\nu-2 s)-b)) + \right.$$
$$\left(e^{-\frac{p^2+2 i \pi (b+c (\nu-2 s))}{4 (b+c (\nu-2 s))}} \sqrt{b+c (\nu-2 s)}\ (-b-c (\nu-2 s)) \operatorname{erfi}\left(\frac{p+2 (b+c (\nu-2 s)) z}{2 \sqrt{b+c (\nu-2 s)}} \right) + e^{-\frac{p^2-2 i \pi (-b-c (\nu-2 s))}{4 (-b-c (\nu-2 s))}} \right.$$
$$\left.\left. (b+c (\nu-2 s)) \sqrt{-b-c (\nu-2 s)}\ \operatorname{erfi}\left(\frac{p-2 (b+c (\nu-2 s)) z}{2 \sqrt{-b-c (\nu-2 s)}} \right) \right) \Big/ ((-b-c (\nu-2 s)) (b+c (\nu-2 s))) \right) -$$
$$\frac{i\, 2^{-\nu-2} \sqrt{\pi}}{b} \binom{\nu}{\frac{\nu}{2}} \left(\sqrt{-b}\ e^{\frac{p^2+2 \pi i b}{4 b}} \operatorname{erfi}\left(\frac{p-2 b z}{2 \sqrt{-b}} \right) - \sqrt{b}\ e^{-\frac{p^2+2 \pi i b}{4 b}} \operatorname{erfi}\left(\frac{p+2 b z}{2 \sqrt{b}} \right) \right) (1-\nu \bmod 2) \text{ /; } \nu \in \mathbb{N}^+$$

01.20.21.4623.01

$$\int e^{p z} \sinh\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(\frac{4 e^{p z} \sinh\left(b \sqrt{z}\right)}{p} - \frac{b e^{-\frac{b^2}{4 p}} \sqrt{\pi} \left(\operatorname{erfi}\left(\frac{2 p \sqrt{z}-b}{2 \sqrt{p}} \right) + \operatorname{erfi}\left(\frac{b+2 p \sqrt{z}}{2 \sqrt{p}} \right) \right)}{p^{3/2}} \right) -$$
$$2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(-\frac{1}{p^{3/2}} \left(e^{-\frac{(b+c (\nu-2 s))^2}{4 p}} \sqrt{\pi}\ (b+c (\nu-2 s)) \left(\operatorname{erfi}\left(\frac{b-2 c s+c \nu-2 p \sqrt{z}}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{b-2 c s+c \nu+2 p \sqrt{z}}{2 \sqrt{p}} \right) \right) \right) - \right.$$
$$\frac{1}{p^{3/2}} \left(e^{-\frac{(b+2 c s-c \nu)^2}{4 p}} \sqrt{\pi}\ (b+2 c s-c \nu) \left(\operatorname{erfi}\left(\frac{b+2 c s-c \nu-2 p \sqrt{z}}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{b+2 c s-c \nu+2 p \sqrt{z}}{2 \sqrt{p}} \right) \right) \right) -$$
$$\left. \frac{4 e^{p z} \left(\sinh\left((b+2 c s-c \nu) \sqrt{z} \right) + \sinh\left((b+c (\nu-2 s)) \sqrt{z} \right) \right)}{p} \right) \text{ /; } \nu \in \mathbb{N}^+$$

Involving $e^{p z^r} \sinh\left(b z^r\right) \cosh^{\nu}\left(c z^r\right)$

01.20.21.4624.01

$$\int e^{p z^r} \sinh(b z^r) \cosh^v(c z^r)\, dz ==$$

$$\frac{2^{-v-1} z}{r}\left(\binom{v}{\frac{v}{2}}\left(((-b-p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (-b-p) z^r\right) - ((b-p) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (b-p) z^r\right)\right)(v \bmod 2 - 1) + \right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\Gamma\left(\frac{1}{r}, (-b-p-2cs+cv) z^r\right)((-b-p-2cs+cv) z^r)^{-1/r} + \right.$$

$$((b-p-2cs+cv) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (b-p-2cs+cv) z^r\right) - ((-b-p+2cs-cv) z^r)^{-1/r}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{r}, (-b-p+2cs-cv) z^r\right) + ((b-p+2cs-cv) z^r)^{-1/r}\,\Gamma\left(\frac{1}{r}, (b-p+2cs-cv) z^r\right)\right)\right) /; v \in \mathbb{N}^+$$

01.20.21.4625.01

$$\int e^{p z^2} \sinh\left(b z^2\right) \cosh^v\left(c z^2\right) dz ==$$

$$2^{-v-2}\sqrt{\pi}\binom{v}{\frac{v}{2}}\left(\frac{\operatorname{erfi}\left(\sqrt{b+p}\ z\right)}{\sqrt{b+p}} - \frac{\operatorname{erfi}\left(\sqrt{p-b}\ z\right)}{\sqrt{p-b}}\right)(1 - v \bmod 2) - 2^{-v-2}\sqrt{\pi}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{\operatorname{erfi}\left(\sqrt{-b+p-2cs+cv}\ z\right)}{\sqrt{-b+p-2cs+cv}} + \right.$$

$$\left.\frac{\operatorname{erfi}\left(\sqrt{-b+p+2cs-cv}\ z\right)}{\sqrt{-b+p+2cs-cv}} - \frac{\operatorname{erfi}\left(\sqrt{b+p-2cs+cv}\ z\right)}{\sqrt{b+p-2cs+cv}} - \frac{\operatorname{erfi}\left(\sqrt{b+p+2cs-cv}\ z\right)}{\sqrt{b+p+2cs-cv}}\right) /; v \in \mathbb{N}^+$$

01.20.21.4626.01

$$\int e^{p\sqrt{z}} \sinh\left(b\sqrt{z}\right) \cosh^v\left(c\sqrt{z}\right) dz == \frac{1}{\left(p^2-b^2\right)^2}\left(-2^{1-v} e^{p\sqrt{z}}\binom{v}{\frac{v}{2}}(1 - v \bmod 2)\right.$$

$$\left.\left(b\left(-\sqrt{z}\ b^2 - 2p + p^2\sqrt{z}\right)\cosh\left(b\sqrt{z}\right) - \left(p^2\left(p\sqrt{z}-1\right) - b^2\left(\sqrt{z}\ p+1\right)\right)\sinh\left(b\sqrt{z}\right)\right) - 2^{1-v} e^{p\sqrt{z}}\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\left(p^2-(-b-2cs+cv)^2\right)^2}\left(\left(p^2\left(p\sqrt{z}-1\right) - (-b-2cs+cv)^2\left(\sqrt{z}\ p+1\right)\right)\sinh\left((-b-2cs+cv)\sqrt{z}\right) - \right.\right.$$

$$(-b-2cs+cv)\left(\sqrt{z}\ p^2 - 2p - (-b-2cs+cv)^2\sqrt{z}\right)\cosh\left((-b-2cs+cv)\sqrt{z}\right)\Big) +$$

$$\frac{1}{\left(p^2-(-b+2cs-cv)^2\right)^2}\left(\left(p^2\left(p\sqrt{z}-1\right) - (-b+2cs-cv)^2\left(\sqrt{z}\ p+1\right)\right)\sinh\left((-b+2cs-cv)\sqrt{z}\right) - \right.$$

$$\left.\left.\left.(-b+2cs-cv)\left(\sqrt{z}\ p^2 - 2p - (-b+2cs-cv)^2\sqrt{z}\right)\cosh\left((-b+2cs-cv)\sqrt{z}\right)\right)\right) /; v \in \mathbb{N}^+$$

Involving $e^{b z^r+e} \sinh\left(a z^r+q\right) \cosh^v\left(c z^r+g\right)$

01.20.21.4627.01

$$\int e^{b z^r+e} \sinh(a z^r+q) \cosh^v(c z^r+g)\, dz == -\frac{i\, 2^{-v-1} z}{r}\left(\binom{v}{\frac{v}{2}}\left(e^{e+q-\frac{i\pi}{2}} \Gamma\left(\frac{1}{r}, (-a-b) z^r\right)((-a-b) z^r)^{-1/r} + e^{e-q+\frac{i\pi}{2}} ((a-b) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (a-b) z^r\right)\right)(1-v \bmod 2) + \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e+q+2 g s-g v-\frac{i\pi}{2}} \Gamma\left(\frac{1}{r}, (-a-b-2 c s+c v) z^r\right)((-a-b-2 c s+c v) z^r)^{-1/r} + e^{e-q+2 g s-g v+\frac{i\pi}{2}} ((a-b-2 c s+c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (a-b-2 c s+c v) z^r\right) + e^{e+q-2 g s+g v-\frac{i\pi}{2}} ((-a-b+2 c s-c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-a-b+2 c s-c v) z^r\right) + e^{e-q-2 g s+g v+\frac{i\pi}{2}} ((a-b+2 c s-c v) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (a-b+2 c s-c v) z^r\right)\right)\right) /; v \in \mathbb{N}^+$$

01.20.21.4628.01

$$\int e^{b z^2+e} \sinh\left(a z^2+q\right) \cosh^v\left(c z^2+g\right) dz == 2^{-v-2} e^{e-q} \sqrt{\pi}\, \binom{v}{\frac{v}{2}}\left(\frac{e^{2 q} \operatorname{erfi}\left(\sqrt{a+b}\, z\right)}{\sqrt{a+b}} - \frac{\operatorname{erfi}\left(\sqrt{b-a}\, z\right)}{\sqrt{b-a}}\right)(1-v \bmod 2) - i\, 2^{-v-2} \sqrt{\pi} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{e^{e-q+g (v-2 s)-\frac{i\pi}{2}} \operatorname{erfi}\left(\sqrt{-a+b+c (v-2 s)}\, z\right)}{\sqrt{-a+b+c (v-2 s)}} + \frac{e^{e+q+g (v-2 s)+\frac{i\pi}{2}} \operatorname{erfi}\left(\sqrt{a+b+c (v-2 s)}\, z\right)}{\sqrt{a+b+c (v-2 s)}} + \frac{e^{e-q-g (v-2 s)-\frac{i\pi}{2}} \operatorname{erfi}\left(\sqrt{-a+b-c (v-2 s)}\, z\right)}{\sqrt{-a+b-c (v-2 s)}} + \frac{e^{e+q-g (v-2 s)+\frac{i\pi}{2}} \operatorname{erfi}\left(\sqrt{a+b-c (v-2 s)}\, z\right)}{\sqrt{a+b-c (v-2 s)}}\right) /; v \in \mathbb{N}^+$$

01.20.21.4629.01

$$\int e^{\sqrt{z}\, b+e} \sinh\left(\sqrt{z}\, a+q\right) \cosh^v\left(\sqrt{z}\, c+g\right) dz == 2^{-v}\left(\frac{e^{\sqrt{z}\, (a+b)+e+q}\left((a+b)\sqrt{z}-1\right)}{(a+b)^2} - \frac{e^{\sqrt{z}\, (b-a)+e-q}\left((b-a)\sqrt{z}-1\right)}{(b-a)^2}\right)\binom{v}{\frac{v}{2}}(1-v \bmod 2) + 2^{-v} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\frac{e^{e+q+g (v-2 s)+(a+b+c (v-2 s))\sqrt{z}}\left((a+b+c (v-2 s))\sqrt{z}-1\right)}{(a+b+c (v-2 s))^2} - \frac{e^{e-q-g (v-2 s)+(-a+b-c (v-2 s))\sqrt{z}}\left((-a+b-c (v-2 s))\sqrt{z}-1\right)}{(-a+b-c (v-2 s))^2} + \frac{e^{e+q-g (v-2 s)+(a+b-c (v-2 s))\sqrt{z}}\left((a+b-c (v-2 s))\sqrt{z}-1\right)}{(a+b-c (v-2 s))^2} - \frac{e^{e-q+g (v-2 s)+(-a+b+c (v-2 s))\sqrt{z}}\left((-a+b+c (v-2 s))\sqrt{z}-1\right)}{(-a+b+c (v-2 s))^2}\right)\binom{v}{s} /; v \in \mathbb{N}^+$$

Involving $e^{b z^r+d z+e} \sinh(a z^r+p z+q) \cosh^v(c z^r+f z+g)$

01.20.21.4630.01

$$\int e^{b z^2+d z+e} \sinh\left(a z^2+p z+q\right) \cosh^v\left(c z^2+f z+g\right) dz ==$$

$$\frac{i\, 2^{-v-2} \sqrt{\pi}}{(b-a)(a+b)} \binom{v}{\frac{v}{2}} \left(\sqrt{b-a}\ (a+b)\, e^{-\frac{(d-p)^2-4(b-a)\left(e-q+\frac{i\pi}{2}\right)}{4(b-a)}} \operatorname{erfi}\left(\frac{d-p-2az+2bz}{2\sqrt{b-a}}\right) + \right.$$

$$(b-a)\sqrt{a+b}\ e^{-\frac{(d+p)^2-4(a+b)\left(e+q-\frac{i\pi}{2}\right)}{4(a+b)}} \operatorname{erfi}\left(\frac{d+p+2(a+b)z}{2\sqrt{a+b}}\right) \Bigg) (1-v \bmod 2) +$$

$$2^{-v-2}\, i \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{(d-p+f(v-2s))^2-4(-a+b+c(v-2s))\left(e-q+g(v-2s)+\frac{i\pi}{2}\right)}{4(-a+b+c(v-2s))}} \sqrt{-a+b+c(v-2s)}\ (a+b-c(v-2s)) \right.\right.$$

$$\operatorname{erfi}\left(\frac{d-p+f(v-2s)+2(-a+b+c(v-2s))z}{2\sqrt{-a+b+c(v-2s)}}\right) + e^{-\frac{(d+p-f(v-2s))^2-4(a+b-c(v-2s))\left(e+q-g(v-2s)-\frac{i\pi}{2}\right)}{4(a+b-c(v-2s))}}$$

$$\left.\left. (-a+b+c(v-2s)) \sqrt{a+b-c(v-2s)}\ \operatorname{erfi}\left(\frac{d+p-f(v-2s)+2bz-2(c(v-2s)-a)z}{2\sqrt{a+b-c(v-2s)}}\right) \right) \Big/ \right.$$

$$\left. ((a+b-c(v-2s))(-a+b+c(v-2s))) + \left(e^{-\frac{(d+p+f(v-2s))^2-4(a+b+c(v-2s))\left(e+q+g(v-2s)-\frac{i\pi}{2}\right)}{4(a+b+c(v-2s))}} \right.\right.$$

$$\sqrt{a+b+c(v-2s)}\ (-a+b-c(v-2s)) \operatorname{erfi}\left(\frac{d+p+f(v-2s)+2(a+b+c(v-2s))z}{2\sqrt{a+b+c(v-2s)}}\right) +$$

$$e^{-\frac{(d-p-f(v-2s))^2-4(-a+b-c(v-2s))\left(e-q-g(v-2s)+\frac{i\pi}{2}\right)}{4(-a+b-c(v-2s))}} (a+b+c(v-2s)) \sqrt{-a+b-c(v-2s)}\ \operatorname{erfi}\left(\right.$$

$$\left.\left.\left. \frac{d-p-f(v-2s)+2bz-2(a+c(v-2s))z}{2\sqrt{-a+b-c(v-2s)}} \right) \right) \Big/ ((-a+b-c(v-2s))(a+b+c(v-2s))) \right) /;\ v \in \mathbb{N}^+$$

01.20.21.4631.01

$$\int e^{\sqrt{z}\,b+d\,z+e}\sinh\left(\sqrt{z}\,a+p\,z+q\right)\cosh^{\nu}\left(\sqrt{z}\,c+f\,z+g\right)dz =$$

$$2^{-\nu-2}\,e^{e-q+\frac{i\pi}{2}}\,i\left(\sqrt{\pi}\left(-\frac{(b-a)\,e^{-\frac{(b-a)^2}{4(d-p)}}\operatorname{erfi}\left(\frac{-a+b+2(d-p)\sqrt{z}}{2\sqrt{d-p}}\right)}{(d-p)^{3/2}}-\frac{(a+b)\,e^{-\frac{(a+b)^2}{4(d+p)}+2q-i\pi}\operatorname{erfi}\left(\frac{a+b+2(d+p)\sqrt{z}}{2\sqrt{d+p}}\right)}{(d+p)^{3/2}}\right)+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\,(b-a)+(d-p)z}}{d-p}-\frac{2\,e^{\sqrt{z}\,(a+b)+2q+(d+p)z}}{d+p}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-2}\,i\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+q-g(\nu-2s)-\frac{i\pi}{2}}\left(-\frac{2\,e^{-2q+2g(\nu-2s)+(d-p+f(\nu-2s))z+(-a+b+c(\nu-2s))\sqrt{z}}}{d-p-2fs+f\nu}-\right.\right.$$

$$\frac{1}{(d-p-2fs+f\nu)^{3/2}}\left(e^{-\frac{(-a+b-2cs+c\nu)^2}{4(d-p-2fs+f\nu)}-2q+2g(\nu-2s)+i\pi}\sqrt{\pi}\,(-a+b-2cs+c\nu)\right.$$

$$\left.\operatorname{erfi}\left(\frac{-a+b+c(\nu-2s)+2(d-p-2fs+f\nu)\sqrt{z}}{2\sqrt{d-p-2fs+f\nu}}\right)\right)+\frac{2\,e^{\sqrt{z}\,(a+b+2cs-c\nu)+(d+p+2fs-f\nu)z}}{d+p+2fs-f\nu}-$$

$$\left.\left(e^{-\frac{(a+b+2cs-c\nu)^2}{4(d+p+2fs-f\nu)}}\sqrt{\pi}\,(a+b+2cs-c\nu)\operatorname{erfi}\left(\frac{a+b+c(2s-\nu)+2(d+p+2fs-f\nu)\sqrt{z}}{2\sqrt{d+p+2fs-f\nu}}\right)\right)\Big/\right.$$

$$\left.(d+p+2fs-f\nu)^{3/2}\right)+e^{e-q-g(\nu-2s)+\frac{i\pi}{2}}$$

$$\left(-\frac{2\,e^{2q+2g(\nu-2s)+(d+p+f(\nu-2s))z+(a+b+c(\nu-2s))\sqrt{z}}}{d+p-2fs+f\nu}-\frac{1}{(d+p-2fs+f\nu)^{3/2}}\left(e^{-\frac{(a+b+c(\nu-2s))^2}{4(d+p-2fs+f\nu)}+2q+2g(\nu-2s)-i\pi}\right.\right.$$

$$\left.\sqrt{\pi}\,(a+b+c(\nu-2s))\operatorname{erfi}\left(\frac{a+b+c(\nu-2s)+2(d+p-2fs+f\nu)\sqrt{z}}{2\sqrt{d+p-2fs+f\nu}}\right)\right)+$$

$$\frac{2\,e^{\sqrt{z}\,(-a+b+2cs-c\nu)+(d-p+2fs-f\nu)z}}{d-p+2fs-f\nu}-\left(e^{-\frac{(-a+b+2cs-c\nu)^2}{4(d-p+2fs-f\nu)}}\sqrt{\pi}\,(-a+b+2cs-c\nu)\right.$$

$$\left.\left.\left.\operatorname{erfi}\left(\frac{-a+b+c(2s-\nu)+2(d-p+2fs-f\nu)\sqrt{z}}{2\sqrt{d-p+2fs-f\nu}}\right)\right)\Big/(d-p+2fs-f\nu)^{3/2}\right)\right);\ \nu\in\mathbb{N}^{+}$$

Involving sinh and rational functions of exp

Involving $\sinh(e\,z)\cosh^{v}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.4632.01

$$\int \frac{\sinh(e\,z)\cosh^{v}(c\,z)}{\left(a+b\,e^{d\,z}\right)^{n}}\,dz == \frac{2^{-v-1}\,a^{-n}\,(1-v \bmod 2)}{e}\binom{v}{\frac{v}{2}}\left(e^{e\,z}\,{}_2F_1\left(\frac{e}{d},\,n;\,\frac{d+e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+e^{-e\,z}\,{}_2F_1\left(-\frac{e}{d},\,n;\,\frac{d-e}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)-$$

$$2^{-v-1}\,a^{-n}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{-e-2\,c\,s+c\,v}\left(e^{(-e-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{-e-2\,c\,s+c\,v}{d},\,n;\,\frac{d-e-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.e^{(e+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{e+2\,c\,s-c\,v}{d},\,n;\,\frac{d+e+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)+$$

$$\frac{1}{-e+2\,c\,s-c\,v}\left(e^{(e-2\,c\,s+c\,v)\,z}\,{}_2F_1\left(\frac{e-2\,c\,s+c\,v}{d},\,n;\,\frac{d+e-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.$$

$$\left.\left.e^{(-e+2\,c\,s-c\,v)\,z}\,{}_2F_1\left(\frac{-e+2\,c\,s-c\,v}{d},\,n;\,\frac{d-e+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right)\Big/;\,n\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving $e^{p\,z}\sinh(e\,z)\cosh^{v}(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.4633.01

$$\int \frac{e^{p\,z}\sinh(e\,z)\cosh^{v}(c\,z)}{\left(a+b\,e^{d\,z}\right)^{n}}\,dz == \frac{1}{(e-p)\,(e+p)}$$

$$\left(2^{-v-1}\,a^{-n}\binom{v}{\frac{v}{2}}\left(e^{(p-e)\,z}\,(e+p)\,{}_2F_1\left(\frac{p-e}{d},\,n;\,\frac{d-e+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+e^{(e+p)\,z}\,(e-p)\,{}_2F_1\left(\frac{e+p}{d},\,n;\,\frac{d+e+p}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\right.$$

$$\left.(1-v \bmod 2)\right)-$$

$$2^{-v-1}\,a^{-n}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(e^{(-e+p-2\,c\,s+c\,v)\,z}\,(-e-p-2\,c\,s+c\,v)\,{}_2F_1\left(\frac{-e+p-2\,c\,s+c\,v}{d},\,n;\,\frac{d-e+p-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.\right.$$

$$\left.e^{(e+p+2\,c\,s-c\,v)\,z}\,(-e+p-2\,c\,s+c\,v)\,{}_2F_1\left(\frac{e+p+2\,c\,s-c\,v}{d},\,n;\,\frac{d+e+p+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$

$$((-e-p-2\,c\,s+c\,v)\,(-e+p-2\,c\,s+c\,v))+$$

$$\left(e^{(e+p-2\,c\,s+c\,v)\,z}\,(-e+p+2\,c\,s-c\,v)\,{}_2F_1\left(\frac{e+p-2\,c\,s+c\,v}{d},\,n;\,\frac{d+e+p-2\,c\,s+c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)+\right.$$

$$\left.e^{(-e+p+2\,c\,s-c\,v)\,z}\,(-e-p+2\,c\,s-c\,v)\,{}_2F_1\left(\frac{-e+p+2\,c\,s-c\,v}{d},\,n;\,\frac{d-e+p+2\,c\,s-c\,v}{d};\,-\frac{b\,e^{d\,z}}{a}\right)\right)\Big/$$

$$\left.((-e-p+2\,c\,s-c\,v)\,(-e+p+2\,c\,s-c\,v))\right)/;\,n\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving sinh and algebraic functions of exp

Involving $(a + b\, e^{d z})^{\beta} \sinh(e z) \cosh^{\nu}(c z)$

01.20.21.4634.01

$$\int (a + b\, e^{d z})^{\beta} \sinh(e z) \cosh^{\nu}(c z)\, dz ==$$

$$\frac{1}{e}\left(2^{-\nu-1} (a + b\, e^{d z})^{\beta} \left(\frac{e^{d z} b}{a} + 1\right)^{-\beta} \binom{\nu}{\frac{\nu}{2}} \left(e^{e z}\, {}_2F_1\left(\frac{e}{d}, -\beta; \frac{d+e}{d}; -\frac{b\, e^{d z}}{a}\right) + e^{-e z}\, {}_2F_1\left(-\frac{e}{d}, -\beta; \frac{d-e}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\right.$$

$$\left.(1 - \nu \bmod 2)\right) - 2^{-\nu-1} (a + b\, e^{d z})^{\beta} \left(\frac{e^{d z} b}{a} + 1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{-e - 2 c s + c \nu} \left(e^{(-e-2 c s+c \nu) z}\, {}_2F_1\left(\frac{-e - 2 c s + c \nu}{d}, -\beta; \frac{d - e - 2 c s + c \nu}{d}; -\frac{b\, e^{d z}}{a}\right) + \right.\right.$$

$$\left. e^{(e+2 c s-c \nu) z}\, {}_2F_1\left(\frac{e + 2 c s - c \nu}{d}, -\beta; \frac{d + e + 2 c s - c \nu}{d}; -\frac{b\, e^{d z}}{a}\right)\right) +$$

$$\frac{1}{-e + 2 c s - c \nu} \left(e^{(e-2 c s+c \nu) z}\, {}_2F_1\left(\frac{e - 2 c s + c \nu}{d}, -\beta; \frac{d + e - 2 c s + c \nu}{d}; -\frac{b\, e^{d z}}{a}\right) + \right.$$

$$\left.\left. e^{(-e+2 c s-c \nu) z}\, {}_2F_1\left(\frac{-e + 2 c s - c \nu}{d}, -\beta; \frac{d - e + 2 c s - c \nu}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\right) /; \nu \in \mathbb{N}^{+}$$

Involving $e^{p z} (a + b\, e^{d z})^{\beta} \sinh(e z) \cosh^{\nu}(c z)$

01.20.21.4635.01

$$\int e^{p z} \left(a + b\, e^{d z}\right)^{\beta} \sinh(e z) \cosh^{\nu}(c z)\, dz ==$$

$$\frac{1}{(e-p)(e+p)}\left(2^{-\nu-1}\left(a + b\, e^{d z}\right)^{\beta}\left(\frac{e^{d z} b}{a} + 1\right)^{-\beta}\binom{\nu}{\frac{\nu}{2}}\left(e^{(p-e) z}(e+p)\, {}_2F_1\left(\frac{p-e}{d}, -\beta; \frac{d-e+p}{d}; -\frac{b\, e^{d z}}{a}\right) + e^{(e+p) z}(e-p)\, {}_2F_1\left(\frac{e+p}{d}, -\beta; \frac{d+e+p}{d}; -\frac{b\, e^{d z}}{a}\right)\right)(1 - \nu \bmod 2)\right) - 2^{-\nu-1}\left(a + b\, e^{d z}\right)^{\beta}\left(\frac{e^{d z} b}{a} + 1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor}\binom{\nu}{s}\left(\left(e^{(-e+p-2cs+c\nu) z}(-e-p-2cs+c\nu)\, {}_2F_1\left(\frac{-e+p-2cs+c\nu}{d}, -\beta; \frac{d-e+p-2cs+c\nu}{d}; -\frac{b\, e^{d z}}{a}\right) + e^{(e+p+2cs-c\nu) z}(-e+p-2cs+c\nu)\, {}_2F_1\left(\frac{e+p+2cs-c\nu}{d}, -\beta; \frac{d+e+p+2cs-c\nu}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\Big/ ((-e-p-2cs+c\nu)(-e+p-2cs+c\nu)) + \left(e^{(e+p-2cs+c\nu) z}(-e+p+2cs-c\nu)\, {}_2F_1\left(\frac{e+p-2cs+c\nu}{d}, -\beta; \frac{d+e+p-2cs+c\nu}{d}; -\frac{b\, e^{d z}}{a}\right) + e^{(-e+p+2cs-c\nu) z}(-e-p+2cs-c\nu)\, {}_2F_1\left(\frac{-e+p+2cs-c\nu}{d}, -\beta; \frac{d-e+p+2cs-c\nu}{d}; -\frac{b\, e^{d z}}{a}\right)\right)\Big/ ((-e-p+2cs-c\nu)(-e+p+2cs-c\nu))\right) /; \nu \in \mathbb{N}^{+}$$

Involving powers of sinh and exp

Involving $e^{p z} \sinh^{\mu}(c z) \cosh^{\nu}(a z)$

01.20.21.4636.01

$$\int e^{b z} \sinh^{\mu}(c z) \cosh^{\nu}(a z)\, dz ==$$

$$2^{-\nu} \sinh^{\mu}(c z)\left(1 - e^{-2 c z}\right)^{-\mu}\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor}\binom{\nu}{s}\left(\frac{e^{(b+a(\nu-2s)) z}}{b + a(\nu-2s) + c\mu}\, {}_2F_1\left(-\frac{b + a(\nu-2s) + c\mu}{2c}, -\mu; 1 - \frac{b + a(\nu-2s) + c\mu}{2c}; e^{-2 c z}\right) + \frac{e^{(b-a(\nu-2s)) z}}{b - a(\nu-2s) + c\mu}\, {}_2F_1\left(-\frac{b - a(\nu-2s) + c\mu}{2c}, -\mu; 1 - \frac{b - a(\nu-2s) + c\mu}{2c}; e^{-2 c z}\right)\right) + \frac{2^{-\nu} e^{b z}\left(1 - e^{-2 c z}\right)^{-\mu}(1 - \nu \bmod 2)\sinh^{\mu}(c z)}{b + c\mu}\binom{\nu}{\frac{\nu}{2}}\, {}_2F_1\left(-\frac{b + c\mu}{2c}, -\mu; 1 - \frac{b + c\mu}{2c}; e^{-2 c z}\right) /; \nu \in \mathbb{N}$$

01.20.21.4637.01

$$\int e^{b z} \sinh^m(c z) \cosh^\nu(a z)\, dz ==$$

$$\frac{i^{-m} 2^{-m} e^{b z} \left(1+e^{2 a z}\right)^{-\nu} \cosh^\nu(a z)\ (1-m \bmod 2)}{b-a \nu} \binom{m}{\frac{m}{2}} {}_2F_1\left(\frac{b-a \nu}{2 a}, -\nu; \frac{b-a \nu}{2 a}+1; -e^{2 a z}\right) + 2^{-m} i^{-m} \left(1+e^{2 a z}\right)^{-\nu}$$

$$\cosh^\nu(a z) \sum_{s=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^{m+s} \binom{m}{s} \left(\frac{e^{(b+c(m-2 s)) z - \frac{i m \pi}{2}}}{b+c(m-2 s)-a \nu} {}_2F_1\left(\frac{b+c(m-2 s)-a \nu}{2 a}, -\nu; \frac{b+c(m-2 s)-a \nu}{2 a}+1; -e^{2 a z}\right) + \right.$$

$$\left. \frac{e^{\frac{i \pi m}{2}+(b-c(m-2 s)) z}}{b-c(m-2 s)-a \nu} {}_2F_1\left(\frac{b-c(m-2 s)-a \nu}{2 a}, -\nu; \frac{b-c(m-2 s)-a \nu}{2 a}+1; -e^{2 a z}\right) \right) /;\ m \in \mathbb{N}$$

01.20.21.4638.01

$$\int e^{p z} \sinh^m(c z) \cosh^\nu(a z)\, dz == 2^{-m-\nu} \left(\frac{i^m e^{p z} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (m \bmod 2-1)(\nu \bmod 2-1)}{p} + \right.$$

$$\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \left(\frac{e^{-c z m+i \pi m+2 c k z+p z}}{-2 c k+c m-p} - \frac{e^{(c(m-2 k)+p) z}}{c(m-2 k)+p} \right) \binom{m}{k} -$$

$$i^m \binom{m}{\frac{m}{2}} (m \bmod 2-1) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\frac{e^{(p+a(\nu-2 s)) z}}{p+a(\nu-2 s)} + \frac{e^{(p+2 a s-a \nu) z}}{p+2 a s-a \nu} \right) \binom{\nu}{s} -$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \left(e^{i m \pi} \left(\frac{e^{(2 c k-c m+p+2 a s-a \nu) z}}{c(m-2 k)-p-2 a s+a \nu} - \frac{e^{(2 c k-c m+p-2 a s+a \nu) z}}{2 c k-c m+p-2 a s+a \nu} \right) + \right.$$

$$\left. \left. \frac{e^{(c(m-2 k)+p+2 a s-a \nu) z}}{2 c k-c m-p-2 a s+a \nu} - \frac{e^{(c(m-2 k)+p+a(\nu-2 s)) z}}{c(m-2 k)+p+a(\nu-2 s)} \right) \binom{m}{k} \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge \nu \in \mathbb{Z} \wedge \nu > 0$$

01.20.21.4639.01

$$\int e^{b z} \sinh^2(a z) \cosh^2(a z)\, dz == \frac{e^{b z} \left(16 a^2-4 b \sinh(4 a z) a-b^2+b^2 \cosh(4 a z)\right)}{8 \left(b^3-16 a^2 b\right)}$$

Involving $e^{p z} \sinh^\mu(c z+d) \cosh^\nu(a z)$

01.20.21.4640.01

$$\int e^{p z} \sinh^{\mu}(d+c z) \cosh^{\nu}(a z)\, dz == 2^{-\nu} \left(1-e^{2(d+c z)}\right)^{-\mu} \sinh^{\mu}(d+c z)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{e^{(p+a(\nu-2s))z}}{p-2as+a\nu-c\mu} {}_2F_1\left(\frac{p-2as+a\nu-c\mu}{2c}, -\mu; \frac{1}{2}\left(\frac{p-2as+a\nu}{c} - \mu + 2 \right); e^{2(d+cz)} \right) + \right.\right.$$

$$\left.\left. \frac{e^{(p+2as-a\nu)z}}{p+2as-a\nu-c\mu} {}_2F_1\left(\frac{p+2as-a\nu-c\mu}{2c}, -\mu; \frac{-\mu c+2c+p+2as-a\nu}{2c}; e^{2(d+cz)} \right) \right) - \right.$$

$$\left. \frac{e^{pz}(\nu \bmod 2 - 1)}{p-c\mu} \binom{\nu}{\frac{\nu}{2}} {}_2F_1\left(\frac{p-c\mu}{2c}, -\mu; \frac{1}{2}\left(\frac{p}{c} - \mu + 2 \right); e^{2(d+cz)} \right) \right) /; \nu \in \mathbb{N}^+$$

01.20.21.4641.01

$$\int e^{p z} \sinh^{m}(d+c z) \cosh^{\nu}(a z)\, dz == \left(\frac{i}{2}\right)^m \cosh^{\nu}(a z)$$

$$\left(-\frac{e^{pz}\left(1+e^{2az}\right)^{-\nu}(m \bmod 2 - 1)}{p-a\nu} \binom{m}{\frac{m}{2}} {}_2F_1\left(\frac{p-a\nu}{2a}, -\nu; \frac{1}{2}\left(\frac{p}{a} - \nu + 2 \right); -e^{2az} \right) + i^{-m}\left(1+e^{-2az}\right)^{-\nu} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{d(m-2k)} \right.$$

$$\left. \binom{m}{k} \left(\frac{e^{4dk+2czk-2dm-cmz+pz+im\pi}}{2ck-cm+p+a\nu} {}_2F_1\left(-\frac{2ck-cm+p+a\nu}{2a}, -\nu; -\frac{2ck-cm+p+a(\nu-2)}{2a}; -e^{-2az} \right) + \right.\right.$$

$$\left.\left. \frac{e^{(c(m-2k)+p)z}}{c(m-2k)+p+a\nu} {}_2F_1\left(-\frac{c(m-2k)+p+a\nu}{2a}, -\nu; -\frac{-2ck+cm+p+a(\nu-2)}{2a}; -e^{-2az} \right) \right) \right) /; m \in \mathbb{N}^+$$

01.20.21.4642.01

$$\int e^{p z} \sinh^{m}(d+c z) \cosh^{\nu}(a z)\, dz == \frac{(i^m 2^{-m-\nu}) e^{pz} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1-m \bmod 2)(1-\nu \bmod 2)}{p} -$$

$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-d(2k+m)} \left(\frac{e^{2dm-(2ck-cm-p)z}}{2ck-cm-p} + \frac{e^{4dk-(-2ck+cm-p)z+im\pi}}{-2ck+cm-p} \right) \binom{m}{k} -$$

$$i^m 2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(\frac{e^{-(-p-a(\nu-2s))z}}{-p-a(\nu-2s)} + \frac{e^{-(-p-2as+a\nu)z}}{-p-2as+a\nu} \right) \binom{\nu}{s} -$$

$$2^{-m-\nu} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-2dk-dm} \left(e^{2dm} \left(\frac{e^{-(2ck-cm-p+2as-a\nu)z}}{2ck-cm-p+2as-a\nu} + \frac{e^{-(2ck-cm-p-2as+a\nu)z}}{2ck-cm-p-2as+a\nu} \right) + \right.$$

$$\left. e^{4dk+im\pi} \left(\frac{e^{-(-2ck+cm-p+2as-a\nu)z}}{-2ck+cm-p+2as-a\nu} + \frac{e^{-(c(m-2k)-p-2as+a\nu)z}}{c(m-2k)-p-2as+a\nu} \right) \right) \binom{m}{k} /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

Involving $e^{p z} \sinh^{\mu}(c z) \cosh^{\nu}(a z+b)$

01.20.21.4643.01

$$\int e^{p z} \sinh^{\mu}(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-\nu} \left(1 - e^{2 c z}\right)^{-\mu} \sinh^{\mu}(c z)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{2 b s - b \nu} \binom{\nu}{s} \left(\frac{e^{2 b (\nu - 2 s) + (p + a (\nu - 2 s)) z}}{p - 2 a s + a \nu - c \mu} \, {}_2F_1\left(\frac{p - 2 a s + a \nu - c \mu}{2 c}, -\mu; \frac{1}{2}\left(\frac{p - 2 a s + a \nu}{c} - \mu + 2 \right); e^{2 c z} \right) + \right.\right.$$

$$\left.\left. \frac{e^{(p + 2 a s - a \nu) z}}{p + 2 a s - a \nu - c \mu} \, {}_2F_1\left(\frac{p + 2 a s - a \nu - c \mu}{2 c}, -\mu; \frac{-\mu c + 2 c + p + 2 a s - a \nu}{2 c}; e^{2 c z} \right) \right) -$$

$$\left. \frac{e^{p z} (\nu \bmod 2 - 1)}{p - c \mu} \binom{\nu}{\frac{\nu}{2}} \, {}_2F_1\left(\frac{p - c \mu}{2 c}, -\mu; \frac{1}{2}\left(\frac{p}{c} - \mu + 2 \right); e^{2 c z} \right) \right) /; \nu \in \mathbb{N}^+$$

01.20.21.4644.01

$$\int e^{p z} \sinh^{m}(c z) \cosh^{\nu}(b + a z)\, dz == \left(\frac{i}{2} \right)^{m} \cosh^{\nu}(b + a z)$$

$$\left(- \frac{e^{p z} \left(1 + e^{2 (b + a z)}\right)^{-\nu} (m \bmod 2 - 1)}{p - a \nu} \binom{m}{\frac{m}{2}} \, {}_2F_1\left(\frac{p - a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{p}{a} - \nu + 2 \right); -e^{2 (b + a z)} \right) + i^{-m} \left(1 + e^{-2 (b + a z)}\right)^{-\nu} \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\frac{e^{2 c z k - c m z + p z + i m \pi}}{2 c k - c m + p + a \nu} \, {}_2F_1\left(- \frac{2 c k - c m + p + a \nu}{2 a}, -\nu; - \frac{2 c k - c m + p + a (\nu - 2)}{2 a}; -e^{-2 (b + a z)} \right) + \right.$$

$$\left.\left. \left. \frac{e^{(c (m - 2 k) + p) z}}{c (m - 2 k) + p + a \nu} \, {}_2F_1\left(- \frac{c (m - 2 k) + p + a \nu}{2 a}, -\nu; - \frac{-2 c k + c m + p + a (\nu - 2)}{2 a}; -e^{-2 (b + a z)} \right) \right) \right) /; m \in \mathbb{N}^+$$

01.20.21.4645.01

$$\int e^{p z} \sinh^{m}(c z) \cosh^{\nu}(b + a z)\, dz == \frac{(i^m \, 2^{-m-\nu}) \, e^{p z} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1 - m \bmod 2) (1 - \nu \bmod 2)}{p} -$$

$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \left(\frac{e^{-(2 c k - c m - p) z}}{2 c k - c m - p} + \frac{e^{i m \pi - (-2 c k + c m - p) z}}{-2 c k + c m - p} \right) \binom{m}{k} -$$

$$i^m \, 2^{-m-\nu} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (2 s + \nu)} \left(\frac{e^{2 b \nu - (-p - a (\nu - 2 s)) z}}{-p - a (\nu - 2 s)} + \frac{e^{4 b s - (-p - 2 a s + a \nu) z}}{-p - 2 a s + a \nu} \right) \binom{\nu}{s} -$$

$$2^{-m-\nu} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \, e^{-2 b s - b \nu} \left((-1)^m \left(\frac{e^{2 b \nu - (-2 c k + c m - p + 2 a s - a \nu) z}}{-2 c k + c m - p + 2 a s - a \nu} + \frac{e^{4 b s - (c (m - 2 k) - p - 2 a s + a \nu) z}}{c (m - 2 k) - p - 2 a s + a \nu} \right) + \right.$$

$$\left. \left. \frac{e^{4 b s - (2 c k - c m - p - 2 a s + a \nu) z}}{2 c k - c m - p - 2 a s + a \nu} + \frac{e^{2 b \nu - (2 c k - c m - p + 2 a s - a \nu) z}}{2 c k - c m - p + 2 a s - a \nu} \right) \binom{m}{k} \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving $e^{p z} \sinh^{\mu}(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.4646.01

$$\int e^{p z} \sinh^{\mu}(d+c z) \cosh^{\nu}(b+a z)\, dz == 2^{-\nu} \left(1-e^{2(d+c z)}\right)^{-\mu} \sinh^{\mu}(d+c z)$$

$$\left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{2 b s - b \nu} \binom{\nu}{s} \left(\frac{e^{2 b (\nu-2 s)+(p+a(\nu-2 s)) z}}{p-2 a s+a \nu-c \mu}\, {}_2F_1\left(\frac{p-2 a s+a \nu-c \mu}{2 c}, -\mu; \frac{1}{2}\left(\frac{p-2 a s+a \nu}{c}-\mu+2\right); e^{2(d+c z)}\right) + \right.\right.$$

$$\left.\left. \frac{e^{(p+2 a s-a \nu) z}}{p+2 a s-a \nu-c \mu}\, {}_2F_1\left(\frac{p+2 a s-a \nu-c \mu}{2 c}, -\mu; \frac{-\mu c+2 c+p+2 a s-a \nu}{2 c}; e^{2(d+c z)}\right)\right) - \right.$$

$$\left. \frac{e^{p z} (\nu \bmod 2-1)}{p-c \mu} \binom{\nu}{\frac{\nu}{2}}\, {}_2F_1\left(\frac{p-c \mu}{2 c}, -\mu; \frac{1}{2}\left(\frac{p}{c}-\mu+2\right); e^{2(d+c z)}\right)\right) /; \nu \in \mathbb{N}^+$$

01.20.21.4647.01

$$\int e^{p z} \sinh^{m}(d+c z) \cosh^{\nu}(b+a z)\, dz ==$$

$$\left(\frac{i}{2}\right)^m \cosh^{\nu}(b+a z) \left(-\frac{e^{p z}\left(1+e^{2(b+a z)}\right)^{-\nu} (m \bmod 2-1)}{p-a \nu} \binom{m}{\frac{m}{2}}\, {}_2F_1\left(\frac{p-a \nu}{2 a}, -\nu; \frac{1}{2}\left(\frac{p}{a}-\nu+2\right); -e^{2(b+a z)}\right) + \right.$$

$$i^{-m}\left(1+e^{-2(b+a z)}\right)^{-\nu} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{d(m-2 k)} \binom{m}{k}$$

$$\left(\frac{e^{4 d k+2 c z k-2 d m-c m z+p z+i m \pi}}{2 c k-c m+p+a \nu}\, {}_2F_1\left(-\frac{2 c k-c m+p+a \nu}{2 a}, -\nu; -\frac{2 c k-c m+p+a(\nu-2)}{2 a}; -e^{-2(b+a z)}\right) + \right.$$

$$\left.\left. \frac{e^{(c(m-2 k)+p) z}}{c(m-2 k)+p+a \nu}\, {}_2F_1\left(-\frac{c(m-2 k)+p+a \nu}{2 a}, -\nu; -\frac{-2 c k+c m+p+a(\nu-2)}{2 a}; -e^{-2(b+a z)}\right)\right)\right) /; m \in \mathbb{N}^+$$

01.20.21.4648.01

$$\int e^{p z} \sinh^{m}(d+c z) \cosh^{\nu}(b+a z)\, dz == \frac{(i^m 2^{-m-\nu})\, e^{p z} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1-m \bmod 2)(1-\nu \bmod 2)}{p} -$$

$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-d(2 k+m)} \left(\frac{e^{2 d m-(2 c k-c m-p) z}}{2 c k-c m-p} + \frac{e^{4 d k-(-2 c k+c m-p) z+i m \pi}}{-2 c k+c m-p} \right) \binom{m}{k} -$$

$$i^m 2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b(2 s+\nu)} \left(\frac{e^{2 b \nu-(-p-a(\nu-2 s)) z}}{-p-a(\nu-2 s)} + \frac{e^{4 b s-(-p-2 a s+a \nu) z}}{-p-2 a s+a \nu} \right) \binom{\nu}{s} -$$

$$2^{-m-\nu} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-2 d k-d m-2 b s-b \nu} \left(e^{2 d m} \left(\frac{e^{2 b \nu-(2 c k-c m-p+2 a s-a \nu) z}}{2 c k-c m-p+2 a s-a \nu} + \frac{e^{4 b s-(2 c k-c m-p-2 a s+a \nu) z}}{2 c k-c m-p-2 a s+a \nu} \right) + e^{4 d k+i m \pi} \right.$$

$$\left. \left(\frac{e^{2 b \nu-(-2 c k+c m-p+2 a s-a \nu) z}}{-2 c k+c m-p+2 a s-a \nu} + \frac{e^{4 b s-(c(m-2 k)-p-2 a s+a \nu) z}}{c(m-2 k)-p-2 a s+a \nu} \right) \right) \binom{m}{k} /; m \in \mathbb{Z} \wedge m > 0 \wedge \nu \in \mathbb{Z} \wedge \nu > 0$$

Involving $e^{p z^r} \sinh^m(b z^r) \cosh^v(c z)$

01.20.21.4649.01

$$\int e^{p z^2} \sinh^m\left(b z^2\right) \cosh^v(c z)\, dz == \frac{i^m 2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} + \frac{1}{\sqrt{p}}$$

$$\left(\left(i^m 2^{-m-v-1}\right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{2 p z - c (v - 2 s)}{2 \sqrt{p}} \right) + e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{c (v - 2 s) + 2 p z}{2 \sqrt{p}} \right) \right) \right) +$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left((-1)^k \binom{m}{k} \left((-1)^m \sqrt{p - b (m - 2 k)}\, (b (m - 2 k) + p) \operatorname{erfi}\left(\frac{2 p z - 2 b (m - 2 k) z}{2 \sqrt{p - b (m - 2 k)}} \right) + \right. \right.$$

$$\left. \left. (p - b (m - 2 k)) \sqrt{b (m - 2 k) + p}\, \operatorname{erfi}\left(\sqrt{b (m - 2 k) + p}\, z \right) \right) \right) \Big/ ((p - b (m - 2 k)) (b (m - 2 k) + p)) +$$

$$i^m 2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{c^2 (v-2s)^2 + 2 i m (p - b (2k - m)) \pi}{4 (p - b (2k - m))}} \sqrt{p - b (2 k - m)}\, (b (2 k - m) + p) \right. \right.$$

$$\operatorname{erfi}\left(\frac{-c (v - 2 s) - 2 b (2 k - m) z + 2 p z}{2 \sqrt{p - b (2 k - m)}} \right) + e^{-\frac{c^2 (v-2s)^2 - 2 i m (b (2k - m) + p) \pi}{4 (b (2k - m) + p)}} (p - b (2 k - m))$$

$$\left. \left. \sqrt{b (2 k - m) + p}\, \operatorname{erfi}\left(\frac{c (v - 2 s) + 2 (b (2 k - m) + p) z}{2 \sqrt{b (2 k - m) + p}} \right) \right) \Big/ ((p - b (2 k - m)) (b (2 k - m) + p)) + \right.$$

$$\left(e^{-\frac{c^2 (v-2s)^2 - 2 i m (p - b (m - 2k)) \pi}{4 (p - b (m - 2k))}} \sqrt{p - b (m - 2 k)}\, (b (m - 2 k) + p) \operatorname{erfi}\left(\frac{-c (v - 2 s) - 2 b (m - 2 k) z + 2 p z}{2 \sqrt{p - b (m - 2 k)}} \right) + \right.$$

$$\left. e^{-\frac{c^2 (v-2s)^2 + 2 i m (b (m - 2k) + p) \pi}{4 (b (m - 2k) + p)}} (p - b (m - 2 k)) \sqrt{b (m - 2 k) + p}\, \operatorname{erfi}\left(\frac{c (v - 2 s) + 2 (b (m - 2 k) + p) z}{2 \sqrt{b (m - 2 k) + p}} \right) \right) \Big/$$

$$\left. ((p - b (m - 2 k)) (b (m - 2 k) + p)) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.4650.01

$$\int e^{p\sqrt{z}}\sinh^m\left(b\sqrt{z}\right)\cosh^v(c\,z)\,dz == \frac{2^{-m-v+1}\,i^{-m}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{p^2}+$$

$$2^{-m-v-1}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{e^{\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\,p+c(v-2s)z}}{c(v-2s)}-\right.$$

$$\left.\frac{2e^{p\sqrt{z}-c(v-2s)z}}{c(v-2s)}-\frac{e^{-\frac{p^2}{4c(v-2s)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)+2^{-m-v+2}\,i^{-m}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k e^{p\sqrt{z}}\binom{m}{k}\left(\left(\sqrt{z}\,p^3-p^2-b^2(m-2k)^2\left(\sqrt{z}\,p+1\right)\right)\cos\left(\frac{m\pi}{2}-i\,b(m-2k)\sqrt{z}\right)+b\,i\,(m-2k)\left(b^2\sqrt{z}\right.\right.\right.$$

$$\left.\left.\left.(m-2k)^2+2p-p^2\sqrt{z}\right)\sin\left(\frac{m\pi}{2}-i\,b(m-2k)\sqrt{z}\right)\right)\right)\Big/\left((-b(m-2k)-p)^2(p-b(m-2k))^2\right)+$$

$$2^{-m-v-1}(-1)^m\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{e^{\frac{(b\,i\,(m-2k)+i\,p)^2}{c(8s-4v)}}(p-b(2k-m))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-b(m-2k)-p+2c(v-2s)\sqrt{z}}{2\sqrt{c(2s-v)}}\right)}{(c(2s-v))^{3/2}}+\right.\right.$$

$$\left.\left(e^{-\frac{(p-b(m-2k))^2}{4c(v-2s)}-i\,m\pi}(2bk-bm+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-b(m-2k)+p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)\right)\Big/$$

$$\left.\left(c(2s-v)\sqrt{c(v-2s)}\right)+\frac{2e^{-i\pi m+c(v-2s)z+(p-b(m-2k))\sqrt{z}}}{c(v-2s)}-\frac{2e^{(b(m-2k)+p)\sqrt{z}-c(v-2s)z}}{c(v-2s)}\right)+$$

$$\frac{e^{\frac{(2ibk-ibm+ip)^2}{c(8s-4v)}}(2bk-bm+p)\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-b(2k-m)-p+2c(v-2s)\sqrt{z}}{2\sqrt{c(2s-v)}}\right)}{(c(2s-v))^{3/2}}+$$

$$\frac{e^{i\,m\pi-\frac{(b\,i\,(m-2k)+i\,p)^2}{c(8s-4v)}}(p-b(2k-m))\sqrt{\pi}\,\operatorname{erfi}\left(\frac{-b(2k-m)+p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{c(2s-v)\sqrt{c(v-2s)}}+$$

$$\left.\frac{2e^{i\pi m+c(v-2s)z+(p-b(2k-m))\sqrt{z}}}{c(v-2s)}-\frac{2e^{(b(2k-m)+p)\sqrt{z}-c(v-2s)z}}{c(v-2s)}\right)/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p z^r} \sinh^m(b z) \cosh^v(c z)$

01.20.21.4651.01

$$\int e^{p z^2} \sinh^m(b z) \cosh^v(c z)\, dz == \frac{i^m 2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} + \frac{1}{\sqrt{p}} \left(\left(i^m 2^{-m-v-1}\right) \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sqrt{\pi} \right.$$

$$\left. \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{b^2 (m-2k)^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{2 p z - b (m-2k)}{2\sqrt{p}} \right) + e^{-\frac{b^2 (m-2k)^2 + 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{b (m-2k) + 2 p z}{2\sqrt{p}} \right) \right) \right) + \frac{1}{\sqrt{p}}$$

$$\left(\left(i^m 2^{-m-v-1}\right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{2 p z - c (v-2s)}{2\sqrt{p}} \right) + e^{-\frac{c^2 (v-2s)^2}{4p}} \operatorname{erfi}\left(\frac{c (v-2s) + 2 p z}{2\sqrt{p}} \right) \right) \right) +$$

$$\frac{1}{\sqrt{p}} \left(\left(i^m 2^{-m-v-1} \sqrt{\pi}\right) \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{(b(2k-m)+c(v-2s))^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{b (2k-m) + c (v-2s) + 2 p z}{2\sqrt{p}} \right) + e^{-\frac{(b(m-2k)+c(v-2s))^2 + 2\pi i m p}{4p}} \right.$$

$$\left. \operatorname{erfi}\left(\frac{b (m-2k) + c (v-2s) + 2 p z}{2\sqrt{p}} \right) + e^{-\frac{(-b(2k-m)-c(v-2s))^2 + 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{-b (2k-m) - c (v-2s) + 2 p z}{2\sqrt{p}} \right) + \right.$$

$$\left. \left. e^{-\frac{(-b(m-2k)-c(v-2s))^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{-b (m-2k) - c (v-2s) + 2 p z}{2\sqrt{p}} \right) \right) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.4652.01

$$\int e^{p \sqrt{z}} \sinh^m(b z) \cosh^v(c z)\, dz == \frac{i^m 2^{-m-v+1} e^{p \sqrt{z}} \left(p \sqrt{z} - 1\right) \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p^2} +$$

$$i^m 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{\frac{i m \pi}{2}} \binom{m}{k} \left(- \frac{e^{\frac{p^2}{4 b (m-2k)}} p \sqrt{\pi} \operatorname{erfi}\left(\frac{p - 2 b (m-2k) \sqrt{z}}{2\sqrt{-b (m-2k)}} \right)}{(-b (m-2k))^{3/2}} + \right.$$

$$\left. \frac{2 e^{-i \pi m + b (m-2k) z + p \sqrt{z}}}{b (m-2k)} - \frac{2 e^{p \sqrt{z} - b (m-2k) z}}{b (m-2k)} - \frac{e^{-\frac{p^2}{4 b (m-2k)} - i m \pi} p \sqrt{\pi} \operatorname{erfi}\left(\frac{2 b \sqrt{z} (m-2k) + p}{2\sqrt{b (m-2k)}} \right)}{(b (m-2k))^{3/2}} \right) +$$

$$i^m\, 2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\frac{e^{\frac{p^2}{4c(v-2s)}}\, p\sqrt{\pi}\ \operatorname{erfi}\left(\frac{p-2c(v-2s)\sqrt{z}}{2\sqrt{-c(v-2s)}}\right)}{(-c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\ p+c(v-2s)z}}{c(v-2s)}-\right.$$

$$\left.\frac{2e^{p\sqrt{z}-c(v-2s)z}}{c(v-2s)}-\frac{e^{-\frac{p^2}{4c(v-2s)}}\, p\sqrt{\pi}\ \operatorname{erfi}\left(\frac{p+2c(v-2s)\sqrt{z}}{2\sqrt{c(v-2s)}}\right)}{(c(v-2s))^{3/2}}\right)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(\frac{2e^{-i\pi m+(b(m-2k)+c(v-2s))z+p\sqrt{z}}}{b(m-2k)+c(v-2s)}-\right.\right.$$

$$\frac{e^{-\frac{p^2}{4(b(m-2k)+c(v-2s))}-imp}\, p\sqrt{\pi}\ \operatorname{erfi}\left(\frac{p+2(b(m-2k)+c(v-2s))\sqrt{z}}{2\sqrt{b(m-2k)+c(v-2s)}}\right)}{(b(m-2k)+c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\ p+(-b(m-2k)-c(v-2s))z}}{-b(m-2k)-c(v-2s)}-$$

$$\left.\left.\frac{e^{-\frac{p^2}{4(-b(m-2k)-c(v-2s))}}\, p\sqrt{\pi}\ \operatorname{erfi}\left(\frac{p+2(-b(m-2k)-c(v-2s))\sqrt{z}}{2\sqrt{-b(m-2k)-c(v-2s)}}\right)}{(-b(m-2k)-c(v-2s))^{3/2}}\right)+\frac{2e^{i\pi m+(b(2k-m)+c(v-2s))z+p\sqrt{z}}}{b(2k-m)+c(v-2s)}-\right.$$

$$\frac{e^{im\pi-\frac{p^2}{4(b(2k-m)+c(v-2s))}}\, p\sqrt{\pi}\ \operatorname{erfi}\left(\frac{p+2(b(2k-m)+c(v-2s))\sqrt{z}}{2\sqrt{b(2k-m)+c(v-2s)}}\right)}{(b(2k-m)+c(v-2s))^{3/2}}+\frac{2e^{\sqrt{z}\ p+(-b(2k-m)-c(v-2s))z}}{-b(2k-m)-c(v-2s)}-$$

$$\left.\frac{e^{-\frac{p^2}{4(-b(2k-m)-c(v-2s))}}\, p\sqrt{\pi}\ \operatorname{erfi}\left(\frac{p+2(-b(2k-m)-c(v-2s))\sqrt{z}}{2\sqrt{-b(2k-m)-c(v-2s)}}\right)}{(-b(2k-m)-c(v-2s))^{3/2}}\right)\Big/;\ m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p\,z}\sinh^m(b\,z^r)\cosh^v(c\,z)$

01.20.21.4653.01

$$\int e^{p z} \sinh^m\left(b z^2\right) \cosh^v(c z)\, dz == \frac{i^m\, 2^{-m-v}\, e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)}{p} -$$

$$\frac{1}{b}\left(\left(i^m\, 2^{-m-v-1}\right) \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m - 2k} \left((-1)^k \binom{m}{k} \left(e^{\frac{p^2 + 2 b i m (m-2k) \pi}{4 b (m-2k)}} \sqrt{-b (m-2k)}\ \operatorname{erfi}\left(\frac{p - 2 b (m-2k) z}{2 \sqrt{-b (m-2k)}}\right) - \right.\right.\right.$$

$$\left.\left.\left. e^{-\frac{p^2 + 2 b i m (m-2k) \pi}{4 b (m-2k)}} \sqrt{b (m-2k)}\ \operatorname{erfi}\left(\frac{p + 2 b (m-2k) z}{2 \sqrt{b (m-2k)}}\right)\right)\right)\right) +$$

$$i^m\, 2^{-m-v+1}\, e^{p z} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{\binom{v}{s} (c (v-2s) \sinh(c (v-2s) z) - p \cosh(c (v-2s) z))}{(c (v-2s) - p)\, (p + c (v-2s))} -$$

$$\frac{1}{b}\left(\left(i^m\, 2^{-m-v-1} \sqrt{\pi}\right)\right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{2k - m} \left(\binom{v}{s} \left(e^{\frac{(p - c (v-2s))^2 - 2 i b (2k-m) m \pi}{4 b (2k-m)}} \sqrt{-b (2k-m)}\ \operatorname{erfi}\left(\frac{p - c (v-2s) - 2 b (2k-m) z}{2 \sqrt{-b (2k-m)}}\right) - \right.\right.$$

$$e^{-\frac{(p + c (v-2s))^2 - 2 i b (2k-m) m \pi}{4 b (2k-m)}} \sqrt{b (2k-m)}\ \operatorname{erfi}\left(\frac{p + c (v-2s) + 2 b (2k-m) z}{2 \sqrt{b (2k-m)}}\right) -$$

$$e^{\frac{(p - c (v-2s))^2 + 2 b i m (m-2k) \pi}{4 b (m-2k)}} \sqrt{-b (m-2k)}\ \operatorname{erfi}\left(\frac{p - c (v-2s) - 2 b (m-2k) z}{2 \sqrt{-b (m-2k)}}\right) + e^{-\frac{(p + c (v-2s))^2 + 2 b i m (m-2k) \pi}{4 b (m-2k)}}$$

$$\left.\left.\left.\sqrt{b (m-2k)}\ \operatorname{erfi}\left(\frac{p + c (v-2s) + 2 b (m-2k) z}{2 \sqrt{b (m-2k)}}\right)\right)\right)\right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.4654.01

$$\int e^{p z} \sinh^m\left(b \sqrt{z}\right) \cosh^v(c z)\, dz == \frac{i^m 2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} +$$

$$i^m 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\frac{e^{(p-c(v-2s))z}}{p - c(v-2s)} + \frac{e^{(p+c(v-2s))z}}{p + c(v-2s)} \right) \binom{v}{s} +$$

$$i^m 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)\, e^{\frac{i m \pi}{2}} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(- \frac{b\, e^{-\frac{b^2 (m-2k)^2}{4p} - i m \pi} (m-2k) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b(m-2k) + 2p\sqrt{z}}{2\sqrt{p}} \right)}{p^{3/2}} + \right.$$

$$\left. \frac{2 e^{p z - b(m-2k)\sqrt{z}}}{p} + \frac{2 e^{-i\pi m + p z + b(m-2k)\sqrt{z}}}{p} - \frac{b\, e^{-\frac{b^2 (m-2k)^2}{4p}} (m-2k) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b(m-2k) - 2p\sqrt{z}}{2\sqrt{p}} \right)}{p^{3/2}} \right) +$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(\frac{2 e^{b\sqrt{z}\,(2k-m) + (p + c(v-2s))z + i m \pi}}{p + c(v-2s)} - \right. \right.$$

$$\frac{b\, e^{i m \pi - \frac{b^2 (2k-m)^2}{4(p + c(v-2s))}} (2k-m) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b(2k-m) + 2(p + c(v-2s))\sqrt{z}}{2\sqrt{p + c(v-2s)}} \right)}{(p + c(v-2s))^{3/2}} + \frac{2 e^{(p - c(v-2s))z - b(2k-m)\sqrt{z}}}{p - c(v-2s)} -$$

$$\left. \frac{b\, e^{-\frac{b^2 (2k-m)^2}{4(p - c(v-2s))}} (2k-m) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b(2k-m) + 2(c(v-2s) - p)\sqrt{z}}{2\sqrt{p - c(v-2s)}} \right)}{(p - c(v-2s))^{3/2}} \right) + (-1)^m \left(\frac{2 e^{-i\pi m + (p + c(v-2s))z + b(m-2k)\sqrt{z}}}{p + c(v-2s)} - \right.$$

$$\frac{b\, e^{-\frac{b^2 (m-2k)^2}{4(p + c(v-2s))} - i m \pi} (m-2k) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b(m-2k) + 2(p + c(v-2s))\sqrt{z}}{2\sqrt{p + c(v-2s)}} \right)}{(p + c(v-2s))^{3/2}} + \frac{2 e^{(p - c(v-2s))z - b(m-2k)\sqrt{z}}}{p - c(v-2s)} -$$

$$\left. \left. \frac{b\, e^{-\frac{b^2 (m-2k)^2}{4(p - c(v-2s))}} (m-2k) \sqrt{\pi}\, \operatorname{erfi}\left(\frac{b(m-2k) + 2(c(v-2s) - p)\sqrt{z}}{2\sqrt{p - c(v-2s)}} \right)}{(p - c(v-2s))^{3/2}} \right) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

Involving $e^{p z} \sinh^m(b z) \cosh^v\left(c z^r\right)$

01.20.21.4655.01

$$\int e^{p z} \sinh^m(b z) \cosh^v\left(c z^2\right) dz ==$$

$$\frac{i^m 2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} - \frac{1}{c}\left(\left(i^m 2^{-m-v-1} \sqrt{\pi}\right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \right.$$

$$\left. \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v-2s} \left(\binom{v}{s} \left(e^{\frac{p^2}{4c(v-2s)}} \sqrt{-c(v-2s)}\ \operatorname{erfi}\left(\frac{p - 2c(v-2s)z}{2\sqrt{-c(v-2s)}} \right) - e^{-\frac{p^2}{4c(v-2s)}} \sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{p + 2c(v-2s)z}{2\sqrt{c(v-2s)}} \right) \right) \right) \right) +$$

$$i^m 2^{-m-v+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{(-1)^k e^{p z} \binom{m}{k} \left(p \cos\left(\frac{\pi m}{2} + b\, i\, (m-2k) z \right) + b\, i\, (m-2k) \sin\left(\frac{\pi m}{2} + b\, i\, (m-2k) z \right) \right)}{(p - b(m-2k))(b(m-2k) + p)} -$$

$$\frac{1}{c}\left(\left(i^m 2^{-m-v-1} \sqrt{\pi}\right) \right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v-2s} \left(\binom{v}{s} \left(e^{\frac{(p - b(2k-m))^2 - 2ic m\pi(v-2s)}{4c(v-2s)}} \sqrt{-c(v-2s)}\ \operatorname{erfi}\left(\frac{-b(2k-m) + p - 2c(v-2s)z}{2\sqrt{-c(v-2s)}} \right) + \right. \right.$$

$$e^{\frac{(p - b(m-2k))^2 + 2ic m\pi(v-2s)}{4c(v-2s)}} \sqrt{-c(v-2s)}\ \operatorname{erfi}\left(\frac{-b(m-2k) + p - 2c(v-2s)z}{2\sqrt{-c(v-2s)}} \right) -$$

$$e^{-\frac{(b(2k-m) + p)^2 - 2ic m\pi(v-2s)}{4c(v-2s)}} \sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{b(2k-m) + p + 2c(v-2s)z}{2\sqrt{c(v-2s)}} \right) -$$

$$\left. \left. e^{-\frac{(b(m-2k) + p)^2 + 2ic m\pi(v-2s)}{4c(v-2s)}} \sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{b(m-2k) + p + 2c(v-2s)z}{2\sqrt{c(v-2s)}} \right) \right) \right) \Big/; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4656.01

$$\int e^{p z} \sinh^m(b z) \cosh^v\left(c \sqrt{z}\right) dz == \frac{2^{-m-v} i^{-m} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} +$$

$$2^{-m-v} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \left(\frac{e^{(b (m-2 k)+p) z}}{b (m-2 k)+p} + \frac{e^{(p-b (m-2 k)) z - i m \pi}}{p - b (m-2 k)} \right) \binom{m}{k} + 2^{-m-v-1} i^{-m} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{4 e^{p z} \cosh\left(c (v-2 s) \sqrt{z}\right)}{p} + \frac{c e^{-\frac{c^2 (v-2 s)^2}{4 p}} \sqrt{\pi} (2 s - v) \left(\operatorname{erfi}\left(\frac{2 p \sqrt{z} - c (2 s - v)}{2 \sqrt{p}} \right) - \operatorname{erfi}\left(\frac{2 p \sqrt{z} - c (v-2 s)}{2 \sqrt{p}} \right) \right)}{p^{3/2}} \right) +$$

$$2^{-m-v-1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left((-1)^m \left(\frac{c e^{i m \pi - \frac{(2 c s - c v)^2}{4 (-2 b k + b m + p)}} \sqrt{\pi} (v - 2 s) \operatorname{erfi}\left(\frac{2 (-2 b k + b m + p) \sqrt{z} - c (v-2 s)}{2 \sqrt{-2 b k + b m + p}} \right)}{(-2 b k + b m + p)^{3/2}} + \right. \right.$$

$$\frac{c e^{-\frac{(c v - 2 c s)^2}{4 (2 b k - b m + p)}} \sqrt{\pi} (2 s - v) \operatorname{erfi}\left(\frac{2 (2 b k - b m + p) \sqrt{z} - c (2 s - v)}{2 \sqrt{2 b k - b m + p}} \right)}{(2 b k - b m + p)^{3/2}} + \frac{2 e^{i \pi m + (-2 b k + b m + p) z + (2 c s - c v) \sqrt{z}}}{-2 b k + b m + p} +$$

$$\left. \frac{2 e^{\sqrt{z} (c v - 2 c s) + (2 b k - b m + p) z}}{2 b k - b m + p} \right) + \frac{c e^{-\frac{(c v - 2 c s)^2}{4 (-2 b k + b m + p)}} \sqrt{\pi} (2 s - v) \operatorname{erfi}\left(\frac{2 (-2 b k + b m + p) \sqrt{z} - c (2 s - v)}{2 \sqrt{-2 b k + b m + p}} \right)}{(-2 b k + b m + p)^{3/2}} +$$

$$\frac{c e^{-\frac{c^2 (v-2 s)^2}{4 (2 b k - b m + p)} - i m \pi} \sqrt{\pi} (v - 2 s) \operatorname{erfi}\left(\frac{2 (2 b k - b m + p) \sqrt{z} - c (v-2 s)}{2 \sqrt{2 b k - b m + p}} \right)}{(2 b k - b m + p)^{3/2}} + \frac{2 e^{\sqrt{z} (c v - 2 c s) + (-2 b k + b m + p) z}}{-2 b k + b m + p} +$$

$$\left. \left. \frac{2 e^{-i \pi m + (2 b k - b m + p) z + (2 c s - c v) \sqrt{z}}}{2 b k - b m + p} \right) \right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

Involving $e^{p z^r} \sinh^m(b z) \cosh^v\left(c z^r\right)$

01.20.21.4657.01

$$\int e^{p z^2} \sinh^m(b z) \cosh^v\left(c z^2\right) dz ==$$

$$\frac{i^m 2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\ z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} + \frac{1}{\sqrt{p}} \left(\left(i^m 2^{-m-v-1}\right) \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sqrt{\pi} \right.$$

$$\left. \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{b^2 (m-2k)^2 - 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{2 p z - b (m-2k)}{2\sqrt{p}} \right) + e^{-\frac{b^2 (m-2k)^2 + 2\pi i m p}{4p}} \operatorname{erfi}\left(\frac{b (m-2k) + 2 p z}{2\sqrt{p}} \right) \right) \right) +$$

$$i^m 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sqrt{\pi} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\binom{v}{s} \left((p + c (v-2s)) \sqrt{p - c (v-2s)}\ \operatorname{erfi}\left(\frac{2 p z - 2 c (v-2s) z}{2\sqrt{p - c (v-2s)}} \right) + \right. \right.$$

$$\left. \left. \sqrt{p + c (v-2s)}\ (p - c (v-2s)) \operatorname{erfi}\left(\sqrt{p + c (v-2s)}\ z \right) \right) \right) \Big/ ((p - c (v-2s)) (p + c (v-2s))) +$$

$$i^m 2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{b^2 (2k-m)^2 - 2 i m \pi (p + c (v-2s))}{4 (p + c (v-2s))}} \sqrt{p + c (v-2s)}\ (p - c (v-2s)) \right. \right.$$

$$\left. \operatorname{erfi}\left(\frac{b (2k-m) + 2 (p + c (v-2s)) z}{2\sqrt{p + c (v-2s)}} \right) + e^{-\frac{b^2 (2k-m)^2 + 2 i m \pi (p - c (v-2s))}{4 (p - c (v-2s))}} (p + c (v-2s)) \sqrt{p - c (v-2s)} \right.$$

$$\left. \operatorname{erfi}\left(\frac{-b (2k-m) + 2 p z - 2 c (v-2s) z}{2\sqrt{p - c (v-2s)}} \right) \right) \Big/ ((p - c (v-2s)) (p + c (v-2s))) +$$

$$\left(e^{-\frac{b^2 (m-2k)^2 + 2 i m \pi (p + c (v-2s))}{4 (p + c (v-2s))}} \sqrt{p + c (v-2s)}\ (p - c (v-2s)) \operatorname{erfi}\left(\frac{b (m-2k) + 2 (p + c (v-2s)) z}{2\sqrt{p + c (v-2s)}} \right) + \right.$$

$$\left. e^{-\frac{b^2 (m-2k)^2 - 2 i m \pi (p - c (v-2s))}{4 (p - c (v-2s))}} (p + c (v-2s)) \sqrt{p - c (v-2s)}\ \operatorname{erfi}\left(\frac{-b (m-2k) + 2 p z - 2 c (v-2s) z}{2\sqrt{p - c (v-2s)}} \right) \right) \Big/$$

$$\left. ((p - c (v-2s)) (p + c (v-2s))) \right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.4658.01

$$\int e^{p\sqrt{z}}\sinh^m(b\,z)\cosh^v\left(c\sqrt{z}\right)dz == \frac{2^{-m-v+1}\,i^{-m}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{p^2}+$$

$$2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m\left(-\frac{e^{\frac{p^2}{4b(m-2k)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{p-2b(m-2k)\sqrt{z}}{2\sqrt{-b(m-2k)}}\right)}{2(-b(m-2k))^{3/2}}-\frac{e^{p\sqrt{z}-b(m-2k)z}}{b(m-2k)}\right)+\right.$$

$$\left.\frac{e^{\sqrt{z}\,p+b(m-2k)z}}{b(m-2k)}-\frac{e^{-\frac{p^2}{4b(m-2k)}}\,p\sqrt{\pi}\,\operatorname{erfi}\left(\frac{2b\sqrt{z}\,(m-2k)+p}{2\sqrt{b(m-2k)}}\right)}{2(b(m-2k))^{3/2}}\right)+2^{-m-v+2}\,i^{-m}\,e^{p\sqrt{z}}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\left(p^2-c^2(v-2s)^2\right)^2}\left(\binom{v}{s}\left(\left(\sqrt{z}\,p^3-p^2-c^2(v-2s)^2\sqrt{z}\,p-c^2(v-2s)^2\right)\cosh\left(c(2s-v)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.c(2s-v)\left(\sqrt{z}\,p^2-2p-c^2(v-2s)^2\sqrt{z}\right)\sinh\left(c(2s-v)\sqrt{z}\right)\right)\right)+2^{-m-v}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left((-1)^m\left(-\frac{e^{(p+c(v-2s))\sqrt{z}-b(m-2k)z}}{b(m-2k)}-\frac{e^{\frac{(p+c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p+c(v-2s))\operatorname{erfi}\left(\frac{-2b\sqrt{z}\,(m-2k)+p+c(v-2s)}{2\sqrt{-b(m-2k)}}\right)}{2(-b(m-2k))^{3/2}}\right)+\right.$$

$$(-1)^m\left(-\frac{e^{(p-c(v-2s))\sqrt{z}-b(m-2k)z}}{b(m-2k)}-\frac{e^{\frac{(p-c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p-c(v-2s))\operatorname{erfi}\left(\frac{-2b\sqrt{z}\,(m-2k)+p-c(v-2s)}{2\sqrt{-b(m-2k)}}\right)}{2(-b(m-2k))^{3/2}}\right)+$$

$$\frac{e^{\sqrt{z}\,(p+c(v-2s))+b(m-2k)z}}{b(m-2k)}+\frac{e^{\sqrt{z}\,(p-c(v-2s))+b(m-2k)z}}{b(m-2k)}-$$

$$\frac{e^{-\frac{(p+c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p+c(v-2s))\operatorname{erfi}\left(\frac{2b\sqrt{z}\,(m-2k)+p+c(v-2s)}{2\sqrt{b(m-2k)}}\right)}{2(b(m-2k))^{3/2}}-$$

$$\left.\frac{e^{-\frac{(p-c(v-2s))^2}{4b(m-2k)}}\sqrt{\pi}\,(p-c(v-2s))\operatorname{erfi}\left(\frac{2b\sqrt{z}\,(m-2k)+p-c(v-2s)}{2\sqrt{b(m-2k)}}\right)}{2(b(m-2k))^{3/2}}\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p\,z}\sinh^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.4659.01

$$\int e^{p z} \sinh^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == \frac{i^m 2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} -$$

$$\frac{1}{b}\left(\left(i^m 2^{-m-v-1}\right) \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m-2k} \left((-1)^k \binom{m}{k} \left(e^{\frac{p^2+2bim(m-2k)\pi}{4b(m-2k)}} \sqrt{-b(m-2k)}\ \operatorname{erfi}\left(\frac{p-2b(m-2k)z}{2\sqrt{-b(m-2k)}}\right) - \right.\right.\right.$$

$$\left.\left.\left. e^{-\frac{p^2+2bim(m-2k)\pi}{4b(m-2k)}} \sqrt{b(m-2k)}\ \operatorname{erfi}\left(\frac{p+2b(m-2k)z}{2\sqrt{b(m-2k)}}\right)\right)\right)\right) - \frac{1}{c}\left(\left(i^m 2^{-m-v-1} \sqrt{\pi}\right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\right.$$

$$\left. \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v-2s} \left(\binom{v}{s} \left(e^{\frac{p^2}{4c(v-2s)}} \sqrt{-c(v-2s)}\ \operatorname{erfi}\left(\frac{p-2c(v-2s)z}{2\sqrt{-c(v-2s)}}\right) - e^{-\frac{p^2}{4c(v-2s)}} \sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{p+2c(v-2s)z}{2\sqrt{c(v-2s)}}\right)\right)\right)\right) +$$

$$i^m 2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{p^2-2im\pi(b(2k-m)+c(v-2s))}{4(b(2k-m)+c(v-2s))}} \sqrt{b(2k-m)+c(v-2s)}\right.\right.$$

$$(-b(2k-m)-c(v-2s)) \operatorname{erfi}\left(\frac{p+2(b(2k-m)+c(v-2s))z}{2\sqrt{b(2k-m)+c(v-2s)}}\right) + e^{-\frac{p^2+2im\pi(-b(2k-m)-c(v-2s))}{4(-b(2k-m)-c(v-2s))}}$$

$$\left.(b(2k-m)+c(v-2s)) \sqrt{-b(2k-m)-c(v-2s)}\ \operatorname{erfi}\left(\frac{p-2(b(2k-m)+c(v-2s))z}{2\sqrt{-b(2k-m)-c(v-2s)}}\right)\right) /$$

$$((-b(2k-m)-c(v-2s))(b(2k-m)+c(v-2s))) + \left(e^{-\frac{p^2+2im\pi(b(m-2k)+c(v-2s))}{4(b(m-2k)+c(v-2s))}} \sqrt{b(m-2k)+c(v-2s)}\right.$$

$$(-b(m-2k)-c(v-2s)) \operatorname{erfi}\left(\frac{p+2(b(m-2k)+c(v-2s))z}{2\sqrt{b(m-2k)+c(v-2s)}}\right) + e^{-\frac{p^2-2im\pi(-b(m-2k)-c(v-2s))}{4(-b(m-2k)-c(v-2s))}}$$

$$\left.(b(m-2k)+c(v-2s)) \sqrt{-b(m-2k)-c(v-2s)}\ \operatorname{erfi}\left(\frac{p-2(b(m-2k)+c(v-2s))z}{2\sqrt{-b(m-2k)-c(v-2s)}}\right)\right) /$$

$$\left.((-b(m-2k)-c(v-2s))(b(m-2k)+c(v-2s)))\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4660.01

$$\int e^{p z} \sinh^m\left(b \sqrt{z}\right) \cosh^v\left(c \sqrt{z}\right) dz == \frac{2^{-m-v} i^{-m} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} + 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\sqrt{\pi} \left(\frac{(-1)^m b e^{-\frac{b^2 (m-2k)^2}{4p}} (m-2k) \operatorname{erfi}\left(\frac{2p\sqrt{z} - b(m-2k)}{2\sqrt{p}}\right)}{p^{3/2}} - \frac{e^{-\frac{(bm-2bk)^2}{4p}} (bm-2bk) \operatorname{erfi}\left(\frac{2p\sqrt{z} - b(2k-m)}{2\sqrt{p}}\right)}{p^{3/2}}\right) +\right.$$

$$\frac{4\,e^{p\,z-\frac{i\,m\,\pi}{2}}\cos\left(b\,i\,\sqrt{z}\,(2\,k-m)+\frac{m\,\pi}{2}\right)}{p}\Bigg)+2^{-m-v-1}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\sqrt{\pi}\left(\frac{c\,e^{-\frac{c^2\,(v-2\,s)^2}{4\,p}}\,(v-2\,s)\,\text{erfi}\left(\frac{2\,p\,\sqrt{z}-c\,(v-2\,s)}{2\,\sqrt{p}}\right)}{p^{3/2}}-\frac{e^{-\frac{(c\,v-2\,c\,s)^2}{4\,p}}\,(c\,v-2\,c\,s)\,\text{erfi}\left(\frac{2\,p\,\sqrt{z}-c\,(2\,s-v)}{2\,\sqrt{p}}\right)}{p^{3/2}}\right)+$$

$$\frac{4\,e^{p\,z}\cosh\left(c\,(v-2\,s)\,\sqrt{z}\right)}{p}\Bigg)+$$

$$2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\frac{4\,e^{p\,z-\frac{i\,m\,\pi}{2}}\cos\left(\frac{\pi\,m}{2}+(2\,i\,b\,k-i\,b\,m+2\,i\,c\,s-i\,c\,v)\,\sqrt{z}\right)}{p}-$$

$$\frac{1}{p^{3/2}}\left(e^{-\frac{(-2\,b\,k+b\,m-2\,c\,s+c\,v)^2}{4\,p}}\,\sqrt{\pi}\,(-2\,b\,k+b\,m-2\,c\,s+c\,v)\,\text{erfi}\left(\frac{-b\,(2\,k-m)-c\,(2\,s-v)+2\,p\,\sqrt{z}}{2\,\sqrt{p}}\right)\right)+$$

$$(-1)^m\Bigg(\frac{4\,e^{\frac{i\,\pi\,m}{2}+p\,z}\cos\left(\frac{\pi\,m}{2}+(2\,i\,b\,k-i\,b\,m-2\,i\,c\,s+i\,c\,v)\,\sqrt{z}\right)}{p}-$$

$$\frac{1}{p^{3/2}}\left(e^{-\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,p}}\,\sqrt{\pi}\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\,\text{erfi}\left(\frac{-b\,(m-2\,k)-c\,(2\,s-v)+2\,p\,\sqrt{z}}{2\,\sqrt{p}}\right)\right)-$$

$$\frac{1}{p^{3/2}}\left(e^{i\,m\,\pi-\frac{(-2\,b\,k+b\,m+2\,c\,s-c\,v)^2}{4\,p}}\,\sqrt{\pi}\,(-2\,b\,k+b\,m+2\,c\,s-c\,v)\,\text{erfi}\left(\frac{-b\,(2\,k-m)-c\,(v-2\,s)+2\,p\,\sqrt{z}}{2\,\sqrt{p}}\right)\right)\Bigg)-$$

$$\frac{1}{p^{3/2}}\left(e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,p}-i\,m\,\pi}\,\sqrt{\pi}\,(-b\,(m-2\,k)-c\,(v-2\,s))\right.$$

$$\left.\text{erfi}\left(\frac{-b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}}{2\,\sqrt{p}}\right)\right)\Bigg)\Bigg);\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{p\,z^r}\sinh^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.4661.01

$$\int e^{p z} \sinh^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == \frac{i^m 2^{-m-v} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2)}{p} -$$

$$\frac{1}{b}\left(\left(i^m 2^{-m-v-1}\right) \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \frac{1}{m-2k} \left((-1)^k \binom{m}{k} \left(e^{\frac{p^2+2bim(m-2k)\pi}{4b(m-2k)}} \sqrt{-b(m-2k)}\ \operatorname{erfi}\left(\frac{p-2b(m-2k)z}{2\sqrt{-b(m-2k)}}\right) - \right.\right.\right.$$

$$\left.\left.\left. e^{-\frac{p^2+2bim(m-2k)\pi}{4b(m-2k)}} \sqrt{b(m-2k)}\ \operatorname{erfi}\left(\frac{p+2b(m-2k)z}{2\sqrt{b(m-2k)}}\right)\right)\right)\right) - \frac{1}{c}\left(\left(i^m 2^{-m-v-1} \sqrt{\pi}\right) \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\right.$$

$$\left.\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \frac{1}{v-2s} \left(\binom{v}{s} \left(e^{\frac{p^2}{4c(v-2s)}} \sqrt{-c(v-2s)}\ \operatorname{erfi}\left(\frac{p-2c(v-2s)z}{2\sqrt{-c(v-2s)}}\right) - e^{-\frac{p^2}{4c(v-2s)}} \sqrt{c(v-2s)}\ \operatorname{erfi}\left(\frac{p+2c(v-2s)z}{2\sqrt{c(v-2s)}}\right)\right)\right)\right) +$$

$$i^m 2^{-m-v-1} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(e^{-\frac{p^2-2im\pi(b(2k-m)+c(v-2s))}{4(b(2k-m)+c(v-2s))}} \sqrt{b(2k-m)+c(v-2s)}\right.\right.$$

$$(-b(2k-m)-c(v-2s)) \operatorname{erfi}\left(\frac{p+2(b(2k-m)+c(v-2s))z}{2\sqrt{b(2k-m)+c(v-2s)}}\right) + e^{-\frac{p^2+2im\pi(-b(2k-m)-c(v-2s))}{4(-b(2k-m)-c(v-2s))}}$$

$$\left.(b(2k-m)+c(v-2s)) \sqrt{-b(2k-m)-c(v-2s)}\ \operatorname{erfi}\left(\frac{p-2(b(2k-m)+c(v-2s))z}{2\sqrt{-b(2k-m)-c(v-2s)}}\right)\right) /$$

$$((-b(2k-m)-c(v-2s))(b(2k-m)+c(v-2s))) + \left(e^{-\frac{p^2+2im\pi(b(m-2k)+c(v-2s))}{4(b(m-2k)+c(v-2s))}} \sqrt{b(m-2k)+c(v-2s)}\right.$$

$$(-b(m-2k)-c(v-2s)) \operatorname{erfi}\left(\frac{p+2(b(m-2k)+c(v-2s))z}{2\sqrt{b(m-2k)+c(v-2s)}}\right) + e^{-\frac{p^2-2im\pi(-b(m-2k)-c(v-2s))}{4(-b(m-2k)-c(v-2s))}}$$

$$\left.(b(m-2k)+c(v-2s)) \sqrt{-b(m-2k)-c(v-2s)}\ \operatorname{erfi}\left(\frac{p-2(b(m-2k)+c(v-2s))z}{2\sqrt{-b(m-2k)-c(v-2s)}}\right)\right) /$$

$$\left.((-b(m-2k)-c(v-2s))(b(m-2k)+c(v-2s)))\right) /; m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.4662.01

$$\int e^{p z^2} \sinh^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == \frac{i^m 2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{p}\, z\right) (1 - m \bmod 2) (1 - v \bmod 2)}{\sqrt{p}} +$$

$$i^m 2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\frac{e^{\frac{i m \pi}{2}} \operatorname{erfi}\left(\sqrt{p - b (m - 2 k)}\, z\right)}{\sqrt{p - b (m - 2 k)}} + \frac{e^{-\frac{1}{2} i m \pi} \operatorname{erfi}\left(\sqrt{b (m - 2 k) + p}\, z\right)}{\sqrt{b (m - 2 k) + p}} \right) +$$

$$i^m 2^{-m-v-1} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{\operatorname{erfi}\left(\sqrt{p + c (v - 2 s)}\, z\right)}{\sqrt{p + c (v - 2 s)}} + \frac{\operatorname{erfi}\left(\sqrt{p - c (v - 2 s)}\, z\right)}{\sqrt{p - c (v - 2 s)}} \right) + i^m 2^{-m-v-1} \sqrt{\pi}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(\frac{\operatorname{erfi}\left(\sqrt{-2 b k + b m + p - 2 c s + c v}\, z\right)}{\sqrt{-2 b k + b m + p - 2 c s + c v}} + \frac{\operatorname{erfi}\left(\sqrt{2 b k - b m + p - 2 c s + c v}\, z\right)}{\sqrt{2 b k - b m + p - 2 c s + c v}} + \right.\right.$$

$$\left. \frac{\operatorname{erfi}\left(\sqrt{-2 b k + b m + p + 2 c s - c v}\, z\right)}{\sqrt{-2 b k + b m + p + 2 c s - c v}} + \frac{\operatorname{erfi}\left(\sqrt{2 b k - b m + p + 2 c s - c v}\, z\right)}{\sqrt{2 b k - b m + p + 2 c s - c v}} \right) \cos\left(\frac{m \pi}{2}\right) +$$

$$i \left(- \frac{\operatorname{erfi}\left(\sqrt{-2 b k + b m + p - 2 c s + c v}\, z\right)}{\sqrt{-2 b k + b m + p - 2 c s + c v}} + \frac{\operatorname{erfi}\left(\sqrt{2 b k - b m + p - 2 c s + c v}\, z\right)}{\sqrt{2 b k - b m + p - 2 c s + c v}} - \right.$$

$$\frac{\operatorname{erfi}\left(\sqrt{-2 b k + b m + p + 2 c s - c v}\, z\right)}{\sqrt{-2 b k + b m + p + 2 c s - c v}} +$$

$$\left. \left. \frac{\operatorname{erfi}\left(\sqrt{2 b k - b m + p + 2 c s - c v}\, z\right)}{\sqrt{2 b k - b m + p + 2 c s - c v}} \right) \sin\left(\frac{m \pi}{2}\right) \right) /;\ m \in \mathbb{Z} \wedge m > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

01.20.21.4663.01

$$\int e^{p\sqrt{z}}\sinh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz ==$$

$$\frac{i^m\,2^{-m-v+1}\,e^{p\sqrt{z}}\left(p\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{p^2}+i^m\,2^{-m-v+2}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\,e^{p\sqrt{z}}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{\left(p^2-b^2\,(m-2\,k)^2\right)^2}\left((-1)^k\binom{m}{k}\left(\left(p^2\left(p\sqrt{z}-1\right)-b^2\,(m-2\,k)^2\left(\sqrt{z}\;p+1\right)\right)\cos\left(\frac{\pi\,m}{2}+b\,i\,(m-2\,k)\sqrt{z}\right)+\right.\right.$$

$$\left.\left.b\,i\,(m-2\,k)\left(-b^2\sqrt{z}\;(m-2\,k)^2-2\,p+p^2\sqrt{z}\right)\sin\left(\frac{\pi\,m}{2}+b\,i\,(m-2\,k)\sqrt{z}\right)\right)\right)+i^m\,2^{-m-v+2}\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\,e^{p\sqrt{z}}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{\left(p^2-c^2\,(v-2\,s)^2\right)^2}\left(\binom{v}{s}\left(\left(p^2\left(p\sqrt{z}-1\right)-c^2\,(v-2\,s)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left(c\,(v-2\,s)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.c\,(v-2\,s)\left(\sqrt{z}\;p^2-2\,p-c^2\,(v-2\,s)^2\sqrt{z}\right)\sinh\left(c\,(v-2\,s)\sqrt{z}\right)\right)\right)+i^m\,2^{-m-v+2}\,e^{p\sqrt{z}}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(\left(p^2\left(p\sqrt{z}-1\right)-(2\,b\,k-b\,m-2\,c\,s+c\,v)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{z}\right)-(2\,b\,k-b\,m-2\,c\,s+c\,v)\left(\sqrt{z}\;p^2-2\,p-(2\,b\,k-b\,m-2\,c\,s+c\,v)^2\sqrt{z}\right)\right.\right.\right.$$

$$\left.\left.\left.\sinh\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\sqrt{z}\right)\right)\Big/\left(p^2-(2\,b\,k-b\,m-2\,c\,s+c\,v)^2\right)^2+\right.$$

$$\left.\left(\left(p^2\left(p\sqrt{z}-1\right)-(2\,b\,k-b\,m+2\,c\,s-c\,v)^2\left(\sqrt{z}\;p+1\right)\right)\cosh\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.(2\,b\,k-b\,m+2\,c\,s-c\,v)\left(\sqrt{z}\;p^2-2\,p-(2\,b\,k-b\,m+2\,c\,s-c\,v)^2\sqrt{z}\right)\right.\right.$$

$$\left.\left.\sinh\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\sqrt{z}\right)\right)\Big/\left(p^2-(2\,b\,k-b\,m+2\,c\,s-c\,v)^2\right)^2\right)\cos\left(\frac{m\,\pi}{2}\right)+$$

$$\left(\left(i\left(p^2\left(p\sqrt{z}-1\right)-(2\,b\,k-b\,m-2\,c\,s+c\,v)^2\left(\sqrt{z}\;p+1\right)\right)\sinh\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.i\,(2\,b\,k-b\,m-2\,c\,s+c\,v)\left(\sqrt{z}\;p^2-2\,p-(2\,b\,k-b\,m-2\,c\,s+c\,v)^2\sqrt{z}\right)\right.\right.$$

$$\left.\left.\cosh\left((2\,b\,k-b\,m-2\,c\,s+c\,v)\sqrt{z}\right)\right)\Big/\left(p^2-(2\,b\,k-b\,m-2\,c\,s+c\,v)^2\right)^2+\right.$$

$$\left.\left(i\left(p^2\left(p\sqrt{z}-1\right)-(2\,b\,k-b\,m+2\,c\,s-c\,v)^2\left(\sqrt{z}\;p+1\right)\right)\sinh\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\sqrt{z}\right)-\right.\right.$$

$$\left.\left.i\,(2\,b\,k-b\,m+2\,c\,s-c\,v)\left(\sqrt{z}\;p^2-2\,p-(2\,b\,k-b\,m+2\,c\,s-c\,v)^2\sqrt{z}\right)\right.\right.$$

$$\left.\left.\cosh\left((2\,b\,k-b\,m+2\,c\,s-c\,v)\sqrt{z}\right)\right)\Big/\right.$$

$$\left.\left(p^2-(2\,b\,k-b\,m+2\,c\,s-c\,v)^2\right)^2\right)\sin\left(\frac{m\,\pi}{2}\right)\Big)\;/;\;m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{b\,z^r+e}\sinh^m\left(a\,z^r+q\right)\cosh^v\left(c\,z^r+g\right)$

01.20.21.4664.01

$$\int e^{b z^r+e} \sinh^m(a z^r+q) \cosh^v(c z^r+g)\, dz ==$$

$$-\frac{i^m 2^{-m-v} z}{r}\left(e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{1}{r}, -b z^r\right)(1-m \bmod 2)(1-v \bmod 2)(-b z^r)^{-1/r} + \binom{v}{\frac{v}{2}}(1-v \bmod 2)\right.$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}\left(e^{e+2kq-mq+\frac{i m \pi}{2}} \Gamma\left(\frac{1}{r}, (-b-2ak+am) z^r\right)((-b-2ak+am) z^r)^{-1/r} + e^{e-2kq+mq-\frac{i m \pi}{2}}\right.$$

$$\left.\left.((-b+2ak-am) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2ak-am) z^r\right)\right)+$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2gs-gv} \Gamma\left(\frac{1}{r}, (-b-2cs+cv) z^r\right)((-b-2cs+cv) z^r)^{-1/r}+\right.$$

$$\left.e^{e-2gs+gv}((-b+2cs-cv) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2cs-cv) z^r\right)\right)+\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor}(-1)^k \binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}\left(e^{e+2kq-mq+2gs-gv+\frac{i m \pi}{2}} \Gamma\left(\frac{1}{r}, (-b-2ak+am-2cs+cv) z^r\right)((-b-2ak+am-2cs+cv) z^r)^{-1/r}+\right.$$

$$e^{e-2kq+mq+2gs-gv-\frac{i m \pi}{2}}((-b+2ak-am-2cs+cv) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2ak-am-2cs+cv) z^r\right)+$$

$$e^{e+2kq-mq-2gs+gv+\frac{i m \pi}{2}}((-b-2ak+am+2cs-cv) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b-2ak+am+2cs-cv) z^r\right)+$$

$$\left.\left.e^{e-2kq+mq-2gs+gv-\frac{i m \pi}{2}}((-b+2ak-am+2cs-cv) z^r)^{-1/r} \Gamma\left(\frac{1}{r}, (-b+2ak-am+2cs-cv) z^r\right)\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4665.01

$$\int e^{b z^2+e} \sinh^m\left(a z^2+q\right) \cosh^v\left(c z^2+g\right) dz ==$$

$$\frac{2^{-m-v-1}\, i^{-m}\, e^e \sqrt{\pi} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \operatorname{erfi}\left(\sqrt{b}\, z\right) (1-m \bmod 2)\, (1-v \bmod 2)}{\sqrt{b}} + 2^{-m-v-1} \sqrt{\pi} \binom{v}{\frac{v}{2}} (1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k\, e^{e+(-2k-m)q} \binom{m}{k} \left(\frac{(-1)^m\, e^{4kq} \operatorname{erfi}\left(\sqrt{b+a(2k-m)}\, z\right)}{\sqrt{b+a(2k-m)}} + \frac{e^{2mq} \operatorname{erfi}\left(\sqrt{b-a(2k-m)}\, z\right)}{\sqrt{b-a(2k-m)}} \right) +$$

$$2^{-m-v-1}\, i^{-m} \sqrt{\pi} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{e+g(2s+v)} \binom{v}{s} \left(\frac{e^{-4gs} \operatorname{erfi}\left(\sqrt{b-c(2s-v)}\, z\right)}{\sqrt{b-c(2s-v)}} + \frac{e^{-2gv} \operatorname{erfi}\left(\sqrt{b+2cs-cv}\, z\right)}{\sqrt{b+2cs-cv}} \right) +$$

$$2^{-m-v-1}\, i^{-m} \sqrt{\pi} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{e^{e+(m-2k)q+g(v-2s)+\frac{i m \pi}{2}} \operatorname{erfi}\left(\sqrt{b+a(m-2k)+c(v-2s)}\, z\right)}{\sqrt{b+a(m-2k)+c(v-2s)}} + \right.$$

$$\frac{e^{e-(m-2k)q+g(v-2s)-\frac{i m \pi}{2}} \operatorname{erfi}\left(\sqrt{b-a(m-2k)+c(v-2s)}\, z\right)}{\sqrt{b-a(m-2k)+c(v-2s)}} +$$

$$\frac{e^{e+(m-2k)q-g(v-2s)+\frac{i m \pi}{2}} \operatorname{erfi}\left(\sqrt{b+a(m-2k)-c(v-2s)}\, z\right)}{\sqrt{b+a(m-2k)-c(v-2s)}} +$$

$$\left. \frac{e^{e-(m-2k)q-g(v-2s)-\frac{i m \pi}{2}} \operatorname{erfi}\left(\sqrt{b-a(m-2k)-c(v-2s)}\, z\right)}{\sqrt{b-a(m-2k)-c(v-2s)}} \right) /;\ m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4666.01

$$\int e^{\sqrt{z}\,b+e}\sinh^m\left(\sqrt{z}\,a+q\right)\cosh^v\left(\sqrt{z}\,c+g\right)dz == \frac{2^{-m-v+1}\,i^{-m}\,e^{\sqrt{z}\,b+e}\left(b\sqrt{z}-1\right)\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)}{b^2}+$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\left(\frac{e^{e+(m-2k)\,q+(b+a\,(m-2k))\sqrt{z}}\left((b+a\,(m-2k))\sqrt{z}-1\right)}{(b+a\,(m-2k))^2}+\right.$$

$$\left.\frac{(-1)^m\,e^{e-(m-2k)\,q+(b-a\,(m-2k))\sqrt{z}}\left((b-a\,(m-2k))\sqrt{z}-1\right)}{(b-a\,(m-2k))^2}\right)\binom{m}{k}+2^{-m-v+1}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\frac{e^{e+g\,(v-2s)+(b+c\,(v-2s))\sqrt{z}}\left((b+c\,(v-2s))\sqrt{z}-1\right)}{(b+c\,(v-2s))^2}+\frac{e^{e-g\,(v-2s)+(b-c\,(v-2s))\sqrt{z}}\left((b-c\,(v-2s))\sqrt{z}-1\right)}{(b-c\,(v-2s))^2}\right)\binom{v}{s}+$$

$$2^{-m-v+1}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\left(e^{e+(m-2k)\,q+g\,(v-2s)+(b+a\,(m-2k)+c\,(v-2s))\sqrt{z}+\frac{i\,m\,\pi}{2}}\left((b+a\,(m-2k)+c\,(v-2s))\sqrt{z}-1\right)\right)\Big/\right.$$

$$(b+a\,(m-2k)+c\,(v-2s))^2+\left(e^{e-(m-2k)\,q+g\,(v-2s)+(b-a\,(m-2k)+c\,(v-2s))\sqrt{z}-\frac{i\,m\,\pi}{2}}\right.$$

$$\left.\left((b-a\,(m-2k)+c\,(v-2s))\sqrt{z}-1\right)\right)\Big/(b-a\,(m-2k)+c\,(v-2s))^2+$$

$$\left(e^{e+(m-2k)\,q-g\,(v-2s)+(b+a\,(m-2k)-c\,(v-2s))\sqrt{z}+\frac{i\,m\,\pi}{2}}\left((b+a\,(m-2k)-c\,(v-2s))\sqrt{z}-1\right)\right)\Big/$$

$$(b+a\,(m-2k)-c\,(v-2s))^2+\left(e^{e-(m-2k)\,q-g\,(v-2s)+(b-a\,(m-2k)-c\,(v-2s))\sqrt{z}-\frac{i\,m\,\pi}{2}}\right.$$

$$\left.\left.\left((b-a\,(m-2k)-c\,(v-2s))\sqrt{z}-1\right)\right)\Big/(b-a\,(m-2k)-c\,(v-2s))^2\right)\binom{v}{s}\Big/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\sinh^m\left(a\,z^r+p\,z+q\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

01.20.21.4667.01

$$\int e^{b\,z^2+d\,z+e}\sinh^m\left(a\,z^2+p\,z+q\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz ==$$

$$\frac{i^m\,2^{-m-v-1}\,e^{-\frac{d^2-4\,b\,e}{4\,b}}\sqrt{\pi}\;(1-m \bmod 2)\,(1-v \bmod 2)}{\sqrt{b}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\operatorname{erfi}\left(\frac{d+2\,b\,z}{2\sqrt{b}}\right)+$$

$$i^m\,2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\binom{m}{k}\left(e^{-\frac{(d+(m-2k)\,p)^2-4\,(b+a\,(m-2k))\left(e+(m-2k)\,q-\frac{i\,m\,\pi}{2}\right)}{4\,(b+a\,(m-2k))}}\sqrt{b+a\,(m-2k)}\right.\right.$$

$$(b-a\,(m-2k))\operatorname{erfi}\left(\frac{d+(m-2k)\,p+2\,(b+a\,(m-2k))\,z}{2\sqrt{b+a\,(m-2k)}}\right)+e^{-\frac{(d-(m-2k)\,p)^2-4\,(b-a\,(m-2k))\left(e-(m-2k)\,q+\frac{i\,m\,\pi}{2}\right)}{4\,(b-a\,(m-2k))}}$$

$$\left.\left.(b+a\,(m-2k))\sqrt{b-a\,(m-2k)}\;\operatorname{erfi}\left(\frac{d-(m-2k)\,p+2\,b\,z-2\,a\,(m-2k)\,z}{2\sqrt{b-a\,(m-2k)}}\right)\right)\right)\Big/$$

$$((b-a\,(m-2\,k))\,(b+a\,(m-2\,k)))+i^m\,2^{-m-\nu-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,\sqrt{\pi}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\left(\binom{\nu}{s}\left(e^{-\frac{(d+f\,(\nu-2\,s))^2-4\,(b+c\,(\nu-2\,s))\,(e+g\,(\nu-2\,s))}{4\,(b+c\,(\nu-2\,s))}}\sqrt{b+c\,(\nu-2\,s)}\;(b-c\,(\nu-2\,s))\,\operatorname{erfi}\left(\frac{d+f\,(\nu-2\,s)+2\,(b+c\,(\nu-2\,s))\,z}{2\sqrt{b+c\,(\nu-2\,s)}}\right)+\right.\right.$$
$$\left.\left.e^{-\frac{(d-f\,(\nu-2\,s))^2-4\,(b-c\,(\nu-2\,s))\,(e-g\,(\nu-2\,s))}{4\,(b-c\,(\nu-2\,s))}}\,(b+c\,(\nu-2\,s))\sqrt{b-c\,(\nu-2\,s)}\;\operatorname{erfi}\left(\frac{d-f\,(\nu-2\,s)+2\,b\,z-2\,c\,(\nu-2\,s)\,z}{2\sqrt{b-c\,(\nu-2\,s)}}\right)\right)\Bigg)\Bigg/$$
$$((b-c\,(\nu-2\,s))\,(b+c\,(\nu-2\,s)))+i^m\,2^{-m-\nu-1}\,\sqrt{\pi}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\left(e^{-\frac{(d+(2\,k-m)\,p+f\,(\nu-2\,s))^2-4\,(b+a\,(2\,k-m)+c\,(\nu-2\,s))\left(e+(2\,k-m)\,q+g\,(\nu-2\,s)+\frac{i\,m\,\pi}{2}\right)}{4\,(b+a\,(2\,k-m)+c\,(\nu-2\,s))}}\sqrt{b+a\,(2\,k-m)+c\,(\nu-2\,s)}\right.\right.$$
$$(b-a\,(2\,k-m)-c\,(\nu-2\,s))\,\operatorname{erfi}\left(\frac{d+(2\,k-m)\,p+f\,(\nu-2\,s)+2\,(b+a\,(2\,k-m)+c\,(\nu-2\,s))\,z}{2\sqrt{b+a\,(2\,k-m)+c\,(\nu-2\,s)}}\right)+$$
$$e^{-\frac{(d-(2\,k-m)\,p-f\,(\nu-2\,s))^2-4\,(b-a\,(2\,k-m)-c\,(\nu-2\,s))\left(e-(2\,k-m)\,q-g\,(\nu-2\,s)-\frac{i\,m\,\pi}{2}\right)}{4\,(b-a\,(2\,k-m)-c\,(\nu-2\,s))}}\,(b+a\,(2\,k-m)+c\,(\nu-2\,s))$$
$$\sqrt{b-a\,(2\,k-m)-c\,(\nu-2\,s)}\;\operatorname{erfi}\left((d-(2\,k-m)\,p-f\,(\nu-2\,s)+2\,b\,z-2\,(a\,(2\,k-m)+c\,(\nu-2\,s))\right.$$
$$\left.\left.z\right)\Big/\left(2\sqrt{b-a\,(2\,k-m)-c\,(\nu-2\,s)}\right)\right)\Bigg/((b-a\,(2\,k-m)-c\,(\nu-2\,s))\,(b+a\,(2\,k-m)+c$$
$$(\nu-2\,s)))+\left(e^{-\frac{(d+(m-2\,k)\,p+f\,(\nu-2\,s))^2-4\,(b+a\,(m-2\,k)+c\,(\nu-2\,s))\left(e+(m-2\,k)\,q+g\,(\nu-2\,s)-\frac{i\,m\,\pi}{2}\right)}{4\,(b+a\,(m-2\,k)+c\,(\nu-2\,s))}}\sqrt{b+a\,(m-2\,k)+c\,(\nu-2\,s)}\right.$$
$$(b-a\,(m-2\,k)-c\,(\nu-2\,s))\,\operatorname{erfi}\left(\frac{d+(m-2\,k)\,p+f\,(\nu-2\,s)+2\,(b+a\,(m-2\,k)+c\,(\nu-2\,s))\,z}{2\sqrt{b+a\,(m-2\,k)+c\,(\nu-2\,s)}}\right)+$$
$$e^{-\frac{(d-(m-2\,k)\,p-f\,(\nu-2\,s))^2-4\,(b-a\,(m-2\,k)-c\,(\nu-2\,s))\left(e-(m-2\,k)\,q-g\,(\nu-2\,s)+\frac{i\,m\,\pi}{2}\right)}{4\,(b-a\,(m-2\,k)-c\,(\nu-2\,s))}}\,(b+a\,(m-2\,k)+c\,(\nu-2\,s))$$
$$\sqrt{b-a\,(m-2\,k)-c\,(\nu-2\,s)}\;\operatorname{erfi}\left((d-(m-2\,k)\,p-f\,(\nu-2\,s)+2\,b\,z-\right.$$
$$\left.\left.2\,(a\,(m-2\,k)+c\,(\nu-2\,s))\,z\right)\Big/\left(2\sqrt{b-a\,(m-2\,k)-c\,(\nu-2\,s)}\right)\right)\Bigg/$$
$$\left.((b-a\,(m-2\,k)-c\,(\nu-2\,s))\,(b+a\,(m-2\,k)+c\,(\nu-2\,s)))\right);\ m\in\mathbb{N}^+\bigwedge\nu\in\mathbb{N}^+$$

01.20.21.4668.01

$$\int e^{\sqrt{z}\ b+d\,z+e}\sinh^m\left(\sqrt{z}\ a+p\,z+q\right)\cosh^v\left(\sqrt{z}\ c+f\,z+g\right)dz ==$$

$$i^m\,2^{-m-v-2}\,e^e\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\left(\frac{4\,e^{\sqrt{z}\ b+d\,z}}{d}-\frac{2\,b\,e^{-\frac{b^2}{4d}}\sqrt{\pi}\ \operatorname{erfi}\left(\frac{b+2\,d\,\sqrt{z}}{2\sqrt{d}}\right)}{d^{3/2}}\right)(1-m \bmod 2)\,(1-v \bmod 2)+$$

$$i^m\,2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,e^{e-(m-2\,k)\,q+\frac{i\,m\,\pi}{2}}\binom{m}{k}$$

$$\left(\sqrt{\pi}\left(-\left(e^{-\frac{(b+a\,(m-2\,k))^2}{4\,(d+(m-2\,k)\,p)}+2\,(m-2\,k)\,q-i\,m\,\pi}\,(b+a\,(m-2\,k))\operatorname{erfi}\left(\frac{b+a\,(m-2\,k)+2\,(d-2\,k\,p+m\,p)\,\sqrt{z}}{2\sqrt{d+(m-2\,k)\,p}}\right)\right)\Big/\right.\right.$$

$$\left.\left.(d+(m-2\,k)\,p)^{3/2}-\frac{e^{-\frac{(b+2\,a\,k-a\,m)^2}{4\,(d+2\,k\,p-m\,p)}}\,(b+2\,a\,k-a\,m)\operatorname{erfi}\left(\frac{b+a\,(2\,k-m)+2\,(d+2\,k\,p-m\,p)\,\sqrt{z}}{2\sqrt{d+2\,k\,p-m\,p}}\right)}{(d+2\,k\,p-m\,p)^{3/2}}\right)+\right.$$

$$\left.\frac{2\,e^{\sqrt{z}\ (b+a\,(m-2\,k))+2\left((m-2\,k)\,q-\frac{i\,m\,\pi}{2}\right)+(d+(m-2\,k)\,p)\,z}}{d+(m-2\,k)\,p}+\frac{2\,e^{\sqrt{z}\ (b-a\,(m-2\,k))+(d-(m-2\,k)\,p)\,z}}{d-(m-2\,k)\,p}\right)+$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}e^{e-g\,(v-2\,s)}\binom{v}{s}\left(\sqrt{\pi}\left(-\frac{e^{-\frac{(b+2\,c\,s-c\,v)^2}{4\,(d+2\,f\,s-f\,v)}}\,(b+2\,c\,s-c\,v)\operatorname{erfi}\left(\frac{b+c\,(2\,s-v)+2\,(d+2\,f\,s-f\,v)\,\sqrt{z}}{2\sqrt{d+2\,f\,s-f\,v}}\right)}{(d+2\,f\,s-f\,v)^{3/2}}-\right.\right.$$

$$\left.\left.\frac{e^{2\,g\,(v-2\,s)-\frac{(b+c\,(v-2\,s))^2}{4\,(d+f\,(v-2\,s))}}\,(b+c\,(v-2\,s))\operatorname{erfi}\left(\frac{b+c\,(v-2\,s)+2\,(d-2\,f\,s+f\,v)\,\sqrt{z}}{2\sqrt{d+f\,(v-2\,s)}}\right)}{(d+f\,(v-2\,s))^{3/2}}\right)+\right.$$

$$\left.\frac{2\,e^{2\,g\,(v-2\,s)+(d+f\,(v-2\,s))\,z+(b+c\,(v-2\,s))\,\sqrt{z}}}{d+f\,(v-2\,s)}+\frac{2\,e^{\sqrt{z}\ (b-c\,(v-2\,s))+(d-f\,(v-2\,s))\,z}}{d-f\,(v-2\,s)}\right)+i^m\,2^{-m-v-1}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{e-(m-2\,k)\,q-g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\left(\frac{2\,e^{-i\,\pi\,m+2\,(m-2\,k)\,q+2\,g\,(v-2\,s)+(d-2\,k\,p+m\,p-2\,f\,s+f\,v)\,z+(b-2\,a\,k+a\,m-2\,c\,s+c\,v)\,\sqrt{z}}}{d-2\,k\,p+m\,p-2\,f\,s+f\,v}-\right.\right.$$

$$\left(e^{-\frac{(b+a(m-2k)+c(v-2s))^2}{4(d-2kp+mp-2fs+fv)}+2(m-2k)q+2g(v-2s)-im\pi}\sqrt{\pi}\,(b+a(m-2k)+c(v-2s))\right.$$
$$\left.\operatorname{erfi}\left((b+a(m-2k)+c(v-2s)+2(d-2kp+mp-2fs+fv)\sqrt{z}\right)\Big/\left(2\sqrt{d-2kp+mp-2fs+fv}\right)\right)\Big/(d-2kp+mp-2fs+fv)^{3/2}+$$
$$\frac{2e^{\sqrt{z}\,(b+2ak-am+2cs-cv)+(d+2kp-mp+2fs-fv)z}}{d+2kp-mp+2fs-fv}-\left(e^{-\frac{(b+2ak-am+2cs-cv)^2}{4(d+2kp-mp+2fs-fv)}}\sqrt{\pi}\,(b+2ak-am+2cs-cv)\right.$$
$$\left.\operatorname{erfi}\left((b+a(2k-m)+c(2s-v)+2(d+2kp-mp+2fs-fv)\sqrt{z}\right)\Big/\left(2\sqrt{d+2kp-mp+2fs-fv}\right)\right)\Big/(d+2kp-mp+2fs-fv)^{3/2}\Bigg)+$$
$$e^{e-(2k-m)q-g(v-2s)-\frac{im\pi}{2}}\left(\frac{2e^{-2qm+i\pi m+4kq+2g(v-2s)+(d+2kp-mp-2fs+fv)z+(b+2ak-am-2cs+cv)\sqrt{z}}}{d+2kp-mp-2fs+fv}-\right.$$
$$\left(e^{-\frac{(b+2ak-am-2cs+cv)^2}{4(d+2kp-mp-2fs+fv)}+4kq-2mq+2g(v-2s)+im\pi}\sqrt{\pi}\,(b+2ak-am-2cs+cv)\right.$$
$$\left.\operatorname{erfi}\left((b+a(2k-m)+c(v-2s)+2(d+2kp-mp-2fs+fv)\sqrt{z}\right)\Big/\left(2\sqrt{d+2kp-mp-2fs+fv}\right)\right)\Big/(d+2kp-mp-2fs+fv)^{3/2}+$$
$$\frac{2e^{\sqrt{z}\,(b-2ak+am+2cs-cv)+(d-2kp+mp+2fs-fv)z}}{d-2kp+mp+2fs-fv}-\left(e^{-\frac{(b-2ak+am+2cs-cv)^2}{4(d-2kp+mp+2fs-fv)}}\sqrt{\pi}\,(b-2ak+am+2cs-cv)\right.$$
$$\left.\left.\operatorname{erfi}\left((b+a(m-2k)+c(2s-v)+2(d-2kp+mp+2fs-fv)\sqrt{z}\right)\Big/\left(2\sqrt{d-2kp+mp+2fs-fv}\right)\right)\Big/(d-2kp+mp+2fs-fv)^{3/2}\right)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving powers of sinh and rational functions of exp

Involving $\sinh^m(e\,z)\cosh^v(c\,z)\left(a+b\,e^{d\,z}\right)^{-n}$

01.20.21.4669.01

$$\int \frac{\sinh^m(e z)\cosh^v(c z)}{\left(a+b e^{d z}\right)^n}\,dz == -\frac{1}{d n}\left(i^m 2^{-m-v} b^{-n} e^{-d n z}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}{}_2F_1\left(n, n; n+1; -\frac{a e^{-d z}}{b}\right)(1-m \bmod 2)(1-v \bmod 2)\right)+$$

$$\frac{1}{e}\left(i^m 2^{-m-v} a^{-n}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{1}{m-2k}\left((-1)^k\binom{m}{k}\left(e^{e(m-2k)z-\frac{i m \pi}{2}}{}_2F_1\left(\frac{e(m-2k)}{d}, n; \frac{d+e(m-2k)}{d}; -\frac{b e^{d z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{\frac{i m \pi}{2}-e(m-2k)z}{}_2F_1\left(-\frac{e(m-2k)}{d}, n; \frac{d-e(m-2k)}{d}; -\frac{b e^{d z}}{a}\right)\right)\right)\right)+$$

$$\frac{1}{c}\left(i^m 2^{-m-v} a^{-n}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\left(\binom{v}{s}\left(e^{c(v-2s)z}{}_2F_1\left(\frac{c(v-2s)}{d}, n; \frac{d+c(v-2s)}{d}; -\frac{b e^{d z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{-c(v-2s)z}{}_2F_1\left(-\frac{c(v-2s)}{d}, n; \frac{d-c(v-2s)}{d}; -\frac{b e^{d z}}{a}\right)\right)\right)\right)+i^m 2^{-m-v} a^{-n}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(e^{(2ek-em+2cs-cv)z}{}_2F_1\left(\frac{2ek-em+2cs-cv}{d}, n; \frac{d+2ek-em+2cs-cv}{d}; -\frac{b e^{d z}}{a}\right)-\right.\right.\right.$$

$$\left.\left.\left.e^{(-2ek+em-2cs+cv)z}{}_2F_1\left(\frac{-2ek+em-2cs+cv}{d}, n; \frac{d-2ek+em-2cs+cv}{d}; -\frac{b e^{d z}}{a}\right)\right)\right/$$

$$(2ek-em+2cs-cv)+\left(e^{(2ek-em-2cs+cv)z}{}_2F_1\left(\frac{2ek-em-2cs+cv}{d}, n;\right.\right.$$

$$\left.\left.\frac{d+2ek-em-2cs+cv}{d}; -\frac{b e^{d z}}{a}\right)-e^{(-2ek+em+2cs-cv)z}{}_2F_1\left(\frac{-2ek+em+2cs-cv}{d},\right.\right.$$

$$\left.\left.n; \frac{d-2ek+em+2cs-cv}{d}; -\frac{b e^{d z}}{a}\right)\right)\Big/(2ek-em-2cs+cv)\Bigg)\cos\left(\frac{m\pi}{2}\right)+$$

$$i\left(\left(e^{(-2ek+em-2cs+cv)z}{}_2F_1\left(\frac{-2ek+em-2cs+cv}{d}, n; \frac{d-2ek+em-2cs+cv}{d}; -\frac{b e^{d z}}{a}\right)+\right.\right.$$

$$e^{(2ek-em+2cs-cv)z}{}_2F_1\left(\frac{2ek-em+2cs-cv}{d}, n;\right.$$

$$\left.\left.\frac{d+2ek-em+2cs-cv}{d}; -\frac{b e^{d z}}{a}\right)\right)\Big/(2ek-em+2cs-cv)+$$

$$\left(e^{(2ek-em-2cs+cv)z}{}_2F_1\left(\frac{2ek-em-2cs+cv}{d}, n; \frac{d+2ek-em-2cs+cv}{d}; -\frac{b e^{d z}}{a}\right)+\right.$$

$$\left.\left.e^{(-2ek+em+2cs-cv)z}{}_2F_1\left(\frac{-2ek+em+2cs-cv}{d}, n; \frac{d-2ek+em+2cs-cv}{d}; -\frac{b e^{d z}}{a}\right)\right)\Big/\right.$$

$$\left.(2ek-em-2cs+cv)\right)\sin\left(\frac{m\pi}{2}\right)\Bigg)\Big/;\ n\in\mathbb{Z}\wedge n>0\wedge m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $e^{p z} \sinh^m(e z) \cosh^v(c z) \left(a + b\, e^{d z}\right)^{-n}$

01.20.21.4670.01

$$\int \frac{e^{p z} \sinh^m(e z) \cosh^v(c z)}{\left(a + b\, e^{d z}\right)^n} dz ==$$

$$\frac{i^m 2^{-m-v} a^{-n} e^{p z} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} {}_2F_1\left(\frac{p}{d}, n; \frac{d+p}{d}; -\frac{b e^{d z}}{a}\right) (1 - m \bmod 2) (1 - v \bmod 2)}{p} + i^m 2^{-m-v} a^{-n} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left((-1)^k \binom{m}{k} \left(e^{(e(m-2k)+p) z - \frac{i m \pi}{2}} (e(m-2k) - p) {}_2F_1\left(\frac{e(m-2k)+p}{d}, n; \frac{d + e(m-2k) + p}{d}; -\frac{b e^{d z}}{a}\right) - \right.\right.$$

$$\left.\left. e^{\frac{i \pi m}{2} + (p - e(m-2k)) z} (e(m-2k) + p) {}_2F_1\left(\frac{p - e(m-2k)}{d}, n; \frac{d - e(m-2k) + p}{d}; -\frac{b e^{d z}}{a}\right) \right) \right) \Big/$$

$$((e(m-2k) - p)(e(m-2k) + p)) + i^m 2^{-m-v} a^{-n} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \left(\binom{v}{s} \left(e^{(p + c(v-2s)) z} (c(v-2s) - p) {}_2F_1\left(\frac{p + c(v-2s)}{d}, n; \frac{d + p + c(v-2s)}{d}; -\frac{b e^{d z}}{a}\right) - e^{(p - c(v-2s)) z} \right.\right.$$

$$\left.\left. (p + c(v-2s)) {}_2F_1\left(\frac{p - c(v-2s)}{d}, n; \frac{d + p - c(v-2s)}{d}; -\frac{b e^{d z}}{a}\right) \right) \right) \Big/ ((c(v-2s) - p)(p + c(v-2s))) +$$

$$i^m 2^{-m-v} a^{-n} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\left(\left(e^{(2ek - em + p + 2cs - cv) z} (2ek - em - p + 2cs - cv) {}_2F_1\left(\frac{2ek - em + p + 2cs - cv}{d}, \right.\right.\right.\right.$$

$$\left.\left.\left.\left. n; \frac{d + 2ek - em + p + 2cs - cv}{d}; -\frac{b e^{d z}}{a}\right) - e^{(-2ek + em + p - 2cs + cv) z} (2ek - em + p + 2cs - \right.\right.\right.$$

$$\left.\left.\left. cv) {}_2F_1\left(\frac{-2ek + em + p - 2cs + cv}{d}, n; \frac{d - 2ek + em + p - 2cs + cv}{d}; -\frac{b e^{d z}}{a}\right) \right) \right) \Big/$$

$$((2ek - em - p + 2cs - cv)(2ek - em + p + 2cs - cv)) + \left(e^{(2ek - em + p - 2cs + cv) z} \right.$$

$$(2ek - em - p - 2cs + cv) {}_2F_1\left(\frac{2ek - em + p - 2cs + cv}{d}, n; \frac{d + 2ek - em + p - 2cs + cv}{d}; \right.$$

$$\left. -\frac{b e^{d z}}{a}\right) - e^{(-2ek + em + p + 2cs - cv) z} (2ek - em + p - 2cs + cv)$$

$$\left. {}_2F_1\left(\frac{-2ek + em + p + 2cs - cv}{d}, n; \frac{d - 2ek + em + p + 2cs - cv}{d}; -\frac{b e^{d z}}{a}\right) \right) \Big/$$

$$\left. ((2ek - em - p - 2cs + cv)(2ek - em + p - 2cs + cv)) \right) \cos\left(\frac{m \pi}{2}\right) +$$

$$i \left(\left(e^{(-2ek + em + p - 2cs + cv) z} (2ek - em + p + 2cs - cv) {}_2F_1\left(\frac{-2ek + em + p - 2cs + cv}{d}, n; \right.\right.\right.$$

$$\frac{d-2ek+em+p-2cs+cv}{d};-\frac{b\,e^{dz}}{a}\Bigg)+e^{(2ek-em+p+2cs-cv)z}(2ek-em-p+2cs-cv)$$
$${}_2F_1\Bigg(\frac{2ek-em+p+2cs-cv}{d},n;\frac{d+2ek-em+p+2cs-cv}{d};-\frac{b\,e^{dz}}{a}\Bigg)\Bigg)\Bigg/$$
$$((2ek-em-p+2cs-cv)(2ek-em+p+2cs-cv))+\Bigg(e^{(2ek-em+p-2cs+cv)z}(2ek-em-p-$$
$$2cs+cv)\,{}_2F_1\Bigg(\frac{2ek-em+p-2cs+cv}{d},n;\frac{d+2ek-em+p-2cs+cv}{d};-\frac{b\,e^{dz}}{a}\Bigg)+$$
$$e^{(-2ek+em+p+2cs-cv)z}(2ek-em+p-2cs+cv)\,{}_2F_1\Bigg(\frac{-2ek+em+p+2cs-cv}{d},$$
$$n;\frac{d-2ek+em+p+2cs-cv}{d};-\frac{b\,e^{dz}}{a}\Bigg)\Bigg)\Bigg/((2ek-em-p-2cs+cv)$$
$$(2ek-em+p-2cs+cv))\Bigg)\sin\Big(\frac{m\pi}{2}\Big)\Bigg)/;\ n\in\mathbb{Z}\wedge n>0\wedge m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving powers of sinh and algebraic functions of exp

Involving $(a+b\,e^{dz})^{\beta}\sinh^m(ez)\cosh^v(cz)$

01.20.21.4671.01

$$\int(a+b\,e^{dz})^{\beta}\sinh^m(ez)\cosh^v(cz)\,dz==$$
$$\frac{i^m\,2^{-m-v}\,(1-m\bmod 2)\,(1-v\bmod 2)}{d\,\beta}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Big(\frac{e^{-dz}a}{b}+1\Big)^{-\beta}(a+b\,e^{dz})^{\beta}\,{}_2F_1\Big(-\beta,-\beta;1-\beta;-\frac{a\,e^{-dz}}{b}\Big)+$$
$$\frac{i^m\,2^{-m-v}}{e}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\,(a+b\,e^{dz})^{\beta}\Big(\frac{e^{dz}b}{a}+1\Big)^{-\beta}$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\frac{(-1)^k}{m-2k}\binom{m}{k}\Bigg(e^{e(m-2k)z-\frac{im\pi}{2}}\,{}_2F_1\Big(\frac{e(m-2k)}{d},-\beta;\frac{d+e(m-2k)}{d};-\frac{b\,e^{dz}}{a}\Big)-$$
$$e^{\frac{im\pi}{2}-e(m-2k)z}\,{}_2F_1\Big(-\frac{e(m-2k)}{d},-\beta;\frac{d-e(m-2k)}{d};-\frac{b\,e^{dz}}{a}\Big)\Bigg)+$$
$$\frac{i^m\,2^{-m-v}}{c}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,(a+b\,e^{dz})^{\beta}\Big(\frac{e^{dz}b}{a}+1\Big)^{-\beta}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{v-2s}\binom{v}{s}$$
$$\Bigg(e^{c(v-2s)z}\,{}_2F_1\Big(\frac{c(v-2s)}{d},-\beta;\frac{d+c(v-2s)}{d};-\frac{b\,e^{dz}}{a}\Big)-e^{-c(v-2s)z}\,{}_2F_1\Big(-\frac{c(v-2s)}{d},-\beta;\frac{d-c(v-2s)}{d};-\frac{b\,e^{dz}}{a}\Big)\Bigg)+$$
$$i^m\,2^{-m-v}\,(a+b\,e^{dz})^{\beta}\Big(\frac{e^{dz}b}{a}+1\Big)^{-\beta}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(\Bigg(\frac{1}{2ek-em+2cs-cv}$$

$$\left(e^{(2ek-em+2cs-cv)z}\,{}_2F_1\left(\frac{2ek-em+2cs-cv}{d},\,-\beta;\,\frac{d+2ek-em+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)-\right.$$
$$\left.e^{(-2ek+em-2cs+cv)z}\,{}_2F_1\left(\frac{-2ek+em-2cs+cv}{d},\,-\beta;\,\frac{d-2ek+em-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)+$$
$$\frac{1}{2ek-em-2cs+cv}\left(e^{(2ek-em-2cs+cv)z}\,{}_2F_1\left(\frac{2ek-em-2cs+cv}{d},\,-\beta;\right.\right.$$
$$\left.\frac{d+2ek-em-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)-e^{(-2ek+em+2cs-cv)z}\,{}_2F_1\left(\frac{-2ek+em+2cs-cv}{d},\right.$$
$$\left.\left.-\beta;\,\frac{d-2ek+em+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\cos\left(\frac{m\pi}{2}\right)+i\left(\frac{1}{2ek-em+2cs-cv}\right.$$
$$\left(e^{(-2ek+em-2cs+cv)z}\,{}_2F_1\left(\frac{-2ek+em-2cs+cv}{d},\,-\beta;\,\frac{d-2ek+em-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)+\right.$$
$$\left.e^{(2ek-em+2cs-cv)z}\,{}_2F_1\left(\frac{2ek-em+2cs-cv}{d},\,-\beta;\,\frac{d+2ek-em+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)+$$
$$\frac{1}{2ek-em-2cs+cv}\left(e^{(2ek-em-2cs+cv)z}\,{}_2F_1\left(\frac{2ek-em-2cs+cv}{d},\,-\beta;\right.\right.$$
$$\left.\frac{d+2ek-em-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)+e^{(-2ek+em+2cs-cv)z}\,{}_2F_1\left(\frac{-2ek+em+2cs-cv}{d},\right.$$
$$\left.\left.-\beta;\,\frac{d-2ek+em+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\sin\left(\frac{m\pi}{2}\right)\Big)\Big/;\,m\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $e^{pz}\left(a+b\,e^{dz}\right)^{\beta}\sinh^m(ez)\cosh^v(cz)$

01.20.21.4672.01

$$\int e^{pz}\left(a+b\,e^{dz}\right)^{\beta}\sinh^m(ez)\cosh^v(cz)\,dz==$$
$$\frac{1}{p}\left(i^m\,2^{-m-v}\,e^{pz}\left(a+b\,e^{dz}\right)^{\beta}\left(\frac{e^{dz}\,b}{a}+1\right)^{-\beta}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\,{}_2F_1\left(\frac{p}{d},\,-\beta;\,\frac{d+p}{d};\,-\frac{b\,e^{dz}}{a}\right)(1-m\bmod 2)\,(1-v\bmod 2)\right)+$$
$$i^m\,2^{-m-v}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(a+b\,e^{dz}\right)^{\beta}\left(\frac{e^{dz}\,b}{a}+1\right)^{-\beta}$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\binom{m}{k}\left(e^{(e(m-2k)+p)z-\frac{im\pi}{2}}\,(e(m-2k)-p)\,{}_2F_1\left(\frac{e(m-2k)+p}{d},\,-\beta;\,\frac{d+e(m-2k)+p}{d};\,-\frac{b\,e^{dz}}{a}\right)-\right.\right.$$
$$\left.\left.e^{\frac{i\pi m}{2}+(p-e(m-2k))z}\,(e(m-2k)+p)\,{}_2F_1\left(\frac{p-e(m-2k)}{d},\,-\beta;\,\frac{d-e(m-2k)+p}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\right)\Big/$$
$$((e(m-2k)-p)\,(e(m-2k)+p))+i^m\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\left(a+b\,e^{dz}\right)^{\beta}\left(\frac{e^{dz}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\left(\binom{v}{s}\left(e^{(p+c(v-2s))z}(c(v-2s)-p)\,{}_2F_1\left(\frac{p+c(v-2s)}{d},\,-\beta;\,\frac{d+p+c(v-2s)}{d};\,-\frac{b\,e^{dz}}{a}\right)-\right.\right.$$
$$\left.\left.e^{(p-c(v-2s))z}(p+c(v-2s))\,{}_2F_1\left(\frac{p-c(v-2s)}{d},\,-\beta;\,\frac{d+p-c(v-2s)}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\right)\Big/$$
$$((c(v-2s)-p)(p+c(v-2s)))+i^m\,2^{-m-v}\left(a+b\,e^{dz}\right)^{\beta}\left(\frac{e^{dz}\,b}{a}+1\right)^{-\beta}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\left(\left(e^{(2ek-em+p+2cs-cv)z}(2ek-em-p+2cs-cv)\,{}_2F_1\left(\frac{2ek-em+p+2cs-cv}{d},\,-\beta;\right.\right.\right.\right.$$
$$\left.\left.\frac{d+2ek-em+p+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)-e^{(-2ek+em+p-2cs+cv)z}(2ek-em+p+2cs-$$
$$\left.cv)\,{}_2F_1\left(\frac{-2ek+em+p-2cs+cv}{d},\,-\beta;\,\frac{d-2ek+em+p-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\Big/$$
$$((2ek-em-p+2cs-cv)(2ek-em+p+2cs-cv))+$$
$$\left(e^{(2ek-em+p-2cs+cv)z}(2ek-em-p-2cs+cv)\,{}_2F_1\left(\frac{2ek-em+p-2cs+cv}{d},\,-\beta;\right.\right.$$
$$\left.\frac{d+2ek-em+p-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)-e^{(-2ek+em+p+2cs-cv)z}(2ek-em+p-2cs+$$
$$\left.cv)\,{}_2F_1\left(\frac{-2ek+em+p+2cs-cv}{d},\,-\beta;\,\frac{d-2ek+em+p+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\Big/$$
$$\left.((2ek-em-p-2cs+cv)(2ek-em+p-2cs+cv))\right)\cos\left(\frac{m\pi}{2}\right)+$$
$$i\left(\left(e^{(-2ek+em+p-2cs+cv)z}(2ek-em+p+2cs-cv)\,{}_2F_1\left(\frac{-2ek+em+p-2cs+cv}{d},\,-\beta;\right.\right.\right.$$
$$\left.\left.\frac{d-2ek+em+p-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)+e^{(2ek-em+p+2cs-cv)z}(2ek-em-p+2cs-cv)$$
$$\left.{}_2F_1\left(\frac{2ek-em+p+2cs-cv}{d},\,-\beta;\,\frac{d+2ek-em+p+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\Big/$$
$$((2ek-em-p+2cs-cv)(2ek-em+p+2cs-cv))+\left(e^{(2ek-em+p-2cs+cv)z}(2ek-em-p-\right.$$
$$2cs+cv)\,{}_2F_1\left(\frac{2ek-em+p-2cs+cv}{d},\,-\beta;\,\frac{d+2ek-em+p-2cs+cv}{d};\,-\frac{b\,e^{dz}}{a}\right)+$$
$$e^{(-2ek+em+p+2cs-cv)z}(2ek-em+p-2cs+cv)\,{}_2F_1\left(\frac{-2ek+em+p+2cs-cv}{d},\right.$$
$$\left.\left.-\beta;\,\frac{d-2ek+em+p+2cs-cv}{d};\,-\frac{b\,e^{dz}}{a}\right)\right)\Big/((2ek-em-p-2cs+cv)$$
$$\left.\left.(2ek-em+p-2cs+cv))\right)\sin\left(\frac{m\pi}{2}\right)\right)/;\,m\in\mathbb{Z}\wedge m>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving products of the direct function, hyperbolic and exponential functions

Involving sinh and exp

Involving $e^{p z} \sinh(a z) \cosh(b z) \cosh(c z)$

01.20.21.4673.01

$$\int e^{p z} \sinh(a z) \cosh(b z) \cosh(c z)\, dz ==$$
$$\frac{1}{4} e^{p z} \left(\frac{(-a+b+c) \cosh((a-b-c) z) + p \sinh((a-b-c) z)}{(a-b-c+p)(-a+b+c+p)} + \frac{p \sinh((a+b-c) z) - (a+b-c) \cosh((a+b-c) z)}{(a+b-c+p)(-a-b+c+p)} + \right.$$
$$\left. \frac{p \sinh((a-b+c) z) - (a-b+c) \cosh((a-b+c) z)}{(-a+b-c+p)(a-b+c+p)} + \frac{(a+b+c) \cosh((a+b+c) z) - p \sinh((a+b+c) z)}{(a+b+c-p)(a+b+c+p)} \right)$$

Involving rational functions of sinh and exp

Involving $\frac{e^{p z} \cosh(e z) \cosh(d z)}{a+b \sinh(c z)}$

01.20.21.4674.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(d z)}{a + b \sinh(c z)} dz ==$$

$$\frac{1}{4}\left(-\frac{1}{b\sqrt{a^2+b^2}\,(c-d-e+p)}\left(e^{(c-d-e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-e+p}{c}, 1; \frac{-d-e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d-e+p}{c}, 1; \frac{-d-e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d-e+p)}\left(e^{(c+d-e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e+p}{c}, 1; \frac{d-e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d-e+p}{c}, 1; \frac{d-e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c-d+e+p)}\left(e^{(c-d+e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+e+p}{c}, 1; \frac{-d+e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c-d+e+p}{c}, 1; \frac{-d+e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2+b^2}\,(c+d+e+p)}\left(e^{(c+d+e+p)z}\left(\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e+p}{c}, 1; \frac{d+e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2+b^2}-a\right){}_2F_1\left(\frac{c+d+e+p}{c}, 1; \frac{d+e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \cosh(e z) \cosh(d z) (a + b \sinh(c z))^{-n}$

01.20.21.4675.01

$$\int \frac{e^{p z} \cosh(e z) \cosh(d z)}{(a + b \sinh(c z))^2} dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d-e+p)}\left(e^{(c-d-e+p)z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-e+p}{c}, 1; \frac{-d-e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right.\right.\right.$$
$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d-e+p}{c}, 1; \frac{-d-e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2+b^2}}\right)+$$
$$\left.\left.\left.\left(a^2+\sqrt{a^2+b^2}\,a+b^2\right){}_2F_1\left(\frac{c-d-e+p}{c}, 2; \frac{-d-e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2+b^2}-a}\right)+\right)\right)\right.$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d-e+p}{c},\,2;\,\frac{-d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d-e+p)}\left(e^{(c+d-e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e+p}{c},\,1;\,\frac{d-e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d-e+p}{c},\,1;\,\frac{d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d-e+p}{c},\,2;\,\frac{d-e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d-e+p}{c},\,2;\,\frac{d-e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c-d+e+p)}\left(e^{(c-d+e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+e+p}{c},\,1;\,\frac{-d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c-d+e+p}{c},\,1;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2+b^2\right)^{3/2}(c+d+e+p)}\left(e^{(c+d+e+p)\,z}\left(-a\left(a+\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e+p}{c},\,1;\,\frac{d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+\right.\right.$$

$$a\left(a-\sqrt{a^2+b^2}\right){}_2F_1\left(\frac{c+d+e+p}{c},\,1;\,\frac{d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)+$$

$$\left(a^2+\sqrt{a^2+b^2}\;a+b^2\right){}_2F_1\left(\frac{c+d+e+p}{c},\,2;\,\frac{d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2+b^2}\;-a}\right)+$$

$$\left(-a^2+\sqrt{a^2+b^2}\;a-b^2\right){}_2F_1\left(\frac{c+d+e+p}{c},\,2;\,\frac{d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2+b^2}}\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{e^{p z}\cosh(e z)\cosh(d z)}{a+b\sinh^2(c z)}$

01.20.21.4676.01

$$\int \frac{e^{p z}\cosh(e z)\cosh(d z)}{a+b\sinh^2(c z)}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(-2c-d-e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-d-e+p}{2c},1;2-\frac{-d-e+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-d-e+p}{2c},1;2-\frac{-d-e+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d-e+p)\right)+\left(e^{(-2c+d-e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d-e+p}{2c},1;2-\frac{d-e+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d-e+p}{2c},1;2-\frac{d-e+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d-e+p)\right)+$$
$$\left(e^{(-2c-d+e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{-d+e+p}{2c},1;2-\frac{-d+e+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{-d+e+p}{2c},1;2-\frac{-d+e+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c-d+e+p)\right)+\left(e^{(-2c+d+e+p)z}\left(\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(1-\frac{d+e+p}{2c},1;2-\frac{d+e+p}{2c};\frac{b e^{-2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(1-\frac{d+e+p}{2c},1;2-\frac{d+e+p}{2c};\frac{b e^{-2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{a-b}\,b(-2c+d+e+p)\right)\right)$$

Involving $e^{p z}\cosh(e z)\cosh(d z)\left(a+b\sinh^2(c z)\right)^{-n}$

01.20.21.4677.01

$$\int \frac{e^{p z}\cosh(e z)\cosh(d z)}{\left(a+b\sinh^2(c z)\right)^2}\,dz ==$$
$$\frac{1}{4}\left(\left(e^{(2c-d-e+p)z}\left((2a-b)\left(2a+2\sqrt{a-b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,1;\frac{-d-e+p}{2c}+2;\frac{b e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\right)+(2a-b)\left(-2a+2\sqrt{a-b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,1;\frac{-d-e+p}{2c}+2;\frac{b e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,2;\frac{-d-e+p}{2c}+2;\right.\right.\right.\right.$$

$$\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{-d-e+p}{2c}+$$
$$1,\,2;\,\frac{-d-e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c-d-e+p)\Big)+$$
$$\Big(e^{(2c+d-e+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big)\,{}_2F_1\Big(\frac{d-e+p}{2c}+1,\,1;\,\frac{d-e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big)\,{}_2F_1\Big(\frac{d-e+p}{2c}+1,\,1;\,\frac{d-e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{d-e+p}{2c}+1,\,2;\,\frac{d-e+p}{2c}+2;$$
$$\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{d-e+p}{2c}+$$
$$1,\,2;\,\frac{d-e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c+d-e+p)\Big)+$$
$$\Big(e^{(2c-d+e+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big)\,{}_2F_1\Big(\frac{-d+e+p}{2c}+1,\,1;\,\frac{-d+e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big)\,{}_2F_1\Big(\frac{-d+e+p}{2c}+1,\,1;\,\frac{-d+e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{-d+e+p}{2c}+1,\,2;\,\frac{-d+e+p}{2c}+2;$$
$$\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{-d+e+p}{2c}+$$
$$1,\,2;\,\frac{-d+e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c-d+e+p)\Big)+$$
$$\Big(e^{(2c+d+e+p)z}\Big((2a-b)\Big(2a+2\sqrt{a-b}\,\sqrt{a}-b\Big)\,{}_2F_1\Big(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$(2a-b)\Big(-2a+2\sqrt{a-b}\,\sqrt{a}+b\Big)\,{}_2F_1\Big(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)+$$
$$2\sqrt{a}\,\Big(\Big(-2a^{3/2}-2\sqrt{a-b}\,a+2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{d+e+p}{2c}+1,\,2;\,\frac{d+e+p}{2c}+2;$$
$$\frac{b\,e^{2cz}}{-2a+2\sqrt{a-b}\,\sqrt{a}+b}\Big)+\Big(2a^{3/2}-2\sqrt{a-b}\,a-2b\sqrt{a}+\sqrt{a-b}\,b\Big)\,{}_2F_1\Big(\frac{d+e+p}{2c}+$$
$$1,\,2;\,\frac{d+e+p}{2c}+2;\,\frac{b\,e^{2cz}}{-2a-2\sqrt{a-b}\,\sqrt{a}+b}\Big)\Big)\Big)\Big)\Big/\Big(2a^{3/2}(a-b)^{3/2}b(2c+d+e+p)\Big)\Big)$$

Involving algebraic functions of sinh and exp

Involving $e^{p z} \cosh(d z) \cosh(e z) (a + b \sinh(c z))^{\beta}$

01.20.21.4678.01

$$\int e^{p z} \cosh(d z) \cosh(e z) (a + b \sinh(c z))^{\beta} dz == \frac{1}{4}\left(\frac{e^{c z} b}{a - \sqrt{a^2 + b^2}} + 1\right)^{-\beta}\left(\frac{e^{c z} b}{a + \sqrt{a^2 + b^2}} + 1\right)^{-\beta}(a + b \sinh(c z))^{\beta}$$
$$\left(\frac{e^{(d-e+p) z}}{d - e + p - c \beta} F_1\left(\frac{d - e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d - e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right) + \right.$$
$$\frac{e^{(-d+e+p) z}}{-d + e + p - c \beta} F_1\left(\frac{-d + e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - d + e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right) +$$
$$\frac{e^{(d+e+p) z}}{d + e + p - c \beta} F_1\left(\frac{d + e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d + e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right) -$$
$$\left.\frac{e^{-(d+e-p) z}}{d + e - p + c \beta} F_1\left(-\frac{d + e - p + c \beta}{c}; -\beta, -\beta; -\frac{d + e - p + c (\beta - 1)}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 + b^2}}, \frac{b e^{c z}}{\sqrt{a^2 + b^2} - a}\right)\right)$$

Involving $e^{p z} \cosh(d z) \cosh(e z) \left(a + b \sinh^2(c z)\right)^{\beta}$

01.20.21.4679.01

$$\int e^{p z} \cosh(d z) \cosh(e z) \left(a + b \sinh^2(c z)\right)^{\beta} dz ==$$
$$\frac{1}{4}\left(\frac{e^{2 c z} b}{2 a - b + 2 \sqrt{a (a - b)}} + 1\right)^{-\beta}\left(1 - \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right)^{-\beta}\left(\frac{1}{4} b e^{-2 c z}\left(-1 + e^{2 c z}\right)^2 + a\right)^{\beta}$$
$$\left(\frac{e^{(d-e+p) z}}{d - e + p - 2 c \beta} F_1\left(\frac{d - e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{d - e + p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}}, \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right) + \right.$$
$$\frac{e^{(-d+e+p) z}}{-d + e + p - 2 c \beta} F_1\left(\frac{-d + e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{-d + e + p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}},\right.$$
$$\left.\frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right) + \frac{e^{(d+e+p) z}}{d + e + p - 2 c \beta} F_1\left(\frac{d + e + p - 2 c \beta}{2 c}; -\beta, -\beta;\right.$$
$$\left.\frac{d + e + p}{2 c} - \beta + 1; \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}}, \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right) - \frac{e^{-(d+e-p) z}}{d + e - p + 2 c \beta}$$
$$\left.F_1\left(-\frac{d + e - p + 2 c \beta}{2 c}; -\beta, -\beta; -\frac{d + e - p + 2 c (\beta - 1)}{2 c}; \frac{b e^{2 c z}}{-2 a + b - 2 \sqrt{a (a - b)}}, \frac{b e^{2 c z}}{-2 a + b + 2 \sqrt{a (a - b)}}\right)\right)$$

Involving rational functions of the direct function, hyperbolic and exponential functions

Involving sinh and exp

Involving $\frac{e^{p z}\sinh(d z)}{a+b\cosh(c z)}$

01.20.21.4680.01

$$\int \frac{e^{p z}\sinh(d z)}{a+b\cosh(c z)}\,dz == \frac{1}{2}\left(\frac{1}{b\sqrt{a^2-b^2}\,(c+d+p)}\left(e^{(c+d+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+p}{c},\,1;\,\frac{d+p}{c}+2;\,\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c+d+p}{c},\,1;\,\frac{d+p}{c}+2;\,-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d+p)}\left(e^{(c-d+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+p}{c},\,1;\,\frac{p-d}{c}+2;\,\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+p}{c},\,1;\,\frac{p-d}{c}+2;\,-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

01.20.21.4681.01

$$\int \frac{e^{p z}\sinh(c z)}{a+b\cosh(c z)}\,dz == -\frac{1}{2b\sqrt{a^2-b^2}\,p\,(2c+p)}\left(e^{p z}\left(-p\,e^{2cz}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{p}{c}+2,\,1;\,\frac{p}{c}+3;\,\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{p}{c}+2,\,1;\,\frac{p}{c}+3;\,-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)+\left(a+\sqrt{a^2-b^2}\right)(2c+p)\right.\right.$$
$$\left.\left.{}_2F_1\left(\frac{p}{c},\,1;\,\frac{c+p}{c};\,\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right)(2c+p)\,{}_2F_1\left(\frac{p}{c},\,1;\,\frac{c+p}{c};\,-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)$$

01.20.21.4682.01

$$\int \frac{e^{c z}\sinh(c z)}{a+b\cosh(c z)}\,dz == \frac{1}{b^2 c}\left(e^{c z}\,b-2\sqrt{b^2-a^2}\,\tan^{-1}\left(\frac{a+b\,e^{c z}}{\sqrt{b^2-a^2}}\right)-a\log\left(2\,e^{c z}\,a+b\,e^{2cz}+b\right)\right)$$

Involving $e^{p z}\sinh(d z)\,(a+b\cosh(c z))^{-n}$

01.20.21.4683.01

$$\int \frac{e^{p z} \sinh(d z)}{(a + b \cosh(c z))^2} dz ==$$

$$\frac{1}{2}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+p)}\left(e^{(c+d+p)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+p}{c}, 1; \frac{d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+a\left(\sqrt{a^2-b^2}-a\right)\right.\right.\right.$$
$${}_2F_1\left(\frac{c+d+p}{c}, 1; \frac{d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+p}{c}, 2; \frac{d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\left.{}_2F_1\left(\frac{c+d+p}{c}, 2; \frac{d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$
$$\left.\left({}_2F_1\left(\frac{c+d+p}{c}, 2; \frac{d+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+d+p}{c}, 2; \frac{d+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$
$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+p)}\left(e^{(c-d+p)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+p}{c}, 1; \frac{p-d}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+p}{c}, 1; \frac{p-d}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+p}{c}, 2; \frac{p-d}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-d+p}{c}, 2; \frac{p-d}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d+p}{c}, 2; \frac{p-d}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c-d+p}{c}, 2; \frac{p-d}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)$$

01.20.21.4684.01

$$\int \frac{e^{p z} \sinh(c z)}{(a + b \cosh(c z))^2} dz == -\frac{1}{b^2\sqrt{a^2-b^2}\,(c+p)} e^{(c+p)z}$$
$$\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+p}{c}, 2; \frac{p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+p}{c}, 2; \frac{p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)$$

01.20.21.4685.01

$$\int \frac{e^{c z} \sinh(c z)}{(a + b \cosh(c z))^2} dz == \frac{1}{b^2 c}\left(\frac{2\left(2 e^{c z} a+b\right)}{2 e^{c z} a+b e^{2 c z}+b}+\log\left(2 e^{c z} a+b e^{2 c z}+b\right)-\frac{2 a}{\sqrt{b^2-a^2}}\tan^{-1}\left(\frac{a+b e^{c z}}{\sqrt{b^2-a^2}}\right)\right)$$

Involving $\frac{e^{p z} \sinh(d z)}{a+b \cosh^2(c z)}$

01.20.21.4686.01

$$\int \frac{e^{p z} \sinh(d z)}{a + b \cosh^2(c z)}\, dz == \frac{1}{2}\left(\frac{1}{\sqrt{a}\ b\sqrt{a+b}\ (2c - d + p)}\right.$$
$$\left(e^{(2c-d+p)z}\left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b\right){}_2F_1\left(\frac{p-d}{2c} + 1, 1; \frac{p-d}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b}\right) + \left(-2a - 2\sqrt{a+b}\right.\right.\right.$$
$$\left.\left.\left.\sqrt{a} - b\right){}_2F_1\left(\frac{p-d}{2c} + 1, 1; \frac{p-d}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b}\right)\right)\right) - \frac{1}{\sqrt{a}\ b\sqrt{a+b}\ (2c + d + p)}$$
$$\left(e^{(2c+d+p)z}\left(\left(2a - 2\sqrt{a+b}\ \sqrt{a} + b\right){}_2F_1\left(\frac{d+p}{2c} + 1, 1; \frac{d+p}{2c} + 2; -\frac{b e^{2cz}}{2a + 2\sqrt{a+b}\ \sqrt{a} + b}\right) + \right.\right.$$
$$\left.\left.\left(-2a - 2\sqrt{a+b}\ \sqrt{a} - b\right){}_2F_1\left(\frac{d+p}{2c} + 1, 1; \frac{d+p}{2c} + 2; -\frac{b e^{2cz}}{2a - 2\sqrt{a+b}\ \sqrt{a} + b}\right)\right)\right)\right)$$

Involving $e^{p z} \sinh(d z) \left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.4687.01

$$\int \frac{e^{p z} \sinh(d z)}{\left(a + b \cosh^2(c z)\right)^2} dz == \frac{1}{2}\left(\frac{1}{2 a^{3/2} b (a+b)^{3/2} (2 c - d + p)}\right.$$
$$\left(e^{(2 c - d + p) z}\left(-(2 a + b)\left(-2 a + 2\sqrt{a+b}\ \sqrt{a} - b\right){}_2F_1\left(\frac{p-d}{2 c} + 1, 1; \frac{p-d}{2 c} + 2; -\frac{b e^{2 c z}}{2 a + 2\sqrt{a+b}\ \sqrt{a} + b}\right) + \right.\right.$$
$$(-2 a - b)\left(2 a + 2\sqrt{a+b}\ \sqrt{a} + b\right){}_2F_1\left(\frac{p-d}{2 c} + 1, 1; \frac{p-d}{2 c} + 2; -\frac{b e^{2 c z}}{2 a - 2\sqrt{a+b}\ \sqrt{a} + b}\right) + 2\sqrt{a}$$
$$\left(\left(-2 a^{3/2} + 2\sqrt{a+b}\ a - 2 b\sqrt{a} + b\sqrt{a+b}\right){}_2F_1\left(\frac{p-d}{2 c} + 1, 2; \frac{p-d}{2 c} + 2; -\frac{b e^{2 c z}}{2 a + 2\sqrt{a+b}\ \sqrt{a} + b}\right) + \right.$$
$$\left.\left.\left.\left.\left(2 a^{3/2} + 2\sqrt{a+b}\ a + 2 b\sqrt{a} + b\sqrt{a+b}\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{p-d}{2 c} + 1, 2; \frac{p-d}{2 c} + 2; -\frac{b e^{2 c z}}{2 a - 2\sqrt{a+b}\ \sqrt{a} + b}\right)\right)\right)\right) - \frac{1}{2 a^{3/2} b (a+b)^{3/2} (2 c + d + p)}$$
$$\left(e^{(2 c + d + p) z}\left(-(2 a + b)\left(-2 a + 2\sqrt{a+b}\ \sqrt{a} - b\right){}_2F_1\left(\frac{d+p}{2 c} + 1, 1; \frac{d+p}{2 c} + 2; -\frac{b e^{2 c z}}{2 a + 2\sqrt{a+b}\ \sqrt{a} + b}\right) + \right.\right.$$
$$(-2 a - b)\left(2 a + 2\sqrt{a+b}\ \sqrt{a} + b\right){}_2F_1\left(\frac{d+p}{2 c} + 1, 1; \frac{d+p}{2 c} + 2; -\frac{b e^{2 c z}}{2 a - 2\sqrt{a+b}\ \sqrt{a} + b}\right) + 2\sqrt{a}$$
$$\left(\left(-2 a^{3/2} + 2\sqrt{a+b}\ a - 2 b\sqrt{a} + b\sqrt{a+b}\right){}_2F_1\left(\frac{d+p}{2 c} + 1, 2; \frac{d+p}{2 c} + 2; -\frac{b e^{2 c z}}{2 a + 2\sqrt{a+b}\ \sqrt{a} + b}\right) + \right.$$
$$\left.\left.\left.\left.\left(2 a^{3/2} + 2\sqrt{a+b}\ a + 2 b\sqrt{a} + b\sqrt{a+b}\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{d+p}{2 c} + 1, 2; \frac{d+p}{2 c} + 2; -\frac{b e^{2 c z}}{2 a - 2\sqrt{a+b}\ \sqrt{a} + b}\right)\right)\right)\right)$$

Involving $\frac{e^{p z} \cosh(e z) \sinh(d z)}{a + b \cosh(c z)}$

01.20.21.4688.01

$$\int \frac{e^{p z}\cosh(e z)\sinh(d z)}{a+b\cosh(c z)}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\,(c+d-e+p)}\left(e^{(c+d-e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-e+p}{c},1;\frac{d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-e+p}{c},1;\frac{d-e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d+e+p)}\left(e^{(c+d+e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+e+p}{c},1;\frac{d+e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+e+p}{c},1;\frac{d+e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d-e+p)}\left(e^{(c-d-e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e+p}{c},1;\frac{-d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-e+p}{c},1;\frac{-d-e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d+e+p)}\left(e^{(c-d+e+p)z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+e+p}{c},1;\frac{-d+e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+e+p}{c},1;\frac{-d+e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $e^{p z}\cosh(e z)\sinh(d z)(a+b\cosh(c z))^{-n}$

01.20.21.4689.01

$$\int \frac{e^{p z}\cosh(e z)\sinh(d z)}{(a+b\cosh(c z))^2}\,dz ==$$
$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-e+p)}\left(e^{(c+d-e+p)z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-e+p}{c},1;\frac{d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-e+p}{c},1;\frac{d-e+p}{c}+2;-\frac{b\,e^{c z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.$$
$$\left.\left.\left.\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-e+p}{c},2;\frac{d-e+p}{c}+2;\frac{b\,e^{c z}}{\sqrt{a^2-b^2}-a}\right)-\right.\right.\right.$$

$$ {}_2F_1\left(\frac{c+d-e+p}{c},\, 2;\, \frac{d-e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\Bigg) - a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d-e+p}{c},\, 2;\, \frac{d-e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)+{}_2F_1\left(\frac{c+d-e+p}{c},\, 2;\, \frac{d-e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)+$$

$$ \frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+e+p)}\left(e^{(c+d+e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+e+p}{c},\, 1;\, \frac{d+e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)+ a\left(\sqrt{a^2-b^2}\ -a\right){}_2F_1\left(\frac{c+d+e+p}{c},\, 1;\, \frac{d+e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)+ \left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+e+p}{c},\, 2;\, \frac{d+e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)- {}_2F_1\left(\frac{c+d+e+p}{c},\, 2;\, \frac{d+e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)- a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d+e+p}{c},\, 2;\, \frac{d+e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)+{}_2F_1\left(\frac{c+d+e+p}{c},\, 2;\, \frac{d+e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$

$$ \frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-e+p)}\left(e^{(c-d-e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-e+p}{c},\, 1;\, \frac{-d-e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)+ a\left(\sqrt{a^2-b^2}\ -a\right){}_2F_1\left(\frac{c-d-e+p}{c},\, 1;\, \frac{-d-e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)+ \left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-e+p}{c},\, 2;\, \frac{-d-e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)- {}_2F_1\left(\frac{c-d-e+p}{c},\, 2;\, \frac{-d-e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)- a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d-e+p}{c},\, 2;\, \frac{-d-e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)+{}_2F_1\left(\frac{c-d-e+p}{c},\, 2;\, \frac{-d-e+p}{c}+2;\, -\frac{b\, e^{c\, z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$

$$ \frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+e+p)}\left(e^{(c-d+e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+e+p}{c},\, 1;\, \frac{-d+e+p}{c}+2;\, \frac{b\, e^{c\, z}}{\sqrt{a^2-b^2}\ -a}\right)+\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+e+p}{c},\,1;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$

$$\left.{}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d+e+p}{c},\,2;\right.\right.$$

$$\left.\left.\frac{-d+e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-d+e+p}{c},\,2;\,\frac{-d+e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)$$

Involving $\frac{e^{p\,z}\cosh(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4690.01

$$\int\frac{e^{p\,z}\cosh(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}\,dz==$$

$$\frac{1}{4}\left(\left(\left(e^{(2\,c-d-e+p)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e+p}{2\,c}+1,\,1;\,\frac{-d-e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e+p}{2\,c}+1,\,1;\,\frac{-d-e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\right.$$

$$\left.\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-d-e+p)\right)+\left(e^{(2\,c-d+e+p)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.\right.$$

$${}_2F_1\left(\frac{-d+e+p}{2\,c}+1,\,1;\,\frac{-d+e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$\left.\left.\left.{}_2F_1\left(\frac{-d+e+p}{2\,c}+1,\,1;\,\frac{-d+e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c-d+e+p)\right)-$$

$$\left(e^{(2\,c+d-e+p)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-e+p}{2\,c}+1,\,1;\,\frac{d-e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$\left.\left.\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-e+p}{2\,c}+1,\,1;\,\frac{d-e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/$$

$$\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c+d-e+p)\right)-\left(e^{(2\,c+d+e+p)\,z}\left(\left(2\,a-2\sqrt{a+b}\,\sqrt{a}+b\right)\right.\right.$$

$${}_2F_1\left(\frac{d+e+p}{2\,c}+1,\,1;\,\frac{d+e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\,\sqrt{a}-b\right)$$

$$\left.\left.{}_2F_1\left(\frac{d+e+p}{2\,c}+1,\,1;\,\frac{d+e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2\,c+d+e+p)\right)\Bigg)$$

Involving $e^{p z} \cosh(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.4691.01

$$\int \frac{e^{p z} \cosh(e z) \sinh(d z)}{\left(a + b \cosh^2(c z)\right)^2} dz ==$$

$$\frac{1}{4}\left(\left(e^{(2c-d-e+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,1;\frac{-d-e+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,1;\frac{-d-e+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d-e+p}{2c}+1,2;\frac{-d-e+p}{2c}+\right.\right.$$
$$\left.2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.{}_2F_1\left(\frac{-d-e+p}{2c}+1,2;\frac{-d-e+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\Big)\Big)\Big)\Big/$$
$$\left(2a^{3/2}b(a+b)^{3/2}(2c-d-e+p)\right)+\left(e^{(2c-d+e+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right)\right.\right.$$
$${}_2F_1\left(\frac{-d+e+p}{2c}+1,1;\frac{-d+e+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d+e+p}{2c}+1,1;\frac{-d+e+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d+e+p}{2c}+1,2;\frac{-d+e+p}{2c}+2;\right.\right.$$
$$-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\Big)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d+e+p}{2c}+\right.$$
$$\left.\left.\left.\left.1,2;\frac{-d+e+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-d+e+p)\right)-$$
$$\left(e^{(2c+d-e+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-e+p}{2c}+1,1;\frac{d-e+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-e+p}{2c}+1,1;\frac{d-e+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d-e+p}{2c}+1,2;\frac{d-e+p}{2c}+2;\right.\right.$$
$$-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\Big)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d-e+p}{2c}+\right.$$

$$1,\,2;\,\frac{d-e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c+d-e+p)\right)-$$
$$\Bigg(e^{(2c+d+e+p)z}\Bigg(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\Bigg(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\Bigg(\frac{d+e+p}{2c}+1,\,1;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+$$
$$2\sqrt{a}\Bigg(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\Bigg(\frac{d+e+p}{2c}+1,\,2;\,\frac{d+e+p}{2c}+2;$$
$$-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\Bigg)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\Bigg(\frac{d+e+p}{2c}+$$
$$1,\,2;\,\frac{d+e+p}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\Bigg)\Bigg)\Bigg)\Bigg)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c+d+e+p)\right)\Bigg)$$

Involving rational functions of sinh and exp

Involving $e^{pz}(a\sinh(ez)+b\cosh(ez))^{-n}$

01.20.21.4692.01

$$\int\frac{e^{pz}}{(a\sinh(ez)+b\cosh(ez))^2}\,dz==\frac{4\,e^{(2e+p)z}}{(a-b)^2(2e+p)}\,{}_2F_1\left(\frac{2e+p}{2e},\,2;\,\frac{2e+p}{2e}+1;\,-\frac{(a+b)\,e^{2ez}}{b-a}\right)$$

01.20.21.4693.01

$$\int\frac{e^{pz}}{a\sinh(ez)+b\cosh(ez)}\,dz==-\frac{2\,e^{(e+p)z}}{(a-b)(e+p)}\,{}_2F_1\left(\frac{e+p}{2e},\,1;\,\frac{3e+p}{2e};\,\frac{(a+b)\,e^{2ez}}{a-b}\right)$$

01.20.21.4694.01

$$\int\frac{e^{ez}}{a\sinh(ez)+b\cosh(ez)}\,dz==\frac{\log\left(e^{2ez}a-a+be^{2ez}+b\right)}{(a+b)\,e}$$

01.20.21.4695.01

$$\int\frac{e^{pz}}{\sinh(ez)+\cosh(ez)}\,dz==\frac{e^{pz}(\sinh(ez)-\cosh(ez))}{e-p}$$

01.20.21.4696.01

$$\int\frac{e^{pz}}{\sinh(ez)-\cosh(ez)}\,dz==-\frac{e^{pz}(\cosh(ez)+\sinh(ez))}{e+p}$$

Involving $e^{pz}\sinh(dz)(a\sinh(ez)+b\cosh(ez))^{-n}$

01.20.21.4697.01

$$\int\frac{e^{pz}\sinh(dz)}{a\sinh(ez)+b\cosh(ez)}\,dz==$$
$$\frac{1}{a-b}\left(\frac{e^{(e-d+p)z}}{e-d+p}\,{}_2F_1\left(\frac{e-d+p}{2e},\,1;\,\frac{3e-d+p}{2e};\,\frac{(a+b)\,e^{2ez}}{a-b}\right)-\frac{e^{(e+d+p)z}}{e+d+p}\,{}_2F_1\left(\frac{e+d+p}{2e},\,1;\,\frac{3e+d+p}{2e};\,\frac{(a+b)\,e^{2ez}}{a-b}\right)\right)$$

01.20.21.4698.01

$$\int \frac{e^{p z} \sinh(d z)}{(a \sinh(e z) + b \cosh(e z))^2} dz ==$$
$$\frac{2}{(a-b)^2}\left(\frac{e^{(2e+d+p)z}}{2e+d+p}\,{}_2F_1\left(\frac{d+p}{2e}+1, 2; \frac{d+p}{2e}+2; \frac{(a+b)e^{2ez}}{a-b}\right) - \frac{e^{(2e-d+p)z}}{2e-d+p}\,{}_2F_1\left(\frac{p-d}{2e}+1, 2; \frac{p-d}{2e}+2; \frac{(a+b)e^{2ez}}{a-b}\right)\right)$$

Involving $e^{pz}\cosh(dz)(a\sinh(ez)+b\cosh(ez))^{-n}$

01.20.21.4699.01

$$\int \frac{e^{p z} \cosh(d z)}{a \sinh(e z) + b \cosh(e z)} dz ==$$
$$-\frac{1}{a-b}\left(\frac{e^{(e-d+p)z}}{e-d+p}\,{}_2F_1\left(\frac{e-d+p}{2e}, 1; \frac{3e-d+p}{2e}; \frac{(a+b)e^{2ez}}{a-b}\right) + \frac{e^{(e+d+p)z}}{e+d+p}\,{}_2F_1\left(\frac{e+d+p}{2e}, 1; \frac{3e+d+p}{2e}; \frac{(a+b)e^{2ez}}{a-b}\right)\right)$$

01.20.21.4700.01

$$\int \frac{e^{p z} \cosh(d z)}{(a \sinh(e z) + b \cosh(e z))^2} dz ==$$
$$\frac{2}{(a-b)^2}\left(\frac{e^{(2e-d+p)z}}{2e-d+p}\,{}_2F_1\left(\frac{p-d}{2e}+1, 2; \frac{p-d}{2e}+2; \frac{(a+b)e^{2ez}}{a-b}\right) + \frac{e^{(2e+d+p)z}}{2e+d+p}\,{}_2F_1\left(\frac{d+p}{2e}+1, 2; \frac{d+p}{2e}+2; \frac{(a+b)e^{2ez}}{a-b}\right)\right)$$

Involving $e^{pz}(a+b\sinh(ez)+c\cosh(ez))^{-n}$

01.20.21.4701.01

$$\int \frac{e^{p z}}{a + b \sinh(e z) + c \cosh(e z)} dz ==$$
$$-\frac{1}{(b-c)\sqrt{a^2+b^2-c^2}\,(e+p)}\left(e^{(e+p)z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+p}{e}, 1; \frac{p}{e}+2; \frac{(b+c)e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right) + \left(\sqrt{a^2+b^2-c^2}-a\right){}_2F_1\left(\frac{e+p}{e}, 1; \frac{p}{e}+2; -\frac{(b+c)e^{ez}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)$$

01.20.21.4702.01

$$\int \frac{e^{p z}}{(a+b\sinh(e z)+c\cosh(e z))^2}\,dz == \frac{1}{(b-c)\left(a^2+b^2-c^2\right)^{3/2}(e+p)}$$

$$\left(e^{(e+p)z}\left({}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,\frac{(b+c)\,e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)a^2-{}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,-\frac{(b+c)\,e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+p}{e},\,1;\,\frac{p}{e}+2;\,-\frac{(b+c)\,e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+\sqrt{a^2+b^2-c^2}$$

$${}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,\frac{(b+c)\,e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)a+\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,-\frac{(b+c)\,e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+p}{e},\,1;\,\frac{p}{e}+2;\,\frac{(b+c)\,e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)+$$

$$b^2\,{}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,\frac{(b+c)\,e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)-c^2\,{}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,\frac{(b+c)\,e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)-$$

$$\left.\left.b^2\,{}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,-\frac{(b+c)\,e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)+c^2\,{}_2F_1\left(\frac{e+p}{e},\,2;\,\frac{p}{e}+2;\,-\frac{(b+c)\,e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)$$

Involving $e^{p z}\sinh(d z)(a+b\sinh(e z)+c\cosh(e z))^{-n}$

01.20.21.4703.01

$$\int \frac{e^{p z}\sinh(d z)}{a+b\sinh(e z)+c\cosh(e z)}\,dz ==$$

$$\frac{1}{2}\left(\left(e^{(-d+e+p)z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{-d+e+p}{e},\,1;\,\frac{p-d}{e}+2;\,\frac{(b+c)\,e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)+\left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{-d+e+p}{e},\,1;\,\frac{p-d}{e}+2;\,-\frac{(b+c)\,e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\,(-d+e+p)\right)-$$

$$\left(e^{(d+e+p)z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e+p}{e},\,1;\,\frac{d+p}{e}+2;\,\frac{(b+c)\,e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)+\left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{d+e+p}{e},\,1;\,\frac{d+p}{e}+2;\,-\frac{(b+c)\,e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\,(d+e+p)\right)$$

01.20.21.4704.01

$$\int \frac{e^{p z} \sinh(d z)}{(a + b \sinh(e z) + c \cosh(e z))^2} dz ==$$

$$\frac{1}{2}\left(\left(e^{(d+e+p) z}\left({}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)a^2 - {}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2 + \left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e+p}{e}, 1; \frac{d+p}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a + \sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)a + \sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a - a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e+p}{e}, 1; \frac{d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right) + b^2\ {}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right) - c^2\ {}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right) - b^2\ {}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right) + c^2\ {}_2F_1\left(\frac{d+e+p}{e}, 2; \frac{d+p}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/ \left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(d+e+p)\right) - \left(e^{(-d+e+p) z}\left({}_2F_1\left(\frac{-d+e+p}{e}, 2; \frac{p-d}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)a^2 - {}_2F_1\left(\frac{-d+e+p}{e}, 2; \frac{p-d}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2 + \left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{-d+e+p}{e}, 1; \frac{p-d}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)a + \sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{-d+e+p}{e}, 2; \frac{p-d}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)a +$$

$$\sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{-d+e+p}{e},\ 2;\ \frac{p-d}{e}+2;\ -\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{-d+e+p}{e},\ 1;\ \frac{p-d}{e}+2;\ \frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)+$$

$$b^2\ {}_2F_1\left(\frac{-d+e+p}{e},\ 2;\ \frac{p-d}{e}+2;\ \frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)-$$

$$c^2\ {}_2F_1\left(\frac{-d+e+p}{e},\ 2;\ \frac{p-d}{e}+2;\ \frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)-$$

$$b^2\ {}_2F_1\left(\frac{-d+e+p}{e},\ 2;\ \frac{p-d}{e}+2;\ -\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$c^2\ {}_2F_1\left(\frac{-d+e+p}{e},\ 2;\ \frac{p-d}{e}+2;\ -\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(-d+e+p)\right)$$

Involving $e^{p\,z}\cosh(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{-n}$

01.20.21.4705.01

$$\int\frac{e^{p\,z}\cosh(d\,z)}{a+b\sinh(e\,z)+c\cosh(e\,z)}\,dz==$$

$$\frac{1}{2}\left(-\left(e^{(-d+e+p)\,z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{-d+e+p}{e},\ 1;\ \frac{p-d}{e}+2;\ \frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)+\left(\sqrt{a^2+b^2-c^2}\ -a\right)\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{-d+e+p}{e},\ 1;\ \frac{p-d}{e}+2;\ -\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\ (-d+e+p)\right)-$$

$$\left(e^{(d+e+p)\,z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e+p}{e},\ 1;\ \frac{d+p}{e}+2;\ \frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)+\left(\sqrt{a^2+b^2-c^2}\ -a\right)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{d+e+p}{e},\ 1;\ \frac{d+p}{e}+2;\ -\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\ (d+e+p)\right)\Bigg)$$

01.20.21.4706.01

$$\int\frac{e^{p\,z}\cosh(d\,z)}{(a+b\sinh(e\,z)+c\cosh(e\,z))^2}\,dz==\frac{1}{2}$$

$$\left(\left(e^{(-d+e+p)\,z}\left({}_2F_1\left(\frac{-d+e+p}{e},\ 2;\ \frac{p-d}{e}+2;\ \frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)a^2-{}_2F_1\left(\frac{-d+e+p}{e},\ 2;\ \frac{p-d}{e}+2;\ -\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right.\right.\right.$$

$$a^2+\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{-d+e+p}{e},\,1;\,\frac{p-d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{-d+e+p}{e},\,2;\,\frac{p-d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{-d+e+p}{e},\,2;\,\frac{p-d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{-d+e+p}{e},\,1;\,\frac{p-d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+$$

$$b^2\,{}_2F_1\left(\frac{-d+e+p}{e},\,2;\,\frac{p-d}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-c^2\,{}_2F_1\left(\frac{-d+e+p}{e},\,2;\,\frac{p-d}{e}+2;\right.$$

$$\left.\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{-d+e+p}{e},\,2;\,\frac{p-d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$\left.c^2\,{}_2F_1\left(\frac{-d+e+p}{e},\,2;\,\frac{p-d}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\Big/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(-d+e+p)\right)+$$

$$\left(e^{(d+e+p)\,z}\left({}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right.\right.$$

$$a^2+\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e+p}{e},\,1;\,\frac{d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{d+e+p}{e},\,1;\,\frac{d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+$$

$$b^2\,{}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-c^2\,{}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-$$

$$b^2\,{}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$c^2\,{}_2F_1\left(\frac{d+e+p}{e},\,2;\,\frac{d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Big/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(d+e+p)\right)$$

Involving $e^{p\,z}\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{-n}$

01.20.21.4707.01

$$\int\frac{e^{p\,z}}{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\,dz==$$

$$-\frac{1}{\sqrt{a}\;\sqrt{b}\;(a+b)\,(2\,e+p)}\left(i\,e^{(2\,e+p)\,z}\left({}_2F_1\left(\frac{p}{2\,e}+1,\,1;\,\frac{p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2}\right)\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2-\right.\right.$$

$$\left.\left.\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2\,{}_2F_1\left(\frac{p}{2\,e}+1,\,1;\,\frac{p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2}\right)\right)\right)$$

01.20.21.4708.01

$$\int\frac{e^{p\,z}}{\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^2}\,dz==$$

$$-\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(2\,e+p)}\left(i\,e^{(2\,e+p)\,z}\left((a-b)\,{}_2F_1\left(\frac{p}{2\,e}+1,\,1;\,\frac{p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2}\right)\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2-\right.\right.$$

$$\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(\frac{p}{2\,e}+1,\,1;\,\frac{p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2}\right)-$$

$$2\,i\,\sqrt{a}\;\sqrt{b}\left({}_2F_1\left(\frac{p}{2\,e}+1,\,2;\,\frac{p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2}\right)\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2+\right.$$

$$\left.\left.\left.\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2\,{}_2F_1\left(\frac{p}{2\,e}+1,\,2;\,\frac{p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2}\right)\right)\right)\right)$$

Involving $e^{p\,z}\sinh(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{-n}$

01.20.21.4709.01

$$\int \frac{e^{p z} \sinh(d z)}{a \sinh^2(e z) + b \cosh^2(e z)} dz ==$$

$$\frac{1}{2}\left(\left(i e^{(-d+2e+p)z}\left(\left(\sqrt{a} + i\sqrt{b}\right)^2 {}_2F_1\left(\frac{p-d}{2e}+1, 1; \frac{p-d}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a} - i\sqrt{b}\right)^2}\right) - \left(\sqrt{a} - i\sqrt{b}\right)^2 {}_2F_1\left(\frac{p-d}{2e}+1, 1; \frac{p-d}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a} + i\sqrt{b}\right)^2}\right)\right)\right) \Big/ \left(\sqrt{a}\sqrt{b}(a+b)(-d+2e+p)\right) - \frac{1}{\sqrt{a}\sqrt{b}(a+b)(d+2e+p)}\left(i e^{(d+2e+p)z}\left(\left(\sqrt{a} + i\sqrt{b}\right)^2 {}_2F_1\left(\frac{d+p}{2e}+1, 1; \frac{d+p}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a} - i\sqrt{b}\right)^2}\right) - \left(\sqrt{a} - i\sqrt{b}\right)^2 {}_2F_1\left(\frac{d+p}{2e}+1, 1; \frac{d+p}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a} + i\sqrt{b}\right)^2}\right)\right)\right)\right)$$

01.20.21.4710.01

$$\int \frac{e^{p z} \sinh(d z)}{\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^2} dz ==$$

$$\frac{1}{2}\left(\left(i e^{(-d+2e+p)z}\left((a-b)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 - \left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right) - 2i\sqrt{a}\sqrt{b}\left({}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 + \left(\sqrt{a}-i\sqrt{b}\right)^2 {}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(2a^{3/2}b^{3/2}(a+b)(-d+2e+p)\right) - \frac{1}{2a^{3/2}b^{3/2}(a+b)(d+2e+p)}\left(i e^{(d+2e+p)z}\left((a-b)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 - \left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right) - 2i\sqrt{a}\sqrt{b}\left({}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 + \left(\sqrt{a}-i\sqrt{b}\right)^2 {}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(a+b)e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)$$

Involving $e^{p z}\cosh(d z)\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{-n}$

01.20.21.4711.01

$$\int \frac{e^{p z} \cosh(d z)}{a \sinh^2(e z) + b \cosh^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(-\left(i e^{(-d+2e+p)z}\left(\left(\sqrt{a}+i\sqrt{b}\right)^2 {}_2F_1\left(\frac{p-d}{2e}+1, 1; \frac{p-d}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)-\left(\sqrt{a}-i\sqrt{b}\right)^2 {}_2F_1\left(\frac{p-d}{2e}+1, 1; \frac{p-d}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(\sqrt{a}\sqrt{b}\,(a+b)(-d+2e+p)\right)-\right.$$

$$\left.\frac{1}{\sqrt{a}\sqrt{b}\,(a+b)(d+2e+p)}\left(i e^{(d+2e+p)z}\left(\left(\sqrt{a}+i\sqrt{b}\right)^2 {}_2F_1\left(\frac{d+p}{2e}+1, 1; \frac{d+p}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)-\left(\sqrt{a}-i\sqrt{b}\right)^2 {}_2F_1\left(\frac{d+p}{2e}+1, 1; \frac{d+p}{2e}+2; \frac{(a+b)e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)$$

01.20.21.4712.01

$$\int \frac{e^{p z} \cosh(d z)}{\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^2} dz ==$$

$$\frac{1}{2}\left(-\left(i e^{(-d+2e+p)z}\left((a-b)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 - \left(\sqrt{a}-i\sqrt{b}\right)^2 (a-b)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right) - 2i\sqrt{a}\sqrt{b}\left({}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 + \left(\sqrt{a}-i\sqrt{b}\right)^2 {}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(2a^{3/2}b^{3/2}(a+b)(-d+2e+p)\right) - \frac{1}{2a^{3/2}b^{3/2}(a+b)(d+2e+p)}\left(i e^{(d+2e+p)z}\left((a-b)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 - \left(\sqrt{a}-i\sqrt{b}\right)^2 (a-b)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right) - 2i\sqrt{a}\sqrt{b}\left({}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2 + \left(\sqrt{a}-i\sqrt{b}\right)^2 {}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)\right)$$

Involving $e^{p z}\left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{-n}$

01.20.21.4713.01

$$\int \frac{e^{p z}}{a + b \sinh^2(e z) + c \cosh^2(e z)}\, dz ==$$
$$\left(e^{(2e+p)z}\left(\left(2a - b + c + 2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{p}{2e} + 1, 1; \frac{p}{2e} + 2; \frac{(b+c)e^{2ez}}{-2a + b - c + 2\sqrt{(a-b)(a+c)}}\right) + \left(-2a + b - c + 2\sqrt{(a-b)(a+c)}\right) {}_2F_1\left(\frac{p}{2e} + 1, 1; \frac{p}{2e} + 2; \frac{(b+c)e^{2ez}}{-2a + b - c - 2\sqrt{(a-b)(a+c)}}\right)\right)\right) \Big/ \left(\sqrt{(a-b)(a+c)}\,(b+c)(2e+p)\right)$$

01.20.21.4714.01

$$\int \frac{e^{p z}}{\left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^2}\, dz == -\frac{1}{2((a-b)(a+c))^{3/2}(2e+p)}\left((b+c)e^{(2e+p)z}\right.$$
$$\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(\frac{p}{2e} + 1, 2; \frac{p}{2e} + 2; \frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a - b + c + 2\sqrt{(a-b)(a+c)}} - \frac{{}_2F_1\left(\frac{p}{2e} + 1, 2; \frac{p}{2e} + 2; \frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a + b - c + 2\sqrt{(a-b)(a+c)}}\right) + \right.$$
$$\frac{(2a - b + c)\,{}_2F_1\left(\frac{p}{2e} + 1, 1; \frac{p}{2e} + 2; \frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a - b + c + 2\sqrt{(a-b)(a+c)}} -$$
$$\left.\left.\frac{(2a - b + c)\,{}_2F_1\left(\frac{p}{2e} + 1, 1; \frac{p}{2e} + 2; \frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a - b + c - 2\sqrt{(a-b)(a+c)}}\right)\right)$$

Involving $e^{p z} \sinh(d z)\left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{-n}$

01.20.21.4715.01

$$\int \frac{e^{p z} \sinh(d z)}{a + b \sinh^2(e z) + c \cosh^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(\left(e^{(d+2e+p)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/$$

$$\left(\sqrt{(a-b)(a+c)}\;(b+c)(d+2e+p)\right)-\left(e^{(-d+2e+p)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right)\right.\right.$$

$${}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right){}_2F_1$$

$$\left.\left.\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a-b)(a+c)}\;(b+c)(-d+2e+p)\right)\Bigg)$$

01.20.21.4716.01

$$\int \frac{e^{p\,z}\sinh(d\,z)}{\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\left((b+c)\,e^{(-d+2e+p)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.$$

$$\left.\left.\left.\frac{{}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Bigg/$$

$$\left(2\left((a-b)(a+c)\right)^{3/2}(-d+2e+p)\right)-\left((b+c)\,e^{(d+2e+p)z}\left(2\sqrt{(a-b)(a+c)}\right.\right.$$

$$\left.\left(\frac{{}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\frac{{}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.$$

$$\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Bigg/\left(2\left((a-b)(a+c)\right)^{3/2}(d+2e+p)\right)\right)$$

Involving $e^{p\,z}\cosh(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4717.01

$$\int \frac{e^{p z} \cosh(d z)}{a + b \sinh^2(e z) + c \cosh^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(\left(e^{(-d+2e+p)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{(a-b)(a+c)}\;(b+c)(-d+2e+p)\right)+\left(e^{(d+2e+p)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right)\right.\right.$$

$${}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right)$$

$$\left.\left.{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Bigg/\left(\sqrt{(a-b)(a+c)}\;(b+c)(d+2e+p)\right)\Bigg)$$

01.20.21.4718.01

$$\int \frac{e^{p z} \cosh(d z)}{\left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^2} dz ==$$

$$\frac{1}{2}\left(-\left(\left((b+c)\, e^{(-d+2e+p)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{{}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\right/\left(2\left((a-b)(a+c)\right)^{3/2}(-d+2e+p)\right)-$$

$$\left(\left((b+c)\, e^{(d+2e+p)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{{}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\right/\left(2\left((a-b)(a+c)\right)^{3/2}(d+2e+p)\right)\right)$$

Involving $e^{p z}\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{-n}$

01.20.21.4719.01

$$\int \frac{e^{p z}}{a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)}\, dz ==$$
$$-\left((a+2b+c)\, e^{(2e+p)z}\left(\left(-a+c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{p}{2e}+1,\, 1;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+\right.\right.$$
$$\left.\left.\left(a-c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{p}{2e}+1,\, 1;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)\right)\right)\Big/$$
$$\left(\sqrt{b^2-ac}\left(a-c+2\sqrt{b^2-ac}\right)\left(-a+c+2\sqrt{b^2-ac}\right)(2e+p)\right)$$

01.20.21.4720.01

$$\int \frac{e^{p z}}{\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^2}\, dz ==$$
$$\left((a+2b+c)\, e^{(2e+p)z}\left(4\,{}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)b^2-4\,{}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)\right.\right.$$
$$b^2+(a-c)\left(-a+c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{p}{2e}+1,\, 1;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+$$
$$(a-c)\left(a-c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{p}{2e}+1,\, 1;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)-$$
$$4ac\,{}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)-2a\sqrt{b^2-ac}$$
$${}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+2c\sqrt{b^2-ac}\;{}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+$$
$$4ac\,{}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)-2a\sqrt{b^2-ac}$$
$$\left.\left.{}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)+2c\sqrt{b^2-ac}\;{}_2F_1\left(\frac{p}{2e}+1,\, 2;\, \frac{p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)\right)\right)\Big/$$
$$\left(2\left(b^2-ac\right)^{3/2}\left(a-c+2\sqrt{b^2-ac}\right)\left(-a+c+2\sqrt{b^2-ac}\right)(2e+p)\right)$$

Involving $e^{p z} \sinh(d z) \left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{-n}$

01.20.21.4721.01

$$\int \frac{e^{p z} \sinh(d z)}{a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(\left((a+2b+c)\, e^{(-d+2e+p)z}\left(\left(-a+c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{p-d}{2e}+1,\, 1;\, \frac{p-d}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(a-c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{p-d}{2e}+1,\, 1;\, \frac{p-d}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)\right)\right)\Big/$$

$$\left(\sqrt{b^2-ac}\left(a-c+2\sqrt{b^2-ac}\right)\left(-a+c+2\sqrt{b^2-ac}\right)(-d+2e+p)\right)-$$

$$\left((a+2b+c)\, e^{(d+2e+p)z}\left(\left(-a+c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{d+p}{2e}+1,\, 1;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+\right.\right.$$

$$\left.\left.\left(a-c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{d+p}{2e}+1,\, 1;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)\right)\right)\Big/$$

$$\left.\left(\sqrt{b^2-ac}\left(a-c+2\sqrt{b^2-ac}\right)\left(-a+c+2\sqrt{b^2-ac}\right)(d+2e+p)\right)\right)$$

01.20.21.4722.01

$$\int \frac{e^{p z} \sinh(d z)}{\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^2}\, dz ==$$

$$\frac{1}{2}\left(\left((a+2b+c)\, e^{(d+2e+p)z}\left(4\,{}_2F_1\left(\frac{d+p}{2e}+1,\, 2;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)b^2-\right.\right.\right.$$

$$4\,{}_2F_1\left(\frac{d+p}{2e}+1,\, 2;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)b^2+$$

$$(a-c)\left(-a+c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{d+p}{2e}+1,\, 1;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+$$

$$(a-c)\left(a-c+2\sqrt{b^2-ac}\right){}_2F_1\left(\frac{d+p}{2e}+1,\, 1;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-ac}}\right)-$$

$$4ac\,{}_2F_1\left(\frac{d+p}{2e}+1,\, 2;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)-$$

$$\left.\left.2a\sqrt{b^2-ac}\;{}_2F_1\left(\frac{d+p}{2e}+1,\, 2;\, \frac{d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)+\right.\right.$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(d+2\,e+p)\right)-$$

$$\left((a+2\,b+c)\,e^{(-d+2\,e+p)\,z}\left(4\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-\right.\right.$$

$$\left.4\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+\right.$$

$$(a-c)\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{p-d}{2\,e}+1,\,1;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$(a-c)\left(a-c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{p-d}{2\,e}+1,\,1;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$\left.4\,a\,c\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-\right.$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(-d+2\,e+p)\right)\Bigg)$$

Involving $e^{p\,z}\cosh(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4723.01

$$\int\frac{e^{p\,z}\cosh(d\,z)}{a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)}\,dz==$$

$$\frac{1}{2}\left(-\left(\left(a+2\,b+c\right)e^{(-d+2\,e+p)\,z}\left(\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{p-d}{2\,e}+1,\,1;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(a-c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{p-d}{2\,e}+1,\,1;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{b^2-a\,c}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(-d+2\,e+p)\right)-$$

$$\left(\left(a+2\,b+c\right)e^{(d+2\,e+p)\,z}\left(\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d+p}{2\,e}+1,\,1;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+\right.\right.$$

$$\left.\left.\left(a-c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d+p}{2\,e}+1,\,1;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\right)\right)\Bigg/$$

$$\left.\left(\sqrt{b^2-a\,c}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(d+2\,e+p)\right)\right)$$

01.20.21.4724.01

$$\int\frac{e^{p\,z}\cosh(d\,z)}{\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^2}\,dz==$$

$$\frac{1}{2}\left(\left(\left(a+2\,b+c\right)e^{(-d+2\,e+p)\,z}\left(4\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-\right.\right.\right.$$

$$\left.\left.\left.4\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+\right.\right.\right.$$

$$(a-c)\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{p-d}{2\,e}+1,\,1;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+$$

$$(a-c)\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{p-d}{2\,e}+1,\,1;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{p-d}{2\,e}+1,\,2;\,\frac{p-d}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(-d+2\,e+p)\right)+$$

$$\left((a+2\,b+c)\,e^{(d+2\,e+p)\,z}\left(4\,{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)b^2-\right.\right.$$

$$4\,{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)b^2+$$

$$(a-c)\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d+p}{2\,e}+1,\,1;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+$$

$$(a-c)\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{d+p}{2\,e}+1,\,1;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{d+p}{2\,e}+1,\,2;\,\frac{d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(d+2\,e+p)\right)$$

Involving algebraic functions of the direct function, hyperbolic and exponential functions

Involving sinh and exp

Involving $e^{p\,z}\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.4725.01

$$\int e^{p\,z}\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz ==$$

$$\frac{1}{2\,(d+p-c\,\beta)\,(d-p+c\,\beta)}\left(\left(\frac{e^{c\,z}\,b}{a-\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(\frac{e^{c\,z}\,b}{a+\sqrt{a^2-b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left(e^{(d+p)\,z}\,(d-p+c\,\beta)\,F_1\left(\frac{d+p-c\,\beta}{c};\,-\beta,\,-\beta;\,\frac{-\beta\,c+c+d+p}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.e^{(p-d)\,z}\,(d+p-c\,\beta)\,F_1\left(-\frac{d-p+c\,\beta}{c};\,-\beta,\,-\beta;\,\frac{-\beta\,c+c-d+p}{c};\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}},\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)\right)\right)$$

Involving $e^{p\,z}\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.4726.01

$$\int e^{p z} \sinh(d z) \left(a + b \cosh^2(c z)\right)^{\beta} dz == \frac{1}{2 (d + p - 2 c \beta) (d - p + 2 c \beta)}$$
$$\left(\left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a + b)}} + 1\right)^{-\beta} \left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a + b)}} + 1\right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(1 + e^{2 c z}\right)^2 + a\right)^{\beta} \left(e^{(d+p) z} (d - p + 2 c \beta)\right.\right.$$
$$F_1\left(\frac{d + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{d + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right) + e^{(p-d) z}$$
$$\left.\left.(d + p - 2 c \beta) F_1\left(-\frac{d - p + 2 c \beta}{2 c}; -\beta, -\beta; \frac{p - d}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a + b)}}, -\frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a + b)}}\right)\right)\right)$$

Involving $e^{p z} \cosh(e z) \sinh(d z) (a + b \cosh(c z))^{\beta}$

01.20.21.4727.01

$$\int e^{p z} \cosh(e z) \sinh(d z) (a + b \cosh(c z))^{\beta} dz == \frac{1}{4} \left(\frac{e^{c z} b}{a - \sqrt{a^2 - b^2}} + 1\right)^{-\beta} \left(\frac{e^{c z} b}{a + \sqrt{a^2 - b^2}} + 1\right)^{-\beta} \left(a + \frac{1}{2} b e^{-c z} \left(1 + e^{2 c z}\right)\right)^{\beta}$$
$$\left(\frac{e^{(d-e+p) z}}{d - e + p - c \beta} F_1\left(\frac{d - e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d - e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) +\right.$$
$$\frac{e^{(-d+e+p) z}}{d - e - p + c \beta} F_1\left(\frac{-d + e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - d + e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) +$$
$$\frac{e^{(d+e+p) z}}{d + e + p - c \beta} F_1\left(\frac{d + e + p - c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c + d + e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right) +$$
$$\left.\frac{e^{-(d+e-p) z}}{d + e - p + c \beta} F_1\left(-\frac{d + e - p + c \beta}{c}; -\beta, -\beta; \frac{-\beta c + c - d - e + p}{c}; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}}, \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a}\right)\right)$$

Involving $e^{p z} \cosh(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{\beta}$

01.20.21.4728.01

$$\int e^{p z} \cosh(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{\beta} dz ==$$

$$\frac{1}{4}\left(\frac{e^{2 c z} b}{2 a + b - 2\sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{e^{2 c z} b}{2 a + b + 2\sqrt{a (a+b)}} + 1\right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}$$

$$\left(\frac{e^{(d-e+p) z}}{d - e + p - 2 c \beta} F_1\left(\frac{d - e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{d - e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \right.$$

$$\frac{e^{(-d+e+p) z}}{d - e - p + 2 c \beta} F_1\left(\frac{-d + e + p - 2 c \beta}{2 c}; -\beta, -\beta; \frac{-d + e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, \right.$$

$$\left. -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{(d+e+p) z}}{d + e + p - 2 c \beta} F_1\left(\frac{d + e + p - 2 c \beta}{2 c}; -\beta, -\beta; \right.$$

$$\left.\left. \frac{d + e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right) + \frac{e^{-(d+e-p) z}}{d + e - p + 2 c \beta} \right.$$

$$\left. F_1\left(-\frac{d + e - p + 2 c \beta}{2 c}; -\beta, -\beta; -\frac{d + e - p + 2 c (\beta - 1)}{2 c}; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right)$$

Involving algebraic functions of sinh and exp

Involving $e^{p z} (a \sinh(e z) + b \cosh(e z))^{\beta}$

01.20.21.4729.01

$$\int e^{p z} (a \sinh(e z) + b \cosh(e z))^{\beta} dz ==$$

$$-\frac{2^{-\beta} e e^{p z} \left(e^{-e z} \left(a \left(-1 + e^{2 e z}\right) + b \left(1 + e^{2 e z}\right)\right)\right)^{\beta}}{e (e \beta - p)} \left(\frac{e^{2 e z} (a + b)}{b - a} + 1\right)^{-\beta} {}_2F_1\left(\frac{p - e \beta}{2 e}, -\beta; \frac{1}{2}\left(\frac{p}{e} - \beta + 2\right); \frac{(a + b) e^{2 e z}}{a - b}\right)$$

Involving $e^{p z} \sinh(d z) (a \sinh(e z) + b \cosh(e z))^{\beta}$

01.20.21.4730.01

$$\int e^{p z} \sinh(d z) (a \sinh(e z) + b \cosh(e z))^{\beta} dz ==$$

$$\frac{1}{2}\left(\frac{1}{d - p + e \beta}\left(2^{-\beta} e^{(p-d) z} \left(\frac{e^{2 e z} (a + b)}{b - a} + 1\right)^{-\beta} \left(e^{-e z} \left(a \left(-1 + e^{2 e z}\right) + b \left(1 + e^{2 e z}\right)\right)\right)^{\beta} \right.\right.$$

$$\left. {}_2F_1\left(\frac{-d + p - e \beta}{2 e}, -\beta; \frac{1}{2}\left(\frac{p - d}{e} - \beta + 2\right); \frac{(a + b) e^{2 e z}}{a - b}\right)\right) - \frac{1}{-d - p + e \beta}\left(2^{-\beta} e^{(d+p) z} \left(\frac{e^{2 e z} (a + b)}{b - a} + 1\right)^{-\beta} \right.$$

$$\left.\left. \left(e^{-e z} \left(a \left(-1 + e^{2 e z}\right) + b \left(1 + e^{2 e z}\right)\right)\right)^{\beta} {}_2F_1\left(\frac{d + p - e \beta}{2 e}, -\beta; \frac{1}{2}\left(\frac{d + p}{e} - \beta + 2\right); \frac{(a + b) e^{2 e z}}{a - b}\right)\right)\right)$$

Involving $e^{p z} \cosh(d z) (a \sinh(e z) + b \cosh(e z))^{\beta}$

01.20.21.4731.01

$$\int e^{p z} \cosh(d z)\,(a \sinh(e z) + b \cosh(e z))^{\beta}\, dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d-p+e\beta}\left(2^{-\beta}\, e^{(p-d)z}\left(\frac{e^{2ez}(a+b)}{b-a}+1\right)^{-\beta}\left(e^{-ez}\left(a\left(-1+e^{2ez}\right)+b\left(1+e^{2ez}\right)\right)\right)^{\beta}\right.\right.$$

$$\left.{}_2F_1\left(\frac{-d+p-e\beta}{2e}, -\beta; \frac{1}{2}\left(\frac{p-d}{e}-\beta+2\right); \frac{(a+b)\,e^{2ez}}{a-b}\right)\right) - \frac{1}{-d-p+e\beta}\left(2^{-\beta}\, e^{(d+p)z}\left(\frac{e^{2ez}(a+b)}{b-a}+1\right)^{-\beta}\right.$$

$$\left.\left.\left(e^{-ez}\left(a\left(-1+e^{2ez}\right)+b\left(1+e^{2ez}\right)\right)\right)^{\beta}\, {}_2F_1\left(\frac{d+p-e\beta}{2e}, -\beta; \frac{1}{2}\left(\frac{d+p}{e}-\beta+2\right); \frac{(a+b)\,e^{2ez}}{a-b}\right)\right)\right)$$

Involving $e^{p z}(a + b \sinh(e z) + c \cosh(e z))^{\beta}$

01.20.21.4732.01

$$\int e^{p z}\,(a + b \sinh(e z) + c \cosh(e z))^{\beta}\, dz ==$$

$$-\frac{1}{e\beta - p}\left(2^{-\beta}\, e^{pz}\left(1-\frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{ez}(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-ez}\left(2\,e^{ez}a + c\,e^{2ez} + c + b\left(-1+e^{2ez}\right)\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{p}{e}-\beta; -\beta, -\beta; \frac{p}{e}-\beta+1; -\frac{(b+c)\,e^{ez}}{a+\sqrt{a^2+b^2-c^2}}, \frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)$$

Involving $e^{p z}\sinh(d z)\,(a + b \sinh(e z) + c \cosh(e z))^{\beta}$

01.20.21.4733.01

$$\int e^{p z}\sinh(d z)\,(a + b \sinh(e z) + c \cosh(e z))^{\beta}\, dz == \frac{1}{2}\left(\frac{1}{d-p+e\beta}\right.$$

$$\left(2^{-\beta}\, e^{(p-d)z}\left(1-\frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{ez}(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-ez}\left(2\,e^{ez}a + c\,e^{2ez} + c + b\left(-1+e^{2ez}\right)\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{p-d}{e}-\beta; -\beta, -\beta; \frac{p-d}{e}-\beta+1; -\frac{(b+c)\,e^{ez}}{a+\sqrt{a^2+b^2-c^2}}, \frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)\right) - \frac{1}{-d-p+e\beta}$$

$$\left(2^{-\beta}\, e^{(d+p)z}\left(1-\frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{ez}(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-ez}\left(2\,e^{ez}a + c\,e^{2ez} + c + b\left(-1+e^{2ez}\right)\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{d+p}{e}-\beta; -\beta, -\beta; \frac{d+p}{e}-\beta+1; -\frac{(b+c)\,e^{ez}}{a+\sqrt{a^2+b^2-c^2}}, \frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)\right)$$

Involving $e^{p z} \cosh(d z) (a + b \sinh(e z) + c \cosh(e z))^{\beta}$

01.20.21.4734.01

$$\int e^{p z} \cosh(d z) (a + b \sinh(e z) + c \cosh(e z))^{\beta} \, dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d - p + e\,\beta}\left(2^{-\beta}\, e^{(p-d) z}\left(1 - \frac{(b + c)\, e^{e z}}{\sqrt{a^2 + b^2 - c^2}\ - a}\right)^{-\beta}\left(\frac{e^{e z}\,(b + c)}{a + \sqrt{a^2 + b^2 - c^2}} + 1\right)^{-\beta}\right.\right.$$

$$\left(e^{-e z}\left(2\, e^{e z}\, a + c\, e^{2 e z} + c + b\left(-1 + e^{2 e z}\right)\right)\right)^{\beta} F_1\left(\frac{p - d}{e} - \beta; -\beta, -\beta;\right.$$

$$\left.\left.\frac{p - d}{e} - \beta + 1; -\frac{(b + c)\, e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}}, \frac{(b + c)\, e^{e z}}{\sqrt{a^2 + b^2 - c^2}\ - a}\right)\right) - \frac{1}{-d - p + e\,\beta}$$

$$\left(2^{-\beta}\, e^{(d+p) z}\left(1 - \frac{(b + c)\, e^{e z}}{\sqrt{a^2 + b^2 - c^2}\ - a}\right)^{-\beta}\left(\frac{e^{e z}\,(b + c)}{a + \sqrt{a^2 + b^2 - c^2}} + 1\right)^{-\beta}\left(e^{-e z}\left(2\, e^{e z}\, a + c\, e^{2 e z} + c + b\left(-1 + e^{2 e z}\right)\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{d + p}{e} - \beta; -\beta, -\beta; \frac{d + p}{e} - \beta + 1; -\frac{(b + c)\, e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}}, \frac{(b + c)\, e^{e z}}{\sqrt{a^2 + b^2 - c^2}\ - a}\right)\right)\right)$$

Involving $e^{p z}\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{\beta}$

01.20.21.4735.01

$$\int e^{p z}\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{\beta} \, dz ==$$

$$-\frac{1}{2 e\,\beta - p}\left(4^{-\beta}\, e^{p z}\left(1 - \frac{(a + b)\, e^{2 e z}}{a - b + 2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2 e z}\,(a + b)}{-a + b + 2\sqrt{-a\,b}} + 1\right)^{-\beta}\left(e^{-2 e z}\left(a\left(-1 + e^{2 e z}\right)^2 + b\left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{p}{2 e} - \beta; -\beta, -\beta; \frac{p}{2 e} - \beta + 1; -\frac{(a + b)\, e^{2 e z}}{-a + b + 2\sqrt{-a\,b}}, \frac{(a + b)\, e^{2 e z}}{a - b + 2\sqrt{-a\,b}}\right)\right)$$

Involving $e^{p z} \sinh(d z)\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{\beta}$

01.20.21.4736.01

$$\int e^{pz}\sinh(dz)\left(a\sinh^2(ez)+b\cosh^2(ez)\right)^{\beta}dz ==$$

$$\frac{1}{2}\left(\frac{1}{d-p+2e\beta}\left(4^{-\beta}e^{(p-d)z}\left(1-\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)^{-\beta}\left(\frac{e^{2ez}(a+b)}{-a+b+2\sqrt{-ab}}+1\right)^{-\beta}\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2+b\left(1+e^{2ez}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{p-d}{2e}-\beta;-\beta,-\beta;\frac{p-d}{2e}-\beta+1;-\frac{(a+b)e^{2ez}}{-a+b+2\sqrt{-ab}},\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)\right)-\frac{1}{-d-p+2e\beta}$$
$$\left(4^{-\beta}e^{(d+p)z}\left(1-\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)^{-\beta}\left(\frac{e^{2ez}(a+b)}{-a+b+2\sqrt{-ab}}+1\right)^{-\beta}\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2+b\left(1+e^{2ez}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{d+p}{2e}-\beta;-\beta,-\beta;\frac{d+p}{2e}-\beta+1;-\frac{(a+b)e^{2ez}}{-a+b+2\sqrt{-ab}},\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)\right)\right)$$

Involving $e^{pz}\cosh(dz)\left(a\sinh^2(ez)+b\cosh^2(ez)\right)^{\beta}$

01.20.21.4737.01

$$\int e^{pz}\cosh(dz)\left(a\sinh^2(ez)+b\cosh^2(ez)\right)^{\beta}dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d-p+2e\beta}\left(4^{-\beta}e^{(p-d)z}\left(1-\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)^{-\beta}\left(\frac{e^{2ez}(a+b)}{-a+b+2\sqrt{-ab}}+1\right)^{-\beta}\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2+b\left(1+e^{2ez}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{p-d}{2e}-\beta;-\beta,-\beta;\frac{p-d}{2e}-\beta+1;-\frac{(a+b)e^{2ez}}{-a+b+2\sqrt{-ab}},\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)\right)-\frac{1}{-d-p+2e\beta}$$
$$\left(4^{-\beta}e^{(d+p)z}\left(1-\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)^{-\beta}\left(\frac{e^{2ez}(a+b)}{-a+b+2\sqrt{-ab}}+1\right)^{-\beta}\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2+b\left(1+e^{2ez}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{d+p}{2e}-\beta;-\beta,-\beta;\frac{d+p}{2e}-\beta+1;-\frac{(a+b)e^{2ez}}{-a+b+2\sqrt{-ab}},\frac{(a+b)e^{2ez}}{a-b+2\sqrt{-ab}}\right)\right)\right)$$

Involving $e^{pz}\left(a+b\sinh^2(ez)+c\cosh^2(ez)\right)^{\beta}$

01.20.21.4738.01

$$\int e^{pz}\left(a+b\sinh^2(ez)+c\cosh^2(ez)\right)^{\beta}dz ==$$

$$-\frac{1}{2e\beta-p}\left(4^{-\beta}e^{pz}\left(1-\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2ez}(b+c)}{2a-b+c+2\sqrt{(a-b)(a+c)}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2ez}\left(b\left(-1+e^{2ez}\right)^2+4ae^{2ez}+c\left(1+e^{2ez}\right)^2\right)\right)^{\beta}$$
$$\left.F_1\left(\frac{p}{2e}-\beta;-\beta,-\beta;\frac{p}{2e}-\beta+1;\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}},\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)\right)$$

Involving $e^{p z} \sinh(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta}$

01.20.21.4739.01

$$\int e^{p z} \sinh(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta} dz ==$$

$$\frac{1}{2}\left(\frac{1}{d - p + 2 e \beta}\left(4^{-\beta} e^{(p-d) z}\left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2 e z}(b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2 e z}\left(b\left(-1 + e^{2 e z}\right)^2 + 4 a e^{2 e z} + c\left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}$$
$$F_1\left(\frac{p-d}{2e} - \beta; -\beta, -\beta; \frac{p-d}{2e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\Bigg) -$$
$$\frac{1}{-d - p + 2 e \beta}\left(4^{-\beta} e^{(d+p) z}\left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2 e z}(b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.$$
$$\left(e^{-2 e z}\left(b\left(-1 + e^{2 e z}\right)^2 + 4 a e^{2 e z} + c\left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(\frac{d+p}{2e} - \beta; -\beta, -\beta; \frac{d+p}{2e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\right)\right)$$

Involving $e^{p z} \cosh(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta}$

01.20.21.4740.01

$$\int e^{p z} \cosh(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta} dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d - p + 2 e \beta}\left(4^{-\beta} e^{(p-d) z}\left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2 e z}(b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2 e z}\left(b\left(-1 + e^{2 e z}\right)^2 + 4 a e^{2 e z} + c\left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}$$
$$F_1\left(\frac{p-d}{2e} - \beta; -\beta, -\beta; \frac{p-d}{2e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\Bigg) -$$
$$\frac{1}{-d - p + 2 e \beta}\left(4^{-\beta} e^{(d+p) z}\left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2 e z}(b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.$$
$$\left(e^{-2 e z}\left(b\left(-1 + e^{2 e z}\right)^2 + 4 a e^{2 e z} + c\left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(\frac{d+p}{2e} - \beta; -\beta, -\beta; \frac{d+p}{2e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\right)\right)$$

Involving $e^{p z}\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{\beta}$

01.20.21.4741.01

$$\int e^{pz}\left(a\sinh^2(ez)+b\sinh(2ez)+c\cosh^2(ez)\right)^{\beta}dz=$$
$$-\frac{1}{2e\beta-p}\left(4^{-\beta}e^{pz}\left(1-\frac{(a+2b+c)e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)^{-\beta}\left(\frac{e^{2ez}(a+2b+c)}{-a+c+2\sqrt{b^2-ac}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2+\left(1+e^{2ez}\right)\left(2b\left(-1+e^{2ez}\right)+c\left(1+e^{2ez}\right)\right)\right)\right)^{\beta}$$
$$\left.F_1\left(\frac{p}{2e}-\beta;-\beta,-\beta;\frac{p}{2e}-\beta+1;-\frac{(a+2b+c)e^{2ez}}{-a+c+2\sqrt{b^2-ac}},\frac{(a+2b+c)e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)\right)$$

Involving $e^{pz}\sinh(dz)\left(a\sinh^2(ez)+b\sinh(2ez)+c\cosh^2(ez)\right)^{\beta}$

01.20.21.4742.01

$$\int e^{pz}\sinh(dz)\left(a\sinh^2(ez)+b\sinh(2ez)+c\cosh^2(ez)\right)^{\beta}dz=$$
$$\frac{1}{2}\left(\frac{1}{d-p+2e\beta}\left(4^{-\beta}e^{(p-d)z}\left(1-\frac{(a+2b+c)e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)^{-\beta}\left(\frac{e^{2ez}(a+2b+c)}{-a+c+2\sqrt{b^2-ac}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2+\left(1+e^{2ez}\right)\left(2b\left(-1+e^{2ez}\right)+c\left(1+e^{2ez}\right)\right)\right)\right)^{\beta}$$
$$\left.F_1\left(\frac{p-d}{2e}-\beta;-\beta,-\beta;\frac{p-d}{2e}-\beta+1;-\frac{(a+2b+c)e^{2ez}}{-a+c+2\sqrt{b^2-ac}},\frac{(a+2b+c)e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)\right)-$$
$$\frac{1}{-d-p+2e\beta}\left(4^{-\beta}e^{(d+p)z}\left(1-\frac{(a+2b+c)e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)^{-\beta}\left(\frac{e^{2ez}(a+2b+c)}{-a+c+2\sqrt{b^2-ac}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2ez}\left(a\left(-1+e^{2ez}\right)^2+\left(1+e^{2ez}\right)\left(2b\left(-1+e^{2ez}\right)+c\left(1+e^{2ez}\right)\right)\right)\right)^{\beta}$$
$$\left.\left.F_1\left(\frac{d+p}{2e}-\beta;-\beta,-\beta;\frac{d+p}{2e}-\beta+1;-\frac{(a+2b+c)e^{2ez}}{-a+c+2\sqrt{b^2-ac}},\frac{(a+2b+c)e^{2ez}}{a-c+2\sqrt{b^2-ac}}\right)\right)\right)$$

Involving $e^{pz}\cosh(dz)\left(a\sinh^2(ez)+b\sinh(2ez)+c\cosh^2(ez)\right)^{\beta}$

01.20.21.4743.01

$$\int e^{p z} \cosh(d z) \left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{\beta} dz ==$$

$$\frac{1}{2}\left(-\frac{1}{d-p+2 e \beta}\left(4^{-\beta} e^{(p-d) z}\left(1-\frac{(a+2 b+c) e^{2 e z}}{a-c+2\sqrt{b^2-a c}}\right)^{-\beta}\left(\frac{e^{2 e z}(a+2 b+c)}{-a+c+2\sqrt{b^2-a c}}+1\right)^{-\beta}\right.\right.$$

$$\left(e^{-2 e z}\left(a\left(-1+e^{2 e z}\right)^2+\left(1+e^{2 e z}\right)\left(2 b\left(-1+e^{2 e z}\right)+c\left(1+e^{2 e z}\right)\right)\right)\right)^{\beta}$$

$$\left.F_1\left(\frac{p-d}{2 e}-\beta;-\beta,-\beta;\frac{p-d}{2 e}-\beta+1;-\frac{(a+2 b+c) e^{2 e z}}{-a+c+2\sqrt{b^2-a c}},\frac{(a+2 b+c) e^{2 e z}}{a-c+2\sqrt{b^2-a c}}\right)\right)-$$

$$\frac{1}{-d-p+2 e \beta}\left(4^{-\beta} e^{(d+p) z}\left(1-\frac{(a+2 b+c) e^{2 e z}}{a-c+2\sqrt{b^2-a c}}\right)^{-\beta}\left(\frac{e^{2 e z}(a+2 b+c)}{-a+c+2\sqrt{b^2-a c}}+1\right)^{-\beta}\right.$$

$$\left(e^{-2 e z}\left(a\left(-1+e^{2 e z}\right)^2+\left(1+e^{2 e z}\right)\left(2 b\left(-1+e^{2 e z}\right)+c\left(1+e^{2 e z}\right)\right)\right)\right)^{\beta}$$

$$\left.\left.F_1\left(\frac{d+p}{2 e}-\beta;-\beta,-\beta;\frac{d+p}{2 e}-\beta+1;-\frac{(a+2 b+c) e^{2 e z}}{-a+c+2\sqrt{b^2-a c}},\frac{(a+2 b+c) e^{2 e z}}{a-c+2\sqrt{b^2-a c}}\right)\right)\right)$$

Involving functions of the direct function, hyperbolic and trigonometric functions

Involving powers of the direct function, hyperbolic and trigonometric functions

Involving sin and sinh

Involving $\sin(a z^r + q) \sinh(w z^r + t) \cosh^v(c z^r + g)$

01.20.21.4744.01

$$\int \sin(a\,z^r+q)\sinh(w\,z^r+t)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$-\frac{1}{r}\left(i\,2^{-\nu-2}\,z\binom{\nu}{\frac{\nu}{2}}\left(-e^{i\,q+t}\,\Gamma\left(\frac{1}{r},\,(-i\,a-w)\,z^r\right)((-i\,a-w)\,z^r)^{-1/r}+e^{t-i\,q}\,((i\,a-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(i\,a-w)\,z^r\right)+\right.\right.$$
$$\left.\left.e^{i\,q-t}\,((-i\,a+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-i\,a+w)\,z^r\right)-e^{-i\,q-t}\,((i\,a+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(i\,a+w)\,z^r\right)\right)(1-\nu \bmod 2)\right)-$$
$$\frac{1}{r}\left(i\,2^{-\nu-2}\,z\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-e^{2\,g\,h+i\,q+t-g\,\nu}\,\Gamma\left(\frac{1}{r},\,(-2\,c\,h-i\,a+c\,\nu-w)\,z^r\right)((-2\,c\,h-i\,a+c\,\nu-w)\,z^r)^{-1/r}+\right.\right.$$
$$e^{2\,g\,h-i\,q+t-g\,\nu}\,((-2\,c\,h+i\,a+c\,\nu-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,c\,h+i\,a+c\,\nu-w)\,z^r\right)-$$
$$e^{-2\,g\,h+i\,q+t+g\,\nu}\,((2\,c\,h-i\,a-c\,\nu-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,h-i\,a-c\,\nu-w)\,z^r\right)+$$
$$e^{-2\,g\,h-i\,q+t+g\,\nu}\,((2\,c\,h+i\,a-c\,\nu-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,h+i\,a-c\,\nu-w)\,z^r\right)+$$
$$e^{2\,g\,h+i\,q-t-g\,\nu}\,((-2\,c\,h-i\,a+c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,c\,h-i\,a+c\,\nu+w)\,z^r\right)-$$
$$e^{2\,g\,h-i\,q-t-g\,\nu}\,((-2\,c\,h+i\,a+c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,c\,h+i\,a+c\,\nu+w)\,z^r\right)+$$
$$e^{-2\,g\,h+i\,q-t+g\,\nu}\,((2\,c\,h-i\,a-c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,h-i\,a-c\,\nu+w)\,z^r\right)-$$
$$\left.\left.e^{-2\,g\,h-i\,q-t+g\,\nu}\,((2\,c\,h+i\,a-c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,h+i\,a-c\,\nu+w)\,z^r\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

Involving $\sin(a\,z^r+p\,z+q)\sinh(w\,z^r+s\,z+t)\cosh^{\nu}(c\,z^r+f\,z+g)$

01.20.21.4745.01

$$\int \sin(a\,z^2+p\,z+q)\sinh(w\,z^2+s\,z+t)\cosh^{\nu}(c\,z^2+f\,z+g)\,dz ==$$

$$-i\,2^{-\nu-3}\left(-\frac{e^{-\frac{(-i\,p-s)^2}{4\,(-i\,a-w)}-i\,q-t}\,(-i\,p-s+2\,(-i\,a-w)\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(-i\,p-s+2\,(-i\,a-w)\,z)^2}{4\,(-i\,a-w)}\right)}{(-i\,a-w)\sqrt{-\frac{(-i\,p-s+2\,(-i\,a-w)\,z)^2}{-i\,a-w}}}+\right.$$
$$\left.\frac{e^{-\frac{(i\,p-s)^2}{4\,(i\,a-w)}+i\,q-t}\,(i\,p-s+2\,(i\,a-w)\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(i\,p-s+2\,(i\,a-w)\,z)^2}{4\,(i\,a-w)}\right)}{(i\,a-w)\sqrt{-\frac{(i\,p-s+2\,(i\,a-w)\,z)^2}{i\,a-w}}}+\right.$$

$$\frac{e^{-\frac{(s-i\,p)^2}{4(-i\,a+w)}-i\,q+t}\,(-i\,p+s+2\,(-i\,a+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{4\,(-i\,a+w)}\right)}{(-i\,a+w)\,\sqrt{-\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{-i\,a+w}}}-$$

$$\left.\frac{e^{-\frac{(i\,p+s)^2}{4\,(i\,a+w)}+i\,q+t}\,(i\,p+s+2\,(i\,a+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{4\,(i\,a+w)}\right)}{(i\,a+w)\,\sqrt{-\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{i\,a+w}}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)-$$

$$i\,2^{-\nu-3}\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-\left(e^{-\frac{(-i\,p-s+f\,(2\,h-\nu))^2}{4\,(-i\,a+c\,(2\,h-\nu)-w)}-i\,q-t+g\,(2\,h-\nu)}\,(-i\,p-s+f\,(2\,h-\nu)+2\,(-i\,a+c\,(2\,h-\nu)-w)\,z)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p-s+f\,(2\,h-\nu)+2\,(-i\,a+c\,(2\,h-\nu)-w)\,z)^2}{4\,(-i\,a+c\,(2\,h-\nu)-w)}\right)\right)\Big/$$

$$\left((-i\,a+c\,(2\,h-\nu)-w)\,\sqrt{-\frac{(-i\,p-s+f\,(2\,h-\nu)+2\,(-i\,a+c\,(2\,h-\nu)-w)\,z)^2}{-i\,a+c\,(2\,h-\nu)-w}}\right)+$$

$$\left(e^{-\frac{(i\,p-s+f\,(2\,h-\nu))^2}{4\,(i\,a+c\,(2\,h-\nu)-w)}+i\,q-t+g\,(2\,h-\nu)}\,(i\,p-s+f\,(2\,h-\nu)+2\,(i\,a+c\,(2\,h-\nu)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p-s+f\,(2\,h-\nu)+2\,(i\,a+c\,(2\,h-\nu)-w)\,z)^2}{4\,(i\,a+c\,(2\,h-\nu)-w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(2\,h-\nu)-w)\,\sqrt{-\frac{(i\,p-s+f\,(2\,h-\nu)+2\,(i\,a+c\,(2\,h-\nu)-w)\,z)^2}{i\,a+c\,(2\,h-\nu)-w}}\right)+$$

$$\left(e^{-\frac{(i\,p-s+f\,(\nu-2\,h))^2}{4\,(i\,a+c\,(\nu-2\,h)-w)}+i\,q-t+g\,(\nu-2\,h)}\,(i\,p-s+f\,(\nu-2\,h)+2\,(i\,a+c\,(\nu-2\,h)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p-s+f\,(\nu-2\,h)+2\,(i\,a+c\,(\nu-2\,h)-w)\,z)^2}{4\,(i\,a+c\,(\nu-2\,h)-w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(\nu-2\,h)-w)\,\sqrt{-\frac{(i\,p-s+f\,(\nu-2\,h)+2\,(i\,a+c\,(\nu-2\,h)-w)\,z)^2}{i\,a+c\,(\nu-2\,h)-w}}\right)+$$

$$\left(e^{-\frac{(-i\,p+s+f\,(2\,h-\nu))^2}{4\,(-i\,a+c\,(2\,h-\nu)+w)}-i\,q+t+g\,(2\,h-\nu)}\,(-i\,p+s+f\,(2\,h-\nu)+2\,(-i\,a+c\,(2\,h-\nu)+w)\,z)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p+s+f\,(2\,h-\nu)+2\,(-i\,a+c\,(2\,h-\nu)+w)\,z)^2}{4\,(-i\,a+c\,(2\,h-\nu)+w)}\right)\right)\Big/\right.$$

$$\left((-i\,a+c\,(2\,h-v)+w)\sqrt{-\frac{(-i\,p+s+f\,(2\,h-v)+2\,(-i\,a+c\,(2\,h-v)+w)\,z)^2}{-i\,a+c\,(2\,h-v)+w}}\right)-$$

$$\left(e^{-\frac{(i\,p+s+f\,(2\,h-v))^2}{4\,(i\,a+c\,(2\,h-v)+w)}+i\,q+t+g\,(2\,h-v)}\,(i\,p+s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p+s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)+w)\,z)^2}{4\,(i\,a+c\,(2\,h-v)+w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(2\,h-v)+w)\sqrt{-\frac{(i\,p+s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)+w)\,z)^2}{i\,a+c\,(2\,h-v)+w}}\right)-$$

$$\left(e^{-\frac{(i\,p+s+f\,(v-2\,h))^2}{4\,(i\,a+c\,(v-2\,h)+w)}+i\,q+t+g\,(v-2\,h)}\,(i\,p+s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p+s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)+w)\,z)^2}{4\,(i\,a+c\,(v-2\,h)+w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(v-2\,h)+w)\sqrt{-\frac{(i\,p+s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)+w)\,z)^2}{i\,a+c\,(v-2\,h)+w}}\right)-$$

$$\left(e^{-\frac{(-i\,p-s+f\,(v-2\,h))^2}{4\,(-i\,a+c\,(v-2\,h)-w)}-i\,q-t+g\,(v-2\,h)}\,(-i\,p-s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p-s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)-w)\,z)^2}{4\,(-i\,a+c\,(v-2\,h)-w)}\right)\right)\Big/$$

$$\left((-i\,a+c\,(v-2\,h)-w)\sqrt{-\frac{(-i\,p-s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)-w)\,z)^2}{-i\,a+c\,(v-2\,h)-w}}\right)+$$

$$\left(e^{-\frac{(-i\,p+s+f\,(v-2\,h))^2}{4\,(-i\,a+c\,(v-2\,h)+w)}-i\,q+t+g\,(v-2\,h)}\,(-i\,p+s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p+s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)+w)\,z)^2}{4\,(-i\,a+c\,(v-2\,h)+w)}\right)\right)\Big/$$

$$\left.\left((-i\,a+c\,(v-2\,h)+w)\sqrt{-\frac{(-i\,p+s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)+w)\,z)^2}{-i\,a+c\,(v-2\,h)+w}}\right)\right/;\,v\in\mathbb{N}^+$$

01.20.21.4746.01

$$\int \sin\left(\sqrt{z}\ a+q+p\,z\right)\sinh\left(t+s\,z+w\sqrt{z}\right)\cosh^{v}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-v-3}\,i\left(-\left(e^{-\frac{(-i\,a-w)^2}{4(-i\,p-s)}-i\,q-t}\left(2\,e^{\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{4(-i\,p-s)}}\sqrt{-\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{-i\,p-s}}\ (-i\,p-s)+\right.\right.\right.$$

$$\left.\left.\left.(-i\,a-w)\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{4(-i\,p-s)}\right)\right)\right)\Bigg/$$

$$\left((-i\,p-s)^2\sqrt{-\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{-i\,p-s}}\right)+$$

$$\left(e^{-\frac{(i\,a-w)^2}{4(i\,p-s)}+i\,q-t}\left(2\,e^{\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{4(i\,p-s)}}\sqrt{-\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{i\,p-s}}\ (i\,p-s)+(i\,a-w)\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{4(i\,p-s)}\right)\right)\Bigg/\left((i\,p-s)^2\sqrt{-\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{i\,p-s}}\right)+$$

$$\left(e^{-\frac{(-i\,a+w)^2}{4(s-i\,p)}-i\,q+t}\left(2\,e^{\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{4(s-i\,p)}}\sqrt{-\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{s-i\,p}}\ (s-i\,p)+(-i\,a+w)\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{4(s-i\,p)}\right)\right)\Bigg/\left((s-i\,p)^2\sqrt{-\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{s-i\,p}}\right)-$$

$$\left(e^{-\frac{(i\,a+w)^2}{4(i\,p+s)}+i\,q+t}\left(2\,e^{\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{4(i\,p+s)}}\sqrt{-\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{i\,p+s}}\ (i\,p+s)+(i\,a+w)\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{4(i\,p+s)}\right)\right)\Bigg/\left((i\,p+s)^2\sqrt{-\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{i\,p+s}}\right)\right)\binom{v}{\frac{v}{2}}(1-v \bmod 2)+$$

$$2^{-v-3}\, i \sum_{h=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{h} \left(\left(e^{-\frac{(i a+c(2h-v)-w)^2}{4(i p-s+f(2h-v))}+i q-t+g(2h-v)} \left((i a+c(2h-v)-w)\left(i a+c(2h-v)-w+2(i p-s+f(2h-v))\sqrt{z}\right) \right.\right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}, -\frac{\left(i a+c(2h-v)-w+2(i p-s+f(2h-v))\sqrt{z}\right)^2}{4(i p-s+f(2h-v))}\right) + 2 e^{\frac{\left(i a+c(2h-v)-w+2(i p-s+f(2h-v))\sqrt{z}\right)^2}{4(i p-s+f(2h-v))}} \right.$$

$$\left. \left. (i p-s+f(2h-v)) \sqrt{-\frac{\left(i a+c(2h-v)-w+2(i p-s+f(2h-v))\sqrt{z}\right)^2}{i p-s+f(2h-v)}} \right) \right) \Big/$$

$$\left((i p-s+f(2h-v))^2 \sqrt{-\frac{\left(i a+c(2h-v)-w+2(i p-s+f(2h-v))\sqrt{z}\right)^2}{i p-s+f(2h-v)}} \right) -$$

$$\left(e^{-\frac{(i a+c(2h-v)+w)^2}{4(i p+s+f(2h-v))}+i q+t+g(2h-v)} \left((i a+c(2h-v)+w)\left(i a+c(2h-v)+w+2(i p+s+f(2h-v))\sqrt{z}\right) \right.\right.$$

$$\left. \Gamma\left(\frac{1}{2}, -\frac{\left(i a+c(2h-v)+w+2(i p+s+f(2h-v))\sqrt{z}\right)^2}{4(i p+s+f(2h-v))}\right) + 2 e^{\frac{\left(i a+c(2h-v)+w+2(i p+s+f(2h-v))\sqrt{z}\right)^2}{4(i p+s+f(2h-v))}} \right.$$

$$\left. \left. (i p+s+f(2h-v)) \sqrt{-\frac{\left(i a+c(2h-v)+w+2(i p+s+f(2h-v))\sqrt{z}\right)^2}{i p+s+f(2h-v)}} \right) \right) \Big/$$

$$\left((i p+s+f(2h-v))^2 \sqrt{-\frac{\left(i a+c(2h-v)+w+2(i p+s+f(2h-v))\sqrt{z}\right)^2}{i p+s+f(2h-v)}} \right) -$$

$$\left(e^{-\frac{(-i a+c(2h-v)-w)^2}{4(-i p-s+f(2h-v))}-i q-t+g(2h-v)} \left((-i a+c(2h-v)-w)\left(-i a+c(2h-v)-w+2(-i p-s+f(2h-v))\sqrt{z}\right) \right.\right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}, -\frac{\left(-i a+c(2h-v)-w+2(-i p-s+f(2h-v))\sqrt{z}\right)^2}{4(-i p-s+f(2h-v))}\right) + 2 e^{\frac{\left(-i a+c(2h-v)-w+2(-i p-s+f(2h-v))\sqrt{z}\right)^2}{4(-i p-s+f(2h-v))}} \right) \right)$$

$$(-i\,p-s+f\,(2\,h-v))\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)-w+2\,(-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2\,h-v)}}\Bigg)\Bigg/$$

$$\left((-i\,p-s+f\,(2\,h-v))^2\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)-w+2\,(-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(-i\,a+c\,(2\,h-v)+w)^2}{4\,(-i\,p+s+f\,(2\,h-v))}-i\,q+t+g\,(2\,h-v)}\left((-i\,a+c\,(2\,h-v)+w)\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}\right)+2\,e^{\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}}$$

$$(-i\,p+s+f\,(2\,h-v))\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}}\Bigg)\Bigg/$$

$$\left((-i\,p+s+f\,(2\,h-v))^2\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}}\right)-$$

$$\left(e^{-\frac{(-i\,a+c\,(v-2\,h)-w)^2}{4\,(-i\,p-s+f\,(v-2\,h))}-i\,q-t+g\,(v-2\,h)}\left((-i\,a+c\,(v-2\,h)-w)\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(v-2\,h))}}$$

$$(-i\,p-s+f\,(v-2\,h))\sqrt{-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(v-2\,h)}}\Bigg)\Bigg/$$

$$\left((-i\,p-s+f\,(v-2\,h))^2\sqrt{-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(v-2\,h)}}\right)+$$

$$\left(e^{-\frac{(i a+c (v-2 h)-w)^2}{4 (i p-s+f (v-2 h))}+i q-t+g (v-2 h)} \left((i a+c (v-2 h)-w) \left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}, -\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{4 (i p-s+f (v-2 h))}\right)+2 e^{\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{4 (i p-s+f (v-2 h))}}$$

$$\left.\left.(i p-s+f (v-2 h)) \sqrt{-\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{i p-s+f (v-2 h)}}\right)\right) /$$

$$\left((i p-s+f (v-2 h))^2 \sqrt{-\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{i p-s+f (v-2 h)}}\right)+$$

$$\left(e^{-\frac{(-i a+c (v-2 h)+w)^2}{4 (-i p+s+f (v-2 h))}-i q+t+g (v-2 h)} \left((-i a+c (v-2 h)+w) \left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}, -\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{4 (-i p+s+f (v-2 h))}\right)+2 e^{\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{4 (-i p+s+f (v-2 h))}}$$

$$\left.\left.(-i p+s+f (v-2 h)) \sqrt{-\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{-i p+s+f (v-2 h)}}\right)\right) /$$

$$\left((-i p+s+f (v-2 h))^2 \sqrt{-\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{-i p+s+f (v-2 h)}}\right)-$$

$$\left(e^{-\frac{(i a+c (v-2 h)+w)^2}{4 (i p+s+f (v-2 h))}+i q+t+g (v-2 h)} \left((i a+c (v-2 h)+w) \left(i a+c (v-2 h)+w+2 (i p+s+f (v-2 h)) \sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}, -\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(v-2\,h))}}$$

$$\left.\left.(i\,p+s+f\,(v-2\,h))\sqrt{-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p+s+f\,(v-2\,h)}}\right)\right/$$

$$\left.\left((i\,p+s+f\,(v-2\,h))^2\sqrt{-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p+s+f\,(v-2\,h)}}\right)\right/;\ v\in\mathbb{Z}\wedge v>0$$

Involving powers of sin and powers of sinh

Involving $\sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int \sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)\,dz ==$$

$$-i^u\,2^{-m-u-v}\,z\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(u \bmod 2-1)\,(v \bmod 2-1)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u \bmod 2)$$

$$(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-i\,q\,m+\frac{i\,\pi\,m}{2}+2\,i\,k\,q}\,\Gamma\left(\frac{1}{r},\,(i\,a\,m-2\,i\,a\,k)\,z^r\right)((i\,a\,m-2\,i\,a\,k)\,z^r)^{-1/r}+e^{i\,q\,m-\frac{i\,\pi\,m}{2}-2\,i\,k\,q}\right.$$

$$\left.((2\,i\,a\,k-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,i\,a\,k-i\,a\,m)\,z^r\right)\right)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)\,(1-u \bmod 2)$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2\,g\,h-g\,v}\,\Gamma\left(\frac{1}{r},\,(c\,v-2\,c\,h)\,z^r\right)((c\,v-2\,c\,h)\,z^r)^{-1/r}+e^{g\,v-2\,g\,h}\,((2\,c\,h-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,h-c\,v)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}$$

$$\left(e^{2\,k\,t-u\,t+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{1}{r},\,(u\,w-2\,k\,w)\,z^r\right)((u\,w-2\,k\,w)\,z^r)^{-1/r}+e^{-2\,k\,t+u\,t-\frac{i\,\pi\,u}{2}}\,((2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,k\,w-u\,w)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2\,g\,h+2\,i\,k\,q-i\,m\,q-g\,v+\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{1}{r},\,(-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v)\,z^r\right)((-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v)\,z^r)^{-1/r}+\right.$$

$$\left.e^{2\,g\,h-2\,i\,k\,q+i\,m\,q-g\,v-\frac{i\,m\,\pi}{2}}\,((-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v)\,z^r\right)+\right.$$

$$e^{-2gh+2ikq-imq+gv+\frac{im\pi}{2}}((2ch-2iak+iam-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-2iak+iam-cv)z^r\right)+$$
$$e^{-2gh-2ikq+imq+gv-\frac{im\pi}{2}}((2ch+2iak-iam-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch+2iak-iam-cv)z^r\right)\Bigg)-$$

$$\frac{i^u 2^{-m-u-v}z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-iqm+\frac{i\pi m}{2}+2ikq+2jt-tu+\frac{i\pi u}{2}}$$
$$\Gamma\left(\frac{1}{r},(-2aik+iam-2jw+uw)z^r\right)((-2aik+iam-2jw+uw)z^r)^{-1/r}+$$
$$e^{iqm-\frac{i\pi m}{2}-2ikq+2jt-tu+\frac{i\pi u}{2}}((2iak-iam-2jw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2iak-iam-2jw+uw)z^r\right)+$$
$$e^{-iqm+\frac{i\pi m}{2}+2ikq-2jt+tu-\frac{i\pi u}{2}}((-2aik+iam+2jw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-2aik+iam+2jw-uw)z^r\right)+$$
$$e^{iqm-\frac{i\pi m}{2}-2ikq-2jt+tu-\frac{i\pi u}{2}}((2iak-iam+2jw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2iak-iam+2jw-uw)z^r\right)\Bigg)-$$

$$\frac{i^u 2^{-m-u-v}z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{2gh+2kt-tu+\frac{i\pi u}{2}-gv}\Gamma\left(\frac{1}{r},(-2ch+cv-2kw+uw)z^r\right)$$
$$((-2ch+cv-2kw+uw)z^r)^{-1/r}+$$
$$e^{-2gh+2kt-tu+\frac{i\pi u}{2}+gv}((2ch-cv-2kw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-cv-2kw+uw)z^r\right)+$$
$$e^{2gh-2kt+tu-gv-\frac{i\pi u}{2}}((-2ch+cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-2ch+cv+2kw-uw)z^r\right)+$$
$$e^{-2gh-2kt+tu+gv-\frac{i\pi u}{2}}((2ch-cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-cv+2kw-uw)z^r\right)\Bigg)-$$

$$\frac{i^u 2^{-m-u-v}z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{2gh+2ikq-imq+2jt-tu+\frac{i\pi u}{2}-gv+\frac{im\pi}{2}}$$
$$\Gamma\left(\frac{1}{r},(-2ch-2iak+iam+cv-2jw+uw)z^r\right)((-2ch-2iak+iam+cv-2jw+uw)z^r)^{-1/r}+$$
$$e^{2gh-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-gv-\frac{im\pi}{2}}((-2ch+2iak-iam+cv-2jw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-2ch+2iak-iam+cv-2jw+uw)z^r\right)+e^{-2gh+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+gv+\frac{im\pi}{2}}$$
$$((2ch-2iak+iam-cv-2jw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-2iak+iam-cv-2jw+uw)z^r\right)+$$
$$e^{-2gh-2ikq+imq+2jt-tu+\frac{i\pi u}{2}+gv-\frac{im\pi}{2}}((2ch+2iak-iam-cv-2jw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(2ch+2iak-iam-cv-2jw+uw)z^r\right)+e^{2gh+2ikq-imq-2jt+tu-gv-\frac{i\pi u}{2}+\frac{im\pi}{2}}$$
$$((-2ch-2iak+iam+cv+2jw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-2ch-2iak+iam+cv+2jw-uw)z^r\right)+$$
$$e^{2gh-2ikq+imq-2jt+tu-gv-\frac{i\pi u}{2}-\frac{im\pi}{2}}((-2ch+2iak-iam+cv+2jw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-2ch+2iak-iam+cv+2jw-uw)z^r\right)+e^{-2gh+2ikq-imq-2jt+tu+gv-\frac{i\pi u}{2}+\frac{im\pi}{2}}$$

$$((2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r\right)+$$
$$e^{-2\,g\,h-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,((2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},\,(2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r\right)\Big)\Big/;\,m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\sin^m(a\,z^r+p\,z+q)\sinh^u(w\,z^r+s\,z+t)\cosh^v(c\,z^r+f\,z+g)$

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$$\int\sin^m(a\,z^2+p\,z+q)\sinh^u(w\,z^2+s\,z+t)\cosh^v(c\,z^2+f\,z+g)\,dz==$$
$$i^u\,2^{-m-u-v}\,z\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)+i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(i\,e^{-\frac{i\,(2\,k-m)\,p^2}{4\,a}+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(i\,(2\,k-m)\,p+2\,a\,i\,(2\,k-m)\,z)\,\Gamma\left(\frac{1}{2},\,\frac{i\,(i\,(2\,k-m)\,p+2\,a\,i\,(2\,k-m)\,z)^2}{4\,a\,(2\,k-m)}\right)\right)\Big/$$
$$\left(a\,(2\,k-m)\sqrt{\frac{i\,(i\,(2\,k-m)\,p+2\,a\,i\,(2\,k-m)\,z)^2}{a\,(2\,k-m)}}\right)+$$
$$\left(i\,e^{-\frac{i\,(m-2\,k)\,p^2}{4\,a}+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(i\,(m-2\,k)\,p+2\,a\,i\,(m-2\,k)\,z)\,\Gamma\left(\frac{1}{2},\,\frac{i\,(i\,(m-2\,k)\,p+2\,a\,i\,(m-2\,k)\,z)^2}{4\,a\,(m-2\,k)}\right)\right)\Big/$$
$$\left(a\,(m-2\,k)\sqrt{\frac{i\,(i\,(m-2\,k)\,p+2\,a\,i\,(m-2\,k)\,z)^2}{a\,(m-2\,k)}}\right)\Big)-i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)$$
$$(1-u\bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\frac{e^{g\,(2\,h-v)-\frac{f^2\,(2\,h-v)}{4\,c}}\,(f\,(2\,h-v)+2\,c\,z\,(2\,h-v))\,\Gamma\left(\frac{1}{2},\,-\frac{(f\,(2\,h-v)+2\,c\,z\,(2\,h-v))^2}{4\,c\,(2\,h-v)}\right)}{c\,(2\,h-v)\sqrt{-\frac{(f\,(2\,h-v)+2\,c\,z\,(2\,h-v))^2}{c\,(2\,h-v)}}}+\right.$$
$$\left.\frac{e^{g\,(v-2\,h)-\frac{f^2\,(v-2\,h)}{4\,c}}\,(f\,(v-2\,h)+2\,c\,z\,(v-2\,h))\,\Gamma\left(\frac{1}{2},\,-\frac{(f\,(v-2\,h)+2\,c\,z\,(v-2\,h))^2}{4\,c\,(v-2\,h)}\right)}{c\,(v-2\,h)\sqrt{-\frac{(f\,(v-2\,h)+2\,c\,z\,(v-2\,h))^2}{c\,(v-2\,h)}}}\right)-i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)$$
$$(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{(2\,k-u)\,s^2}{4\,w}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\,(s\,(2\,k-u)+2\,w\,z\,(2\,k-u))\,\Gamma\left(\frac{1}{2},\,-\frac{(s\,(2\,k-u)+2\,w\,z\,(2\,k-u))^2}{4\,(2\,k-u)\,w}\right)\right)\Big/\right.$$
$$\left.\left((2\,k-u)\,w\sqrt{-\frac{(s\,(2\,k-u)+2\,w\,z\,(2\,k-u))^2}{(2\,k-u)\,w}}\right)+\right.$$

$$\left(e^{-\frac{(u-2k)s^2}{4w}-\frac{i\pi u}{2}+t(u-2k)}(s(u-2k)+2wz(u-2k))\,\Gamma\left(\frac{1}{2},-\frac{(s(u-2k)+2wz(u-2k))^2}{4(u-2k)w}\right)\right)\Big/$$

$$\left((u-2k)w\sqrt{-\frac{(s(u-2k)+2wz(u-2k))^2}{(u-2k)w}}\right)-i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(i(2k-m)p+f(2h-v))^2}{4(ai(2k-m)+c(2h-v))}+i(2k-m)q+g(2h-v)+\frac{im\pi}{2}}(i(2k-m)p+f(2h-v)+2(ai(2k-m)+c(2h-v))z)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2k-m)p+f(2h-v)+2(ai(2k-m)+c(2h-v))z)^2}{4(ai(2k-m)+c(2h-v))}\right)\right)\Big/$$

$$\left((ai(2k-m)+c(2h-v))\sqrt{-\frac{(i(2k-m)p+f(2h-v)+2(ai(2k-m)+c(2h-v))z)^2}{ai(2k-m)+c(2h-v)}}\right)+$$

$$\left(e^{-\frac{(i(m-2k)p+f(2h-v))^2}{4(ai(m-2k)+c(2h-v))}+i(m-2k)q+g(2h-v)-\frac{im\pi}{2}}(i(m-2k)p+f(2h-v)+2(ai(m-2k)+c(2h-v))z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2k)p+f(2h-v)+2(ai(m-2k)+c(2h-v))z)^2}{4(ai(m-2k)+c(2h-v))}\right)\right)\Big/$$

$$\left((ai(m-2k)+c(2h-v))\sqrt{-\frac{(i(m-2k)p+f(2h-v)+2(ai(m-2k)+c(2h-v))z)^2}{ai(m-2k)+c(2h-v)}}\right)+$$

$$\left(e^{-\frac{(i(2k-m)p+f(v-2h))^2}{4(ai(2k-m)+c(v-2h))}+i(2k-m)q+g(v-2h)+\frac{im\pi}{2}}(i(2k-m)p+f(v-2h)+2(ai(2k-m)+c(v-2h))z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2k-m)p+f(v-2h)+2(ai(2k-m)+c(v-2h))z)^2}{4(ai(2k-m)+c(v-2h))}\right)\right)\Big/$$

$$\left((ai(2k-m)+c(v-2h))\sqrt{-\frac{(i(2k-m)p+f(v-2h)+2(ai(2k-m)+c(v-2h))z)^2}{ai(2k-m)+c(v-2h)}}\right)+$$

$$\left(e^{-\frac{(i(m-2k)p+f(v-2h))^2}{4(ai(m-2k)+c(v-2h))}+i(m-2k)q+g(v-2h)-\frac{im\pi}{2}}(i(m-2k)p+f(v-2h)+2(ai(m-2k)+c(v-2h))z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2k)p+f(v-2h)+2(ai(m-2k)+c(v-2h))z)^2}{4(ai(m-2k)+c(v-2h))}\right)\right)\Big/$$

$$\left.\left((ai(m-2k)+c(v-2h))\sqrt{-\frac{(i(m-2k)p+f(v-2h)+2(ai(m-2k)+c(v-2h))z)^2}{ai(m-2k)+c(v-2h)}}\right)\right)-$$

$$i^u\, 2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}$$

$$\left(\left(e^{-\frac{(i(2k-m)p+s(2j-u))^2}{4(a\,i(2k-m)+(2j-u)w)}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}(i(2k-m)p+s(2j-u)+2(a\,i(2k-m)+(2j-u)w)z)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2k-m)p+s(2j-u)+2(a\,i(2k-m)+(2j-u)w)z)^2}{4(a\,i(2k-m)+(2j-u)w)}\right)\right)\Big/$$

$$\left((a\,i(2k-m)+(2j-u)w)\sqrt{-\frac{(i(2k-m)p+s(2j-u)+2(a\,i(2k-m)+(2j-u)w)z)^2}{a\,i(2k-m)+(2j-u)w}}\right)+$$

$$\left(e^{-\frac{(i(m-2k)p+s(2j-u))^2}{4(a\,i(m-2k)+(2j-u)w)}+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}-\frac{im\pi}{2}}(i(m-2k)p+s(2j-u)+2(a\,i(m-2k)+(2j-u)w)z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2k)p+s(2j-u)+2(a\,i(m-2k)+(2j-u)w)z)^2}{4(a\,i(m-2k)+(2j-u)w)}\right)\right)\Big/$$

$$\left((a\,i(m-2k)+(2j-u)w)\sqrt{-\frac{(i(m-2k)p+s(2j-u)+2(a\,i(m-2k)+(2j-u)w)z)^2}{a\,i(m-2k)+(2j-u)w}}\right)+$$

$$\left(e^{-\frac{(i(2k-m)p+s(u-2j))^2}{4(a\,i(2k-m)+(u-2j)w)}+i(2k-m)q+t(u-2j)-\frac{i\pi u}{2}+\frac{im\pi}{2}}(i(2k-m)p+s(u-2j)+2(a\,i(2k-m)+(u-2j)w)z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2k-m)p+s(u-2j)+2(a\,i(2k-m)+(u-2j)w)z)^2}{4(a\,i(2k-m)+(u-2j)w)}\right)\right)\Big/$$

$$\left((a\,i(2k-m)+(u-2j)w)\sqrt{-\frac{(i(2k-m)p+s(u-2j)+2(a\,i(2k-m)+(u-2j)w)z)^2}{a\,i(2k-m)+(u-2j)w}}\right)+$$

$$\left(e^{-\frac{(i(m-2k)p+s(u-2j))^2}{4(a\,i(m-2k)+(u-2j)w)}+i(m-2k)q+t(u-2j)-\frac{i\pi u}{2}-\frac{im\pi}{2}}(i(m-2k)p+s(u-2j)+2(a\,i(m-2k)+(u-2j)w)z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2k)p+s(u-2j)+2(a\,i(m-2k)+(u-2j)w)z)^2}{4(a\,i(m-2k)+(u-2j)w)}\right)\right)\Big/$$

$$\left.\left((a\,i(m-2k)+(u-2j)w)\sqrt{-\frac{(i(m-2k)p+s(u-2j)+2(a\,i(m-2k)+(u-2j)w)z)^2}{a\,i(m-2k)+(u-2j)w}}\right)\right)-$$

$$i^u\, 2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(s(2k-u)+f(2h-v))^2}{4(c(2h-v)+(2k-u)w)}+t(2k-u)+\frac{i\pi u}{2}+g(2h-v)}(s(2k-u)+f(2h-v)+\right.\right.$$

$$2\,(c\,(2\,h-v)+(2\,k-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(s\,(2\,k-u)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2}{4\,(c\,(2\,h-v)+(2\,k-u)\,w)}\right)\Bigg)\Bigg/$$

$$\left((c\,(2\,h-v)+(2\,k-u)\,w)\,\sqrt{-\frac{(s\,(2\,k-u)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2}{c\,(2\,h-v)+(2\,k-u)\,w}}\right)+$$

$$\left(e^{-\frac{(s\,(2\,k-u)+f\,(v-2\,h))^2}{4\,(c\,(v-2\,h)+(2\,k-u)\,w)}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(s\,(2\,k-u)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(2\,k-u)\,w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},\,-\frac{(s\,(2\,k-u)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2}{4\,(c\,(v-2\,h)+(2\,k-u)\,w)}\right)\right)\Bigg/$$

$$\left((c\,(v-2\,h)+(2\,k-u)\,w)\,\sqrt{-\frac{(s\,(2\,k-u)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2}{c\,(v-2\,h)+(2\,k-u)\,w}}\right)+$$

$$\left(e^{-\frac{(s\,(u-2\,k)+f\,(2\,h-v))^2}{4\,(c\,(2\,h-v)+(u-2\,k)\,w)}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(2\,h-v)}\,(s\,(u-2\,k)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(u-2\,k)\,w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},\,-\frac{(s\,(u-2\,k)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(u-2\,k)\,w)\,z)^2}{4\,(c\,(2\,h-v)+(u-2\,k)\,w)}\right)\right)\Bigg/$$

$$\left((c\,(2\,h-v)+(u-2\,k)\,w)\,\sqrt{-\frac{(s\,(u-2\,k)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(u-2\,k)\,w)\,z)^2}{c\,(2\,h-v)+(u-2\,k)\,w}}\right)+$$

$$\left(e^{-\frac{(s\,(u-2\,k)+f\,(v-2\,h))^2}{4\,(c\,(v-2\,h)+(u-2\,k)\,w)}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(v-2\,h)}\,(s\,(u-2\,k)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(u-2\,k)\,w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},\,-\frac{(s\,(u-2\,k)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(u-2\,k)\,w)\,z)^2}{4\,(c\,(v-2\,h)+(u-2\,k)\,w)}\right)\right)\Bigg/$$

$$\left.\left((c\,(v-2\,h)+(u-2\,k)\,w)\,\sqrt{-\frac{(s\,(u-2\,k)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(u-2\,k)\,w)\,z)^2}{c\,(v-2\,h)+(u-2\,k)\,w}}\right)\right)-$$

$$i^u\,2^{-m-u-v-1}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))^2}{4\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}\right.\right.$$

$$(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.-(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\Big/\right.$$

$$\left.\left.(4\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w))\right)\right)\Big/\left((a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\right.$$

$$\sqrt{\left(-(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\Big/\right.}$$

$$\left.\left.(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\right)\right)+$$

$$\left(e^{-\frac{(i(m-2k)p+s(2j-u)+f(2h-v))^2}{4(ai(m-2k)+c(2h-v)+(2j-u)w)}+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}+g(2h-v)-\frac{im\pi}{2}}(i(m-2k)p+s(2j-u)+\right.$$
$$f(2h-v)+2(ai(m-2k)+c(2h-v)+(2j-u)w)z)\,\Gamma\left(\frac{1}{2},\right.$$
$$-(i(m-2k)p+s(2j-u)+f(2h-v)+2(ai(m-2k)+c(2h-v)+(2j-u)w)z)^2\Big/$$
$$\left.\left.(4(ai(m-2k)+c(2h-v)+(2j-u)w))\right)\right)\Big/\left((ai(m-2k)+c(2h-v)+(2j-u)w)\right.$$
$$\sqrt{\left(-(i(m-2k)p+s(2j-u)+f(2h-v)+2(ai(m-2k)+c(2h-v)+(2j-u)w)z)^2\Big/\right.}$$
$$\left.(ai(m-2k)+c(2h-v)+(2j-u)w)\right)\Big)+$$
$$\left(e^{-\frac{(i(2k-m)p+s(2j-u)+f(v-2h))^2}{4(ai(2k-m)+c(v-2h)+(2j-u)w)}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+g(v-2h)+\frac{im\pi}{2}}(i(2k-m)p+s(2j-u)+\right.$$
$$f(v-2h)+2(ai(2k-m)+c(v-2h)+(2j-u)w)z)\,\Gamma\left(\frac{1}{2},\right.$$
$$-(i(2k-m)p+s(2j-u)+f(v-2h)+2(ai(2k-m)+c(v-2h)+(2j-u)w)z)^2\Big/$$
$$\left.\left.(4(ai(2k-m)+c(v-2h)+(2j-u)w))\right)\right)\Big/\left((ai(2k-m)+c(v-2h)+(2j-u)w)\right.$$
$$\sqrt{\left(-(i(2k-m)p+s(2j-u)+f(v-2h)+2(ai(2k-m)+c(v-2h)+(2j-u)w)z)^2\Big/\right.}$$
$$\left.(ai(2k-m)+c(v-2h)+(2j-u)w)\right)\Big)+$$
$$\left(e^{-\frac{(i(m-2k)p+s(2j-u)+f(v-2h))^2}{4(ai(m-2k)+c(v-2h)+(2j-u)w)}+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}+g(v-2h)-\frac{im\pi}{2}}(i(m-2k)p+s(2j-u)+\right.$$
$$f(v-2h)+2(ai(m-2k)+c(v-2h)+(2j-u)w)z)\,\Gamma\left(\frac{1}{2},\right.$$
$$-(i(m-2k)p+s(2j-u)+f(v-2h)+2(ai(m-2k)+c(v-2h)+(2j-u)w)z)^2\Big/$$
$$\left.\left.(4(ai(m-2k)+c(v-2h)+(2j-u)w))\right)\right)\Big/\left((ai(m-2k)+c(v-2h)+(2j-u)w)\right.$$
$$\sqrt{\left(-(i(m-2k)p+s(2j-u)+f(v-2h)+2(ai(m-2k)+c(v-2h)+(2j-u)w)z)^2\Big/\right.}$$
$$\left.(ai(m-2k)+c(v-2h)+(2j-u)w)\right)\Big)+$$
$$\left(e^{-\frac{(i(2k-m)p+s(u-2j)+f(2h-v))^2}{4(ai(2k-m)+c(2h-v)+(u-2j)w)}+i(2k-m)q+t(u-2j)+g(2h-v)-\frac{i\pi u}{2}+\frac{im\pi}{2}}(i(2k-m)p+s(u-2j)+\right.$$
$$f(2h-v)+2(ai(2k-m)+c(2h-v)+(u-2j)w)z)\,\Gamma\left(\frac{1}{2},\right.$$
$$-(i(2k-m)p+s(u-2j)+f(2h-v)+2(ai(2k-m)+c(2h-v)+(u-2j)w)z)^2\Big/$$
$$\left.\left.(4(ai(2k-m)+c(2h-v)+(u-2j)w))\right)\right)\Big/\left((ai(2k-m)+c(2h-v)+(u-2j)w)\right.$$
$$\sqrt{\left(-(i(2k-m)p+s(u-2j)+f(2h-v)+2(ai(2k-m)+c(2h-v)+(u-2j)w)z)^2\Big/\right.}$$
$$\left.(ai(2k-m)+c(2h-v)+(u-2j)w)\right)\Big)+$$
$$\left(e^{-\frac{(i(m-2k)p+s(u-2j)+f(2h-v))^2}{4(ai(m-2k)+c(2h-v)+(u-2j)w)}+i(m-2k)q+t(u-2j)+g(2h-v)-\frac{i\pi u}{2}-\frac{im\pi}{2}}(i(m-2k)p+s(u-2j)+\right.$$
$$f(2h-v)+2(ai(m-2k)+c(2h-v)+(u-2j)w)z)\,\Gamma\left(\frac{1}{2},\right.$$
$$-(i(m-2k)p+s(u-2j)+f(2h-v)+2(ai(m-2k)+c(2h-v)+(u-2j)w)z)^2\Big/$$

$$(4\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w))\Big)\Big/\Big((a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)$$
$$\sqrt{\left(-(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\Big)\Big)+$$
$$\left(e^{-\frac{(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.$$
$$f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w))\Big)\Big)\Big/\Big((a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)$$
$$\sqrt{\left(-(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w))+$$
$$\left(e^{-\frac{(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.$$
$$f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w))\Big)\Big)\Big/\Big((a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)$$
$$\sqrt{\left(-(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w))\Big)\Big/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int \sin^m\left(\sqrt{z}\ a+p\,z+q\right)\sinh^u\left(w\,\sqrt{z}\ +s\,z+t\right)\cosh^v\left(\sqrt{z}\ c+f\,z+g\right)dz==$$
$$i^u\,2^{-m-u-v}\,z\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-u \bmod 2)\,(1-v \bmod 2)-$$
$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$
$$\left(\left(e^{-\frac{i\,(2\,k-m)\,a^2}{4\,p}+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\left(2\,e^{-\frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,(2\,k-m)\,p}}\,i\,(2\,k-m)\,\sqrt{\frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{(2\,k-m)\,p}}\ p+\right.\right.\right.$$
$$\left.\left.\left.a\,i\,(2\,k-m)\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)\Gamma\left(\frac{1}{2},\ \frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,(2\,k-m)\,p}\right)\right)\right)\Big/$$

$$\left((2k-m)^2\,p^2\sqrt{\frac{i\left(a\,i\,(2k-m)+2\,i\,p\sqrt{z}\;(2k-m)\right)^2}{(2k-m)\,p}}\right)+$$

$$\left(e^{-\frac{i\,(m-2k)\,a^2}{4p}+i\,(m-2k)\,q-\frac{i\,m\,\pi}{2}}\left(2\,e^{-\frac{i\left(a\,i\,(m-2k)+2\,i\,p\sqrt{z}\;(m-2k)\right)^2}{4\,(m-2k)\,p}}\,i\,(m-2k)\sqrt{\frac{i\left(a\,i\,(m-2k)+2\,i\,p\sqrt{z}\;(m-2k)\right)^2}{(m-2k)\,p}}\;p+\right.\right.$$

$$\left.\left.a\,i\,(m-2k)\left(a\,i\,(m-2k)+2\,i\,p\sqrt{z}\;(m-2k)\right)\Gamma\left(\frac{1}{2},\,\frac{i\left(a\,i\,(m-2k)+2\,i\,p\sqrt{z}\;(m-2k)\right)^2}{4\,(m-2k)\,p}\right)\right)\right)\Big/$$

$$\left((m-2k)^2\,p^2\sqrt{\frac{i\left(a\,i\,(m-2k)+2\,i\,p\sqrt{z}\;(m-2k)\right)^2}{(m-2k)\,p}}\right)+i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{(2k-u)\,w^2}{4s}+t\,(2k-u)+\frac{i\,\pi\,u}{2}}\left(w\left(w\,(2k-u)+2\,s\sqrt{z}\;(2k-u)\right)\Gamma\left(\frac{1}{2},\,-\frac{\left(w\,(2k-u)+2\,s\sqrt{z}\;(2k-u)\right)^2}{4\,s\,(2k-u)}\right)\right.\right.\right.$$

$$\left.\left.\left.(2k-u)+2\,e^{\frac{\left(w\,(2k-u)+2\,s\sqrt{z}\;(2k-u)\right)^2}{4\,s\,(2k-u)}}\,s\sqrt{-\frac{\left(w\,(2k-u)+2\,s\sqrt{z}\;(2k-u)\right)^2}{s\,(2k-u)}}\;(2k-u)\right)\right)\Big/$$

$$\left(s^2\,(2k-u)^2\sqrt{-\frac{\left(w\,(2k-u)+2\,s\sqrt{z}\;(2k-u)\right)^2}{s\,(2k-u)}}\right)+\left(e^{-\frac{(u-2k)\,w^2}{4s}-\frac{i\,\pi\,u}{2}+t\,(u-2k)}\right.$$

$$\left(w\left(w\,(u-2k)+2\,s\sqrt{z}\;(u-2k)\right)\Gamma\left(\frac{1}{2},\,-\frac{\left(w\,(u-2k)+2\,s\sqrt{z}\;(u-2k)\right)^2}{4\,s\,(u-2k)}\right)(u-2k)+\right.$$

$$\left.\left.2\,e^{\frac{\left(w\,(u-2k)+2\,s\sqrt{z}\;(u-2k)\right)^2}{4\,s\,(u-2k)}}\,s\sqrt{-\frac{\left(w\,(u-2k)+2\,s\sqrt{z}\;(u-2k)\right)^2}{s\,(u-2k)}}\;(u-2k)\right)\right)\Big/$$

$$\left.\left(s^2\,(u-2k)^2\sqrt{-\frac{\left(w\,(u-2k)+2\,s\sqrt{z}\;(u-2k)\right)^2}{s\,(u-2k)}}\right)\right)+i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{g(2h-v)-\frac{c^2(2h-v)}{4f}}\left(c\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)\Gamma\left(\frac{1}{2},-\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{4f(2h-v)}\right)(2h-v)+\right.\right.\right.$$

$$\left.\left.\left.2e^{\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{4f(2h-v)}}f\sqrt{-\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{f(2h-v)}}\,(2h-v)\right)\right)\Big/$$

$$\left(f^2(2h-v)^2\sqrt{-\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{f(2h-v)}}\right)+$$

$$\left(e^{g(v-2h)-\frac{c^2(v-2h)}{4f}}\left(c\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)\Gamma\left(\frac{1}{2},-\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{4f(v-2h)}\right)(v-2h)+\right.\right.$$

$$\left.\left.2e^{\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{4f(v-2h)}}f\sqrt{-\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{f(v-2h)}}\,(v-2h)\right)\right)\Big/$$

$$\left.\left(f^2(v-2h)^2\sqrt{-\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{f(v-2h)}}\right)\right)+i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(a\,i(2k-m)+(2j-u)w)^2}{4(i(2k-m)p+s(2j-u))}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+\frac{im\pi}{2}}\left(\left(a\,i(2k-m)+(2j-u)w\right)\right.\right.\right.$$

$$\left(a\,i(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i(2k-m)+(2j-u)w+\right.\right.$$

$$\left.\left.2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\left(4(i(2k-m)p+s(2j-u))\right)\right)+2$$

$$e^{\frac{\left(a\,i(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(i(2k-m)p+s(2j-u))}}(i(2k-m)p+s(2j-u))\sqrt{\left(-\left(a\,i(2k-m)+\right.\right.}$$

$$\left.\left.\left.\left.(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\left(i(2k-m)p+s(2j-u)\right)\right)\right)\right)\Big/$$

$$\left((i(2k-m)p+s(2j-u))^2\sqrt{-\frac{\left(a\,i(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{i(2k-m)p+s(2j-u)}}\right)+$$

$$\left(e^{-\frac{(a i (m-2k)+(2j-u) w)^2}{4 (i (m-2k) p+s (2j-u))}+i (m-2k) q+t (2j-u)+\frac{i \pi u}{2}-\frac{i m \pi}{2}} \left((a i (m-2k)+(2j-u) w)\right.\right.$$
$$\left(a i (m-2k)+(2j-u) w+2 (i (m-2k) p+s (2j-u)) \sqrt{z}\right) \Gamma\left(\frac{1}{2}, -\left(a i (m-2k)+(2j-u) w+\right.\right.$$
$$\left.\left.2 (i (m-2k) p+s (2j-u)) \sqrt{z}\right)^2 \Big/ (4 (i (m-2k) p+s (2j-u)))\right)+2$$
$$e^{\frac{\left(a i (m-2k)+(2j-u) w+2 (i (m-2k) p+s (2j-u)) \sqrt{z}\right)^2}{4 (i (m-2k) p+s (2j-u))}} (i (m-2k) p+s (2j-u)) \sqrt{\left(-\left(a i (m-2k)+\right.\right.}$$
$$\left.\left.\left.(2j-u) w+2 (i (m-2k) p+s (2j-u)) \sqrt{z}\right)^2 \Big/ (i (m-2k) p+s (2j-u))\right)\right)\Big/$$
$$\left((i (m-2k) p+s (2j-u))^2 \sqrt{-\frac{\left(a i (m-2k)+(2j-u) w+2 (i (m-2k) p+s (2j-u)) \sqrt{z}\right)^2}{i (m-2k) p+s (2j-u)}}\right)+$$
$$\left(e^{-\frac{(a i (2k-m)+(u-2j) w)^2}{4 (i (2k-m) p+s (u-2j))}+i (2k-m) q+t (u-2j)-\frac{i \pi u}{2}+\frac{i m \pi}{2}} \left((a i (2k-m)+(u-2j) w)\right.\right.$$
$$\left(a i (2k-m)+(u-2j) w+2 (i (2k-m) p+s (u-2j)) \sqrt{z}\right) \Gamma\left(\frac{1}{2}, -\left(a i (2k-m)+(u-2j) w+\right.\right.$$
$$\left.\left.2 (i (2k-m) p+s (u-2j)) \sqrt{z}\right)^2 \Big/ (4 (i (2k-m) p+s (u-2j)))\right)+2$$
$$e^{\frac{\left(a i (2k-m)+(u-2j) w+2 (i (2k-m) p+s (u-2j)) \sqrt{z}\right)^2}{4 (i (2k-m) p+s (u-2j))}} (i (2k-m) p+s (u-2j)) \sqrt{\left(-\left(a i (2k-m)+\right.\right.}$$
$$\left.\left.\left.(u-2j) w+2 (i (2k-m) p+s (u-2j)) \sqrt{z}\right)^2 \Big/ (i (2k-m) p+s (u-2j))\right)\right)\Big/$$
$$\left((i (2k-m) p+s (u-2j))^2 \sqrt{-\frac{\left(a i (2k-m)+(u-2j) w+2 (i (2k-m) p+s (u-2j)) \sqrt{z}\right)^2}{i (2k-m) p+s (u-2j)}}\right)+$$
$$\left(e^{-\frac{(a i (m-2k)+(u-2j) w)^2}{4 (i (m-2k) p+s (u-2j))}+i (m-2k) q+t (u-2j)-\frac{i \pi u}{2}-\frac{i m \pi}{2}} \left((a i (m-2k)+(u-2j) w)\right.\right.$$
$$\left(a i (m-2k)+(u-2j) w+2 (i (m-2k) p+s (u-2j)) \sqrt{z}\right) \Gamma\left(\frac{1}{2}, -\left(a i (m-2k)+(u-2j) w+\right.\right.$$
$$\left.\left.2 (i (m-2k) p+s (u-2j)) \sqrt{z}\right)^2 \Big/ (4 (i (m-2k) p+s (u-2j)))\right)+2$$
$$e^{\frac{\left(a i (m-2k)+(u-2j) w+2 (i (m-2k) p+s (u-2j)) \sqrt{z}\right)^2}{4 (i (m-2k) p+s (u-2j))}} (i (m-2k) p+s (u-2j)) \sqrt{\left(-\left(a i (m-2k)+\right.\right.}$$
$$\left.\left.\left.(u-2j) w+2 (i (m-2k) p+s (u-2j)) \sqrt{z}\right)^2 \Big/ (i (m-2k) p+s (u-2j))\right)\right)\Big/$$

$$\left((i\,(m-2\,k)\,p+s\,(u-2\,j))^2\sqrt{-\frac{\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p+s\,(u-2\,j)}}\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(i\,(2\,k-m)\,p+f\,(2\,h-v))}+i\,(2\,k-m)\,q+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}\right.\right.$$

$$\left((a\,i\,(2\,k-m)+c\,(2\,h-v))\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2},-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(i\,(2\,k-m)\,p+f\,(2\,h-v)))\right)+2\,e^{\frac{\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+f\,(2\,h-v))}}$$

$$(i\,(2\,k-m)\,p+f\,(2\,h-v))\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.\left.(i\,(2\,k-m)\,p+f\,(2\,h-v))\right)\right)\Big/$$

$$\left((i\,(2\,k-m)\,p+f\,(2\,h-v))^2\sqrt{-\frac{\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(i\,(m-2\,k)\,p+f\,(2\,h-v))}+i\,(m-2\,k)\,q+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}\left((a\,i\,(m-2\,k)+c\,(2\,h-v))\right.\right.$$

$$\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.$$

$$\left.\left.2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(i\,(m-2\,k)\,p+f\,(2\,h-v)))\right)+2$$

$$e^{\frac{\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+f\,(2\,h-v))}}(i\,(m-2\,k)\,p+f\,(2\,h-v))\sqrt{\left(-\left(a\,i\,(m-2\,k)+\right.\right.}$$

$$\left.\left.\left.c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+f\,(2\,h-v))\right)\right)\Big/$$

$$\left((i\,(m-2\,k)\,p+f\,(2\,h-v))^2\sqrt{-\frac{\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))}+i\,(2\,k-m)\,q+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\left((a\,i\,(2\,k-m)+c\,(v-2\,h))\right.\right.$$

$$\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\right)\right)+2$$

$$e^{\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))}}\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(i\,(2\,k-m)\,p+f\,(v-2\,h)\right)\right)}\Big/$$

$$\left((i\,(2\,k-m)\,p+f\,(v-2\,h))^2\sqrt{-\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p+f\,(v-2\,h)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(i\,(m-2\,k)\,p+f\,(v-2\,h))}+i\,(m-2\,k)\,q+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\left(a\,i\,(m-2\,k)+c\,(v-2\,h)\right)\right.$$

$$\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\right)\right)+2$$

$$e^{\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+f\,(v-2\,h))}}\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(i\,(m-2\,k)\,p+f\,(v-2\,h)\right)\right)}\Big/$$

$$\left.\left((i\,(m-2\,k)\,p+f\,(v-2\,h))^2\sqrt{-\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p+f\,(v-2\,h)}}\right)\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(c\,(2\,h-v)+(2\,k-u)\,w)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}\right.\right.$$

$$\left((c\,(2\,h-v)+(2\,k-u)\,w)\left(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}\right)+2\right.$$

$$\left.e^{\frac{\left(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}}\,(s\,(2\,k-u)+f\,(2\,h-v))\right.$$

$$\sqrt{\left(-\left(2\sqrt{z}\ (s(2k-u)+f(2h-v))+c(2h-v)+(2k-u)w\right)^2\Big/(s(2k-u)+f(2h-v))\right)}\Bigg)\Bigg)\Bigg/$$

$$\left((s(2k-u)+f(2h-v))^2\sqrt{-\frac{\left(2\sqrt{z}\ (s(2k-u)+f(2h-v))+c(2h-v)+(2k-u)w\right)^2}{s(2k-u)+f(2h-v)}}\right)+$$

$$\left(e^{-\frac{(c(2h-v)+(u-2k)w)^2}{4(s(u-2k)+f(2h-v))}-\frac{i\pi u}{2}+t(u-2k)+g(2h-v)}\left((c(2h-v)+(u-2k)w)\left(2\sqrt{z}\ (s(u-2k)+f(2h-v))+c(2h-v)+\right.\right.\right.$$

$$\left.\left.\left.(u-2k)w\right)\Gamma\left(\frac{1}{2},-\frac{\left(2\sqrt{z}\ (s(u-2k)+f(2h-v))+c(2h-v)+(u-2k)w\right)^2}{4(s(u-2k)+f(2h-v))}\right)+2\right.\right.$$

$$e^{\frac{\left(2\sqrt{z}\ (s(u-2k)+f(2h-v))+c(2h-v)+(u-2k)w\right)^2}{4(s(u-2k)+f(2h-v))}}(s(u-2k)+f(2h-v))$$

$$\left.\left.\sqrt{\left(-\left(2\sqrt{z}\ (s(u-2k)+f(2h-v))+c(2h-v)+(u-2k)w\right)^2\Big/(s(u-2k)+f(2h-v))\right)}\right)\right)\Bigg/$$

$$\left((s(u-2k)+f(2h-v))^2\sqrt{-\frac{\left(2\sqrt{z}\ (s(u-2k)+f(2h-v))+c(2h-v)+(u-2k)w\right)^2}{s(u-2k)+f(2h-v)}}\right)+$$

$$\left(e^{-\frac{(c(v-2h)+(2k-u)w)^2}{4(s(2k-u)+f(v-2h))}+t(2k-u)+\frac{i\pi u}{2}+g(v-2h)}\left((c(v-2h)+(2k-u)w)\right.\right.$$

$$\left(c(v-2h)+(2k-u)w+2(s(2k-u)+f(v-2h))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(c(v-2h)+(2k-u)w+2(s(2k-u)+f(v-2h))\sqrt{z}\right)^2}{4(s(2k-u)+f(v-2h))}\right)+2$$

$$e^{\frac{\left(c(v-2h)+(2k-u)w+2(s(2k-u)+f(v-2h))\sqrt{z}\right)^2}{4(s(2k-u)+f(v-2h))}}(s(2k-u)+f(v-2h))$$

$$\left.\left.\sqrt{\left(-\left(c(v-2h)+(2k-u)w+2(s(2k-u)+f(v-2h))\sqrt{z}\right)^2\Big/(s(2k-u)+f(v-2h))\right)}\right)\right)\Bigg/$$

$$\left((s(2k-u)+f(v-2h))^2\sqrt{-\frac{\left(c(v-2h)+(2k-u)w+2(s(2k-u)+f(v-2h))\sqrt{z}\right)^2}{s(2k-u)+f(v-2h)}}\right)+$$

$$\left(e^{-\frac{(c(v-2h)+(u-2k)w)^2}{4(s(u-2k)+f(v-2h))}-\frac{i\pi u}{2}+t(u-2k)+g(v-2h)}\left((c(v-2h)+(u-2k)w)\right.\right.$$
$$\left(c(v-2h)+(u-2k)w+2(s(u-2k)+f(v-2h))\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\frac{\left(c(v-2h)+(u-2k)w+2(s(u-2k)+f(v-2h))\sqrt{z}\right)^2}{4(s(u-2k)+f(v-2h))}\right)+2$$
$$e^{\frac{\left(c(v-2h)+(u-2k)w+2(s(u-2k)+f(v-2h))\sqrt{z}\right)^2}{4(s(u-2k)+f(v-2h))}}(s(u-2k)+f(v-2h))$$
$$\left.\left.\sqrt{\left(-\left(c(v-2h)+(u-2k)w+2(s(u-2k)+f(v-2h))\sqrt{z}\right)^2\Big/(s(u-2k)+f(v-2h))\right)}\right)\Big/$$
$$\left.\left((s(u-2k)+f(v-2h))^2\sqrt{-\frac{\left(c(v-2h)+(u-2k)w+2(s(u-2k)+f(v-2h))\sqrt{z}\right)^2}{s(u-2k)+f(v-2h)}}\right)\right)+$$
$$i^u\,2^{-m-u-v-1}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(a\,i(2k-m)+c(2h-v)+(2j-u)w)^2}{4(i(2k-m)p+s(2j-u)+f(2h-v))}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+g(2h-v)+\frac{im\pi}{2}}\right.\right.$$
$$\left((a\,i(2k-m)+c(2h-v)+(2j-u)w)\left(a\,i(2k-m)+c(2h-v)+\right.\right.$$
$$\left.(2j-u)w+2(i(2k-m)p+s(2j-u)+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2},$$
$$-\left(a\,i(2k-m)+c(2h-v)+(2j-u)w+2(i(2k-m)p+s(2j-u)+f(2h-v))\sqrt{z}\right)^2\Big/$$
$$\left.(4(i(2k-m)p+s(2j-u)+f(2h-v)))\right)+$$
$$2e^{\frac{\left(a\,i(2k-m)+c(2h-v)+(2j-u)w+2(i(2k-m)p+s(2j-u)+f(2h-v))\sqrt{z}\right)^2}{4(i(2k-m)p+s(2j-u)+f(2h-v))}}(i(2k-m)p+s(2j-u)+f(2h-v))$$
$$\sqrt{\left(-\left(a\,i(2k-m)+c(2h-v)+(2j-u)w+2(i(2k-m)p+s(2j-u)+f(2h-v))\right.\right.}$$
$$\left.\left.\left.\sqrt{z}\right)^2\Big/(i(2k-m)p+s(2j-u)+f(2h-v))\right)\right)\Big/$$
$$\left((i(2k-m)p+s(2j-u)+f(2h-v))^2\sqrt{\left(-\left(a\,i(2k-m)+c(2h-v)+(2j-u)w+2(i(2k-m)p+\right.\right.\right.\right.$$
$$\left.\left.\left.\left.s(2j-u)+f(2h-v))\sqrt{z}\right)^2\Big/(i(2k-m)p+s(2j-u)+f(2h-v))\right)\right)+$$
$$\left(e^{-\frac{(a\,i(m-2k)+c(2h-v)+(2j-u)w)^2}{4(i(m-2k)p+s(2j-u)+f(2h-v))}+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}+g(2h-v)-\frac{im\pi}{2}}\left((a\,i(m-2k)+c(2h-v)+(2j-u)w)\right.\right.$$
$$\left.\left(a\,i(m-2k)+c(2h-v)+(2j-u)w+2(i(m-2k)p+s(2j-u)+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$

$$-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))}}\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))$$

$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right.\right.}$$

$$\left.\left.\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)\Big]\Big/$$

$$\Big((i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))^2\,\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+\right.\right.}$$

$$\left.\left.s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\Bigg((a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)$$

$$\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2},$$

$$-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$

$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.\right.}$$

$$\left.\left.\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Big]\Big/$$

$$\Big((i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2\,\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+\right.\right.}$$

$$\left.\left.s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\Bigg(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)$$

$$\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2},$$

$$-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$

$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.\right.}$$

$$\sqrt{z}\Big)^2\Big/\left(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\Big)\Big)\Big/$$

$$\Big(\left(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)^2\sqrt{\Big(-\big(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+$$

$$s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/\left(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\Bigg(\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w\right)$$

$$\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2},$$

$$-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$\left(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)$$

$$\sqrt{\Big(-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\sqrt{z}\big)^2\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+$$

$$s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\Bigg(\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w\right)$$

$$\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2},$$

$$-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$\left(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)$$

$$\sqrt{\Big(-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\sqrt{z}\big)^2\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+$$

$$s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\Bigg(\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w\right)$$

$$\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$
$$\left.-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)))\right)+$$
$$2\,e^{\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$
$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.\right.}$$
$$\left.\left.\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\Big/$$
$$\left((i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2\,\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+\right.\right.\right.}$$
$$\left.\left.\left.s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)+$$
$$\left(e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\left((a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\right.\right.$$
$$\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$
$$\left.-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)))\right)+$$
$$2\,e^{\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$
$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.\right.}$$
$$\left.\left.\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\Big/$$
$$\left((i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2\,\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+\right.\right.\right.}$$
$$\left.\left.\left.2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.\right.$$
$$\left.\left.\left.(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving cos and sinh

Involving $\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int \cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$\frac{1}{r}\left(2^{-\nu-2}\,z\binom{\nu}{\frac{\nu}{2}}\left(-e^{i\,q+t}\,\Gamma\left(\frac{1}{r},(-i\,a-w)\,z^r\right)((-i\,a-w)\,z^r)^{-1/r}-e^{t-i\,q}\,((i\,a-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,a-w)\,z^r\right)+\right.\right.$$
$$\left.\left.e^{i\,q-t}\,((-i\,a+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-i\,a+w)\,z^r\right)+e^{-i\,q-t}\,((i\,a+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(i\,a+w)\,z^r\right)\right)(1-\nu \bmod 2)\right)+$$
$$\frac{1}{r}\left(2^{-\nu-2}\,z\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-e^{2\,g\,h+i\,q+t-g\,\nu}\,\Gamma\left(\frac{1}{r},(-2\,c\,h-i\,a+c\,\nu-w)\,z^r\right)((-2\,c\,h-i\,a+c\,\nu-w)\,z^r)^{-1/r}-\right.\right.$$
$$e^{2\,g\,h-i\,q+t-g\,\nu}\,((-2\,c\,h+i\,a+c\,\nu-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,c\,h+i\,a+c\,\nu-w)\,z^r\right)-$$
$$e^{-2\,g\,h+i\,q+t+g\,\nu}\,((2\,c\,h-i\,a-c\,\nu-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,h-i\,a-c\,\nu-w)\,z^r\right)-$$
$$e^{-2\,g\,h-i\,q+t+g\,\nu}\,((2\,c\,h+i\,a-c\,\nu-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,h+i\,a-c\,\nu-w)\,z^r\right)+$$
$$e^{2\,g\,h+i\,q-t-g\,\nu}\,((-2\,c\,h-i\,a+c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,c\,h-i\,a+c\,\nu+w)\,z^r\right)+$$
$$e^{2\,g\,h-i\,q-t-g\,\nu}\,((-2\,c\,h+i\,a+c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,c\,h+i\,a+c\,\nu+w)\,z^r\right)+$$
$$e^{-2\,g\,h+i\,q-t+g\,\nu}\,((2\,c\,h-i\,a-c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,h-i\,a-c\,\nu+w)\,z^r\right)+$$
$$\left.\left.e^{-2\,g\,h-i\,q-t+g\,\nu}\,((2\,c\,h+i\,a-c\,\nu+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,h+i\,a-c\,\nu+w)\,z^r\right)\right)\right);\ \nu\in\mathbb{N}^+$$

Involving $\cos(a\,z^r+p\,z+q)\sinh(w\,z^r\,s\,z+t)\cosh^{\nu}(c\,z^r+f\,z+g)$

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$$\int \cos(a\,z^2+p\,z+q)\sinh(w\,z^2+s\,z+t)\cosh^{\nu}(c\,z^2+f\,z+g)\,dz ==$$

$$2^{-\nu-3}\left(\frac{e^{-\frac{(-i\,p-s)^2}{4(-i\,a-w)}-i\,q-t}\,(-i\,p-s+2(-i\,a-w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(-i\,p-s+2(-i\,a-w)\,z)^2}{4(-i\,a-w)}\right)}{(-i\,a-w)\sqrt{-\frac{(-i\,p-s+2(-i\,a-w)\,z)^2}{-i\,a-w}}}+\right.$$
$$\left.\frac{e^{-\frac{(i\,p-s)^2}{4(i\,a-w)}+i\,q-t}\,(i\,p-s+2(i\,a-w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(i\,p-s+2(i\,a-w)\,z)^2}{4(i\,a-w)}\right)}{(i\,a-w)\sqrt{-\frac{(i\,p-s+2(i\,a-w)\,z)^2}{i\,a-w}}}-\right.$$

$$\frac{e^{-\frac{(s-i\,p)^2}{4(-i\,a+w)}-i\,q+t}\,(-i\,p+s+2\,(-i\,a+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{4\,(-i\,a+w)}\right)}{(-i\,a+w)\,\sqrt{-\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{-i\,a+w}}}-$$

$$\left.\frac{e^{-\frac{(i\,p+s)^2}{4(i\,a+w)}+i\,q+t}\,(i\,p+s+2\,(i\,a+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{4\,(i\,a+w)}\right)}{(i\,a+w)\,\sqrt{-\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{i\,a+w}}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-3}\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{k}\left(\left(e^{-\frac{(-i\,p-s+f\,(2\,k-\nu))^2}{4\,(-i\,a+c\,(2\,k-\nu)-w)}-i\,q-t+g\,(2\,k-\nu)}\,(-i\,p-s+f\,(2\,k-\nu)+2\,(-i\,a+c\,(2\,k-\nu)-w)\,z)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p-s+f\,(2\,k-\nu)+2\,(-i\,a+c\,(2\,k-\nu)-w)\,z)^2}{4\,(-i\,a+c\,(2\,k-\nu)-w)}\right)\right)\Big/$$

$$\left((-i\,a+c\,(2\,k-\nu)-w)\,\sqrt{-\frac{(-i\,p-s+f\,(2\,k-\nu)+2\,(-i\,a+c\,(2\,k-\nu)-w)\,z)^2}{-i\,a+c\,(2\,k-\nu)-w}}\right)+$$

$$\left(e^{-\frac{(i\,p-s+f\,(2\,k-\nu))^2}{4\,(i\,a+c\,(2\,k-\nu)-w)}+i\,q-t+g\,(2\,k-\nu)}\,(i\,p-s+f\,(2\,k-\nu)+2\,(i\,a+c\,(2\,k-\nu)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p-s+f\,(2\,k-\nu)+2\,(i\,a+c\,(2\,k-\nu)-w)\,z)^2}{4\,(i\,a+c\,(2\,k-\nu)-w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(2\,k-\nu)-w)\,\sqrt{-\frac{(i\,p-s+f\,(2\,k-\nu)+2\,(i\,a+c\,(2\,k-\nu)-w)\,z)^2}{i\,a+c\,(2\,k-\nu)-w}}\right)+$$

$$\left(e^{-\frac{(i\,p-s+f\,(\nu-2\,k))^2}{4\,(i\,a+c\,(\nu-2\,k)-w)}+i\,q-t+g\,(\nu-2\,k)}\,(i\,p-s+f\,(\nu-2\,k)+2\,(i\,a+c\,(\nu-2\,k)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p-s+f\,(\nu-2\,k)+2\,(i\,a+c\,(\nu-2\,k)-w)\,z)^2}{4\,(i\,a+c\,(\nu-2\,k)-w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(\nu-2\,k)-w)\,\sqrt{-\frac{(i\,p-s+f\,(\nu-2\,k)+2\,(i\,a+c\,(\nu-2\,k)-w)\,z)^2}{i\,a+c\,(\nu-2\,k)-w}}\right)-$$

$$\left(e^{-\frac{(-i\,p+s+f\,(2\,k-\nu))^2}{4\,(-i\,a+c\,(2\,k-\nu)+w)}-i\,q+t+g\,(2\,k-\nu)}\,(-i\,p+s+f\,(2\,k-\nu)+2\,(-i\,a+c\,(2\,k-\nu)+w)\,z)\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p+s+f\,(2\,k-\nu)+2\,(-i\,a+c\,(2\,k-\nu)+w)\,z)^2}{4\,(-i\,a+c\,(2\,k-\nu)+w)}\right)\right)\Big/\right.$$

$$\left((-i\,a+c\,(2\,k-v)+w)\sqrt{-\frac{(-i\,p+s+f\,(2\,k-v)+2\,(-i\,a+c\,(2\,k-v)+w)\,z)^2}{-i\,a+c\,(2\,k-v)+w}}\right)-$$

$$\left(e^{-\frac{(i\,p+s+f\,(2\,k-v))^2}{4\,(i\,a+c\,(2\,k-v)+w)}+i\,q+t+g\,(2\,k-v)}\,(i\,p+s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p+s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)+w)\,z)^2}{4\,(i\,a+c\,(2\,k-v)+w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(2\,k-v)+w)\sqrt{-\frac{(i\,p+s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)+w)\,z)^2}{i\,a+c\,(2\,k-v)+w}}\right)-$$

$$\left(e^{-\frac{(i\,p+s+f\,(v-2\,k))^2}{4\,(i\,a+c\,(v-2\,k)+w)}+i\,q+t+g\,(v-2\,k)}\,(i\,p+s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i\,p+s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)+w)\,z)^2}{4\,(i\,a+c\,(v-2\,k)+w)}\right)\right)\Big/$$

$$\left((i\,a+c\,(v-2\,k)+w)\sqrt{-\frac{(i\,p+s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)+w)\,z)^2}{i\,a+c\,(v-2\,k)+w}}\right)+$$

$$\left(e^{-\frac{(-i\,p-s+f\,(v-2\,k))^2}{4\,(-i\,a+c\,(v-2\,k)-w)}-i\,q-t+g\,(v-2\,k)}\,(-i\,p-s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p-s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)-w)\,z)^2}{4\,(-i\,a+c\,(v-2\,k)-w)}\right)\right)\Big/$$

$$\left((-i\,a+c\,(v-2\,k)-w)\sqrt{-\frac{(-i\,p-s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)-w)\,z)^2}{-i\,a+c\,(v-2\,k)-w}}\right)-$$

$$\left(e^{-\frac{(-i\,p+s+f\,(v-2\,k))^2}{4\,(-i\,a+c\,(v-2\,k)+w)}-i\,q+t+g\,(v-2\,k)}\,(-i\,p+s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(-i\,p+s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)+w)\,z)^2}{4\,(-i\,a+c\,(v-2\,k)+w)}\right)\right)\Big/$$

$$\left.\left((-i\,a+c\,(v-2\,k)+w)\sqrt{-\frac{(-i\,p+s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)+w)\,z)^2}{-i\,a+c\,(v-2\,k)+w}}\right)\right)/;\,v\in\mathbb{N}^+$$

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$$\int \cos\left(\sqrt{z}\, a+q+p\, z\right)\sinh\left(t+s\, z+w\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\, c+g+f\, z\right)dz ==$$

$$-2^{-\nu-3}\left(\left(e^{-\frac{(-i\,a-w)^2}{4(-i\,p-s)}-i\,q-t}\left(2\,e^{\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{4(-i\,p-s)}}\sqrt{-\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{-i\,p-s}}\,(-i\,p-s)+\right.\right.\right.$$

$$\left.\left.\left.(-i\,a-w)\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{4(-i\,p-s)}\right)\right)\right)\Bigg/$$

$$\left((-i\,p-s)^2\sqrt{-\frac{\left(-i\,a-w+2(-i\,p-s)\sqrt{z}\right)^2}{-i\,p-s}}\right)+$$

$$\left(e^{-\frac{(i\,a-w)^2}{4(i\,p-s)}+i\,q-t}\left(2\,e^{\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{4(i\,p-s)}}\sqrt{-\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{i\,p-s}}\,(i\,p-s)+(i\,a-w)\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{4(i\,p-s)}\right)\right)\Bigg/\left((i\,p-s)^2\sqrt{-\frac{\left(i\,a-w+2(i\,p-s)\sqrt{z}\right)^2}{i\,p-s}}\right)-$$

$$\left(e^{-\frac{(-i\,a+w)^2}{4(s-i\,p)}-i\,q+t}\left(2\,e^{\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{4(s-i\,p)}}\sqrt{-\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{s-i\,p}}\,(s-i\,p)+(-i\,a+w)\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{4(s-i\,p)}\right)\right)\Bigg/\left((s-i\,p)^2\sqrt{-\frac{\left(-i\,a+w+2(s-i\,p)\sqrt{z}\right)^2}{s-i\,p}}\right)-$$

$$\left(e^{-\frac{(i\,a+w)^2}{4(i\,p+s)}+i\,q+t}\left(2\,e^{\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{4(i\,p+s)}}\sqrt{-\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{i\,p+s}}\,(i\,p+s)+(i\,a+w)\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{4(i\,p+s)}\right)\right)\Bigg/\left((i\,p+s)^2\sqrt{-\frac{\left(i\,a+w+2(i\,p+s)\sqrt{z}\right)^2}{i\,p+s}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)-$$

$$2^{-\nu-3}\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(\left(e^{-\frac{(i\,a+c\,(2\,h-\nu)-w)^2}{4\,(i\,p-s+f\,(2\,h-\nu))}+i\,q-t+g\,(2\,h-\nu)}\left(\left(i\,a+c\,(2\,h-\nu)-w\right)\left(i\,a+c\,(2\,h-\nu)-w+2\,(i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)\right.\right.\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(i\,a+c\,(2\,h-\nu)-w+2\,(i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(2\,h-\nu))}\right)+2\,e^{\frac{\left(i\,a+c\,(2\,h-\nu)-w+2\,(i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(2\,h-\nu))}}$$
$$\left.\left.\left.(i\,p-s+f\,(2\,h-\nu))\sqrt{-\frac{\left(i\,a+c\,(2\,h-\nu)-w+2\,(i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{i\,p-s+f\,(2\,h-\nu)}}\right)\right)\Bigg/$$
$$\left(\left(i\,p-s+f\,(2\,h-\nu)\right)^2\sqrt{-\frac{\left(i\,a+c\,(2\,h-\nu)-w+2\,(i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{i\,p-s+f\,(2\,h-\nu)}}\right)-$$
$$\left(e^{-\frac{(i\,a+c\,(2\,h-\nu)+w)^2}{4\,(i\,p+s+f\,(2\,h-\nu))}+i\,q+t+g\,(2\,h-\nu)}\left(\left(i\,a+c\,(2\,h-\nu)+w\right)\left(i\,a+c\,(2\,h-\nu)+w+2\,(i\,p+s+f\,(2\,h-\nu))\,\sqrt{z}\right)\right.\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{\left(i\,a+c\,(2\,h-\nu)+w+2\,(i\,p+s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(2\,h-\nu))}\right)+2\,e^{\frac{\left(i\,a+c\,(2\,h-\nu)+w+2\,(i\,p+s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(2\,h-\nu))}}$$
$$\left.\left.(i\,p+s+f\,(2\,h-\nu))\sqrt{-\frac{\left(i\,a+c\,(2\,h-\nu)+w+2\,(i\,p+s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{i\,p+s+f\,(2\,h-\nu)}}\right)\right)\Bigg/$$
$$\left(\left(i\,p+s+f\,(2\,h-\nu)\right)^2\sqrt{-\frac{\left(i\,a+c\,(2\,h-\nu)+w+2\,(i\,p+s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{i\,p+s+f\,(2\,h-\nu)}}\right)+$$
$$\left(e^{-\frac{(-i\,a+c\,(2\,h-\nu)-w)^2}{4\,(-i\,p-s+f\,(2\,h-\nu))}-i\,q-t+g\,(2\,h-\nu)}\left(\left(-i\,a+c\,(2\,h-\nu)-w\right)\left(-i\,a+c\,(2\,h-\nu)-w+2\,(-i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)\right.\right.$$
$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a+c\,(2\,h-\nu)-w+2\,(-i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(2\,h-\nu))}\right)+2\,e^{\frac{\left(-i\,a+c\,(2\,h-\nu)-w+2\,(-i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(2\,h-\nu))}}\right.\right.$$

$$(-i\,p-s+f\,(2\,h-v))\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)-w+2\,(-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2\,h-v)}}\Bigg)\Bigg/$$

$$\left((-i\,p-s+f\,(2\,h-v))^2\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)-w+2\,(-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2\,h-v)}}\right)-$$

$$\left(e^{-\frac{(-i\,a+c\,(2\,h-v)+w)^2}{4\,(-i\,p+s+f\,(2\,h-v))}-i\,q+t+g\,(2\,h-v)}\left((-i\,a+c\,(2\,h-v)+w)\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}\right)+2\,e^{\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}}$$

$$(-i\,p+s+f\,(2\,h-v))\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}}\Bigg)\Bigg/$$

$$\left((-i\,p+s+f\,(2\,h-v))^2\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(-i\,a+c\,(v-2\,h)-w)^2}{4\,(-i\,p-s+f\,(v-2\,h))}-i\,q-t+g\,(v-2\,h)}\left((-i\,a+c\,(v-2\,h)-w)\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(v-2\,h))}}$$

$$(-i\,p-s+f\,(v-2\,h))\sqrt{-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(v-2\,h)}}\Bigg)\Bigg/$$

$$\left((-i\,p-s+f\,(v-2\,h))^2\sqrt{-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(v-2\,h)}}\right)+$$

$$\left(e^{-\frac{(i a+c (v-2 h)-w)^2}{4 (i p-s+f (v-2 h))}+i q-t+g (v-2 h)} \left((i a+c (v-2 h)-w) \left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}, -\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{4 (i p-s+f (v-2 h))}\right)+2 e^{\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{4 (i p-s+f (v-2 h))}}$$

$$\left.\left.(i p-s+f (v-2 h)) \sqrt{-\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{i p-s+f (v-2 h)}}\right)\right) /$$

$$\left((i p-s+f (v-2 h))^2 \sqrt{-\frac{\left(i a+c (v-2 h)-w+2 (i p-s+f (v-2 h)) \sqrt{z}\right)^2}{i p-s+f (v-2 h)}}\right)-$$

$$\left(e^{-\frac{(-i a+c (v-2 h)+w)^2}{4 (-i p+s+f (v-2 h))}-i q+t+g (v-2 h)} \left((-i a+c (v-2 h)+w) \left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}, -\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{4 (-i p+s+f (v-2 h))}\right)+2 e^{\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{4 (-i p+s+f (v-2 h))}}$$

$$\left.\left.(-i p+s+f (v-2 h)) \sqrt{-\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{-i p+s+f (v-2 h)}}\right)\right) /$$

$$\left((-i p+s+f (v-2 h))^2 \sqrt{-\frac{\left(-i a+c (v-2 h)+w+2 (-i p+s+f (v-2 h)) \sqrt{z}\right)^2}{-i p+s+f (v-2 h)}}\right)-$$

$$\left(e^{-\frac{(i a+c (v-2 h)+w)^2}{4 (i p+s+f (v-2 h))}+i q+t+g (v-2 h)} \left((i a+c (v-2 h)+w) \left(i a+c (v-2 h)+w+2 (i p+s+f (v-2 h)) \sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}, -\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(v-2\,h))}}$$

$$(i\,p+s+f\,(v-2\,h))\sqrt{-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p+s+f\,(v-2\,h)}}\Bigg)\Bigg/$$

$$\left((i\,p+s+f\,(v-2\,h))^2\sqrt{-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p+s+f\,(v-2\,h)}}\right);\ v\in\mathbb{N}^+$$

Involving powers of cos and powers of sinh

Involving $\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)\,dz==$$

$$i^u\,2^{-m-u-v}\,z\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}$$

$$(1-u\bmod 2)\,(1-v\bmod 2)\sum_{h=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{h}\left(e^{2\,i\,h\,q-i\,m\,q}\,\Gamma\left(\frac{1}{r},(-2\,i\,a\,h+i\,a\,m)\,z^r\right)((-2\,i\,a\,h+i\,a\,m)\,z^r)^{-1/r}+\right.$$

$$\left.e^{i\,m\,q-2\,i\,h\,q}\,((2\,i\,a\,h-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,i\,a\,h-i\,a\,m)\,z^r\right)\right)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2\,g\,h-g\,v}\,\Gamma\left(\frac{1}{r},(c\,v-2\,c\,h)\,z^r\right)((c\,v-2\,c\,h)\,z^r)^{-1/r}+e^{g\,v-2\,g\,h}\,((2\,c\,h-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,c\,h-c\,v)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{2\,k\,t-u\,t+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{1}{r},(u\,w-2\,k\,w)\,z^r\right)((u\,w-2\,k\,w)\,z^r)^{-1/r}+\right.$$

$$\left.e^{-2\,k\,t+u\,t-\frac{i\,\pi\,u}{2}}\,((2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(2\,k\,w-u\,w)\,z^r\right)\right)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{u}{\frac{u}{2}}(1-u\bmod 2)$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{2\,g\,h+2\,i\,j\,q-i\,m\,q-g\,v}\,\Gamma\left(\frac{1}{r},(-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v)\,z^r\right)((-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v)\,z^r)^{-1/r}+\right.$$

$$\left.e^{2\,g\,h-2\,i\,j\,q+i\,m\,q-g\,v}\,((-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v)\,z^r\right)+\right.$$

$$e^{-2gh+2ijq-imq+gv}((2ch-2iaj+iam-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-2iaj+iam-cv)z^r\right)+$$
$$e^{-2gh-2ijq+imq+gv}((2ch+2iaj-iam-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch+2iaj-iam-cv)z^r\right)\Bigg)-$$

$$\frac{i^u 2^{-m-u-v}z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\Bigg(e^{2ijq-imq+2kt-tu+\frac{i\pi u}{2}}\Gamma\left(\frac{1}{r},(-2aij+iam-2kw+uw)z^r\right)$$
$$((-2aij+iam-2kw+uw)z^r)^{-1/r}+e^{-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}((2iaj-iam-2kw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(2iaj-iam-2kw+uw)z^r\right)+e^{2ijq-imq-2kt+tu-\frac{i\pi u}{2}}((-2aij+iam+2kw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-2aij+iam+2kw-uw)z^r\right)+e^{-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}((2iaj-iam+2kw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(2iaj-iam+2kw-uw)z^r\right)\Bigg)-\frac{i^u 2^{-m-u-v}z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{2gh+2kt-tu+\frac{i\pi u}{2}-gv}\Gamma\left(\frac{1}{r},(-2ch+cv-2kw+uw)z^r\right)((-2ch+cv-2kw+uw)z^r)^{-1/r}+$$
$$e^{-2gh+2kt-tu+\frac{i\pi u}{2}+gv}((2ch-cv-2kw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-cv-2kw+uw)z^r\right)+$$
$$e^{2gh-2kt+tu-gv-\frac{i\pi u}{2}}((-2ch+cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-2ch+cv+2kw-uw)z^r\right)+$$
$$e^{-2gh-2kt+tu+gv-\frac{i\pi u}{2}}((2ch-cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-cv+2kw-uw)z^r\right)\Bigg)-$$

$$\frac{i^u 2^{-m-u-v}z}{r}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{2gh+2ijq-imq+2kt-tu+\frac{i\pi u}{2}-gv}$$
$$\Gamma\left(\frac{1}{r},(-2ch-2iaj+iam+cv-2kw+uw)z^r\right)((-2ch-2iaj+iam+cv-2kw+uw)z^r)^{-1/r}+$$
$$e^{2gh-2ijq+imq+2kt-tu+\frac{i\pi u}{2}-gv}((-2ch+2iaj-iam+cv-2kw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-2ch+2iaj-iam+cv-2kw+uw)z^r\right)+e^{-2gh+2ijq-imq+2kt-tu+\frac{i\pi u}{2}+gv}$$
$$((2ch-2iaj+iam-cv-2kw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(2ch-2iaj+iam-cv-2kw+uw)z^r\right)+$$
$$e^{-2gh-2ijq+imq+2kt-tu+\frac{i\pi u}{2}+gv}((2ch+2iaj-iam-cv-2kw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(2ch+2iaj-iam-cv-2kw+uw)z^r\right)+e^{2gh+2ijq-imq-2kt+tu-gv-\frac{i\pi u}{2}}$$
$$((-2ch-2iaj+iam+cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-2ch-2iaj+iam+cv+2kw-uw)z^r\right)+$$
$$e^{2gh-2ijq+imq-2kt+tu-gv-\frac{i\pi u}{2}}((-2ch+2iaj-iam+cv+2kw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-2ch+2iaj-iam+cv+2kw-uw)z^r\right)+e^{-2gh+2ijq-imq-2kt+tu+gv-\frac{i\pi u}{2}}$$

$$((2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},\,(2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r\right)+$$
$$e^{-2\,g\,h-2\,i\,j\,q+i\,m\,q-2\,k\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}}\,((2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r)^{-1/r}$$
$$\left.\Gamma\left(\frac{1}{r},\,(2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $\cos^m(a\,z^r+p\,z+q)\sinh^u(w\,z^r+s\,z+t)\cosh^v(c\,z^r+f\,z+g)$

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$$\int\cos^m\left(a\,z^2+p\,z+q\right)\sinh^u\left(w\,z^2+s\,z+t\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==$$
$$i^u\,2^{-m-u-v}\,z\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)+i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)$$
$$\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(\left(i\,e^{i\,(2\,j-m)\,q-\frac{i\,(2\,j-m)\,p^2}{4\,a}}\,(i\,(2\,j-m)\,p+2\,a\,i\,(2\,j-m)\,z)\,\Gamma\left(\frac{1}{2},\,\frac{i\,(i\,(2\,j-m)\,p+2\,a\,i\,(2\,j-m)\,z)^2}{4\,a\,(2\,j-m)}\right)\right)\Big/\right.$$
$$\left.\left(a\,(2\,j-m)\sqrt{\frac{i\,(i\,(2\,j-m)\,p+2\,a\,i\,(2\,j-m)\,z)^2}{a\,(2\,j-m)}}\right)+\right.$$
$$\left(i\,e^{i\,(m-2\,j)\,q-\frac{i\,(m-2\,j)\,p^2}{4\,a}}\,(i\,(m-2\,j)\,p+2\,a\,i\,(m-2\,j)\,z)\,\Gamma\left(\frac{1}{2},\,\frac{i\,(i\,(m-2\,j)\,p+2\,a\,i\,(m-2\,j)\,z)^2}{4\,a\,(m-2\,j)}\right)\right)\Big/$$
$$\left.\left(a\,(m-2\,j)\sqrt{\frac{i\,(i\,(m-2\,j)\,p+2\,a\,i\,(m-2\,j)\,z)^2}{a\,(m-2\,j)}}\right)\right)-i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)$$
$$(1-u\bmod 2)\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\left(\frac{e^{g\,(2\,j-v)-\frac{f^2\,(2\,j-v)}{4\,c}}\,(f\,(2\,j-v)+2\,c\,z\,(2\,j-v))\,\Gamma\left(\frac{1}{2},\,-\frac{(f\,(2\,j-v)+2\,c\,z\,(2\,j-v))^2}{4\,c\,(2\,j-v)}\right)}{c\,(2\,j-v)\sqrt{-\frac{(f\,(2\,j-v)+2\,c\,z\,(2\,j-v))^2}{c\,(2\,j-v)}}}+\right.$$
$$\left.\frac{e^{g\,(v-2\,j)-\frac{f^2\,(v-2\,j)}{4\,c}}\,(f\,(v-2\,j)+2\,c\,z\,(v-2\,j))\,\Gamma\left(\frac{1}{2},\,-\frac{(f\,(v-2\,j)+2\,c\,z\,(v-2\,j))^2}{4\,c\,(v-2\,j)}\right)}{c\,(v-2\,j)\sqrt{-\frac{(f\,(v-2\,j)+2\,c\,z\,(v-2\,j))^2}{c\,(v-2\,j)}}}\right)-i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)$$
$$(1-v\bmod 2)\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(\left(e^{-\frac{(2\,i-u)\,s^2}{4\,w}+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\,(s\,(2\,i-u)+2\,w\,z\,(2\,i-u))\,\Gamma\left(\frac{1}{2},\,-\frac{(s\,(2\,i-u)+2\,w\,z\,(2\,i-u))^2}{4\,(2\,i-u)\,w}\right)\right)\Big/\right.$$
$$\left.\left((2\,i-u)\,w\sqrt{-\frac{(s\,(2\,i-u)+2\,w\,z\,(2\,i-u))^2}{(2\,i-u)\,w}}\right)+\right.$$

$$\left(e^{-\frac{(u-2i)s^2}{4w}-\frac{i\pi u}{2}+t(u-2i)}(s(u-2i)+2wz(u-2i))\,\Gamma\left(\frac{1}{2},-\frac{(s(u-2i)+2wz(u-2i))^2}{4(u-2i)w}\right)\right)\Big/$$

$$\left((u-2i)w\sqrt{-\frac{(s(u-2i)+2wz(u-2i))^2}{(u-2i)w}}\right)-i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\left(\left(e^{-\frac{(i(2k-m)p+f(2j-v))^2}{4(ai(2k-m)+c(2j-v))}+i(2k-m)q+g(2j-v)}(i(2k-m)p+f(2j-v)+2(ai(2k-m)+c(2j-v))z)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2k-m)p+f(2j-v)+2(ai(2k-m)+c(2j-v))z)^2}{4(ai(2k-m)+c(2j-v))}\right)\right)\Big/$$

$$\left((ai(2k-m)+c(2j-v))\sqrt{-\frac{(i(2k-m)p+f(2j-v)+2(ai(2k-m)+c(2j-v))z)^2}{ai(2k-m)+c(2j-v)}}\right)+$$

$$\left(e^{-\frac{(i(m-2k)p+f(2j-v))^2}{4(ai(m-2k)+c(2j-v))}+i(m-2k)q+g(2j-v)}(i(m-2k)p+f(2j-v)+2(ai(m-2k)+c(2j-v))z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2k)p+f(2j-v)+2(ai(m-2k)+c(2j-v))z)^2}{4(ai(m-2k)+c(2j-v))}\right)\right)\Big/$$

$$\left((ai(m-2k)+c(2j-v))\sqrt{-\frac{(i(m-2k)p+f(2j-v)+2(ai(m-2k)+c(2j-v))z)^2}{ai(m-2k)+c(2j-v)}}\right)+$$

$$\left(e^{-\frac{(i(2k-m)p+f(v-2j))^2}{4(ai(2k-m)+c(v-2j))}+i(2k-m)q+g(v-2j)}(i(2k-m)p+f(v-2j)+2(ai(2k-m)+c(v-2j))z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2k-m)p+f(v-2j)+2(ai(2k-m)+c(v-2j))z)^2}{4(ai(2k-m)+c(v-2j))}\right)\right)\Big/$$

$$\left((ai(2k-m)+c(v-2j))\sqrt{-\frac{(i(2k-m)p+f(v-2j)+2(ai(2k-m)+c(v-2j))z)^2}{ai(2k-m)+c(v-2j)}}\right)+$$

$$\left(e^{-\frac{(i(m-2k)p+f(v-2j))^2}{4(ai(m-2k)+c(v-2j))}+i(m-2k)q+g(v-2j)}(i(m-2k)p+f(v-2j)+2(ai(m-2k)+c(v-2j))z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2k)p+f(v-2j)+2(ai(m-2k)+c(v-2j))z)^2}{4(ai(m-2k)+c(v-2j))}\right)\right)\Big/\left((ai(m-2k)+c(v-2j))\right.$$

$$\left.\sqrt{-\frac{(i(m-2k)p+f(v-2j)+2(ai(m-2k)+c(v-2j))z)^2}{ai(m-2k)+c(v-2j)}}\right)-i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(\left(e^{-\frac{(i(2j-m)p+s(2i-u))^2}{4(ai(2j-m)+(2i-u)w)}+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}}(i(2j-m)p+s(2i-u)+2(ai(2j-m)+(2i-u)w)z)\right.\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2j-m)p+s(2i-u)+2(ai(2j-m)+(2i-u)w)z)^2}{4(ai(2j-m)+(2i-u)w)}\right)\right)\Big/$$
$$\left((ai(2j-m)+(2i-u)w)\sqrt{-\frac{(i(2j-m)p+s(2i-u)+2(ai(2j-m)+(2i-u)w)z)^2}{ai(2j-m)+(2i-u)w}}\right)+$$
$$\left(e^{-\frac{(i(m-2j)p+s(2i-u))^2}{4(ai(m-2j)+(2i-u)w)}+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}}(i(m-2j)p+s(2i-u)+2(ai(m-2j)+(2i-u)w)z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2j)p+s(2i-u)+2(ai(m-2j)+(2i-u)w)z)^2}{4(ai(m-2j)+(2i-u)w)}\right)\right)\Big/$$
$$\left((ai(m-2j)+(2i-u)w)\sqrt{-\frac{(i(m-2j)p+s(2i-u)+2(ai(m-2j)+(2i-u)w)z)^2}{ai(m-2j)+(2i-u)w}}\right)+$$
$$\left(e^{-\frac{(i(2j-m)p+s(u-2i))^2}{4(ai(2j-m)+(u-2i)w)}+i(2j-m)q+t(u-2i)-\frac{i\pi u}{2}}(i(2j-m)p+s(u-2i)+2(ai(2j-m)+(u-2i)w)z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(2j-m)p+s(u-2i)+2(ai(2j-m)+(u-2i)w)z)^2}{4(ai(2j-m)+(u-2i)w)}\right)\right)\Big/$$
$$\left((ai(2j-m)+(u-2i)w)\sqrt{-\frac{(i(2j-m)p+s(u-2i)+2(ai(2j-m)+(u-2i)w)z)^2}{ai(2j-m)+(u-2i)w}}\right)+$$
$$\left(e^{-\frac{(i(m-2j)p+s(u-2i))^2}{4(ai(m-2j)+(u-2i)w)}+i(m-2j)q+t(u-2i)-\frac{i\pi u}{2}}(i(m-2j)p+s(u-2i)+2(ai(m-2j)+(u-2i)w)z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(i(m-2j)p+s(u-2i)+2(ai(m-2j)+(u-2i)w)z)^2}{4(ai(m-2j)+(u-2i)w)}\right)\right)\Big/$$
$$\left.\left((ai(m-2j)+(u-2i)w)\sqrt{-\frac{(i(m-2j)p+s(u-2i)+2(ai(m-2j)+(u-2i)w)z)^2}{ai(m-2j)+(u-2i)w}}\right)\right)-$$
$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(\left(e^{-\frac{(s(2i-u)+f(2j-v))^2}{4(c(2j-v)+(2i-u)w)}+t(2i-u)+\frac{i\pi u}{2}+g(2j-v)}(s(2i-u)+f(2j-v)+\right.\right.$$
$$\left.\left.2(c(2j-v)+(2i-u)w)z\right)\Gamma\left(\frac{1}{2},-\frac{(s(2i-u)+f(2j-v)+2(c(2j-v)+(2i-u)w)z)^2}{4(c(2j-v)+(2i-u)w)}\right)\right)\Big/$$
$$\left((c(2j-v)+(2i-u)w)\sqrt{-\frac{(s(2i-u)+f(2j-v)+2(c(2j-v)+(2i-u)w)z)^2}{c(2j-v)+(2i-u)w}}\right)+$$

$$\left(e^{-\frac{(s(2i-u)+f(v-2j))^2}{4(c(v-2j)+(2i-u)w)}+t(2i-u)+\frac{i\pi u}{2}+g(v-2j)}(s(2i-u)+f(v-2j)+2(c(v-2j)+(2i-u)w)z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(s(2i-u)+f(v-2j)+2(c(v-2j)+(2i-u)w)z)^2}{4(c(v-2j)+(2i-u)w)}\right)\right)\Big/$$

$$\left((c(v-2j)+(2i-u)w)\sqrt{-\frac{(s(2i-u)+f(v-2j)+2(c(v-2j)+(2i-u)w)z)^2}{c(v-2j)+(2i-u)w}}\right)+$$

$$\left(e^{-\frac{(s(u-2i)+f(2j-v))^2}{4(c(2j-v)+(u-2i)w)}-\frac{i\pi u}{2}+t(u-2i)+g(2j-v)}(s(u-2i)+f(2j-v)+2(c(2j-v)+(u-2i)w)z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(s(u-2i)+f(2j-v)+2(c(2j-v)+(u-2i)w)z)^2}{4(c(2j-v)+(u-2i)w)}\right)\right)\Big/$$

$$\left((c(2j-v)+(u-2i)w)\sqrt{-\frac{(s(u-2i)+f(2j-v)+2(c(2j-v)+(u-2i)w)z)^2}{c(2j-v)+(u-2i)w}}\right)+$$

$$\left(e^{-\frac{(s(u-2i)+f(v-2j))^2}{4(c(v-2j)+(u-2i)w)}-\frac{i\pi u}{2}+t(u-2i)+g(v-2j)}(s(u-2i)+f(v-2j)+2(c(v-2j)+(u-2i)w)z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(s(u-2i)+f(v-2j)+2(c(v-2j)+(u-2i)w)z)^2}{4(c(v-2j)+(u-2i)w)}\right)\right)\Big/$$

$$\left.\left((c(v-2j)+(u-2i)w)\sqrt{-\frac{(s(u-2i)+f(v-2j)+2(c(v-2j)+(u-2i)w)z)^2}{c(v-2j)+(u-2i)w}}\right)\right)-$$

$$i^u\,2^{-m-u-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(\left(e^{-\frac{(i(2j-m)p+s(2i-u)+f(2k-v))^2}{4(a\,i(2j-m)+c(2k-v)+(2i-u)w)}+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)}\right.\right.$$

$$(i(2j-m)p+s(2i-u)+f(2k-v)+2(a\,i(2j-m)+c(2k-v)+(2i-u)w)z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.-(i(2j-m)p+s(2i-u)+f(2k-v)+2(a\,i(2j-m)+c(2k-v)+(2i-u)w)z)^2\Big/\right.$$

$$\left.(4(a\,i(2j-m)+c(2k-v)+(2i-u)w))\right)\Big/\left((a\,i(2j-m)+c(2k-v)+(2i-u)w)\right.$$

$$\left.\sqrt{\left(-(i(2j-m)p+s(2i-u)+f(2k-v)+2(a\,i(2j-m)+c(2k-v)+(2i-u)w)z)^2\Big/\right.}\right.$$

$$\left.\left.(a\,i(2j-m)+c(2k-v)+(2i-u)w)\right)\right)+$$

$$\left(e^{-\frac{(i(m-2j)p+s(2i-u)+f(2k-v))^2}{4(a\,i(m-2j)+c(2k-v)+(2i-u)w)}+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)}(i(m-2j)p+s(2i-u)+\right.$$

$$f(2k-v)+2(a\,i(m-2j)+c(2k-v)+(2i-u)w)z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.-(i(m-2j)p+s(2i-u)+f(2k-v)+2(a\,i(m-2j)+c(2k-v)+(2i-u)w)z)^2\Big/\right.$$

$$\left.(4(a\,i(m-2j)+c(2k-v)+(2i-u)w))\right)\Big/\left((a\,i(m-2j)+c(2k-v)+(2i-u)w)\right.$$

$$\sqrt{\left(-(i\,(m-2\,j)\,p+s\,(2\,i-u)+f\,(2\,k-v)+2\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(2\,i-u)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(m-2\,j)+c\,(2\,k-v)+(2\,i-u)\,w)\Big)+$$
$$\left(e^{-\frac{(i\,(2\,j-m)\,p+s\,(2\,i-u)+f\,(v-2\,k))^2}{4\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(2\,i-u)\,w)}+i\,(2\,j-m)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,k)}\,(i\,(2\,j-m)\,p+s\,(2\,i-u)+\right.$$
$$f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(2\,i-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$
$$\left.\left.-(i\,(2\,j-m)\,p+s\,(2\,i-u)+f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(2\,i-u)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(2\,i-u)\,w))\right)\right)\Big/\left((a\,i\,(2\,j-m)+c\,(v-2\,k)+(2\,i-u)\,w)\right.$$

$$\sqrt{\left(-(i\,(2\,j-m)\,p+s\,(2\,i-u)+f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(2\,i-u)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(2\,j-m)+c\,(v-2\,k)+(2\,i-u)\,w)\Big)+$$
$$\left(e^{-\frac{(i\,(m-2\,j)\,p+s\,(2\,i-u)+f\,(v-2\,k))^2}{4\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)}+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,k)}\,(i\,(m-2\,j)\,p+s\,(2\,i-u)+\right.$$
$$f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$
$$\left.\left.-(i\,(m-2\,j)\,p+s\,(2\,i-u)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w))\right)\right)\Big/\left((a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)\right.$$

$$\sqrt{\left(-(i\,(m-2\,j)\,p+s\,(2\,i-u)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)\Big)+$$
$$\left(e^{-\frac{(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)}+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}\,(i\,(2\,j-m)\,p+s\,(u-2\,i)+\right.$$
$$f\,(2\,k-v)+2\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$
$$\left.\left.-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w))\right)\right)\Big/\left((a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\right.$$

$$\sqrt{\left(-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\Big)+$$
$$\left(e^{-\frac{(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)}+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}\,(i\,(m-2\,j)\,p+s\,(u-2\,i)+\right.$$
$$f\,(2\,k-v)+2\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$
$$\left.\left.-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w))\right)\right)\Big/\left((a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\right.$$

$$\sqrt{\left(-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z\right)^2}\Big/$$
$$(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\Big)+$$
$$\left(e^{-\frac{(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k))^2}{4\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)}+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}\,(i\,(2\,j-m)\,p+s\,(u-2\,i)+\right.$$
$$f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w))\Big)\Big/\big((a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)$$
$$\sqrt{\big(-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/}$$
$$(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\big)\big)+$$
$$\Bigg(e^{-\frac{(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)^2}{4\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)}+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}\,(i\,(m-2\,j)\,p+s\,(u-2\,i)+$$
$$f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w))\Big)\Big/\big((a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)$$
$$\sqrt{\big(-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/}$$
$$(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\big)\big)\Bigg)\Big/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int\cos^m\left(\sqrt{z}\ a+q+p\,z\right)\sinh^u\left(t+s\,z+w\,\sqrt{z}\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz==$$
$$i^u\,2^{-m-u-v}\,z\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)-i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\Bigg(\Bigg(e^{i\,(2\,k-m)\,q-\frac{i\,a^2\,(2\,k-m)}{4\,p}}\Bigg(2\,e^{-\frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,(2\,k-m)\,p}}\,i\,(2\,k-m)\sqrt{\frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{(2\,k-m)\,p}}\ p+$$
$$a\,i\,(2\,k-m)\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)\Gamma\left(\frac{1}{2},\ \frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,(2\,k-m)\,p}\right)\Bigg)\Bigg)\Big/$$
$$\left((2\,k-m)^2\,p^2\sqrt{\frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{(2\,k-m)\,p}}\right)+$$
$$\Bigg(e^{i\,(m-2\,k)\,q-\frac{i\,a^2\,(m-2\,k)}{4\,p}}\Bigg(2\,e^{-\frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,(m-2\,k)\,p}}\,i\,(m-2\,k)\sqrt{\frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)^2}{(m-2\,k)\,p}}\ p+$$
$$a\,i\,(m-2\,k)\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)\Gamma\left(\frac{1}{2},\ \frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,(m-2\,k)\,p}\right)\Bigg)\Bigg)\Big/$$

$$\left((m-2k)^2\,p^2\sqrt{\frac{i\left(a\,i\,(m-2k)+2\,i\,p\,\sqrt{z}\;(m-2k)\right)^2}{(m-2k)\,p}}\right)\Bigg)+i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(\Bigg(e^{-\frac{(2k-u)\,w^2}{4s}+t\,(2k-u)+\frac{i\pi u}{2}}\left(w\left(w\,(2k-u)+2\,s\,\sqrt{z}\;(2k-u)\right)\Gamma\left(\frac{1}{2},-\frac{\left(w\,(2k-u)+2\,s\,\sqrt{z}\;(2k-u)\right)^2}{4\,s\,(2k-u)}\right)\right.$$

$$\left.(2k-u)+2\,e^{\frac{\left(w\,(2k-u)+2\,s\,\sqrt{z}\;(2k-u)\right)^2}{4\,s\,(2k-u)}}\,s\sqrt{-\frac{\left(w\,(2k-u)+2\,s\,\sqrt{z}\;(2k-u)\right)^2}{s\,(2k-u)}}\;(2k-u)\right)\Bigg)\Bigg/$$

$$\left(s^2\,(2k-u)^2\sqrt{-\frac{\left(w\,(2k-u)+2\,s\,\sqrt{z}\;(2k-u)\right)^2}{s\,(2k-u)}}\right)+\Bigg(e^{-\frac{(u-2k)\,w^2}{4s}-\frac{i\pi u}{2}+t\,(u-2k)}$$

$$\left(w\left(w\,(u-2k)+2\,s\,\sqrt{z}\;(u-2k)\right)\Gamma\left(\frac{1}{2},-\frac{\left(w\,(u-2k)+2\,s\,\sqrt{z}\;(u-2k)\right)^2}{4\,s\,(u-2k)}\right)(u-2k)+\right.$$

$$\left.2\,e^{\frac{\left(w\,(u-2k)+2\,s\,\sqrt{z}\;(u-2k)\right)^2}{4\,s\,(u-2k)}}\,s\sqrt{-\frac{\left(w\,(u-2k)+2\,s\,\sqrt{z}\;(u-2k)\right)^2}{s\,(u-2k)}}\;(u-2k)\right)\Bigg)\Bigg/$$

$$\left(s^2\,(u-2k)^2\sqrt{-\frac{\left(w\,(u-2k)+2\,s\,\sqrt{z}\;(u-2k)\right)^2}{s\,(u-2k)}}\right)\Bigg)+i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)\,(1-u \bmod 2)$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(\Bigg(e^{g\,(2h-v)-\frac{c^2\,(2h-v)}{4f}}\left(c\left(c\,(2h-v)+2\,f\,\sqrt{z}\;(2h-v)\right)\Gamma\left(\frac{1}{2},-\frac{\left(c\,(2h-v)+2\,f\,\sqrt{z}\;(2h-v)\right)^2}{4\,f\,(2h-v)}\right)(2h-v)+\right.$$

$$\left.2\,e^{\frac{\left(c\,(2h-v)+2\,f\,\sqrt{z}\;(2h-v)\right)^2}{4\,f\,(2h-v)}}\,f\sqrt{-\frac{\left(c\,(2h-v)+2\,f\,\sqrt{z}\;(2h-v)\right)^2}{f\,(2h-v)}}\;(2h-v)\right)\Bigg)\Bigg/$$

$$\left(f^2\,(2h-v)^2\sqrt{-\frac{\left(c\,(2h-v)+2\,f\,\sqrt{z}\;(2h-v)\right)^2}{f\,(2h-v)}}\right)+$$

$$\left(e^{g(v-2h)-\frac{c^2(v-2h)}{4f}}\left(c\left(c(v-2h)+2f\sqrt{z}\ (v-2h)\right)\Gamma\left(\frac{1}{2},-\frac{\left(c(v-2h)+2f\sqrt{z}\ (v-2h)\right)^2}{4f(v-2h)}\right)(v-2h)+\right.\right.$$

$$\left.\left.2e^{\frac{\left(c(v-2h)+2f\sqrt{z}\ (v-2h)\right)^2}{4f(v-2h)}}f\sqrt{-\frac{\left(c(v-2h)+2f\sqrt{z}\ (v-2h)\right)^2}{f(v-2h)}}\ (v-2h)\right)\right)\Big/$$

$$\left(f^2(v-2h)^2\sqrt{-\frac{\left(c(v-2h)+2f\sqrt{z}\ (v-2h)\right)^2}{f(v-2h)}}\right)+i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(a\,i(2k-m)+(2j-u)w)^2}{4(i(2k-m)p+s(2j-u))}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}\left((a\,i(2k-m)+(2j-u)w)\right.\right.\right.$$

$$\left(a\,i(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i(2k-m)+(2j-u)w+\right.\right.$$

$$\left.\left.2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(4(i(2k-m)p+s(2j-u)))\right)+2$$

$$e^{\frac{\left(a\,i(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(i(2k-m)p+s(2j-u))}}(i(2k-m)p+s(2j-u))\sqrt{\left(-\left(a\,i(2k-m)+\right.\right.}$$

$$\left.\left.\left.\left.(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(i(2k-m)p+s(2j-u))\right)\right)\right)\Big/$$

$$\left((i(2k-m)p+s(2j-u))^2\sqrt{-\frac{\left(a\,i(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{i(2k-m)p+s(2j-u)}}\right)+$$

$$\left(e^{-\frac{(a\,i(m-2k)+(2j-u)w)^2}{4(i(m-2k)p+s(2j-u))}+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}}\left((a\,i(m-2k)+(2j-u)w)\right.\right.$$

$$\left(a\,i(m-2k)+(2j-u)w+2(i(m-2k)p+s(2j-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i(m-2k)+(2j-u)w+\right.\right.$$

$$\left.\left.2(i(m-2k)p+s(2j-u))\sqrt{z}\right)^2\Big/(4(i(m-2k)p+s(2j-u)))\right)+2$$

$$e^{\frac{\left(a\,i(m-2k)+(2j-u)w+2(i(m-2k)p+s(2j-u))\sqrt{z}\right)^2}{4(i(m-2k)p+s(2j-u))}}(i(m-2k)p+s(2j-u))\sqrt{\left(-\left(a\,i(m-2k)+\right.\right.}$$

$$\left.\left.\left.\left.(2j-u)w+2(i(m-2k)p+s(2j-u))\sqrt{z}\right)^2\Big/(i(m-2k)p+s(2j-u))\right)\right)\right)\Big/$$

$$\left((i\,(m-2\,k)\,p+s\,(2\,j-u))^2\sqrt{-\frac{\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p+s\,(2\,j-u)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j))}+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\left((a\,i\,(2\,k-m)+(u-2\,j)\,w)\right.\right.$$

$$\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.\right.$$

$$\left.\left.2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\right)+2$$

$$e^{\frac{\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j))}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(a\,i\,(2\,k-m)+\right.\right.}$$

$$\left.\left.\left.(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\left(i\,(2\,k-m)\,p+s\,(u-2\,j)\right)\right)\right)\Big/$$

$$\left((i\,(2\,k-m)\,p+s\,(u-2\,j))^2\sqrt{-\frac{\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p+s\,(u-2\,j)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j))}+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\left((a\,i\,(m-2\,k)+(u-2\,j)\,w)\right.\right.$$

$$\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+\right.\right.$$

$$\left.\left.2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)+2$$

$$e^{\frac{\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j))}}\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(a\,i\,(m-2\,k)+\right.\right.}$$

$$\left.\left.\left.(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\left(i\,(m-2\,k)\,p+s\,(u-2\,j)\right)\right)\right)\Big/$$

$$\left.\left.\left((i\,(m-2\,k)\,p+s\,(u-2\,j))^2\sqrt{-\frac{\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p+s\,(u-2\,j)}}\right)\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(i\,(2\,k-m)\,p+f\,(2\,h-v))}+i\,(2\,k-m)\,q+g\,(2\,h-v)}\left((a\,i\,(2\,k-m)+c\,(2\,h-v))\right.\right.\right.$$

$$\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+\right.\right.$$

$$\left.\left.2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\right)\right)+2$$

$$e^{\frac{\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+f\,(2\,h-v))}}\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{\left(-\left(a\,i\,(2\,k-m)+\right.\right.}$$

$$\left.\left.c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(i\,(2\,k-m)\,p+f\,(2\,h-v)\right)\right)\Big]\Big/$$

$$\left((i\,(2\,k-m)\,p+f\,(2\,h-v))^2\sqrt{-\frac{\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(i\,(m-2\,k)\,p+f\,(2\,h-v))}+i\,(m-2\,k)\,q+g\,(2\,h-v)}\left((a\,i\,(m-2\,k)+c\,(2\,h-v))\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.\right.$$

$$\left.\left.2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.\right.$$

$$\left.\left.\left.2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\right)\right)+2$$

$$e^{\frac{\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+f\,(2\,h-v))}}\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{\left(-\left(a\,i\,(m-2\,k)+\right.\right.}$$

$$\left.\left.c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(i\,(m-2\,k)\,p+f\,(2\,h-v)\right)\right)\Big]\Big/$$

$$\left((i\,(m-2\,k)\,p+f\,(2\,h-v))^2\sqrt{-\frac{\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))}+i\,(2\,k-m)\,q+g\,(v-2\,h)}\left((a\,i\,(2\,k-m)+c\,(v-2\,h))\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.\right.$$

$$\left.\left.2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.\right.$$

$$\left.\left.\left.2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\right)\right)+2$$

$$e^{\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))}}\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{\left(-\left(a\,i\,(2\,k-m)+\right.\right.}$$

$$\left.\left.c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(i\,(2\,k-m)\,p+f\,(v-2\,h)\right)\right)\Big]\Big/$$

$$\left((i\,(2\,k-m)\,p+f\,(v-2\,h))^2\sqrt{-\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,(2\,k-m)\,p+f\,(v-2\,h)}}\right)+$$

$$\left(e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(i\,(m-2\,k)\,p+f\,(v-2\,h))}+i\,(m-2\,k)\,q+g\,(v-2\,h)}\left((a\,i\,(m-2\,k)+c\,(v-2\,h))\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.\right.$$

$$2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2},\,-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+$$

$$2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(4\,(i\,(m-2\,k)\,p+f\,(v-2\,h)))\Big)+2$$

$$e^{\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+f\,(v-2\,h))}}\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{\Big(-\big(a\,i\,(m-2\,k)+$$

$$c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\Big)}\Big)\Big/$$

$$\left((i\,(m-2\,k)\,p+f\,(v-2\,h))^2\,\sqrt{-\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,(m-2\,k)\,p+f\,(v-2\,h)}}\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(\Bigg(e^{-\frac{(c\,(2\,h-v)+(2\,k-u)\,w)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$\Bigg((c\,(2\,h-v)+(2\,k-u)\,w)\left(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)$$

$$\Gamma\left(\frac{1}{2},\,-\frac{\left(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}\right)+2$$

$$e^{\frac{\left(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}}\,(s\,(2\,k-u)+f\,(2\,h-v))$$

$$\sqrt{\Big(-\big(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\big)^2\Big/\,(s\,(2\,k-u)+f\,(2\,h-v))\Big)}\Bigg)\Bigg)\Big/$$

$$\left((s\,(2\,k-u)+f\,(2\,h-v))^2\,\sqrt{-\frac{\left(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2}{s\,(2\,k-u)+f\,(2\,h-v)}}\right)+$$

$$\Bigg(e^{-\frac{(c\,(2\,h-v)+(u-2\,k)\,w)^2}{4\,(s\,(u-2\,k)+f\,(2\,h-v))}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(2\,h-v)}\Bigg((c\,(2\,h-v)+(u-2\,k)\,w)\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+\right.$$

$$\left.(u-2\,k)\,w\right)\Gamma\left(\frac{1}{2},\,-\frac{\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2}{4\,(s\,(u-2\,k)+f\,(2\,h-v))}\right)+2$$

$$e^{\frac{\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2}{4\,(s\,(u-2\,k)+f\,(2\,h-v))}}\,(s\,(u-2\,k)+f\,(2\,h-v))$$

$$\sqrt{\left(-\left(2\sqrt{z}\ (s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2\Big/\left(s\,(u-2\,k)+f\,(2\,h-v)\right)\right)}\Bigg)\Bigg)\Bigg/$$

$$\left((s\,(u-2\,k)+f\,(2\,h-v))^2\sqrt{-\frac{\left(2\sqrt{z}\ (s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2}{s\,(u-2\,k)+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(c\,(v-2\,h)+(2\,k-u)\,w)^2}{4\,(s\,(2\,k-u)+f\,(v-2\,h))}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\left((c\,(v-2\,h)+(2\,k-u)\,w)\right.\right.$$

$$\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\sqrt{z}\right)^2}{4\,(s\,(2\,k-u)+f\,(v-2\,h))}\right)+2$$

$$e^{\frac{\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\sqrt{z}\right)^2}{4\,(s\,(2\,k-u)+f\,(v-2\,h))}}\,(s\,(2\,k-u)+f\,(v-2\,h))$$

$$\sqrt{\left(-\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\sqrt{z}\right)^2\Big/\left(s\,(2\,k-u)+f\,(v-2\,h)\right)\right)}\Bigg)\Bigg)\Bigg/$$

$$\left((s\,(2\,k-u)+f\,(v-2\,h))^2\sqrt{-\frac{\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\sqrt{z}\right)^2}{s\,(2\,k-u)+f\,(v-2\,h)}}\right)+$$

$$\left(e^{-\frac{(c\,(v-2\,h)+(u-2\,k)\,w)^2}{4\,(s\,(u-2\,k)+f\,(v-2\,h))}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(v-2\,h)}\left((c\,(v-2\,h)+(u-2\,k)\,w)\right.\right.$$

$$\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2},-\frac{\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\sqrt{z}\right)^2}{4\,(s\,(u-2\,k)+f\,(v-2\,h))}\right)+2$$

$$e^{\frac{\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\sqrt{z}\right)^2}{4\,(s\,(u-2\,k)+f\,(v-2\,h))}}\,(s\,(u-2\,k)+f\,(v-2\,h))$$

$$\sqrt{\left(-\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\sqrt{z}\right)^2\Big/\left(s\,(u-2\,k)+f\,(v-2\,h)\right)\right)}\Bigg)\Bigg)\Bigg/$$

$$\left.\left.\left((s\,(u-2\,k)+f\,(v-2\,h))^2\sqrt{-\frac{\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\sqrt{z}\right)^2}{s\,(u-2\,k)+f\,(v-2\,h)}}\right)\right)\right)+$$

$$i^u\, 2^{-m-u-v-1} \sum_{h=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{h} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{j=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^j \binom{u}{j} \left(\left(e^{-\frac{(a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w)^2}{4\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))} + i\,(2k-m)\,q + t\,(2j-u) + \frac{i\,\pi\,u}{2} + g\,(2h-v)} \right.\right.$$

$$\left((a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w)\left(a\,i\,(2k-m)+c\,(2h-v)+\right.\right.$$

$$\left.\left.(2j-u)\,w+2\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\left(a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2\Big/\right.\right.$$

$$\left.\left.(4\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v)))\right)+\right.$$

$$2\,e^{\frac{\left(a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2}{4\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))}}\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))$$

$$\sqrt{\left(-\left(a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\right.\right.}$$

$$\left.\left.\left.\sqrt{z}\right)^2\Big/(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\right)\right)\Big/$$

$$\left((i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))^2\sqrt{\left(-\left(a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(2k-m)\,p+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2\Big/(i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\right)\right)+$$

$$\left(e^{-\frac{(a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w)^2}{4\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))} + i\,(m-2k)\,q + t\,(2j-u) + \frac{i\,\pi\,u}{2} + g\,(2h-v)} \right.$$

$$\left((a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w)\right.$$

$$\left.\left(a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\left(a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2\Big/\right.\right.$$

$$\left.\left.(4\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v)))\right)+\right.$$

$$2\,e^{\frac{\left(a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2}{4\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))}}\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))$$

$$\sqrt{\left(-\left(a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\right.\right.}$$

$$\left.\left.\left.\sqrt{z}\right)^2\Big/(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\right)\right)\Big/$$

$$\left((i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))^2\sqrt{\left(-\left(a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(i\,(m-2k)\,p+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\right)\right)+$$

$$\left(e^{-\frac{(a\,i\,(2k-m)+c\,(2h-v)+(u-2j)\,w)^2}{4\,(i\,(2k-m)\,p+s\,(u-2j)+f\,(2h-v))} + i\,(2k-m)\,q + t\,(u-2j) + g\,(2h-v) - \frac{i\,\pi\,u}{2}} \right.$$

$$\left((a\,i\,(2k-m)+c\,(2h-v)+(u-2j)\,w)\right.$$

$$\left.\left(a\,i\,(2k-m)+c\,(2h-v)+(u-2j)\,w+2\,(i\,(2k-m)\,p+s\,(u-2j)+f\,(2h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$

$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.\right.}$$

$$\left.\left.\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Big)\Big/$$

$$\Big((i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2\,\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+\right.\right.}$$

$$\left.\left.s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\Bigg(\Big(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w\Big)$$

$$\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$

$$\left.-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\right)+$$

$$2\,e^{\frac{\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$

$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.\right.}$$

$$\left.\left.\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Big)\Big/$$

$$\Big((i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2\,\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+\right.\right.}$$

$$\left.\left.s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\Bigg(\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w\Big)$$

$$\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$

$$\left.-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)))\right)+$$

$$2\,e^{\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right.\right.}$$

$$\sqrt{z}\Big)^2\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+$$

$$s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\Bigg(\Big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w\Big)$$

$$\Big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2},$$

$$-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$\left(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)$$

$$\sqrt{\Big(-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\sqrt{z}\big)^2\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+$$

$$s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\Bigg(\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w\Big)$$

$$\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2},$$

$$-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$\left(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\Big)+$$

$$2\,e^{\frac{\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}\left(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)$$

$$\sqrt{\Big(-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$

$$\sqrt{z}\big)^2\Big/\left(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+$$

$$s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/\left(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\Bigg(\Big(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w\Big)$$

$$\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$
$$\left.-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)))\right)+$$
$$2\,e^{\frac{\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$
$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.\right.}$$
$$\left.\left.\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\Big)\Big/$$
$$\left((i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2\,\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+\right.\right.\right.}$$
$$\left.\left.\left.2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.\right.$$
$$\left.\left.(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)\Big/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving rational functions of the direct function, hyperbolic and trigonometric functions

Involving sin and sinh

Involving $\frac{\sin(e\,z)\,\sinh(d\,z)}{a+b\,\cosh(c\,z)}$

01.20.21.4756.01

$$\int \frac{\sin(e\,z)\sinh(d\,z)}{a+b\cosh(c\,z)}\,dz ==$$
$$\frac{1}{4}i\left(\frac{1}{b\sqrt{a^2-b^2}\,(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\sin(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.4757.01

$$\int \frac{\sin(e\,z)\sinh(d\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$
$$\frac{1}{4}i\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\right.\right.$$
$$\left.\left.\left.\left.\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\right.\right.$$

$$\left({}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\right.\right.$$

$$\left.\left.\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$

$$\left.\left.\left({}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)$$

$$\left.\left.\left({}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-{}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-\right.\right.$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.$$

$$\left.\left.\left.\left.{}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}\;-a\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)-\right.$$
$${}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)-a\sqrt{a^2-b^2}$$
$$\left({}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}\;-a}\right)+{}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\sin(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4758.01

$$\int\frac{\sin(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}\,dz==$$
$$\frac{1}{4}\,i\left(\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d+i\,e)}\left(e^{(2\,c+d+i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{d+i\,e}{2\,c}+1,\,1;\,\frac{d+i\,e}{2\,c}+2;\right.\right.\right.\right.$$
$$\left.\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right)$$
$$\left.{}_2F_1\left(\frac{d+i\,e}{2\,c}+1,\,1;\,\frac{d+i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\Bigg)+\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d-i\,e)}$$
$$\left(e^{(2\,c-d-i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{-d-i\,e}{2\,c}+1,\,1;\,\frac{-d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{-d-i\,e}{2\,c}+1,\,1;\,\frac{-d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)-$$
$$\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d+i\,e)}\left(e^{(2\,c-d+i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right)\right.\right.$$
$${}_2F_1\left(\frac{i\,e-d}{2\,c}+1,\,1;\,\frac{i\,e-d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right)$$
$$\left.{}_2F_1\left(\frac{i\,e-d}{2\,c}+1,\,1;\,\frac{i\,e-d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\Bigg)-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d-i\,e)}$$
$$\left(e^{(2\,c+d-i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b\right){}_2F_1\left(\frac{d-i\,e}{2\,c}+1,\,1;\,\frac{d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}\;+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}\;-b\right){}_2F_1\left(\frac{d-i\,e}{2\,c}+1,\,1;\,\frac{d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}\;+b}\right)\right)\right)\Bigg)$$

Involving $\sin(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.4759.01

$$\int \frac{\sin(e\,z)\sinh(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}\,i\left(\left(e^{(2c+d+i\,e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+i\,e}{2c}+1,\,1;\,\frac{d+i\,e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+i\,e}{2c}+1,\,1;\,\frac{d+i\,e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d+i\,e}{2c}+1,\,2;\,\frac{d+i\,e}{2c}+\right.\right.$$
$$\left.2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{d+i\,e}{2c}+1,\,2;\,\frac{d+i\,e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c+d+i\,e)\right)+$$
$$\left(e^{(2c-d-i\,e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-i\,e}{2c}+1,\,1;\,\frac{-d-i\,e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-i\,e}{2c}+1,\,1;\,\frac{-d-i\,e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d-i\,e}{2c}+1,\,2;\,\frac{-d-i\,e}{2c}+\right.\right.$$
$$\left.2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{-d-i\,e}{2c}+1,\,2;\,\frac{-d-i\,e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c-d-i\,e)\right)-$$
$$\left(e^{(2c-d+i\,e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{i\,e-d}{2c}+1,\,1;\,\frac{i\,e-d}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{i\,e-d}{2c}+1,\,1;\,\frac{i\,e-d}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{i\,e-d}{2c}+1,\,2;\,\frac{i\,e-d}{2c}+\right.\right.$$
$$\left.2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{i\,e-d}{2c}+1,\,2;\,\frac{i\,e-d}{2c}+2;\,-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c-d+i\,e)\right)-$$
$$\left(e^{(2c+d-i\,e)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-i\,e}{2c}+1,\,1;\,\frac{d-i\,e}{2c}+2;\,-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{d-ie}{2c}+1,\ 1;\ \frac{d-ie}{2c}+2;\ -\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\ a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d-ie}{2c}+1,\ 2;\ \frac{d-ie}{2c}+\right.\right.$$
$$\left.2;\ -\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\ a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{d-ie}{2c}+1,\ 2;\ \frac{d-ie}{2c}+2;\ -\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c+d-ie)\right)$$

Involving $\sin(ez)\,(a\sinh(cz)+b\cosh(cz))^{-n}$

01.20.21.4760.01

$$\int\frac{\sin(ez)}{a\sinh(cz)+b\cosh(cz)}\,dz==$$
$$-\frac{i}{a-b}\left(\frac{e^{(c-ie)z}}{c-ie}\,{}_2F_1\left(\frac{c-ie}{2c},\ 1;\ \frac{3c-ie}{2c};\ \frac{(a+b)\,e^{2cz}}{a-b}\right)-\frac{e^{(c+ie)z}}{c+ie}\,{}_2F_1\left(\frac{c+ie}{2c},\ 1;\ \frac{3c+ie}{2c};\ \frac{(a+b)\,e^{2cz}}{a-b}\right)\right)$$

01.20.21.4761.01

$$\int\frac{\sin(ez)}{(a\sinh(cz)+b\cosh(cz))^2}\,dz==$$
$$\frac{2i}{(a-b)^2}\left(\frac{e^{(2c-ie)z}}{2c-ie}\,{}_2F_1\left(\frac{2c-ie}{2c},\ 2;\ \frac{4c-ie}{2c};\ \frac{(a+b)\,e^{2cz}}{a-b}\right)-\frac{e^{(2c+ie)z}}{2c+ie}\,{}_2F_1\left(\frac{2c+ie}{2c},\ 2;\ \frac{4c+ie}{2c};\ \frac{(a+b)\,e^{2cz}}{a-b}\right)\right)$$

Involving sin and rational functions of sinh

Involving $\sin(dz)\,(a\sinh(ez)+b\cosh(ez))^{-n}$

01.20.21.4762.01

$$\int\frac{\sin(dz)}{a\sinh(ez)+b\cosh(ez)}\,dz==$$
$$-\frac{i}{a-b}\left(\frac{e^{(e-id)z}}{e-id}\,{}_2F_1\left(\frac{e-id}{2e},\ 1;\ \frac{3e-id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)-\frac{e^{(e+id)z}}{e+id}\,{}_2F_1\left(\frac{e+id}{2e},\ 1;\ \frac{3e+id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)\right)$$

01.20.21.4763.01

$$\int\frac{\sin(dz)}{(a\sinh(ez)+b\cosh(ez))^2}\,dz==$$
$$-\frac{2i}{(a-b)^2}\left(\frac{e^{(2e+id)z}}{2e+id}\,{}_2F_1\left(1+\frac{id}{2e},\ 2;\ 2+\frac{id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)-\frac{e^{(2e-id)z}}{2e-id}\,{}_2F_1\left(1-\frac{id}{2e},\ 2;\ 2-\frac{id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)\right)$$

Involving $\sin(dz)\,(a+b\sinh(ez)+c\cosh(ez))^{-n}$

01.20.21.4764.01

$$\int \frac{\sin(d\,z)}{a+b\sinh(e\,z)+c\cosh(e\,z)}\,dz ==$$

$$-\frac{1}{2}\,i\left(\left(e^{(e-i\,d)\,z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-i\,d}{e},\,1;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)+\left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{e-i\,d}{e},\,1;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\;(e-i\,d)\right)-$$

$$\left(e^{(e+i\,d)\,z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)+\left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.$$

$$\left.\left.{}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\;(e+i\,d)\right)$$

01.20.21.4765.01

$$\int \frac{\sin(d\,z)}{(a+b\sinh(e\,z)+c\cosh(e\,z))^2}\,dz ==$$

$$-\frac{1}{2}\,i\left(\left(e^{(e+i\,d)\,z}\left({}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)a^2-{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.\right.$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right)$$

$${}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)+b^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)-$$

$$c^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)-b^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$\left.\left.c^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e+i\,d)\right)-$$

$$\left(e^{(e-i\,d)\,z}\left({}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-i\,d}{e},\,1;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right)$$

$${}_2F_1\left(\frac{e-i\,d}{e},\,1;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+b^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-$$

$$c^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$\left.\left.c^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e-i\,d)\right)\Bigg)$$

Involving $\sin(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{-n}$

01.20.21.4766.01

$$\int\frac{\sin(d\,z)}{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\,dz==$$

$$-\frac{1}{2}\,i\left(\frac{1}{\sqrt{a}\;\sqrt{b}\;(a+b)\,(2\,e-i\,d)}\left(i\,e^{(2\,e-i\,d)\,z}\left(\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2}\right)-\right.\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2}\right)\right)\right)-$$

$$\frac{1}{\sqrt{a}\;\sqrt{b}\;(a+b)\,(2\,e+i\,d)}\left(i\,e^{(2\,e+i\,d)\,z}\left(\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2}\right)-\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2}\right)\right)\right)\right)$$

01.20.21.4767.01

$$\int \frac{\sin(d\,z)}{\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^2}\,dz ==$$

$$-\frac{1}{2}\,i\left(\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(2\,e-i\,d)}\left(i\,e^{(2\,e-i\,d)\,z}\left((a-b)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\,\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\,\sqrt{b}\right)^2-\right.\right.\right.$$

$$\left(\sqrt{a}-i\,\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\,\sqrt{b}\right)^2}\right)-$$

$$2\,i\,\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\,\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\,\sqrt{b}\right)^2+\right.$$

$$\left.\left.\left.\left.\left(\sqrt{a}-i\,\sqrt{b}\right)^2\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\,\sqrt{b}\right)^2}\right)\right)\right)\right)-\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(2\,e+i\,d)}$$

$$\left(i\,e^{(2\,e+i\,d)\,z}\left((a-b)\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\,\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\,\sqrt{b}\right)^2-\left(\sqrt{a}-i\,\sqrt{b}\right)^2(a-b)\right.\right.$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\,\sqrt{b}\right)^2}\right)-2\,i\,\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\,\sqrt{b}\right)^2}\right)\right.$$

$$\left.\left.\left.\left.\left(\sqrt{a}+i\,\sqrt{b}\right)^2+\left(\sqrt{a}-i\,\sqrt{b}\right)^2\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\,\sqrt{b}\right)^2}\right)\right)\right)\right)\right)$$

Involving $\sin(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4768.01

$$\int \frac{\sin(d\,z)}{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\,dz ==$$

$$-\frac{1}{2}\,i\left(\left(e^{(2\,e+i\,d)\,z}\left(\left(2\,a-b+c+2\sqrt{(a-b)\,(a+c)}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{(a-b)\,(a+c)}\;(b+c)\,(2\,e+i\,d)\right)-\left(e^{(2\,e-i\,d)\,z}\left(\left(2\,a-b+c+2\sqrt{(a-b)\,(a+c)}\right)\right.\right.$$

$${}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)+\left(-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}\right)$$

$$\left.\left.{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)\Bigg/\left(\sqrt{(a-b)\,(a+c)}\;(b+c)\,(2\,e-i\,d)\right)$$

01.20.21.4769.01

$$\int \frac{\sinh(d\,z)}{\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\frac{1}{2\left((a-b)(a+c)\right)^{3/2}(2e-d)}\left((b+c)\,e^{(2e-d)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(1-\frac{d}{2e},\,2;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.$$

$$\left.\left.\left.\frac{{}_2F_1\left(1-\frac{d}{2e},\,2;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.$$

$$\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{d}{2e},\,1;\,2-\frac{d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)-$$

$$\frac{1}{2\left((a-b)(a+c)\right)^{3/2}(d+2e)}\left((b+c)\,e^{(d+2e)z}\left(2\sqrt{(a-b)(a+c)}\right.\right.$$

$$\left.\left(\frac{{}_2F_1\left(\frac{d}{2e}+1,\,2;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\frac{{}_2F_1\left(\frac{d}{2e}+1,\,2;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.$$

$$\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d}{2e}+1,\,1;\,\frac{d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)$$

Involving $\sin(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4770.01

$$\int \frac{\sin(d\,z)}{c\cosh^2(e\,z)+a\sinh^2(e\,z)+b\sinh(2\,e\,z)}\,dz ==$$

$$-\frac{1}{2}\,i\left(\left((a+2\,b+c)\,e^{(2\,e-i\,d)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/$$

$$\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(2\,e-i\,d)\right)-$$

$$\left((a+2\,b+c)\,e^{(2\,e+i\,d)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\right.\right.$$

$$\left.\left.\left.\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/$$

$$\left.\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(2\,e+i\,d)\right)\right)$$

01.20.21.4771.01

$$\int \frac{\sin(d\,z)}{\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$-\frac{1}{2}\,i\left(\left((a+2\,b+c)\,e^{(2\,e+i\,d)\,z}\left(4\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)b^2-\right.\right.\right.$$

$$4\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)b^2+(a-c)\left(-a+c+2\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\sqrt{b^2-a\,c}\;{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+2\,c\sqrt{b^2-a\,c}$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e+i\,d)\right)-\Bigg(\Bigg((a+2\,b+c)\,e^{(2\,e-i\,d)\,z}$$

$$\left(4\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-4\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+\right.$$

$$(a-c)\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\,\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+2\,c\,\sqrt{b^2-a\,c}$$

$${}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left.\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e-i\,d)\right)\right)$$

Involving cos and sinh

Involving $\frac{\cos(e\,z)\,\sinh(d\,z)}{a+b\,\cosh(c\,z)}$

01.20.21.4772.01

$$\int \frac{\cos(e\,z)\sinh(d\,z)}{a+b\cosh(c\,z)}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\,(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$
$$\frac{1}{b\sqrt{a^2-b^2}\,(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\cos(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{-n}$

01.20.21.4773.01

$$\int \frac{\cos(e\,z)\sinh(d\,z)}{(a+b\cosh(c\,z))^2}\,dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+i\,e)}\left(e^{(c+d+i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+i\,e}{c},\,1;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\right.\right.$$
$$\left.\left.\left.\left.\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\right.\right.$$

$$\left({}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+d+i\,e}{c},\,2;\,\frac{d+i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-i\,e)}\left(e^{(c+d-i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-i\,e}{c},\,1;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\right.\right.$$

$$\left.\left.\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$

$$\left.\left.\left({}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+d-i\,e}{c},\,2;\,\frac{d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+i\,e)}\left(e^{(c-d+i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+i\,e}{c},\,1;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\left(b^2-a^2\right)$$

$$\left.\left.\left({}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-\right.\right.$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{c-d+i\,e}{c},\,2;\,\frac{i\,e-d}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-i\,e)}\left(e^{(c-d-i\,e)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e}{c},\,1;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+\right.\right.$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\left.{}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}$$
$$\left({}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c-d-i\,e}{c},\,2;\,\frac{-d-i\,e}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)\Bigg)$$

Involving $\frac{\cos(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4774.01

$$\int\frac{\cos(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}\,dz==$$
$$\frac{1}{4}\left(\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d+i\,e)}\left(e^{(2\,c-d+i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{i\,e-d}{2\,c}+1,\,1;\,\frac{i\,e-d}{2\,c}+2;\right.\right.\right.\right.$$
$$\left.\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}-b\right)$$
$${}_2F_1\left(\frac{i\,e-d}{2\,c}+1,\,1;\,\frac{i\,e-d}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\Bigg)\Bigg)+\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c-d-i\,e)}$$
$$\left(e^{(2\,c-d-i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{-d-i\,e}{2\,c}+1,\,1;\,\frac{-d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(\frac{-d-i\,e}{2\,c}+1,\,1;\,\frac{-d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)-$$
$$\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d+i\,e)}\left(e^{(2\,c+d+i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right)\right.\right.$$
$${}_2F_1\left(\frac{d+i\,e}{2\,c}+1,\,1;\,\frac{d+i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}-b\right)$$
$$\left.{}_2F_1\left(\frac{d+i\,e}{2\,c}+1,\,1;\,\frac{d+i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\Bigg)\Bigg)-\frac{1}{\sqrt{a}\;b\sqrt{a+b}\;(2\,c+d-i\,e)}\right.$$
$$\left(e^{(2\,c+d-i\,e)\,z}\left(\left(2\,a-2\sqrt{a+b}\;\sqrt{a}+b\right){}_2F_1\left(\frac{d-i\,e}{2\,c}+1,\,1;\,\frac{d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\sqrt{a+b}\;\sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left.\left(-2\,a-2\sqrt{a+b}\;\sqrt{a}-b\right){}_2F_1\left(\frac{d-i\,e}{2\,c}+1,\,1;\,\frac{d-i\,e}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\sqrt{a+b}\;\sqrt{a}+b}\right)\right)\right)\right)$$

Involving $\cos(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{-n}$

01.20.21.4775.01

$$\int \frac{\cos(e\,z)\sinh(d\,z)}{\left(a+b\cosh^2(c\,z)\right)^2}\,dz ==$$

$$\frac{1}{4}\left(\left(e^{(2c-d+ie)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{ie-d}{2c}+1,1;\frac{ie-d}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{ie-d}{2c}+1,1;\frac{ie-d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{ie-d}{2c}+1,2;\frac{ie-d}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{ie-d}{2c}+1,2;\frac{ie-d}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-d+ie)\right)+$$
$$\left(e^{(2c-d-ie)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-ie}{2c}+1,1;\frac{-d-ie}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-ie}{2c}+1,1;\frac{-d-ie}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d-ie}{2c}+1,2;\frac{-d-ie}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{-d-ie}{2c}+1,2;\frac{-d-ie}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c-d-ie)\right)-$$
$$\left(e^{(2c+d+ie)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+ie}{2c}+1,1;\frac{d+ie}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+ie}{2c}+1,1;\frac{d+ie}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d+ie}{2c}+1,2;\frac{d+ie}{2c}+\right.\right.$$
$$\left.2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{d+ie}{2c}+1,2;\frac{d+ie}{2c}+2;-\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}b(a+b)^{3/2}(2c+d+ie)\right)-$$
$$\left(e^{(2c+d-ie)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-ie}{2c}+1,1;\frac{d-ie}{2c}+2;-\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\right.\right.$$

$$(-2a-b)\left(2a+2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{d-ie}{2c}+1,\ 1;\ \frac{d-ie}{2c}+2;\ -\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\ a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d-ie}{2c}+1,\ 2;\ \frac{d-ie}{2c}+\right.\right.$$
$$\left.2;\ -\frac{b\,e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\ a+2b\sqrt{a}+b\sqrt{a+b}\right)$$
$$\left.\left.{}_2F_1\left(\frac{d-ie}{2c}+1,\ 2;\ \frac{d-ie}{2c}+2;\ -\frac{b\,e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/\left(2a^{3/2}\,b\,(a+b)^{3/2}\,(2c+d-ie)\right)$$

Involving cos and rational functions of sinh

Involving $\cos(dz)\,(a\sinh(ez)+b\cosh(ez))^{-n}$

01.20.21.4776.01

$$\int\frac{\cos(dz)}{a\sinh(ez)+b\cosh(ez)}\,dz==$$
$$-\frac{1}{a-b}\left(\frac{e^{(e-id)z}}{e-id}\,{}_2F_1\left(\frac{e-id}{2e},\ 1;\ \frac{3e-id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)+\frac{e^{(e+id)z}}{e+id}\,{}_2F_1\left(\frac{e+id}{2e},\ 1;\ \frac{3e+id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)\right)$$

01.20.21.4777.01

$$\int\frac{\cos(dz)}{(a\sinh(ez)+b\cosh(ez))^2}\,dz==$$
$$\frac{2}{(a-b)^2}\left(\frac{e^{(2e+id)z}}{2e+id}\,{}_2F_1\left(1+\frac{id}{2e},\ 2;\ 2+\frac{id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)+\frac{e^{(2e-id)z}}{2e-id}\,{}_2F_1\left(1-\frac{id}{2e},\ 2;\ 2-\frac{id}{2e};\ \frac{(a+b)\,e^{2ez}}{a-b}\right)\right)$$

Involving $\cos(dz)\,(a+b\sinh(ez)+c\cosh(ez))^{-n}$

01.20.21.4778.01

$$\int\frac{\cos(dz)}{a+b\sinh(ez)+c\cosh(ez)}\,dz==$$
$$\frac{1}{2}\left(-\left(e^{(e-id)z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-id}{e},\ 1;\ 2-\frac{id}{e};\ \frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)+\left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{e-id}{e},\ 1;\ 2-\frac{id}{e};\ -\frac{(b+c)\,e^{ez}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\ (e-id)\right)-$$
$$\left(e^{(e+id)z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+id}{e},\ 1;\ 2+\frac{id}{e};\ \frac{(b+c)\,e^{ez}}{\sqrt{a^2+b^2-c^2}-a}\right)+\left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.$$
$$\left.\left.{}_2F_1\left(\frac{e+id}{e},\ 1;\ 2+\frac{id}{e};\ -\frac{(b+c)\,e^{ez}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\sqrt{a^2+b^2-c^2}\ (e+id)\right)\Bigg)$$

01.20.21.4779.01

$$\int \frac{\cos(d\,z)}{(a+b\sinh(e\,z)+c\cosh(e\,z))^2}\,dz ==$$

$$\frac{1}{2}\left(\left(e^{(e-i\,d)\,z}\left({}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.\right.$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-i\,d}{e},\,1;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right)$$

$${}_2F_1\left(\frac{e-i\,d}{e},\,1;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+b^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-$$

$$c^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$\left.\left.\left.c^2\,{}_2F_1\left(\frac{e-i\,d}{e},\,2;\,2-\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right)\Big/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e-i\,d)\right)+$$

$$\left(e^{(e+i\,d)\,z}\left({}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a^2-{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+\right.\right.$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-a\left(a+\sqrt{a^2+b^2-c^2}\right)$$

$$ {}_2F_1\left(\frac{e+i\,d}{e},\,1;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)+b^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)- $$

$$ c^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)-b^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+ $$

$$ c^2\,{}_2F_1\left(\frac{e+i\,d}{e},\,2;\,2+\frac{i\,d}{e};\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Big/\Big((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e+i\,d)\Big)\Bigg) $$

Involving $\cos(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{-n}$

01.20.21.4780.01

$$ \int\frac{\cos(d\,z)}{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\,dz== $$

$$ \frac{1}{2}\left(-\frac{1}{\sqrt{a}\;\sqrt{b}\;(a+b)\,(2\,e-i\,d)}\left(i\,e^{(2\,e-i\,d)\,z}\left(\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2}\right)-\right.\right.\right. $$

$$ \left.\left.\left.\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2}\right)\right)\right)- $$

$$ \frac{1}{\sqrt{a}\;\sqrt{b}\;(a+b)\,(2\,e+i\,d)}\left(i\,e^{(2\,e+i\,d)\,z}\left(\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2}\right)-\right.\right. $$

$$ \left.\left.\left.\left(\sqrt{a}\;-i\,\sqrt{b}\right)^2\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\;+i\,\sqrt{b}\right)^2}\right)\right)\right)\right)\right) $$

01.20.21.4781.01

$$\int \frac{\cos(d\,z)}{\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(2\,e-i\,d)}\left(i\,e^{(2\,e-i\,d)\,z}\left((a-b)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\right.\right.\right.$$

$$\left.\left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-\right.$$

$$2\,i\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2+\right.$$

$$\left.\left.\left.\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)-$$

$$\frac{1}{2\,a^{3/2}\,b^{3/2}\,(a+b)\,(2\,e+i\,d)}\left(i\,e^{(2\,e+i\,d)\,z}\left((a-b)\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\right.\right.$$

$$\left.\left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-\right.$$

$$2\,i\sqrt{a}\,\sqrt{b}\left({}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2+\right.$$

$$\left.\left.\left.\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\right)$$

Involving $\cos(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4782.01

$$\int \frac{\cos(d\,z)}{a+b\sinh^2(e\,z)+c\cosh^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(\left(e^{(2e+i\,d)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(1+\frac{i\,d}{2e},\,1;\,2+\frac{i\,d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(1+\frac{i\,d}{2e},\,1;\,2+\frac{i\,d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/$$

$$\left(\sqrt{(a-b)(a+c)}\;(b+c)\,(2e+i\,d)\right)+\left(e^{(2e-i\,d)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right)\right.\right.$$

$${}_2F_1\left(1-\frac{i\,d}{2e},\,1;\,2-\frac{i\,d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right)$$

$$\left.\left.{}_2F_1\left(1-\frac{i\,d}{2e},\,1;\,2-\frac{i\,d}{2e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a-b)(a+c)}\;(b+c)\,(2e-i\,d)\right)$$

01.20.21.4783.01

$$\int \frac{\cos(d\,z)}{\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left(\left((b+c)\,e^{(2e-i\,d)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Big/\left(2\left((a-b)(a+c)\right)^{3/2}(2e-i\,d)\right)-$$

$$\left((b+c)\,e^{(2e+i\,d)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.$$

$$\left.\left.\left.\frac{{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Big/\left(2\left((a-b)(a+c)\right)^{3/2}(2e+i\,d)\right)\Bigg)$$

Involving $\cos(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{-n}$

01.20.21.4784.01

$$\int \frac{\cos(d\,z)}{a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)}\,dz ==$$

$$\frac{1}{2}\left(-\left((a+2\,b+c)\,e^{(2\,e-i\,d)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/$$

$$\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(2\,e-i\,d)\right)-$$

$$\left((a+2\,b+c)\,e^{(2\,e+i\,d)\,z}\left(\left(-a+c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+\right.\right.$$

$$\left.\left.\left(a-c+2\sqrt{b^2-a\,c}\right){}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)\right)\right)\Big/$$

$$\left.\left(\sqrt{b^2-a\,c}\left(a-c+2\sqrt{b^2-a\,c}\right)\left(-a+c+2\sqrt{b^2-a\,c}\right)(2\,e+i\,d)\right)\right)$$

01.20.21.4785.01

$$\int \frac{\cos(d\,z)}{\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(\left((a+2\,b+c)\,e^{(2\,e+i\,d)\,z}\left(4\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)b^2-\right.\right.\right.$$

$$4\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)b^2+(a-c)\left(-a+c+2\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,1;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\sqrt{b^2-a\,c}\;{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+2\,c\sqrt{b^2-a\,c}$$

$${}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1+\frac{i\,d}{2\,e},\,2;\,2+\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e+i\,d)\right)+\Bigg((a+2\,b+c)\,e^{(2\,e-i\,d)\,z}$$

$$\left(4\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-4\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+\right.$$

$$(a-c)\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+(a-c)\left(a-c+2\,\sqrt{b^2-a\,c}\right)$$

$${}_2F_1\left(1-\frac{i\,d}{2\,e},\,1;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-4\,a\,c\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+2\,c\,\sqrt{b^2-a\,c}$$

$${}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+4\,a\,c\,{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(1-\frac{i\,d}{2\,e},\,2;\,2-\frac{i\,d}{2\,e};\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left.\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e-i\,d)\right)\right)$$

Involving algebraic functions of the direct function, hyperbolic and trigonometric functions

Involving sin and sinh

Involving $\sin(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.4786.01

$$\int \sin(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz ==$$

$$\frac{1}{4}i\left(\frac{1}{-d+i\,e\,-c\,\beta}\left(e^{(i\,e-d)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.\right.$$

$$\left.F_1\left(\frac{-d+i\,e\,-c\,\beta}{c};-\beta,-\beta;\frac{-d+i\,e\,-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)-$$

$$\frac{1}{d+i\,e\,-c\,\beta}\left(e^{(d+i\,e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{d+i\,e\,-c\,\beta}{c};-\beta,-\beta;\frac{d+i\,e\,-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)-$$

$$\frac{1}{-d-i\,e-c\,\beta}\left(e^{(-d-i\,e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{-d-i\,e-c\,\beta}{c};-\beta,-\beta;\frac{-d-i\,e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)+$$

$$\frac{1}{d-i\,e-c\,\beta}\left(e^{(d-i\,e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{d-i\,e-c\,\beta}{c};-\beta,-\beta;\frac{d-i\,e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)\right)$$

Involving $\sin(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.4787.01

$$\int \sin(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{4}i\left(\frac{1}{-d+i\,e-2\,c\,\beta}\left(e^{(i\,e-d)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{i\,e-d}{2\,c}-\beta;-\beta,-\beta;\frac{i\,e-d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)-$$
$$\frac{1}{d+i\,e-2\,c\,\beta}\left(e^{(d+i\,e)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$
$$\left.F_1\left(\frac{d+i\,e}{2\,c}-\beta;-\beta,-\beta;\frac{d+i\,e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)-$$
$$\frac{1}{-d-i\,e-2\,c\,\beta}\left(e^{(-d-i\,e)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$
$$\left.F_1\left(\frac{-d-i\,e}{2\,c}-\beta;-\beta,-\beta;\frac{-d-i\,e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)+$$
$$\frac{1}{d-i\,e-2\,c\,\beta}\left(e^{(d-i\,e)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{d-i\,e}{2\,c}-\beta;-\beta,-\beta;\frac{d-i\,e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)\right)$$

Involving sin, algebraic functions of sinh and exp

Involving $\sin(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^{\beta}$

01.20.21.4788.01

$$\int \sin(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^{\beta}\,dz ==$$

$$-\frac{1}{2}i\left(\frac{1}{i\,d+e\,\beta}\left(2^{-\beta}\,e^{-i\,d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^{\beta}\,{}_2F_1\right.\right.$$
$$\left.\left(\frac{-i\,d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(2-\frac{i\,d}{e}-\beta\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)-\frac{1}{-i\,d+e\,\beta}\left(2^{-\beta}\,e^{i\,d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\right.$$
$$\left.\left.\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^{\beta}\,{}_2F_1\left(\frac{i\,d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(2+\frac{i\,d}{e}-\beta\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)\right)$$

Involving $\sin(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}$

01.20.21.4789.01

$$\int \sin(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}\,dz == -\frac{1}{2}\,i$$
$$\left(\frac{1}{i\,d+e\,\beta}\left(2^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(-\frac{i\,d}{e}-\beta;-\beta,-\beta;1-\frac{i\,d}{e}-\beta;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)\right)-\frac{1}{-i\,d+e\,\beta}$$
$$\left(2^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{i\,d}{e}-\beta;-\beta,-\beta;1+\frac{i\,d}{e}-\beta;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\right)\right)\right)$$

Involving $\sin(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4790.01

$$\int \sin(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}\,dz ==$$
$$-\frac{1}{2}\,i\left(\frac{1}{i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(-\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1-\frac{i\,d}{2\,e}-\beta;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)-$$
$$\frac{1}{-i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1+\frac{i\,d}{2\,e}-\beta;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)\right)$$

Involving $\sin(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4791.01

$$\int \sin(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$-\frac{1}{2}i\left(\frac{1}{i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$F_1\left(-\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1-\frac{i\,d}{2\,e}-\beta;\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)-$$
$$\frac{1}{-i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1+\frac{i\,d}{2\,e}-\beta;\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)$$

Involving $\sin(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4792.01

$$\int \sin(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{\beta}\,dz ==$$

$$-\frac{1}{2}i\left(\frac{1}{i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+2\,b+c)}{-a+c+2\sqrt{b^2-a\,c}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+\left(1+e^{2\,e\,z}\right)\left(2\,b\left(-1+e^{2\,e\,z}\right)+c\left(1+e^{2\,e\,z}\right)\right)\right)\right)^{\beta}$$
$$F_1\left(-\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1-\frac{i\,d}{2\,e}-\beta;-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{-a+c+2\sqrt{b^2-a\,c}},\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-$$
$$\frac{1}{-i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+2\,b+c)}{-a+c+2\sqrt{b^2-a\,c}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+\left(1+e^{2\,e\,z}\right)\left(2\,b\left(-1+e^{2\,e\,z}\right)+c\left(1+e^{2\,e\,z}\right)\right)\right)\right)^{\beta}$$
$$\left.\left.F_1\left(\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1+\frac{i\,d}{2\,e}-\beta;-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{-a+c+2\sqrt{b^2-a\,c}},\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)\right)\right)$$

Involving cos and sinh

Involving $\cos(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}$

01.20.21.4793.01

$$\int \cos(e\,z)\sinh(d\,z)\,(a+b\cosh(c\,z))^{\beta}\,dz ==$$

$$\frac{1}{4}\left(-\frac{1}{-d+i\,e\,-c\,\beta}\left(e^{(i\,e-d)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.\right.$$

$$\left.F_1\left(\frac{-d+i\,e\,-c\,\beta}{c};-\beta,-\beta;\frac{-d+i\,e\,-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)+$$

$$\frac{1}{d+i\,e\,-c\,\beta}\left(e^{(d+i\,e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{d+i\,e\,-c\,\beta}{c};-\beta,-\beta;\frac{d+i\,e\,-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)-$$

$$\frac{1}{-d-i\,e-c\,\beta}\left(e^{(-d-i\,e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{-d-i\,e-c\,\beta}{c};-\beta,-\beta;\frac{-d-i\,e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)+$$

$$\frac{1}{d-i\,e-c\,\beta}\left(e^{(d-i\,e)\,z}\left(1-\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)^{-\beta}\left(\frac{2\,e^{c\,z}\,b}{2\,a+\sqrt{4\,a^2-4\,b^2}}+1\right)^{-\beta}\left(a+\frac{1}{2}\,b\,e^{-c\,z}\left(1+e^{2\,c\,z}\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{d-i\,e-c\,\beta}{c};-\beta,-\beta;\frac{d-i\,e-c\,\beta}{c}+1;-\frac{2\,b\,e^{c\,z}}{2\,a+\sqrt{4\,a^2-4\,b^2}},\frac{2\,b\,e^{c\,z}}{\sqrt{4\,a^2-4\,b^2}\,-2\,a}\right)\right)\right)$$

Involving $\cos(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}$

01.20.21.4794.01

$$\int \cos(e\,z)\sinh(d\,z)\left(a+b\cosh^2(c\,z)\right)^{\beta}\,dz ==$$

$$\frac{1}{4}\left(-\frac{1}{-d+i\,e-2\,c\,\beta}\left(e^{(i\,e-d)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{i\,e-d}{2\,c}-\beta;-\beta,-\beta;\frac{i\,e-d}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)+$$
$$\frac{1}{d+i\,e-2\,c\,\beta}\left(e^{(d+i\,e)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$
$$\left.F_1\left(\frac{d+i\,e}{2\,c}-\beta;-\beta,-\beta;\frac{d+i\,e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)-$$
$$\frac{1}{-d-i\,e-2\,c\,\beta}\left(e^{(-d-i\,e)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$
$$\left.F_1\left(\frac{-d-i\,e}{2\,c}-\beta;-\beta,-\beta;\frac{-d-i\,e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)+$$
$$\frac{1}{d-i\,e-2\,c\,\beta}\left(e^{(d-i\,e)\,z}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b-2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{e^{2\,c\,z}\,b}{2\,a+b+2\sqrt{a\,(a+b)}}+1\right)^{-\beta}\left(\frac{1}{4}\,b\,e^{-2\,c\,z}\left(1+e^{2\,c\,z}\right)^2+a\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{d-i\,e}{2\,c}-\beta;-\beta,-\beta;\frac{d-i\,e}{2\,c}-\beta+1;-\frac{b\,e^{2\,c\,z}}{2\,a+b+2\sqrt{a\,(a+b)}},-\frac{b\,e^{2\,c\,z}}{2\,a+b-2\sqrt{a\,(a+b)}}\right)\right)\right)$$

Involving cos, algebraic functions of sinh and exp

Involving $\cos(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^{\beta}$

01.20.21.4795.01

$$\int \cos(d\,z)\,(a\sinh(e\,z)+b\cosh(e\,z))^{\beta}\,dz ==$$

$$\frac{1}{2}\left(-\frac{1}{i\,d+e\,\beta}\left(2^{-\beta}\,e^{-i\,d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^{\beta}\,{}_2F_1\right.\right.$$
$$\left.\left(\frac{-i\,d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(2-\frac{i\,d}{e}-\beta\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)-\frac{1}{-i\,d+e\,\beta}\left(2^{-\beta}\,e^{i\,d\,z}\left(\frac{e^{2\,e\,z}\,(a+b)}{b-a}+1\right)^{-\beta}\right.$$
$$\left.\left.\left(e^{-e\,z}\left(a\left(-1+e^{2\,e\,z}\right)+b\left(1+e^{2\,e\,z}\right)\right)\right)^{\beta}\,{}_2F_1\left(\frac{i\,d-e\,\beta}{2\,e},-\beta;\frac{1}{2}\left(2+\frac{i\,d}{e}-\beta\right);\frac{(a+b)\,e^{2\,e\,z}}{a-b}\right)\right)\right)$$

Involving $\cos(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}$

01.20.21.4796.01

$$\int \cos(d\,z)\,(a+b\sinh(e\,z)+c\cosh(e\,z))^{\beta}\,dz == \frac{1}{2}$$
$$\left(-\frac{1}{-i\,d+e\,\beta}\left(2^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{i\,d}{e}-\beta;-\beta,-\beta;1+\frac{i\,d}{e}-\beta;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)-\frac{1}{i\,d+e\,\beta}$$
$$\left(2^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{e\,z}\,(b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e\,z}\left(2\,e^{e\,z}\,a+c\,e^{2\,e\,z}+c+b\left(-1+e^{2\,e\,z}\right)\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(-\frac{i\,d}{e}-\beta;-\beta,-\beta;1-\frac{i\,d}{e}-\beta;-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}},\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)\right)$$

Involving $\cos(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4797.01

$$\int \cos(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{\beta}\,dz ==$$
$$\frac{1}{2}\left(-\frac{1}{-i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1+\frac{i\,d}{2\,e}-\beta;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)-$$
$$\frac{1}{i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+b)}{-a+b+2\sqrt{-a\,b}}+1\right)^{-\beta}\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+b\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(-\frac{i\,d}{2\,e}-\beta;-\beta,-\beta;1-\frac{i\,d}{2\,e}-\beta;-\frac{(a+b)\,e^{2\,e\,z}}{-a+b+2\sqrt{-a\,b}},\frac{(a+b)\,e^{2\,e\,z}}{a-b+2\sqrt{-a\,b}}\right)\right)\right)$$

Involving $\cos(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4798.01

$$\int \cos(d\,z)\left(a+b\sinh^2(e\,z)+c\cosh^2(e\,z)\right)^{\beta}dz ==$$

$$\frac{1}{2}\left(-\frac{1}{-i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$F_1\left(\frac{i\,d}{2\,e}-\beta;\,-\beta,\,-\beta;\,1+\frac{i\,d}{2\,e}-\beta;\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)-$$
$$\frac{1}{i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(b+c)}{2\,a-b+c+2\sqrt{(a-b)\,(a+c)}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,e\,z}\left(b\left(-1+e^{2\,e\,z}\right)^2+4\,a\,e^{2\,e\,z}+c\left(1+e^{2\,e\,z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{i\,d}{2\,e}-\beta;\,-\beta,\,-\beta;\,1-\frac{i\,d}{2\,e}-\beta;\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c-2\sqrt{(a-b)\,(a+c)}},\,\frac{(b+c)\,e^{2\,e\,z}}{-2\,a+b-c+2\sqrt{(a-b)\,(a+c)}}\right)\right)\right)$$

Involving $\cos(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{\beta}$

01.20.21.4799.01

$$\int \cos(d\,z)\left(a\sinh^2(e\,z)+b\sinh(2\,e\,z)+c\cosh^2(e\,z)\right)^{\beta}dz ==$$

$$\frac{1}{2}\left(-\frac{1}{-i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{i\,d\,z}\left(1-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+2\,b+c)}{-a+c+2\sqrt{b^2-a\,c}}+1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+\left(1+e^{2\,e\,z}\right)\left(2\,b\left(-1+e^{2\,e\,z}\right)+c\left(1+e^{2\,e\,z}\right)\right)\right)\right)^{\beta}$$
$$F_1\left(\frac{i\,d}{2\,e}-\beta;\,-\beta,\,-\beta;\,1+\frac{i\,d}{2\,e}-\beta;\,-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{-a+c+2\sqrt{b^2-a\,c}},\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)-$$
$$\frac{1}{i\,d+2\,e\,\beta}\left(4^{-\beta}\,e^{-i\,d\,z}\left(1-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)^{-\beta}\left(\frac{e^{2\,e\,z}\,(a+2\,b+c)}{-a+c+2\sqrt{b^2-a\,c}}+1\right)^{-\beta}\right.$$
$$\left(e^{-2\,e\,z}\left(a\left(-1+e^{2\,e\,z}\right)^2+\left(1+e^{2\,e\,z}\right)\left(2\,b\left(-1+e^{2\,e\,z}\right)+c\left(1+e^{2\,e\,z}\right)\right)\right)\right)^{\beta}$$
$$\left.\left.F_1\left(-\frac{i\,d}{2\,e}-\beta;\,-\beta,\,-\beta;\,1-\frac{i\,d}{2\,e}-\beta;\,-\frac{(a+2\,b+c)\,e^{2\,e\,z}}{-a+c+2\sqrt{b^2-a\,c}},\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\sqrt{b^2-a\,c}}\right)\right)\right)$$

Involving functions of the direct function, hyperbolic, exponential and a power functions

Involving powers of the direct function, hyperbolic, exponential and a power functions

Involving sinh, exp and power

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh(c\,z)\, \cosh^{\nu}(a\,z)$

01.20.21.4800.01

$$\int z^{\alpha-1}\, e^{p\,z}\, \sinh(c\,z)\, \cosh^{\nu}(a\,z)\, dz ==$$

$$2^{-\nu-1}\, z^{\alpha}\left(\binom{\nu}{\frac{\nu}{2}}\left(E_{1-\alpha}((-p-c)\,z)-E_{1-\alpha}((c-p)\,z)\right)(\nu \bmod 2-1)-\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(E_{1-\alpha}((-p-c-2\,a\,s+a\,\nu)\,z)-\right.\right.$$

$$\left.\left.E_{1-\alpha}((-p+c-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-p-c+2\,a\,s-a\,\nu)\,z)-E_{1-\alpha}((-p+c+2\,a\,s-a\,\nu)\,z)\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4801.01

$$\int z^{n}\, e^{p\,z}\, \sinh(c\,z)\, \cosh^{\nu}(a\,z)\, dz ==$$

$$\frac{1}{2}\left(1+e^{2\,a\,z}\right)^{-\nu}\cosh^{\nu}(a\,z)\,n!\left(e^{(c+p)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(c+p-a\,\nu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(\frac{c+p-a\,\nu}{2\,a},\ \ldots,\ \frac{c+p-a\,\nu}{2\,a},\right.\right.$$

$$\left.-\nu;\ \frac{c+p-a\,\nu}{2\,a}+1,\ \ldots,\ \frac{c+p-a\,\nu}{2\,a}+1;\ -e^{2\,a\,z}\right)-e^{(p-c)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(-c+p-a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left.{}_{j+2}F_{j+1}\left(\frac{-c+p-a\,\nu}{2\,a},\ \ldots,\ \frac{-c+p-a\,\nu}{2\,a},\ -\nu;\ \frac{-c+p-a\,\nu}{2\,a}+1,\ \ldots,\ \frac{-c+p-a\,\nu}{2\,a}+1;\ -e^{2\,a\,z}\right)\right)\Big/;\ n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh(c\,z+d)\, \cosh^{\nu}(a\,z)$

01.20.21.4802.01

$$\int z^{\alpha-1}\, e^{p\,z}\, \sinh(d+c\,z)\, \cosh^{\nu}(a\,z)\, dz ==$$

$$2^{-\nu-1}\, z^{\alpha}\left(e^{-d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,d}\,E_{1-\alpha}(-(c+p)\,z)-E_{1-\alpha}((c-p)\,z)\right)(\nu \bmod 2-1)-e^{-d}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-E_{1-\alpha}((c-p-2\,a\,s+a\,\nu)\,z)+\right.\right.$$

$$\left.\left.e^{2\,d}\,E_{1-\alpha}(-(c+p-2\,a\,s+a\,\nu)\,z)-E_{1-\alpha}((c-p+2\,a\,s-a\,\nu)\,z)+e^{2\,d}\,E_{1-\alpha}(-(c+p+2\,a\,s-a\,\nu)\,z)\right)\right)\Big/;\ \nu\in\mathbb{N}^{+}$$

01.20.21.4803.01

$$\int z^n e^{p z} \sinh(d + c z) \cosh^{\nu}(a z)\, dz ==$$

$$\frac{1}{2}\left(1 + e^{-2 a z}\right)^{-\nu} \cosh^{\nu}(a z)\, n! \left(e^{d+(c+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c+p+a\nu}{2a}, \ldots, -\frac{c+p+a\nu}{2a}, \right.\right.$$

$$\left. -\nu; 1 - \frac{c+p+a\nu}{2a}, \ldots, 1 - \frac{c+p+a\nu}{2a}; -e^{-2 a z} \right) - e^{(p-c) z - d} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-c + p + a \nu)^{-j-1}}{(n-j)!}$$

$$\left. {}_{j+2}F_{j+1}\left(-\frac{-c+p+a\nu}{2a}, \ldots, -\frac{-c+p+a\nu}{2a}, -\nu; 1 - \frac{-c+p+a\nu}{2a}, \ldots, 1 - \frac{-c+p+a\nu}{2a}; -e^{-2 a z} \right) \right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{p z} \sinh(c z) \cosh^{\nu}(a z + b)$

01.20.21.4804.01

$$\int z^{\alpha-1} e^{p z} \sinh(c z) \cosh^{\nu}(b + a z)\, dz == 2^{-\nu-1} z^{\alpha} \left(\binom{\nu}{\frac{\nu}{2}} (E_{1-\alpha}(-(c+p) z) - E_{1-\alpha}((c-p) z))\, (\nu \bmod 2 - 1) - \right.$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-2 b s - b \nu} \binom{\nu}{s} \left(-e^{4 b s} E_{1-\alpha}((c - p - 2 a s + a \nu) z) + e^{2 b \nu} E_{1-\alpha}(-(c + p - 2 a s + a \nu) z) - \right.$$

$$\left. \left. e^{2 b \nu} E_{1-\alpha}((c - p + 2 a s - a \nu) z) + e^{4 b s} E_{1-\alpha}(-(c + p + 2 a s - a \nu) z) \right) \right) /; \nu \in \mathbb{N}^+$$

01.20.21.4805.01

$$\int z^n e^{p z} \sinh(c z) \cosh^{\nu}(b + a z)\, dz ==$$

$$\frac{1}{2}\left(1 + e^{-2 (b+a z)}\right)^{-\nu} \cosh^{\nu}(b + a z)\, n! \left(e^{(c+p) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c+p+a\nu}{2a}, \ldots, -\frac{c+p+a\nu}{2a}, \right.\right.$$

$$\left. -\nu; 1 - \frac{c+p+a\nu}{2a}, \ldots, 1 - \frac{c+p+a\nu}{2a}; -e^{-2 (b+a z)} \right) - e^{(p-c) z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-c + p + a \nu)^{-j-1}}{(n-j)!}$$

$$\left. {}_{j+2}F_{j+1}\left(-\frac{-c+p+a\nu}{2a}, \ldots, -\frac{-c+p+a\nu}{2a}, -\nu; 1 - \frac{-c+p+a\nu}{2a}, \ldots, 1 - \frac{-c+p+a\nu}{2a}; -e^{-2 (b+a z)} \right) \right) /; n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{p z} \sinh(c z + d) \cosh^{\nu}(a z + b)$

01.20.21.4806.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh(d+c\,z) \cosh^{\nu}(b+a\,z)\, dz == 2^{-\nu-1}\, z^{\alpha}\left(e^{-d}\binom{\nu}{\frac{\nu}{2}}\left(e^{2\,d}\, E_{1-\alpha}(-(c+p)\,z) - E_{1-\alpha}((c-p)\,z)\right)(\nu \bmod 2 - 1) - \right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} e^{-d-2\,b\,s-b\,\nu}\binom{\nu}{s}\left(-e^{4\,b\,s}\, E_{1-\alpha}((c-p-2\,a\,s+a\,\nu)\,z) + e^{2\,(d+b\,\nu)}\, E_{1-\alpha}(-(c+p-2\,a\,s+a\,\nu)\,z) - \right.$$

$$\left.\left. e^{2\,b\,\nu}\, E_{1-\alpha}((c-p+2\,a\,s-a\,\nu)\,z) + e^{2\,d+4\,b\,s}\, E_{1-\alpha}(-(c+p+2\,a\,s-a\,\nu)\,z)\right)\right) /;\ \nu \in \mathbb{N}^{+}$$

01.20.21.4807.01

$$\int z^{n}\, e^{p\,z} \sinh(d+c\,z) \cosh^{\nu}(b+a\,z)\, dz ==$$

$$\frac{1}{2}\left(1+e^{-2\,(b+a\,z)}\right)^{-\nu} \cosh^{\nu}(b+a\,z)\, n!\left(e^{d+(c+p)\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\, z^{n-j}\,(c+p+a\,\nu)^{-j-1}}{(n-j)!}\ {}_{j+2}F_{j+1}\left(-\frac{c+p+a\,\nu}{2\,a},\ \ldots,\ -\frac{c+p+a\,\nu}{2\,a},\right.\right.$$

$$\left.-\nu;\ 1-\frac{c+p+a\,\nu}{2\,a},\ \ldots,\ 1-\frac{c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right) - e^{(p-c)\,z-d}\sum_{j=0}^{n}\frac{(-1)^{j}\, z^{n-j}\,(-c+p+a\,\nu)^{-j-1}}{(n-j)!}$$

$$\left.\left.{}_{j+2}F_{j+1}\left(-\frac{-c+p+a\,\nu}{2\,a},\ \ldots,\ -\frac{-c+p+a\,\nu}{2\,a},\ -\nu;\ 1-\frac{-c+p+a\,\nu}{2\,a},\ \ldots,\ 1-\frac{-c+p+a\,\nu}{2\,a};\ -e^{-2\,(b+a\,z)}\right)\right) /;\ n \in \mathbb{N}\right.$$

Involving $z^{n}\, e^{p\,z^{r}} \sinh\left(b\,z^{r}\right) \cosh^{\nu}(c\,z)$

01.20.21.4808.01

$$\int z^n e^{p z^2} \sinh\left(b z^2\right) \cosh^{\nu}(c z)\, dz == \frac{2^{-\nu-2}}{\sqrt{p-b}\ \sqrt{b+p}}$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{\frac{c^2 p (\nu-2s)^2}{2(b-p)(b+p)}} \binom{\nu}{s} \left(e^{\frac{c^2 (\nu-2s)^2}{4(b+p)}} \sqrt{b+p} \sum_{q=0}^{n} 2^{q-n} (p-b)^{-n-\frac{1}{2}} (c(\nu-2s))^{n-q} \left(\frac{(c(\nu-2s)+2(b-p)z)^2}{b-p} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$(2cs - c\nu - 2bz + 2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(c(\nu-2s)+2(b-p)z)^2}{4(b-p)} \right) +$$

$$e^{\frac{c^2 (\nu-2s)^2}{4(b+p)}} \sqrt{b+p} \sum_{q=0}^{n} (p-b)^{-n-\frac{1}{2}} \left(c\left(s - \frac{\nu}{2} \right) \right)^{n-q} (-2cs + c\nu - 2bz + 2pz)^{q+1}$$

$$\left(\frac{(-2cs + c\nu - 2bz + 2pz)^2}{b-p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(-2cs + c\nu - 2bz + 2pz)^2}{4(b-p)} \right) - e^{\frac{c^2 (\nu-2s)^2}{4(p-b)}} \sqrt{p-b}$$

$$\left(\sum_{q=0}^{n} 2^{q-n} (b+p)^{-n-\frac{1}{2}} (c(\nu-2s))^{n-q} (c(2s-\nu)+2(b+p)z)^{q+1} \left(-\frac{(c(2s-\nu)+2(b+p)z)^2}{b+p} \right)^{\frac{1}{2}(-q-1)} \right.$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c(2s-\nu)+2(b+p)z)^2}{4(b+p)} \right) + \sum_{q=0}^{n} (b+p)^{-n-\frac{1}{2}} \left(c\left(s - \frac{\nu}{2} \right) \right)^{n-q} (c(\nu-2s)+2(b+p)z)^{q+1}$$

$$\left. \left. \left(-\frac{(c(\nu-2s)+2(b+p)z)^2}{b+p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c(\nu-2s)+2(b+p)z)^2}{4(b+p)} \right) \right) \right) -$$

$$2^{-\nu-2} z^{n+1} \binom{\nu}{\frac{\nu}{2}} \left(\left((-b-p)z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-p)z^2 \right) - \left((b-p)z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b-p)z^2 \right) \right)$$

$(1 - \nu \bmod 2)$ /; $\nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$

01.20.21.4809.01

$$\int z^n e^{p\sqrt{z}} \sinh\left(b\sqrt{z}\right) \cosh^{\nu}(c z)\, dz ==$$

$$\frac{2^{-2n-\nu-2}}{c^2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \frac{1}{(\nu-2s)^2} \binom{\nu}{s} \left(e^{-\frac{(b+p)^2}{8cs-4c\nu}} (c(2s-\nu))^{-2n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b+p)^{-h-k+2n} \left(b+p+2c(2s-\nu)\sqrt{z} \right)^{h+k} \right.$$

$$\left(-\frac{\left(b+p+2c(2s-\nu)\sqrt{z} \right)^2}{c(2s-\nu)} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \left((b+p)\left(b+p+2c(2s-\nu)\sqrt{z} \right) \Gamma\left(\frac{1}{2}(h+k+1), \right. \right.$$

$$\left. \left. -\frac{\left(b+p+2c(2s-\nu)\sqrt{z} \right)^2}{c(8s-4\nu)} \right) + 2c(2s-\nu) \sqrt{-\frac{\left(b+p+2c(2s-\nu)\sqrt{z} \right)^2}{c(2s-\nu)}}\ \Gamma\left(\right. \right.$$

$$\frac{1}{2}(h+k+2),\ -\frac{\left(b+p+2c(2s-v)\sqrt{z}\right)^2}{c(8s-4v)}\Bigg)\Bigg)-e^{-\frac{(b-p)^2}{8cs-4cv}}(c(2s-v))^{-2n}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(p-b)^{-h-k+2n}\left(-b+p+2c(2s-v)\sqrt{z}\right)^{h+k}\left(-\frac{\left(b-p+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((p-b)\left(-b+p+2c(2s-v)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(b-p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)+$$

$$2c(2s-v)\sqrt{-\frac{\left(b-p+2c(v-2s)\sqrt{z}\right)^2}{c(2s-v)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ -\frac{\left(b-p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)\Bigg)+$$

$$e^{\frac{(b-p)^2}{8cs-4cv}}(c(v-2s))^{-2n}\Bigg(e^{\frac{bp}{2cs-cv}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(b+p)^{-h-k+2n}\left(b+p+2c(v-2s)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+p+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b+p)\left(b+p+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(b+p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)+$$

$$2c(v-2s)\sqrt{-\frac{\left(b+p+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}}\ \Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(b+p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)\Bigg)-$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(p-b)^{-h-k+2n}\left(-b+p+2c(v-2s)\sqrt{z}\right)^{h+k}\left(-\frac{\left(-b+p+2c(v-2s)\sqrt{z}\right)^2}{c(v-2s)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((p-b)\left(-b+p+2c(v-2s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(-b+p+2c(v-2s)\sqrt{z}\right)^2}{c(8s-4v)}\right)+$$

$$2\,c\,(v-2\,s)\sqrt{-\frac{\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\;\frac{\left(-b+p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)\Bigg)\Bigg)-$$

$$2^{-v}\,z^{n+1}\binom{v}{\frac{v}{2}}\Big(\left(-(b+p)\,\sqrt{z}\right)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,-(b+p)\,\sqrt{z}\right)-\left((b-p)\,\sqrt{z}\right)^{-2\,(n+1)}$$

$$\Gamma\left(2\,(n+1),\,(b-p)\,\sqrt{z}\right)\Big)\,(1-v$$

$$\bmod 2)\;/;\;v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sinh(b\,z)\cosh^v(c\,z)$

01.20.21.4810.01

$$\int z^n e^{p z^2} \sinh(b z) \cosh^{\nu}(c z)\, dz ==$$

$$2^{-\nu-2} e^{-\frac{b^2}{4p}} p^{-n-1} \left(e^{\frac{b^2}{4p}} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{b^2+c^2(\nu-2s)^2}{2p}} \binom{\nu}{s} \left(-e^{\frac{(b+2cs-c\nu)^2}{4p}} \sum_{q=0}^{n} p^{-n-\frac{1}{2}} \left(c\left(s-\frac{\nu}{2}\right)-\frac{b}{2} \right)^{n-q} (b-2cs+c\nu+2pz)^{q+1} \right.\right.\right.$$

$$\left(-\frac{(b-2cs+c\nu+2pz)^2}{p} \right)^{-\frac{q}{2}-\frac{1}{2}} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2cs+c\nu+2pz)^2}{4p} \right) -$$

$$e^{\frac{(b-2cs+c\nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (-b-2cs+c\nu)^{n-q} (b+2cs-c\nu+2pz)^{q+1}$$

$$\left(-\frac{(b+2cs-c\nu+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2cs-c\nu+2pz)^2}{4p} \right) +$$

$$e^{\frac{(b+2cs-c\nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (b-2cs+c\nu)^{n-q} \left(-\frac{(b-2cs+c\nu-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$(-b+2cs-c\nu+2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2cs+c\nu-2pz)^2}{4p} \right) +$$

$$e^{\frac{(b-2cs+c\nu)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (b+2cs-c\nu)^{n-q} \left(-\frac{(b+2cs-c\nu-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left. (-b-2cs+c\nu+2pz)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2cs-c\nu-2pz)^2}{4p} \right) \right) \right) p^{n+\frac{1}{2}} +$$

$$\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \sum_{q=0}^{n} 2^{q-n} (-b)^{n-q} (b+2pz)^{q+1} \left(-\frac{(b+2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2pz)^2}{4p} \right) -$$

$$\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1)$$

$$\left. \sum_{q=0}^{n} 2^{q-n} b^{n-q} \left(-\frac{(b-2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} (2pz-b)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2pz)^2}{4p} \right) \right) /;\ \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4811.01

$$\int z^n e^{p\sqrt{z}} \sinh(b z) \cosh^{\nu}(c z)\, dz == 2^{-2n-\nu-2} e^{-\frac{p^2}{4b}} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\, b^{-2n-2}$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2n} \left(2\sqrt{z}\, b+p\right)^{h+k} \left(-\frac{\left(2\sqrt{z}\, b+p\right)^2}{b} \right)^{\frac{1}{2}(-h-k-1)} \binom{k}{h} \binom{n}{k} \right| p\left(2\sqrt{z}\, b+p\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),-\frac{\left(2\sqrt{z}\,b+p\right)^2}{4b}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\,b+p\right)^2}{b}}\;b\,\Gamma\left(\frac{1}{2}(h+k+2),-\frac{\left(2\sqrt{z}\,b+p\right)^2}{4b}\right)\Bigg)-$$

$$e^{\frac{p^2}{2b}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p-2b\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2b\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p-2b\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(p-2b\sqrt{z}\right)^2}{4b}\right)-2b\sqrt{\frac{\left(p-2b\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(p-2b\sqrt{z}\right)^2}{4b}\right)\Bigg)\Bigg)+$$

$$2^{-2n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\Bigg(-e^{\frac{p^2}{4b+8cs-4c\nu}}(-b-2cs+c\nu)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2(-b-2cs+c\nu)\sqrt{z}\right)^{h+k}$$

$$\left(\frac{\left(p+2(-b-2cs+c\nu)\sqrt{z}\right)^2}{b+2cs-c\nu}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2(-b-2cs+c\nu)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),$$

$$\frac{\left(p+2(-b-2cs+c\nu)\sqrt{z}\right)^2}{4b+8cs-4c\nu}\right)+2(-b-2cs+c\nu)\sqrt{\frac{\left(p+2(-b-2cs+c\nu)\sqrt{z}\right)^2}{b+2cs-c\nu}}\;\Gamma\Bigg($$

$$\frac{1}{2}(h+k+2),\frac{\left(p+2(-b-2cs+c\nu)\sqrt{z}\right)^2}{4b+8cs-4c\nu}\Bigg)\Bigg)-e^{\frac{p^2}{4b-8cs+4c\nu}}(-b+2cs-c\nu)^{-2(n+1)}$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p-2(b-2cs+c\nu)\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2(b-2cs+c\nu)\sqrt{z}\right)^2}{b-2cs+c\nu}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(p\left(p-2(b-2cs+c\nu)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\frac{\left(p-2(b-2cs+c\nu)\sqrt{z}\right)^2}{4(b-2cs+c\nu)}\right)-$$

$$2(b-2cs+c\nu)\sqrt{\frac{\left(p-2(b-2cs+c\nu)\sqrt{z}\right)^2}{b-2cs+c\nu}}\;\Gamma\left(\frac{1}{2}(h+k+2),\frac{\left(p-2(b-2cs+c\nu)\sqrt{z}\right)^2}{4(b-2cs+c\nu)}\right)\Bigg)+$$

$$e^{\frac{p^2}{-4b+8cs-4cv}}(b-2cs+cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2(b-2cs+cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2(b-2cs+cv)\sqrt{z}\right)^2}{b-2cs+cv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2(b-2cs+cv)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\,-\frac{\left(p+2(b-2cs+cv)\sqrt{z}\right)^2}{4(b-2cs+cv)}\right)+2\sqrt{-\frac{\left(p+2(b-2cs+cv)\sqrt{z}\right)^2}{b-2cs+cv}}$$

$$(b-2cs+cv)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(p+2(b-2cs+cv)\sqrt{z}\right)^2}{4(b-2cs+cv)}\right)\Bigg)+$$

$$e^{\frac{p^2}{-4b-8cs+4cv}}(b+2cs-cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2n}\left(p+2(b+2cs-cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+2(b+2cs-cv)\sqrt{z}\right)^2}{b+2cs-cv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\left(p\left(p+2(b+2cs-cv)\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+k+1),\,-\frac{\left(p+2(b+2cs-cv)\sqrt{z}\right)^2}{4b+8cs-4cv}\right)+2\sqrt{-\frac{\left(p+2(b+2cs-cv)\sqrt{z}\right)^2}{b+2cs-cv}}$$

$$\left.(b+2cs-cv)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(p+2(b+2cs-cv)\sqrt{z}\right)^2}{4b+8cs-4cv}\right)\right)\Bigg)\Bigg/;\,v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh\left(b\,z^r\right)\cosh^v(c\,z)$

01.20.21.4812.01

$$\int z^n e^{p z} \sinh\left(b z^2\right) \cosh^{\nu}(c z)\, dz == 2^{-\nu-2}$$

$$\left(b^{-n-1} e^{-\frac{p^2}{4b}} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \left((-1)^n e^{\frac{p^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p - 2 b z)^{q+1} \left(\frac{(p-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2bz)^2}{4b}\right) + \right.\right.$$

$$\left.\sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (p + 2 b z)^{q+1} \left(-\frac{(p+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2bz)^2}{4b}\right)\right) -$$

$$b^{-n-1} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-\frac{(p+c(\nu-2s))^2}{4b}} \binom{\nu}{s} \left((-1)^n e^{\frac{(p+c(\nu-2s))^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (-p + 2 c s - c \nu)^{n-q} (p - 2 c s + c \nu - 2 b z)^{q+1} \right.$$

$$\left(\frac{(p-2cs+c\nu-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2cs+c\nu-2bz)^2}{4b}\right) +$$

$$(-1)^n e^{\frac{p^2+c^2(\nu-2s)^2}{2b}} \sum_{q=0}^{n} 2^{q-n} (c(\nu-2s) - p)^{n-q} (p + 2 c s - c \nu - 2 b z)^{q+1} \left(\frac{(p+2cs-c\nu-2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2cs-c\nu-2bz)^2}{4b}\right) + \sum_{q=0}^{n} 2^{q-n} (-p + 2 c s - c \nu)^{n-q} (p - 2 c s + c \nu + 2 b z)^{q+1}$$

$$\left(-\frac{(p-2cs+c\nu+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p-2cs+c\nu+2bz)^2}{4b}\right) +$$

$$e^{\frac{c p (\nu-2s)}{b}} \sum_{q=0}^{n} 2^{q-n} (-p - 2 c s + c \nu)^{n-q} (p + 2 c s - c \nu + 2 b z)^{q+1} \left(-\frac{(p+2cs-c\nu+2bz)^2}{b}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2cs-c\nu+2bz)^2}{4b}\right)\right)\right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4813.01

$$\int z^n e^{p z} \sinh\left(b \sqrt{z}\right) \cosh^{\nu}(c z)\, dz == 2^{-2n-\nu-2} \left(e^{-\frac{b^2}{4p}} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2 - 1) \right.$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b)^{-h-k+2n} \left(-\frac{\left(b - 2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)} \left(2p\sqrt{z} - b\right)^{h+k} \binom{k}{h} \binom{n}{k} \left(b\left(b - 2p\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b-2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b-2\,p\,\sqrt{z}\right)^2}{p}}\;\;p\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b-2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)-$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,p\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,p\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{p}}\;\;p\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)\Bigg)$$

$$p^{-2\,(n+1)}+\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{\frac{b^2}{-4\,p+8\,c\,s-4\,c\,v}}\Bigg(\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,b^{-h-k+2\,n}\left(b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)+2\sqrt{-\frac{\left(b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}$$

$$(p-2\,c\,s+c\,v)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\Bigg)-$$

$$\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b)^{-h-k+2\,n}\left(-\frac{\left(b-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\;-b\right)^{h+k}\binom{k}{h}\binom{n}{k}\Bigg(2\,(p-2\,c\,s+c\,v)\sqrt{-\frac{\left(b-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}$$

$$\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)-b\left(2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\;-b\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b-2(p-2cs+cv)\sqrt{z}\right)^2}{4(p-2cs+cv)}\right)\Bigg)\Bigg)(p-2cs+cv)^{-2(n+1)}+$$

$$e^{\frac{b^2}{-4p-8cs+4cv}}(p+2cs-cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k b^{-h-k+2n}\left(b+2(p+2cs-cv)\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg(b\left(b+2(p+2cs-cv)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)+2\sqrt{-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}}$$

$$(p+2cs-cv)\,\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b+2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)\Bigg)-$$

$$e^{\frac{b^2}{-4p-8cs+4cv}}(p+2cs-cv)^{-2(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}4^k(-b)^{-h-k+2n}\left(-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(2(p+2cs-cv)\sqrt{z}-b\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\Bigg(2(p+2cs-cv)\sqrt{-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{p+2cs-cv}}\;\Gamma\left(\frac{1}{2}(h+k+2),\,-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)-$$

$$b\left(2(p+2cs-cv)\sqrt{z}-b\right)\Gamma\left(\frac{1}{2}(h+k+1),\,-\frac{\left(b-2(p+2cs-cv)\sqrt{z}\right)^2}{4(p+2cs-cv)}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\,v\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\sinh(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.4814.01

$$\int z^n e^{p z} \sinh(b z) \cosh^{\nu}\left(c z^2\right) dz == 2^{-\nu-2}\left(2 z^{n+1}\binom{\nu}{\frac{\nu}{2}}\left(E_{-n}(-(b+p) z)-E_{-n}((b-p) z)\right)(\nu \bmod 2-1)-\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-\frac{1}{\sqrt{c(\nu-2 s)}}\left(e^{\frac{(b-p)^2}{c(8 s-4 \nu)}}\sum_{q=0}^{n}2^{q-n}(b-p)^{n-q}(c(\nu-2 s))^{-n-\frac{1}{2}}(-b+p+2 c(\nu-2 s) z)^{q+1}\right.\right.$$

$$\left.\left(-\frac{(-b+p+2 c(\nu-2 s) z)^2}{c(\nu-2 s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(-b+p+2 c(\nu-2 s) z)^2}{c(8 s-4 \nu)}\right)\right)+$$

$$\frac{1}{\sqrt{c(\nu-2 s)}}\left(e^{\frac{(b+p)^2}{c(8 s-4 \nu)}}\sum_{q=0}^{n}\left(-\frac{b}{2}-\frac{p}{2}\right)^{n-q}(c(\nu-2 s))^{-n-\frac{1}{2}}(b+p+2 c(\nu-2 s) z)^{q+1}\right.$$

$$\left.\left(-\frac{(b+p+2 c(\nu-2 s) z)^2}{c(\nu-2 s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b+p+2 c(\nu-2 s) z)^2}{c(8 s-4 \nu)}\right)\right)-$$

$$\frac{1}{\sqrt{c(2 s-\nu)}}\left(e^{\frac{(b-p)^2}{4 c(\nu-2 s)}}\sum_{q=0}^{n}2^{q-n}(b-p)^{n-q}(c(2 s-\nu))^{-n-\frac{1}{2}}(-b+p+4 c s z-2 c \nu z)^{q+1}\right.$$

$$\left.\left(-\frac{(-b+p+4 c s z-2 c \nu z)^2}{2 c s-c \nu}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b-p+2 c(\nu-2 s) z)^2}{c(8 s-4 \nu)}\right)\right)+$$

$$\frac{1}{\sqrt{c(2 s-\nu)}}\left(e^{\frac{(b+p)^2}{4 c(\nu-2 s)}}\sum_{q=0}^{n}\left(-\frac{b}{2}-\frac{p}{2}\right)^{n-q}(c(2 s-\nu))^{-n-\frac{1}{2}}(b+p+4 c s z-2 c \nu z)^{q+1}\right.$$

$$\left.\left.\left.\left(-\frac{(b+p+4 c s z-2 c \nu z)^2}{2 c s-c \nu}\right)^{-\frac{q}{2}-\frac{1}{2}}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b+p+4 c s z-2 c \nu z)^2}{4(2 c s-c \nu)}\right)\right)\right)\right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4815.01

$$\int z^n e^{p z} \sinh(b z) \cosh^{\nu}\left(c \sqrt{z}\right) dz ==$$

$$2^{-\nu-1}\binom{\nu}{\frac{\nu}{2}}\left((b-p)^{-n-1}\Gamma(n+1,(b-p) z)-(-b-p)^{-n-1}\Gamma(n+1,(-b-p) z)\right)(1-\nu \bmod 2)+$$

$$2^{-2 n-\nu-2}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{-\frac{c^2(\nu-2 s)^2}{4(p-b)}}\left(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(-c(\nu-2 s))^{-h-i+2 n}\left(2(p-b)\sqrt{z}-c(\nu-2 s)\right)^{h+i}\right.\right.$$

$$\left(-\frac{\left(2\,(p-b)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{p-b}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(2\,(p-b)\sqrt{-\frac{\left(2\,(p-b)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{p-b}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,(p-b)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(p-b)}\right)-c\,(v-2\,s)\left(2\,(p-b)\,\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,(p-b)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(p-b)}\right)\right)(p-b)^{-2\,(n+1)}-e^{-\frac{c^2\,(v-2\,s)^2}{4\,(p-b)}}$$

$$\left(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s))^{-h-i+2\,n}\left(2\,\sqrt{z}\,\,(p-b)+c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\,\sqrt{z}\,\,(p-b)+c\,(v-2\,s)\right)^2}{p-b}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left(c\,(v-2\,s)\left(2\,\sqrt{z}\,\,(p-b)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,\sqrt{z}\,\,(p-b)+c\,(v-2\,s)\right)^2}{4\,(p-b)}\right)+2\right.$$

$$\left.\left.\sqrt{-\frac{\left(2\,\sqrt{z}\,\,(p-b)+c\,(v-2\,s)\right)^2}{p-b}}\;\;(p-b)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,\sqrt{z}\,\,(p-b)+c\,(v-2\,s)\right)^2}{4\,(p-b)}\right)\right)\right)$$

$$(p-b)^{-2\,(n+1)}+e^{-\frac{c^2\,(v-2\,s)^2}{4\,(b+p)}}\,(b+p)^{-2\,(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(2\,(b+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\,(b+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{b+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left(2\,(b+p)\sqrt{-\frac{\left(2\,(b+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{b+p}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,(b+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(b+p)}\right)-\right.$$

$$\left.c\,(v-2\,s)\left(2\,(b+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,(b+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(b+p)}\right)\right)+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(b+p)}}\,(b+p)^{-2\,(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s))^{-h-i+2\,n}\left(2\,\sqrt{z}\,\,(b+p)+c\,(v-2\,s)\right)^{h+i}$$

$$\left(-\frac{\left(2\sqrt{z}\ (b+p)+c\,(v-2\,s)\right)^2}{b+p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(c\,(v-2\,s)\left(2\sqrt{z}\ (b+p)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\ -\frac{\left(2\sqrt{z}\ (b+p)+c\,(v-2\,s)\right)^2}{4\,(b+p)}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\ (b+p)+c\,(v-2\,s)\right)^2}{b+p}}\,(b+p)\,\Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{\left(2\sqrt{z}\ (b+p)+c\,(v-2\,s)\right)^2}{4\,(b+p)}\right)\right)\Big/;\ v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sinh(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.4816.01

$$\int z^n e^{p z^2} \sinh(b z) \cosh^{\nu}\left(c z^2\right) dz ==$$

$$2^{-\nu-2} e^{-\frac{b^2}{4 p}} p^{-n-1} \left(e^{\frac{b^2}{4 p}} \left(\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \left(e^{-\frac{b^2 p}{2 (p+2 c s-c \nu) (p-2 c s+c \nu)}} \binom{\nu}{s} \left(e^{\frac{b^2}{4 p+8 c s-4 c \nu}} \sqrt{p+2 c s-c \nu} \left(\sum_{q=0}^{n} 2^{q-n} b^{n-q} \right.\right.\right.\right.\right.$$

$$(p-2 c s+c \nu)^{-n-\frac{1}{2}} \left(-\frac{(b-2 (p-2 c s+c \nu) z)^2}{p-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)} (2 (p-2 c s+c \nu) z-b)^{q+1}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2 (p-2 c s+c \nu) z)^2}{4 (p-2 c s+c \nu)}\right) -$$

$$\sum_{q=0}^{n} 2^{q-n} (-b)^{n-q} (p-2 c s+c \nu)^{-n-\frac{1}{2}} (b+2 (p-2 c s+c \nu) z)^{q+1}$$

$$\left(-\frac{(b+2 (p-2 c s+c \nu) z)^2}{p-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2 (p-2 c s+c \nu) z)^2}{4 (p-2 c s+c \nu)}\right)\Bigg) -$$

$$e^{\frac{b^2}{4 p-8 c s+4 c \nu}} \sqrt{p-2 c s+c \nu} \sum_{q=0}^{n} 2^{q-n} (-b)^{n-q} (p+2 c s-c \nu)^{-n-\frac{1}{2}} (b+2 (p+2 c s-c \nu) z)^{q+1}$$

$$\left(-\frac{(b+2 (p+2 c s-c \nu) z)^2}{p+2 c s-c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2 (p+2 c s-c \nu) z)^2}{4 (p+2 c s-c \nu)}\right) +$$

$$e^{\frac{b^2}{4 p-8 c s+4 c \nu}} \sqrt{p-2 c s+c \nu} \sum_{q=0}^{n} 2^{q-n} b^{n-q} (p+2 c s-c \nu)^{-n-\frac{1}{2}} \left(-\frac{(b-2 (p+2 c s-c \nu) z)^2}{p+2 c s-c \nu}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\left.\left.\left.\left.(2 (p+2 c s-c \nu) z-b)^{q+1} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b-2 (p+2 c s-c \nu) z)^2}{4 (p+2 c s-c \nu)}\right)\right)\right/$$

$$\left.\left.\left(\sqrt{p+2 c s-c \nu} \sqrt{p-2 c s+c \nu}\right)\right) p^{n+1} + \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (-b)^{n-q}\right.$$

$$(b+2 p z)^{q+1} \left(-\frac{(b+2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b+2 p z)^2}{4 p}\right) -$$

$$\binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} b^{n-q} \left(-\frac{(b-2 p z)^2}{p}\right)^{\frac{1}{2}(-q-1)} (2 p z-b)^{q+1} \binom{n}{q}$$

$$\left.\Gamma\left(\frac{q+1}{2}, -\frac{(b-2 p z)^2}{4 p}\right)\right) /; \nu \in \mathbb{Z} \wedge \nu > 0 \wedge n \in \mathbb{N}$$

01.20.21.4817.01

$$\int z^n e^{p\sqrt{z}} \sinh(b z) \cosh^{\nu}\left(c\sqrt{z}\right) dz == 2^{-2n-\nu-2}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)$$

$$\left(e^{-\frac{p^2}{4b}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,p^{-h-i+2n}\left(2\sqrt{z}\,b+p\right)^{h+i}\left(-\frac{\left(2\sqrt{z}\,b+p\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(p\left(2\sqrt{z}\,b+p\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2\sqrt{z}\,b+p\right)^2}{4b}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\,b+p\right)^2}{b}}\;b\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2\sqrt{z}\,b+p\right)^2}{4b}\right)-$$

$$e^{\frac{p^2}{4b}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,p^{-h-i+2n}\left(p-2b\sqrt{z}\right)^{h+i}\left(\frac{\left(p-2b\sqrt{z}\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left.\left(p\left(p-2b\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\frac{\left(p-2b\sqrt{z}\right)^2}{4b}\right)-2b\sqrt{\frac{\left(p-2b\sqrt{z}\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+i+2),\frac{\left(p-2b\sqrt{z}\right)^2}{4b}\right)\right)\right)$$

$$b^{-2(n+1)}+2^{-2n-\nu-2}\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(-e^{\frac{(p+c(\nu-2s))^2}{4b}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p+c(\nu-2s))^{-h-i+2n}\right.\right.$$

$$\left(-2\sqrt{z}\,b+p+c(\nu-2s)\right)^{h+i}\left(\frac{\left(-2\sqrt{z}\,b+p+c(\nu-2s)\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((p+c(\nu-2s))\left(-2\sqrt{z}\,b+p+c(\nu-2s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\frac{\left(-2\sqrt{z}\,b+p+c(\nu-2s)\right)^2}{4b}\right)-2b\right.$$

$$\left.\left.\sqrt{\frac{\left(-2\sqrt{z}\,b+p+c(\nu-2s)\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+i+2),\frac{\left(-2\sqrt{z}\,b+p+c(\nu-2s)\right)^2}{4b}\right)\right)-e^{\frac{(p-c(\nu-2s))^2}{4b}}$$

$$\left.\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c(\nu-2s))^{-h-i+2n}\left(-2\sqrt{z}\,b+p-c(\nu-2s)\right)^{h+i}\left(\frac{\left(-2\sqrt{z}\,b+p-c(\nu-2s)\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left((p-c(v-2s))\left(-2\sqrt{z}\,b+p-c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\frac{\left(-2\sqrt{z}\,b+p-c(v-2s)\right)^2}{4b}\right)-\right.$$

$$\left.2b\sqrt{\frac{\left(-2\sqrt{z}\,b+p-c(v-2s)\right)^2}{b}}\;\Gamma\left(\frac{1}{2}(h+i+2),\frac{\left(-2\sqrt{z}\,b+p-c(v-2s)\right)^2}{4b}\right)\right)+e^{-\frac{(p+c(v-2s))^2}{4b}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p+c(v-2s))^{-h-i+2n}\left(2\sqrt{z}\,b+p+c(v-2s)\right)^{h+i}\left(-\frac{\left(2\sqrt{z}\,b+p+c(v-2s)\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((p+c(v-2s))\left(2\sqrt{z}\,b+p+c(v-2s)\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2\sqrt{z}\,b+p+c(v-2s)\right)^2}{4b}\right)+2\right.$$

$$\left.\sqrt{-\frac{\left(2\sqrt{z}\,b+p+c(v-2s)\right)^2}{b}}\;b\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2\sqrt{z}\,b+p+c(v-2s)\right)^2}{4b}\right)\right)+$$

$$e^{-\frac{(p-c(v-2s))^2}{4b}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c(v-2s))^{-h-i+2n}\left(2\sqrt{z}\,b+p-c(v-2s)\right)^{h+i}$$

$$\left(-\frac{\left(2\sqrt{z}\,b+p-c(v-2s)\right)^2}{b}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((p-c(v-2s))\left(2\sqrt{z}\,b+p-c(v-2s)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(2\sqrt{z}\,b+p-c(v-2s)\right)^2}{4b}\right)+2\sqrt{-\frac{\left(2\sqrt{z}\,b+p-c(v-2s)\right)^2}{b}}$$

$$\left.\left.b\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(2\sqrt{z}\,b+p-c(v-2s)\right)^2}{4b}\right)\right)\right)\Bigg)\,b^{-2(n+1)}\;/;\;v\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

01.20.21.4818.01

$$\int z^n e^{p z} \sinh\left(b z^2\right) \cosh^{\nu}\left(c z^2\right) dz == \frac{1}{\sqrt{-b^2}} 2^{-\nu-2} e^{-\frac{p^2}{4 b}}$$

$$\left(\sqrt{-b^2}\, e^{\frac{p^2}{4 b}} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(\frac{1}{\sqrt{-b+2 c s-c \nu}} \left(e^{\frac{p^2}{4 b-8 c s+4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-b+2 c s-c \nu)^{-n-\frac{1}{2}} (p-2 (b-2 c s+c \nu) z)^{q+1} \right.\right.\right.$$

$$\left.\left.\left(\frac{(p-2 (b-2 c s+c \nu) z)^2}{b-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2 (b-2 c s+c \nu) z)^2}{4 (b-2 c s+c \nu)}\right)\right) +$$

$$\frac{1}{\sqrt{-b-2 c s+c \nu}} \left(e^{\frac{p^2}{4 b+8 c s-4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-b-2 c s+c \nu)^{-n-\frac{1}{2}} (p-2 (b+2 c s-c \nu) z)^{q+1} \right.$$

$$\left.\left(\frac{(p-2 (b+2 c s-c \nu) z)^2}{b+2 c s-c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p-2 (b+2 c s-c \nu) z)^2}{4 (b+2 c s-c \nu)}\right)\right) -$$

$$\frac{1}{\sqrt{b-2 c s+c \nu}} \left(e^{\frac{p^2}{-4 b+8 c s-4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (b-2 c s+c \nu)^{-n-\frac{1}{2}} (p+2 (b-2 c s+c \nu) z)^{q+1} \right.$$

$$\left.\left(-\frac{(p+2 (b-2 c s+c \nu) z)^2}{b-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 (b-2 c s+c \nu) z)^2}{4 (b-2 c s+c \nu)}\right)\right) -$$

$$\frac{1}{\sqrt{b+2 c s-c \nu}} \left(e^{\frac{p^2}{-4 b-8 c s+4 c \nu}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (b+2 c s-c \nu)^{-n-\frac{1}{2}} (p+2 (b+2 c s-c \nu) z)^{q+1} \right.$$

$$\left.\left.\left(\frac{(p+2 (b+2 c s-c \nu) z)^2}{-b-2 c s+c \nu}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p+2 (b+2 c s-c \nu) z)^2}{-4 b-8 c s+4 c \nu}\right)\right)\right) -$$

$$\sqrt{b}\, e^{\frac{p^2}{2 b}} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1) \sum_{q=0}^{n} 2^{q-n} (-b)^{-n-\frac{1}{2}} (-p)^{n-q} (p-2 b z)^{q+1} \left(\frac{(p-2 b z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, \frac{(p-2 b z)^2}{4 b}\right) + \sqrt{-b} \binom{\nu}{\frac{\nu}{2}} (\nu \bmod 2-1)$$

$$\left.\sum_{q=0}^{n} 2^{q-n} b^{-n-\frac{1}{2}} (-p)^{n-q} (p+2 b z)^{q+1} \left(-\frac{(p+2 b z)^2}{b}\right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p+2 b z)^2}{4 b}\right)\right) /; \nu \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4819.01

$$\int z^n e^{p z} \sinh\left(b \sqrt{z}\right) \cosh^{\nu}\left(c \sqrt{z}\right) dz == 2^{-2 n-\nu-2} e^{-\frac{b^2}{4 p}} p^{-2 (n+1)} \binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)$$

$$\left(\sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i b^{-h-i+2 n} \left(b + 2 p \sqrt{z}\right)^{h+i} \left(-\frac{\left(b + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left(b \left(b + 2 p \sqrt{z}\right) \right. \right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(b + 2 p \sqrt{z}\right)^2}{4 p}\right) + 2 \sqrt{-\frac{\left(b + 2 p \sqrt{z}\right)^2}{p}}\ p \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(b + 2 p \sqrt{z}\right)^2}{4 p}\right) \Bigg) -$$

$$\sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-b)^{-h-i+2 n} \left(2 p \sqrt{z} - b\right)^{h+i} \left(-\frac{\left(2 p \sqrt{z} - b\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i} \left(2 p \sqrt{-\frac{\left(2 p \sqrt{z} - b\right)^2}{p}} \right.$$

$$\left. \left. \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2 p \sqrt{z} - b\right)^2}{4 p}\right) - b \left(2 p \sqrt{z} - b\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2 p \sqrt{z} - b\right)^2}{4 p}\right) \right) \right) -$$

$$2^{-2 n-\nu-2} p^{-2 (n+1)} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(c (\nu-2 s)-b)^2}{4 p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (c (\nu-2 s) - b)^{-h-i+2 n} \left(-b + c (\nu-2 s) + 2 p \sqrt{z}\right)^{h+i} \right.$$

$$\left(-\frac{\left(-b + c (\nu-2 s) + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \binom{n}{i}$$

$$\left((c (\nu-2 s) - b) \left(-b + c (\nu-2 s) + 2 p \sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-b + c (\nu-2 s) + 2 p \sqrt{z}\right)^2}{4 p}\right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(-b + c (\nu-2 s) + 2 p \sqrt{z}\right)^2}{p}}\ p \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(-b + c (\nu-2 s) + 2 p \sqrt{z}\right)^2}{4 p}\right) \right) - e^{-\frac{(b+c (\nu-2 s))^2}{4 p}} \right.$$

$$\left. \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (b + c (\nu-2 s))^{-h-i+2 n} \left(b + c (\nu-2 s) + 2 p \sqrt{z}\right)^{h+i} \left(-\frac{\left(b + c (\nu-2 s) + 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-i-1)} \right)$$

$$\binom{i}{h}\binom{n}{i}\left((b+c(v-2s))\left(b+c(v-2s)+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(b+c(v-2s)+2p\sqrt{z}\right)^2}{4p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(b+c(v-2s)+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c(v-2s)+2p\sqrt{z}\right)^2}{4p}\right)\right)+$$

$$e^{-\frac{(-b-c(v-2s))^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(-b-c(v-2s))^{-h-i+2n}\left(-b-c(v-2s)+2p\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-b-c(v-2s)+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-b-c(v-2s))\left(-b-c(v-2s)+2p\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),-\frac{\left(-b-c(v-2s)+2p\sqrt{z}\right)^2}{4p}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-b-c(v-2s)+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(-b-c(v-2s)+2p\sqrt{z}\right)^2}{4p}\right)\right)-$$

$$e^{-\frac{(b-c(v-2s))^2}{4p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b-c(v-2s))^{-h-i+2n}\left(b-c(v-2s)+2p\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b-c(v-2s)+2p\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\left((b-c(v-2s))\left(b-c(v-2s)+2p\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(h+i+1),-\frac{\left(b-c(v-2s)+2p\sqrt{z}\right)^2}{4p}\right)+2\sqrt{-\frac{\left(b-c(v-2s)+2p\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\right.$$

$$\left.\left.\left.\frac{1}{2}(h+i+2),-\frac{\left(b-c(v-2s)+2p\sqrt{z}\right)^2}{4p}\right)\right)\right)\;/;\;v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\,e^{p\,z^r}\,\sinh(b\,z^r)\cosh^v(c\,z^r)$

01.20.21.4820.01

$$\int z^{\alpha-1}\, e^{p\,z^r}\, \sinh(b\,z^r)\cosh^{\nu}(c\,z^r)\,dz ==$$

$$\frac{2^{-\nu-1}\,z^{\alpha}}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left((-(b+p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(b+p)\,z^r\right)-((b-p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(b-p)\,z^r\right)\right)(\nu \bmod 2-1)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{\alpha}{r},\,(b-p-2\,c\,s+c\,\nu)\,z^r\right)((b-p-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}-\right.$$

$$(-(b+p-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(b+p-2\,c\,s+c\,\nu)\,z^r\right)+((b-p+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r},\,(b-p+2\,c\,s-c\,\nu)\,z^r\right)-(-(b+p+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(b+p+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4821.01

$$\int z^n\, e^{p\,z^2}\,\sinh\left(b\,z^2\right)\cosh^{\nu}\left(c\,z^2\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(\left((-b-p)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(-b-p)\,z^2\right)-\left((b-p)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(b-p)\,z^2\right)\right)(1-\nu \bmod 2)\,z^{n+1}-$$

$$2^{-\nu-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(\frac{n+1}{2},\,(-b-p+c\,(\nu-2\,s))\,z^2\right)\left((-b-p+c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}-\left((b-p+c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\right.$$

$$\Gamma\left(\frac{n+1}{2},\,(b-p+c\,(\nu-2\,s))\,z^2\right)+\left((-b-p-c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(-b-p-c\,(\nu-2\,s))\,z^2\right)-$$

$$\left.\left((b-p-c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},\,(b-p-c\,(\nu-2\,s))\,z^2\right)\right)/;\ \nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

01.20.21.4822.01

$$\int z^n\, e^{p\,\sqrt{z}}\,\sinh\left(b\,\sqrt{z}\right)\cosh^{\nu}\left(c\,\sqrt{z}\right)dz ==$$

$$-2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left((-b-p)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b-p)\,\sqrt{z}\right)-(b-p)^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(b-p)\,\sqrt{z}\right)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(\Gamma\left(2\,(n+1),\,(-b-p+c\,(\nu-2\,s))\,\sqrt{z}\right)(-b-p+c\,(\nu-2\,s))^{-2\,(n+1)}-(b-p+c\,(\nu-2\,s))^{-2\,(n+1)}\right.$$

$$\Gamma\left(2\,(n+1),\,(b-p+c\,(\nu-2\,s))\,\sqrt{z}\right)+(-b-p-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(-b-p-c\,(\nu-2\,s))\,\sqrt{z}\right)-$$

$$\left.(b-p-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,(b-p-c\,(\nu-2\,s))\,\sqrt{z}\right)\right)/;\ \nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^{\alpha-1}\, e^{b\,z^r+e}\,\sinh\left(a\,z^r+q\right)\cosh^{\nu}\left(c\,z^r+g\right)$

01.20.21.4823.01

$$\int z^{\alpha-1}\, e^{b\,z^r+e}\sinh(a\,z^r+q)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$-\frac{i\,2^{-\nu-1}\,z^{\alpha}}{r}\left(\binom{\nu}{\frac{\nu}{2}}\left(e^{e+q-\frac{i\pi}{2}}\,\Gamma\left(\frac{\alpha}{r},(-a-b)\,z^r\right)((-a-b)\,z^r)^{-\frac{\alpha}{r}}+e^{e-q+\frac{i\pi}{2}}\,((a-b)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(a-b)\,z^r\right)\right)(1-\nu \bmod 2)+\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+q+2\,g\,s-g\,\nu-\frac{i\pi}{2}}\,\Gamma\left(\frac{\alpha}{r},(-a-b-2\,c\,s+c\,\nu)\,z^r\right)((-a-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}+e^{e-q+2\,g\,s-g\,\nu+\frac{i\pi}{2}}\right.$$

$$((a-b-2\,c\,s+c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(a-b-2\,c\,s+c\,\nu)\,z^r\right)+e^{e+q-2\,g\,s+g\,\nu-\frac{i\pi}{2}}\,((-a-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\right.$$

$$\left.\left.\left.(-a-b+2\,c\,s-c\,\nu)\,z^r\right)+e^{e-q-2\,g\,s+g\,\nu+\frac{i\pi}{2}}\,((a-b+2\,c\,s-c\,\nu)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(a-b+2\,c\,s-c\,\nu)\,z^r\right)\right)\right)/;\ \nu\in\mathbb{N}^+$$

01.20.21.4824.01

$$\int z^n\, e^{b\,z^2+e}\sinh\left(a\,z^2+q\right)\cosh^{\nu}\left(c\,z^2+g\right)dz ==$$

$$-2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(e^{e+q}\left((-a-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(-a-b)\,z^2\right)-e^{e-q}\left((a-b)\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(a-b)\,z^2\right)\right)(1-\nu \bmod 2)$$

$$z^{n+1}-2^{-\nu-2}\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+q-g\,(\nu-2\,s)}\,\Gamma\left(\frac{n+1}{2},(-a-b+c\,(\nu-2\,s))\,z^2\right)\left((-a-b+c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}-\right.$$

$$e^{e-q-g\,(\nu-2\,s)}\left((a-b+c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(a-b+c\,(\nu-2\,s))\,z^2\right)+$$

$$e^{e+q+g\,(\nu-2\,s)}\left((-a-b-c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(-a-b-c\,(\nu-2\,s))\,z^2\right)-$$

$$\left.e^{e-q+g\,(\nu-2\,s)}\left((a-b-c\,(\nu-2\,s))\,z^2\right)^{\frac{1}{2}(-n-1)}\,\Gamma\left(\frac{n+1}{2},(a-b-c\,(\nu-2\,s))\,z^2\right)\right)/;\ \nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

01.20.21.4825.01

$$\int z^n\, e^{\sqrt{z}\,b+e}\sinh\left(\sqrt{z}\,a+q\right)\cosh^{\nu}\left(\sqrt{z}\,c+g\right)dz ==$$

$$2^{-\nu}\binom{\nu}{\frac{\nu}{2}}\left((a-b)^{-2\,(n+1)}\,e^{e-q}\,\Gamma\left(2\,(n+1),(a-b)\,\sqrt{z}\right)-(-a-b)^{-2\,(n+1)}\,e^{e+q}\,\Gamma\left(2\,(n+1),(-a-b)\,\sqrt{z}\right)\right)(1-\nu \bmod 2)-$$

$$2^{-\nu}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{e+q-g\,(\nu-2\,s)}\,\Gamma\left(2\,(n+1),(-a-b+c\,(\nu-2\,s))\,\sqrt{z}\right)(-a-b+c\,(\nu-2\,s))^{-2\,(n+1)}-\right.$$

$$e^{e-q-g\,(\nu-2\,s)}\,(a-b+c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(a-b+c\,(\nu-2\,s))\,\sqrt{z}\right)+$$

$$e^{e+q+g\,(\nu-2\,s)}\,(-a-b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(-a-b-c\,(\nu-2\,s))\,\sqrt{z}\right)-$$

$$\left.e^{e-q+g\,(\nu-2\,s)}\,(a-b-c\,(\nu-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),(a-b-c\,(\nu-2\,s))\,\sqrt{z}\right)\right)/;\ \nu\in\mathbb{N}^+\wedge n\in\mathbb{N}$$

Involving $z^n\, e^{b\,z^r+d\,z+e}\sinh\left(a\,z^r+p\,z+q\right)\cosh^{\nu}\left(c\,z^r+f\,z+g\right)$

01.20.21.4826.01

$$\int z^n e^{b z^2+d z+e} \sinh\left(a z^2+p z+q\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$-i\, 2^{-\nu-2} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(e^{-\frac{(d-p)^2}{4(b-a)}+e-q+\frac{i\pi}{2}} (b-a)^{-n-1} \sum_{j=0}^{n} 2^{j-n} (p-d)^{n-j} (d-p+2(b-a)z)^{j+1} \right.$$

$$\left(-\frac{(d-p+2(b-a)z)^2}{b-a} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-p+2(b-a)z)^2}{4(b-a)} \right) + (a+b)^{-n-1} e^{-\frac{(d+p)^2}{4(a+b)}+e+q-\frac{i\pi}{2}} \sum_{j=0}^{n} 2^{j-n}$$

$$(-d-p)^{n-j} (d+p+2(a+b)z)^{j+1} \left(-\frac{(d+p+2(a+b)z)^2}{a+b} \right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+p+2(a+b)z)^2}{4(a+b)} \right) \Bigg) -$$

$$i\, 2^{-\nu-2} \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(d-p+f(2s-\nu))^2}{4(-a+b+c(2s-\nu))}+e-q+g(2s-\nu)+\frac{i\pi}{2}} (-a+b+c(2s-\nu))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d+p-f(2s-\nu))^{n-j} \right.$$

$$(d-p+f(2s-\nu)+2(-a+b+c(2s-\nu))z)^{j+1} \left(-\frac{(d-p+f(2s-\nu)+2(-a+b+c(2s-\nu))z)^2}{-a+b+c(2s-\nu)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-p+f(2s-\nu)+2(-a+b+c(2s-\nu))z)^2}{4(-a+b+c(2s-\nu))} \right) +$$

$$e^{-\frac{(d+p+f(2s-\nu))^2}{4(a+b+c(2s-\nu))}+e+q+g(2s-\nu)-\frac{i\pi}{2}} (a+b+c(2s-\nu))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d-p-f(2s-\nu))^{n-j}$$

$$(d+p+f(2s-\nu)+2(a+b+c(2s-\nu))z)^{j+1} \left(-\frac{(d+p+f(2s-\nu)+2(a+b+c(2s-\nu))z)^2}{a+b+c(2s-\nu)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+p+f(2s-\nu)+2(a+b+c(2s-\nu))z)^2}{4(a+b+c(2s-\nu))} \right) +$$

$$e^{-\frac{(d-p+f(\nu-2s))^2}{4(-a+b+c(\nu-2s))}+e-q+g(\nu-2s)+\frac{i\pi}{2}} (-a+b+c(\nu-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d+p-f(\nu-2s))^{n-j}$$

$$(d-p+f(\nu-2s)+2(-a+b+c(\nu-2s))z)^{j+1} \left(-\frac{(d-p+f(\nu-2s)+2(-a+b+c(\nu-2s))z)^2}{-a+b+c(\nu-2s)} \right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d-p+f(\nu-2s)+2(-a+b+c(\nu-2s))z)^2}{4(-a+b+c(\nu-2s))} \right) +$$

$$e^{-\frac{(d+p+f(\nu-2s))^2}{4(a+b+c(\nu-2s))}+e+q+g(\nu-2s)-\frac{i\pi}{2}} (a+b+c(\nu-2s))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d-p-f(\nu-2s))^{n-j}$$

$$(d+p+f(\nu-2s)+2(a+b+c(\nu-2s))z)^{j+1} \left(-\frac{(d+p+f(\nu-2s)+2(a+b+c(\nu-2s))z)^2}{a+b+c(\nu-2s)} \right)^{\frac{1}{2}(-j-1)}$$

01.20.21.4827.01

$$\int z^n e^{\sqrt{z}\,b+d\,z+e} \sinh\left(\sqrt{z}\,a+p\,z+q\right) \cosh^{\nu}\left(\sqrt{z}\,c+f\,z+g\right) dz == 2^{-2\,n-\nu-2}\,i \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(e^{-\frac{(b-a)^2}{4\,(d-p)}+e-q+\frac{i\,\pi}{2}} (d-p)^{-2\,n-2} \right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h}\,4^i\,(b-a)^{-h-i+2\,n} \left(-a+b+2\,(d-p)\,\sqrt{z}\right)^{h+i} \left(-\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{d-p} \right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i} \left((b-a)\left(-a+b+2\,(d-p)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{4\,(d-p)} \right) + \right.$$

$$\left. 2\sqrt{-\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{d-p}}\,(d-p)\,\Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(-a+b+2\,(d-p)\,\sqrt{z}\right)^2}{4\,(d-p)} \right) \right) + e^{-\frac{(a+b)^2}{4\,(d+p)}+e+q-\frac{i\,\pi}{2}}$$

$$(d+p)^{-2\,n-2} \sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h}\,4^i\,(a+b)^{-h-i+2\,n} \left(a+b+2\,(d+p)\,\sqrt{z}\right)^{h+i} \left(-\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{d+p} \right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i} \left((a+b)\left(a+b+2\,(d+p)\,\sqrt{z}\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{4\,(d+p)} \right) + \right.$$

$$\left. \left. 2\sqrt{-\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{d+p}}\,(d+p)\,\Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(a+b+2\,(d+p)\,\sqrt{z}\right)^2}{4\,(d+p)} \right) \right) \right) +$$

$$2^{-2\,n-\nu-2}\,i \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(e^{-\frac{(-a+b+c\,(2\,s-\nu))^2}{4\,(d-p+f\,(2\,s-\nu))}+e-q+g\,(2\,s-\nu)+\frac{i\,\pi}{2}} (d-p+f\,(2\,s-\nu))^{-2\,n-2} \right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i} (-1)^{i-h}\,4^i\,(-a+b+c\,(2\,s-\nu))^{-h-i+2\,n} \left(-a+b+c\,(2\,s-\nu)+2\,(d-p+f\,(2\,s-\nu))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-a+b+c\,(2\,s-\nu)+2\,(d-p+f\,(2\,s-\nu))\,\sqrt{z}\right)^2}{d-p+f\,(2\,s-\nu)} \right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h}\binom{n}{i}$$

$$\left((-a+b+c\,(2\,s-v))\left(-a+b+c\,(2\,s-v)+2\,(d-p+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(-a+b+c\,(2\,s-v)+2\,(d-p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d-p+f\,(2\,s-v))}\right)+2\,(d-p+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-a+b+c\,(2\,s-v)+2\,(d-p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d-p+f\,(2\,s-v))}\right)\sqrt{-\frac{\left(-a+b+c\,(2\,s-v)+2\,(d-p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d-p+f\,(2\,s-v)}}\right)+$$

$$e^{-\frac{(a+b+c\,(2\,s-v))^2}{4\,(d+p+f\,(2\,s-v))}+e+q+g\,(2\,s-v)-\frac{i\,\pi}{2}}\,(d+p+f\,(2\,s-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(a+b+c\,(2\,s-v))^{-h-i+2\,n}$$

$$\left(a+b+c\,(2\,s-v)+2\,(d+p+f\,(2\,s-v))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(a+b+c\,(2\,s-v)+2\,(d+p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+p+f\,(2\,s-v)}\right)^{\frac{1}{2}\,(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((a+b+c\,(2\,s-v))\left(a+b+c\,(2\,s-v)+2\,(d+p+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(a+b+c\,(2\,s-v)+2\,(d+p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+p+f\,(2\,s-v))}\right)+2\sqrt{-\frac{\left(a+b+c\,(2\,s-v)+2\,(d+p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+p+f\,(2\,s-v)}}\,(d+p+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(a+b+c\,(2\,s-v)+2\,(d+p+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+p+f\,(2\,s-v))}\right)\right)+$$

$$e^{-\frac{(-a+b+c\,(v-2\,s))^2}{4\,(d-p+f\,(v-2\,s))}+e-q+g\,(v-2\,s)+\frac{i\,\pi}{2}}\,(d-p+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-a+b+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(-a+b+c\,(v-2\,s)+2\,(d-p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-a+b+c\,(v-2\,s)+2\,(d-p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d-p+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((-a+b+c\,(v-2\,s))\left(-a+b+c\,(v-2\,s)+2\,(d-p+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(-a+b+c\,(v-2\,s)+2\,(d-p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d-p+f\,(v-2\,s))}\right)+2\,(d-p+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(-a+b+c\,(v-2\,s)+2\,(d-p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d-p+f\,(v-2\,s))}\right)\sqrt{-\frac{\left(-a+b+c\,(v-2\,s)+2\,(d-p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d-p+f\,(v-2\,s)}}\right)+$$

$$e^{-\frac{(a+b+c\,(v-2\,s))^2}{4\,(d+p+f\,(v-2\,s))}+e+q+g\,(v-2\,s)-\frac{i\,\pi}{2}}\,(d+p+f\,(v-2\,s))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(a+b+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(a+b+c\,(v-2\,s)+2\,(d+p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(a+b+c\,(v-2\,s)+2\,(d+p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+p+f\,(v-2\,s)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((a+b+c\,(v-2\,s))\left(a+b+c\,(v-2\,s)+2\,(d+p+f\,(v-2\,s))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\,-\frac{\left(a+b+c\,(v-2\,s)+2\,(d+p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+p+f\,(v-2\,s))}\right)+2\,(d+p+f\,(v-2\,s))\,\Gamma\left(\frac{1}{2}(h+i+2),\,-\frac{\left(a+b+c\,(v-2\,s)+2\,(d+p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{4\,(d+p+f\,(v-2\,s))}\right)\sqrt{-\frac{\left(a+b+c\,(v-2\,s)+2\,(d+p+f\,(v-2\,s))\,\sqrt{z}\right)^2}{d+p+f\,(v-2\,s)}}\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving powers of sinh, exp and power

Involving $z^{\alpha-1}\, e^{p\,z}\, \sinh^{\mu}(c\,z)\cosh^{\nu}(a\,z)$

01.20.21.4828.01

$$\int z^{\alpha-1}\, e^{p\,z}\sinh^{m}(c\,z)\cosh^{\nu}(a\,z)\,dz == -i^{m}\,2^{-m-\nu}\,z^{\alpha}\,(-p\,z)^{-\alpha}\binom{m}{\frac{m}{2}}\binom{\nu}{\frac{\nu}{2}}\Gamma(\alpha,\,-p\,z)\,(1-m \bmod 2)\,(1-\nu \bmod 2)\,-$$

$$2^{-m-\nu}\,z^{\alpha}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(e^{i\,m\,\pi}\,E_{1-\alpha}((-p-2\,c\,k+c\,m)\,z)+E_{1-\alpha}((-p+2\,c\,k-c\,m)\,z)\right)\,-$$

$$i^{m}\,2^{-m-\nu}\,z^{\alpha}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}(E_{1-\alpha}((-p-2\,a\,s+a\,\nu)\,z)+E_{1-\alpha}((-p-a\,(\nu-2\,s))\,z))\,-$$

$$2^{-m-\nu}\,z^{\alpha}\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\left(E_{1-\alpha}((-p+2\,c\,k-c\,m-2\,a\,s+a\,\nu)\,z)+e^{i\,m\,\pi}\,(E_{1-\alpha}((-p+c\,(m-2\,k)-2\,a\,s+a\,\nu)\,z)+\right.$$

$$\left.E_{1-\alpha}((-p-2\,c\,k+c\,m+2\,a\,s-a\,\nu)\,z))+E_{1-\alpha}((-p+2\,c\,k-c\,m+2\,a\,s-a\,\nu)\,z)\right)\,/;\,m\in\mathbb{N}^{+}\,\bigwedge\,\nu\in\mathbb{N}^{+}$$

01.20.21.4829.01

$$\int z^{n}\, e^{p\,z}\sinh^{\mu}(c\,z)\cosh^{\nu}(a\,z)\,dz == 2^{-\nu}\,e^{p\,z}\binom{\nu}{\frac{\nu}{2}}n!\,(1-\nu \bmod 2)\sinh^{\mu}(c\,z)$$

$$\left(\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(p+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{p+c\,\mu}{2\,c},\,\ldots,\,-\frac{p+c\,\mu}{2\,c},\,-\mu;\,1-\frac{p+c\,\mu}{2\,c},\,\ldots,\,1-\frac{p+c\,\mu}{2\,c};\,e^{-2\,c\,z}\right)\right)\left(1-e^{-2\,c\,z}\right)^{-\mu}\,+$$

$$2^{-\nu}\,n!\sinh^{\mu}(c\,z)\left(\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{(p-a\,(\nu-2\,s))\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(p-a\,(\nu-2\,s)+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{p+2\,a\,s-a\,\nu+c\,\mu}{2\,c},\,\ldots,\right.\right.\right.$$

$$\left.\left.-\frac{p+2\,a\,s-a\,\nu+c\,\mu}{2\,c},\,-\mu;\,1-\frac{p+2\,a\,s-a\,\nu+c\,\mu}{2\,c},\,\ldots,\,1-\frac{p+2\,a\,s-a\,\nu+c\,\mu}{2\,c};\,e^{-2\,c\,z}\right)+$$

$$e^{(p+a\,(\nu-2\,s))\,z}\sum_{j=0}^{n}\frac{(-1)^{j}\,z^{n-j}\,(p+a\,(\nu-2\,s)+c\,\mu)^{-j-1}}{(n-j)!}\,{}_{j+2}F_{j+1}\left(-\frac{p-2\,a\,s+a\,\nu+c\,\mu}{2\,c},\,\ldots,\,-\frac{p-2\,a\,s+a\,\nu+c\,\mu}{2\,c},\right.$$

$$\left.\left.\left.-\mu;\,1-\frac{p-2\,a\,s+a\,\nu+c\,\mu}{2\,c},\,\ldots,\,1-\frac{p-2\,a\,s+a\,\nu+c\,\mu}{2\,c};\,e^{-2\,c\,z}\right)\right)\right)\left(1-e^{-2\,c\,z}\right)^{-\mu}\,/;\,\nu\in\mathbb{N}\,\wedge\,n\in\mathbb{N}$$

01.20.21.4830.01

$$\int z^n e^{p z} \sinh^m(c z) \cosh^\nu(a z)\, dz == 2^{-m} i^{-m} e^{p z} \left(1+e^{-2 a z}\right)^{-\nu} \binom{m}{\frac{m}{2}} \cosh^\nu(a z)\, n!\, (1-m \bmod 2)$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p+a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a \nu}{2 a}, \ldots, -\frac{p+a \nu}{2 a}, -\nu; 1-\frac{p+a \nu}{2 a}, \ldots, 1-\frac{p+a \nu}{2 a}; -e^{-2 a z}\right) +$$

$$2^{-m} i^{-m} n! \left(1+e^{-2 a z}\right)^{-\nu} \cosh^\nu(a z) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{1}{2} i \pi m + (p - c (m-2 k)) z} \right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-c (m-2 k)+p+a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{2 c k - c m + p + a \nu}{2 a}, \ldots, -\frac{2 c k - c m + p + a \nu}{2 a}, \right.$$

$$\left. -\nu; 1-\frac{2 c k - c m + p + a \nu}{2 a}, \ldots, 1-\frac{2 c k - c m + p + a \nu}{2 a}; -e^{-2 a z}\right) + e^{\frac{i \pi m}{2} + (c (m-2 k)+p) z}$$

$$\left. \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c (m-2 k)+p+a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c (m-2 k)+p+a \nu}{2 a}, \ldots, -\frac{c (m-2 k)+p+a \nu}{2 a}, \right.\right.$$

$$\left.\left. -\nu; 1-\frac{c (m-2 k)+p+a \nu}{2 a}, \ldots, 1-\frac{c (m-2 k)+p+a \nu}{2 a}; -e^{-2 a z}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1} e^{p z} \sinh^\mu(c z+d) \cosh^\nu(a z)$

01.20.21.4831.01

$$\int z^{\alpha-1} e^{p z} \sinh^m(d+c z) \cosh^\nu(a z)\, dz == -i^m 2^{-m-\nu} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1-m \bmod 2)\, (1-\nu \bmod 2)\, z^\alpha (-p z)^{-\alpha}\, \Gamma(\alpha, -p z) -$$

$$i^m 2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2)\, z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \left(E_{1-\alpha}(-(p+2 a s-a \nu) z) + E_{1-\alpha}(-(p+a (\nu-2 s)) z)\right) - 2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)$$

$$z^\alpha \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} e^{-d (2 k+m)} \left(e^{2 d m} E_{1-\alpha}((2 c k - c m - p) z) + e^{4 d k + i m \pi} E_{1-\alpha}(-(2 c k - c m + p) z)\right) - 2^{-m-\nu} z^\alpha$$

$$\sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} e^{-2 d k - d m} \left(e^{2 d m} \left(E_{1-\alpha}((2 c k - c m - p - 2 a s + a \nu) z) + E_{1-\alpha}((2 c k - c m - p + 2 a s - a \nu) z)\right) + \right.$$

$$\left. e^{4 d k + i m \pi} \left(E_{1-\alpha}((c (m-2 k) - p - 2 a s + a \nu) z) + E_{1-\alpha}(-(2 c k - c m + p - 2 a s + a \nu) z)\right)\right) /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4832.01

$$\int z^n\, e^{p\,z} \sinh^{\mu}(d+c\,z) \cosh^{\nu}(a\,z)\, dz == 2^{-\nu}\, e^{p\,z} \binom{\nu}{\frac{\nu}{2}}\, n!\, (1-\nu \bmod 2) \sinh^{\mu}(d+c\,z)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+c\,\mu}{2\,c}, \ldots, -\frac{p+c\,\mu}{2\,c}, -\mu; 1-\frac{p+c\,\mu}{2\,c}, \ldots, 1-\frac{p+c\,\mu}{2\,c}; e^{-2\,(d+c\,z)}\right)\right)$$

$$\left(1-e^{-2\,(d+c\,z)}\right)^{-\mu} + 2^{-\nu}\, n!\, \sinh^{\mu}(d+c\,z) \left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k}\right.$$

$$\left(e^{(p-a\,(\nu-2\,k))\,z} \sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p-a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.\right.$$

$$\left.-\mu; 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}; e^{-2\,(d+c\,z)}\right) + e^{(p+a\,(\nu-2\,k))\,z}$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, -\mu;\right.$$

$$\left.\left.\left.1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}; e^{-2\,(d+c\,z)}\right)\right)\right) \left(1-e^{-2\,(d+c\,z)}\right)^{-\mu} /;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4833.01

$$\int z^n\, e^{p\,z} \sinh^{m}(d+c\,z) \cosh^{\nu}(a\,z)\, dz == 2^{-m}\, i^{-m}\, e^{p\,z} \left(1+e^{-2\,a\,z}\right)^{-\nu} \binom{m}{\frac{m}{2}} \cosh^{\nu}(a\,z)\, n!\, (1-m \bmod 2)$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+a\,\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\,\nu}{2\,a}, \ldots, -\frac{p+a\,\nu}{2\,a}, -\nu; 1-\frac{p+a\,\nu}{2\,a}, \ldots, 1-\frac{p+a\,\nu}{2\,a}; -e^{-2\,a\,z}\right) +$$

$$2^{-m}\, i^{-m}\, n! \left(1+e^{-2\,a\,z}\right)^{-\nu} \cosh^{\nu}(a\,z) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{1}{2}\,i\,\pi\,m-d\,(m-2\,k)+(p-c\,(m-2\,k))\,z}\right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (-c\,(m-2\,k)+p+a\,\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{2\,c\,k-c\,m+p+a\,\nu}{2\,a}, \ldots, -\frac{2\,c\,k-c\,m+p+a\,\nu}{2\,a},\right.$$

$$\left.-\nu; 1-\frac{2\,c\,k-c\,m+p+a\,\nu}{2\,a}, \ldots, 1-\frac{2\,c\,k-c\,m+p+a\,\nu}{2\,a}; -e^{-2\,a\,z}\right) + e^{\frac{i\,\pi\,m}{2}+d\,(m-2\,k)+(c\,(m-2\,k)+p)\,z}$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (c\,(m-2\,k)+p+a\,\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c\,(m-2\,k)+p+a\,\nu}{2\,a}, \ldots, -\frac{c\,(m-2\,k)+p+a\,\nu}{2\,a},\right.$$

$$\left.\left.-\nu; 1-\frac{c\,(m-2\,k)+p+a\,\nu}{2\,a}, \ldots, 1-\frac{c\,(m-2\,k)+p+a\,\nu}{2\,a}; -e^{-2\,a\,z}\right)\right) /;\, n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1}\, e^{p\,z} \sinh^{\mu}(c\,z) \cosh^{\nu}(a\,z+b)$

01.20.21.4834.01

$$\int z^{\alpha-1}\, e^{p\,z} \sinh^m(c\,z) \cosh^\nu(b+a\,z)\, dz == -i^m\, 2^{-m-\nu} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1-m \bmod 2)\,(1-\nu \bmod 2)\, z^\alpha\, (-p\,z)^{-\alpha}\, \Gamma(\alpha, -p\,z) -$$

$$i^m\, 2^{-m-\nu} \binom{m}{\frac{m}{2}} (1-m \bmod 2)\, z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b\,(2\,s+\nu)} \binom{\nu}{s} \left(e^{4\,b\,s}\, E_{1-\alpha}(-(p+2\,a\,s-a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}(-(p+a\,(\nu-2\,s))\,z)\right) -$$

$$2^{-m-\nu} \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2)\, z^\alpha \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(E_{1-\alpha}((2\,c\,k-c\,m-p)\,z) + (-1)^m\, E_{1-\alpha}(-(2\,c\,k-c\,m+p)\,z)\right) -$$

$$2^{-m-\nu}\, z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} e^{-2\,b\,s-b\,\nu}$$

$$\left(\left(e^{4\,b\,s}\, E_{1-\alpha}((2\,c\,k-c\,m-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}((2\,c\,k-c\,m-p+2\,a\,s-a\,\nu)\,z)\right) + (-1)^m \left(e^{4\,b\,s}\, E_{1-\alpha}(\right.\right.$$

$$\left.\left.(c\,(m-2\,k)-p-2\,a\,s+a\,\nu)\,z) + e^{2\,b\,\nu}\, E_{1-\alpha}(-(2\,c\,k-c\,m+p-2\,a\,s+a\,\nu)\,z)\right)\right) /;\, m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4835.01

$$\int z^n\, e^{p\,z} \sinh^\mu(c\,z) \cosh^\nu(b+a\,z)\, dz == 2^{-\nu}\, e^{p\,z} \binom{\nu}{\frac{\nu}{2}}\, n!\, (1-\nu \bmod 2) \sinh^\mu(c\,z)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+c\,\mu}{2\,c}, \ldots, -\frac{p+c\,\mu}{2\,c}, -\mu; 1-\frac{p+c\,\mu}{2\,c}, \ldots, 1-\frac{p+c\,\mu}{2\,c}; e^{-2\,c\,z}\right)\right)$$

$$\left(1-e^{-2\,c\,z}\right)^{-\mu} + 2^{-\nu}\, n!\, \sinh^\mu(c\,z) \left(\sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k} \left(e^{(p-a\,(\nu-2\,k))\,z-b\,(\nu-2\,k)}\right.\right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p-a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.$$

$$\left.-\mu; 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{p-a\,(\nu-2\,k)+c\,\mu}{2\,c}; e^{-2\,c\,z}\right) + e^{b\,(\nu-2\,k)+(p+a\,(\nu-2\,k))\,z}$$

$$\left.\sum_{j=0}^{n} \frac{(-1)^j\, z^{n-j}\, (p+a\,(\nu-2\,k)+c\,\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, -\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c},\right.\right.$$

$$\left.\left.\left.-\mu; 1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}, \ldots, 1-\frac{p+a\,(\nu-2\,k)+c\,\mu}{2\,c}; e^{-2\,c\,z}\right)\right)\right) \left(1-e^{-2\,c\,z}\right)^{-\mu} /;\, n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4836.01

$$\int z^n e^{p z} \sinh^m(c z) \cosh^\nu(b + a z)\, dz == 2^{-m} i^{-m} e^{p z} \left(1 + e^{-2 (b+a z)}\right)^{-\nu} \binom{m}{\frac{m}{2}} \cosh^\nu(b + a z)\, n!\, (1 - m \bmod 2)$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p + a \nu}{2 a}, \ldots, -\frac{p + a \nu}{2 a}, -\nu; 1 - \frac{p + a \nu}{2 a}, \ldots, 1 - \frac{p + a \nu}{2 a}; -e^{-2 (b+a z)}\right) +$$

$$2^{-m} i^{-m} n! \left(1 + e^{-2 (b+a z)}\right)^{-\nu} \cosh^\nu(b + a z) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{1}{2} i \pi m + (p - c (m-2 k)) z} \right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-c (m - 2 k) + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{2 c k - c m + p + a \nu}{2 a}, \ldots, -\frac{2 c k - c m + p + a \nu}{2 a}, \right.$$

$$\left. -\nu; 1 - \frac{2 c k - c m + p + a \nu}{2 a}, \ldots, 1 - \frac{2 c k - c m + p + a \nu}{2 a}; -e^{-2 (b+a z)}\right) + e^{\frac{i \pi m}{2} + (c (m-2 k) + p) z}$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c (m - 2 k) + p + a \nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c (m - 2 k) + p + a \nu}{2 a}, \ldots, -\frac{c (m - 2 k) + p + a \nu}{2 a}, \right.$$

$$\left. \left. -\nu; 1 - \frac{c (m - 2 k) + p + a \nu}{2 a}, \ldots, 1 - \frac{c (m - 2 k) + p + a \nu}{2 a}; -e^{-2 (b+a z)}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^{\alpha-1} e^{p z} \sinh^\mu(c z + d) \cosh^\nu(a z + b)$

01.20.21.4837.01

$$\int z^{\alpha-1} e^{p z} \sinh^m(d + c z) \cosh^\nu(b + a z)\, dz == -i^m 2^{-m-\nu} \binom{m}{\frac{m}{2}} \binom{\nu}{\frac{\nu}{2}} (1 - m \bmod 2)\, (1 - \nu \bmod 2)\, z^\alpha (-p z)^{-\alpha} \Gamma(\alpha, -p z) -$$

$$i^m 2^{-m-\nu} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\, z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} e^{-b (2 s + \nu)} \binom{\nu}{s} \left(e^{4 b s} E_{1-\alpha}(-(p + 2 a s - a \nu) z) + e^{2 b \nu} E_{1-\alpha}(-(p + a (\nu - 2 s)) z)\right) - 2^{-m-\nu}$$

$$\binom{\nu}{\frac{\nu}{2}} (1 - \nu \bmod 2)\, z^\alpha \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} e^{-d (2 k + m)} \left(e^{2 d m} E_{1-\alpha}((2 c k - c m - p) z) + e^{4 d k + i m \pi} E_{1-\alpha}(-(2 c k - c m + p) z)\right) -$$

$$2^{-m-\nu} z^\alpha \sum_{s=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} e^{-2 d k - d m - 2 b s - b \nu} \left(e^{2 d m} \left(e^{4 b s} E_{1-\alpha}((2 c k - c m - p - 2 a s + a \nu) z) + \right.\right.$$

$$\left. e^{2 b \nu} E_{1-\alpha}((2 c k - c m - p + 2 a s - a \nu) z)\right) + e^{4 d k + i m \pi} \left(e^{4 b s} E_{1-\alpha}((c (m - 2 k) - p - 2 a s + a \nu) z) + \right.$$

$$\left.\left. e^{2 b \nu} E_{1-\alpha}(-(2 c k - c m + p - 2 a s + a \nu) z)\right)\right) /; m \in \mathbb{N}^+ \bigwedge \nu \in \mathbb{N}^+$$

01.20.21.4838.01

$$\int z^n e^{p z} \sinh^{\mu}(d+c z) \cosh^{\nu}(b+a z)\, dz == 2^{-\nu} e^{p z} \binom{\nu}{\frac{\nu}{2}} n!\, (1-\nu \bmod 2) \sinh^{\mu}(d+c z)$$

$$\left(\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p+c\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+c\mu}{2c}, \ldots, -\frac{p+c\mu}{2c}, -\mu; 1-\frac{p+c\mu}{2c}, \ldots, 1-\frac{p+c\mu}{2c}; e^{-2(d+c z)}\right)\right)$$

$$\left(1-e^{-2(d+c z)}\right)^{-\mu} + 2^{-\nu} n! \sinh^{\mu}(d+c z)$$

$$\left(\sum_{k=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor} \binom{\nu}{k}\right)\left(e^{(p-a(\nu-2k))z - b(\nu-2k)} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p-a(\nu-2k)+c\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p-a(\nu-2k)+c\mu}{2c}, \ldots,\right.\right.$$

$$\left. -\frac{p-a(\nu-2k)+c\mu}{2c}, -\mu; 1-\frac{p-a(\nu-2k)+c\mu}{2c}, \ldots, 1-\frac{p-a(\nu-2k)+c\mu}{2c}; e^{-2(d+c z)}\right) +$$

$$e^{b(\nu-2k)+(p+a(\nu-2k))z} \sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p+a(\nu-2k)+c\mu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a(\nu-2k)+c\mu}{2c},\right.$$

$$\ldots, -\frac{p+a(\nu-2k)+c\mu}{2c}, -\mu; 1-\frac{p+a(\nu-2k)+c\mu}{2c}, \ldots,$$

$$\left.\left. 1-\frac{p+a(\nu-2k)+c\mu}{2c}; e^{-2(d+c z)}\right)\right)\left(1-e^{-2(d+c z)}\right)^{-\mu} /; n \in \mathbb{N} \bigwedge \nu \in \mathbb{N}^+$$

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$$\int z^n e^{p z} \sinh^{m}(d+c z) \cosh^{\nu}(b+a z)\, dz == 2^{-m} i^{-m} e^{p z} \left(1+e^{-2(b+a z)}\right)^{-\nu} \binom{m}{\frac{m}{2}} \cosh^{\nu}(b+a z)\, n!\, (1-m \bmod 2)$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (p+a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{p+a\nu}{2a}, \ldots, -\frac{p+a\nu}{2a}, -\nu; 1-\frac{p+a\nu}{2a}, \ldots, 1-\frac{p+a\nu}{2a}; -e^{-2(b+a z)}\right) +$$

$$2^{-m} i^{-m} n! \left(1+e^{-2(b+a z)}\right)^{-\nu} \cosh^{\nu}(b+a z) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{1}{2} i \pi m - d(m-2k) + (p-c(m-2k))z}\right.$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (-c(m-2k)+p+a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{2ck-cm+p+a\nu}{2a}, \ldots, -\frac{2ck-cm+p+a\nu}{2a}, -\nu;\right.$$

$$\left. 1-\frac{2ck-cm+p+a\nu}{2a}, \ldots, 1-\frac{2ck-cm+p+a\nu}{2a}; -e^{-2(b+a z)}\right) + e^{\frac{i\pi m}{2} + d(m-2k) + (c(m-2k)+p)z}$$

$$\sum_{j=0}^{n} \frac{(-1)^j z^{n-j} (c(m-2k)+p+a\nu)^{-j-1}}{(n-j)!}\, {}_{j+2}F_{j+1}\left(-\frac{c(m-2k)+p+a\nu}{2a}, \ldots, -\frac{c(m-2k)+p+a\nu}{2a},\right.$$

$$\left.\left. -\nu; 1-\frac{c(m-2k)+p+a\nu}{2a}, \ldots, 1-\frac{c(m-2k)+p+a\nu}{2a}; -e^{-2(b+a z)}\right)\right) /; n \in \mathbb{N} \bigwedge m \in \mathbb{N}^+$$

Involving $z^n e^{p z^r} \sinh^m(b z^r) \cosh^{\nu}(c z)$

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$$\int z^n e^{p z^2} \sinh^m\left(b z^2\right) \cosh^v(c z)\, dz ==$$

$$-i^m 2^{-m-v-1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-v \bmod 2)\, z^{n+1}\, E_{\frac{1}{2}-\frac{n}{2}}\left(-p z^2\right) - i^m 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} e^{-\frac{c^2 (v-2s)^2}{4p}}\, p^{-n-1} \binom{v}{s} \left(\sum_{q=0}^{n} 2^{q-n} (c(v-2s))^{n-q} (2cs - cv + 2pz)^{q+1} \left(-\frac{(2cs - cv + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \right.$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(2cs - cv + 2pz)^2}{4p} \right) + \sum_{q=0}^{n} 2^{q-n} (c(2s-v))^{n-q} (c(v-2s) + 2pz)^{q+1}$$

$$\left. \left(-\frac{(c(v-2s) + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c(v-2s) + 2pz)^2}{4p} \right) \right) -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2)\, z^{n+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left((-1)^m \Gamma\left(\frac{n+1}{2}, -(2bk - bm + p) z^2 \right) \left(-(2bk - bm + p) z^2 \right)^{\frac{1}{2}(-n-1)} + \right.$$

$$\left. \left(-(b(m-2k) + p) z^2 \right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -(b(m-2k) + p) z^2 \right) \right) -$$

$$i^m 2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \left((-1)^k e^{\frac{1}{4}\left(-\frac{c^2 (v-2s)^2}{2bk - bm + p} - \frac{c^2 (v-2s)^2}{b(m-2k)+p} - 2\pi i m \right)} \binom{m}{k} \binom{v}{s} \right.$$

$$\left(e^{\frac{c^2 (v-2s)^2}{4(2bk - bm + p)}} \sqrt{2bk - bm + p} \left(\sum_{q=0}^{n} 2^{q-n} (-2bk + bm + p)^{-n-\frac{1}{2}} (c(v-2s))^{n-q} \right. \right.$$

$$(c(2s-v) + 2(-2bk + bm + p) z)^{q+1} \left(-\frac{(c(2s-v) + 2(-2bk + bm + p) z)^2}{-2bk + bm + p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2}, -\frac{(c(2s-v) + 2(-2bk + bm + p) z)^2}{4(-2bk + bm + p)} \right) + \sum_{q=0}^{n} (-2bk + bm + p)^{-n-\frac{1}{2}} \left(c\left(s - \frac{v}{2} \right) \right)^{n-q}$$

$$(c(v-2s) + 2(-2bk + bm + p) z)^{q+1} \left(-\frac{(c(v-2s) + 2(-2bk + bm + p) z)^2}{-2bk + bm + p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q}$$

$$\left. \left. \Gamma\left(\frac{q+1}{2}, -\frac{(c(v-2s) + 2(-2bk + bm + p) z)^2}{4(-2bk + bm + p)} \right) \right) + e^{\frac{c^2 (v-2s)^2}{4(b(m-2k)+p)} + i m \pi} \sqrt{b(m-2k) + p} \right.$$

$$\sum_{q=0}^{n} 2^{q-n} (2bk - bm + p)^{-n-\frac{1}{2}} (c(v-2s))^{n-q} (c(2s-v) + 2(2bk - bm + p) z)^{q+1}$$

$$\left. \left(-\frac{(c(2s-v) + 2(2bk - bm + p) z)^2}{2bk - bm + p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c(2s-v) + 2(2bk - bm + p) z)^2}{4(2bk - bm + p)} \right) + \right.$$

$$e^{\frac{c^2 (v-2 s)^2}{4 (-2 b k+b m+p)}+i m \pi} \sqrt{-2 b k+b m+p} \sum_{q=0}^{n} (2 b k-b m+p)^{-n-\frac{1}{2}} \left(c \left(s-\frac{v}{2}\right)\right)^{n-q}$$

$$(c (v-2 s)+2 (2 b k-b m+p) z)^{q+1} \left(-\frac{(c (v-2 s)+2 (2 b k-b m+p) z)^2}{2 b k-b m+p}\right)^{\frac{1}{2} (-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c (v-2 s)+2 (2 b k-b m+p) z)^2}{4 (2 b k-b m+p)}\right)\Bigg)\Bigg/$$

$$\left(\sqrt{2 b k-b m+p} \sqrt{b (m-2 k)+p}\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

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$$\int z^n e^{p \sqrt{z}} \sinh^m\left(b \sqrt{z}\right) \cosh^v(c z) \, dz == -i^m 2^{-m-v+1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2) (1-v \bmod 2) p^{-2 (n+1)} \Gamma\left(2 (n+1), -p \sqrt{z}\right) +$$

$$i^m 2^{-m-v+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} 2^{-2 (n+1)} e^{\frac{p^2}{4 c v-8 c s}} (c (2 s-v))^{-2 n} (c (v-2 s))^{-2 (n+1)}$$

$$\left(e^{\frac{p^2}{4 c s-2 c v}} (c (2 s-v))^{2 n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2 n} \left(p+2 c (v-2 s) \sqrt{z}\right)^{h+k} \left(-\frac{\left(p+2 c (v-2 s) \sqrt{z}\right)^2}{c (v-2 s)}\right)^{\frac{1}{2} (-h-k-1)}\right.$$

$$\binom{k}{h} \binom{n}{k} \left(p \left(p+2 c (v-2 s) \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h+k+1), \frac{\left(p+2 c (v-2 s) \sqrt{z}\right)^2}{c (8 s-4 v)}\right)+\right.$$

$$\left.2 c \sqrt{\frac{\left(p+2 c (v-2 s) \sqrt{z}\right)^2}{c (2 s-v)}} (v-2 s) \Gamma\left(\frac{1}{2} (h+k+2), \frac{\left(p+2 c (v-2 s) \sqrt{z}\right)^2}{c (8 s-4 v)}\right)\right)+$$

$$(c (v-2 s))^{2 n} \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k p^{-h-k+2 n} \left(p+2 c (2 s-v) \sqrt{z}\right)^{h+k} \left(-\frac{\left(p+2 c (2 s-v) \sqrt{z}\right)^2}{c (2 s-v)}\right)^{\frac{1}{2} (-h-k-1)}$$

$$\binom{k}{h} \binom{n}{k} \left(p \left(p+2 c (2 s-v) \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h+k+1), -\frac{\left(p+2 c (2 s-v) \sqrt{z}\right)^2}{c (8 s-4 v)}\right)+\right.$$

$$\left.\left.2 c (2 s-v) \sqrt{-\frac{\left(p+2 c (2 s-v) \sqrt{z}\right)^2}{c (2 s-v)}} \Gamma\left(\frac{1}{2} (h+k+2), -\frac{\left(p+2 c (2 s-v) \sqrt{z}\right)^2}{c (8 s-4 v)}\right)\right)\right)-$$

$$2^{-m-v+1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\, z^{n+1}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\Big((-1)^m\,\Gamma\big(2\,(n+1),\,-(-b\,m+p+2\,b\,u)\,\sqrt{z}\big)$$

$$\big(-(-b\,m+p+2\,b\,u)\,\sqrt{z}\big)^{-2\,(n+1)}+\big(-(b\,m+p-2\,b\,u)\,\sqrt{z}\big)^{-2\,(n+1)}\,\Gamma\big(2\,(n+1),\,-(b\,m+p-2\,b\,u)\,\sqrt{z}\big)\Big)+$$

$$\frac{1}{c^2}\,2^{-m-2\,n-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\frac{1}{(v-2\,s)^2}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\Bigg(e^{-\frac{(b\,m+p-2\,b\,u)^2}{8\,c\,s-4\,c\,v}}\,(c\,(2\,s-v))^{-2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,m+p-2\,b\,u)^{-h-k+2\,n}$$

$$\big(p+b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^{h+k}\Bigg(-\frac{\big(p+b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^2}{c\,(2\,s-v)}\Bigg)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((b\,m+p-2\,b\,u)\big(p+b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)$$

$$\Gamma\Bigg(\frac{1}{2}\,(h+k+1),\,-\frac{\big(p+b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^2}{c\,(8\,s-4\,v)}\Bigg)+2\,c\,(2\,s-v)\,\Gamma\Bigg(\frac{1}{2}\,(h+k+2),$$

$$-\frac{\big(p+b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^2}{c\,(8\,s-4\,v)}\Bigg)\sqrt{-\frac{\big(p+b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^2}{c\,(2\,s-v)}}\Bigg)+$$

$$e^{i\,m\,\pi-\frac{(-b\,m+p+2\,b\,u)^2}{c\,(8\,s-4\,v)}}\,(c\,(2\,s-v))^{-2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m+p+2\,b\,u)^{-h-k+2\,n}$$

$$\big(p-b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^{h+k}\Bigg(-\frac{\big(p-b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^2}{c\,(2\,s-v)}\Bigg)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg((-b\,m+p+2\,b\,u)\big(p-b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)$$

$$\Gamma\Bigg(\frac{1}{2}\,(h+k+1),\,-\frac{\big(p-b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\big)^2}{c\,(8\,s-4\,v)}\Bigg)+2\,c\,(2\,s-v)\,\Gamma\Bigg(\frac{1}{2}\,(h+k+2),$$

$$-\frac{\left(p-b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\Bigg)\sqrt{-\frac{\left(p-b\,(m-2\,u)+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\Bigg)+$$

$$(c\,(v-2\,s))^{-2\,n}\Bigg(e^{\frac{(b\,m+p-2\,b\,u)^2}{8\,c\,s-4\,c\,v}}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,m+p-2\,b\,u)^{-h-k+2\,n}\left(p+b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p+b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\Bigg((b\,m+p-2\,b\,u)\left(p+b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(h+k+1),$$

$$\frac{\left(p+b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\Bigg)+2\,c\,(v-2\,s)\,\Gamma\Bigg(\frac{1}{2}\,(h+k+2),$$

$$\frac{\left(p+b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\Bigg)\sqrt{-\frac{\left(p+b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\Bigg)+$$

$$e^{\frac{(-b\,m+p+2\,b\,u)^2}{8\,c\,s-4\,c\,v}+i\,m\,\pi}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,m+p+2\,b\,u)^{-h-k+2\,n}\left(p-b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}$$

$$\left(-\frac{\left(p-b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}\Bigg((-b\,m+p+2\,b\,u)\Big(p-b\,(m-$$

$$2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\Big)\Gamma\left(\frac{1}{2}\,(h+k+1),\ \frac{\left(p-b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+$$

$$2\,c\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\ \frac{\left(p-b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)$$

$$\sqrt{-\frac{\left(p-b\,(m-2\,u)+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}}\Bigg)\Bigg)\Bigg)\ /;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n e^{p z^r} \sinh^m(b z) \cosh^v(c z)$

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$$\int z^n e^{p z^2} \sinh^m(b z) \cosh^v(c z)\, dz == -i^m 2^{-m-v-1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2)\, (1 - v \bmod 2)\, z^{n+1} \left(-p z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, -p z^2\right) -$$

$$i^m 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)\, p^{-n-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} e^{-\frac{c^2 (v-2s)^2}{4p}}$$

$$\left(\sum_{q=0}^{n} 2^{q-n} (c (v-2s))^{n-q} (2cs - cv + 2pz)^{q+1} \left(-\frac{(2cs - cv + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2cs - cv + 2pz)^2}{4p}\right) + \right.$$

$$\left. \sum_{q=0}^{n} \left(c\left(s - \frac{v}{2}\right)\right)^{n-q} (c (v-2s) + 2pz)^{q+1} \left(-\frac{(c (v-2s) + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(c (v-2s) + 2pz)^2}{4p}\right) \right) -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} e^{-\frac{b^2 (m-2k)^2}{4p}} p^{-n-1} \left((-1)^m \sum_{q=0}^{n} 2^{q-n} (b (m-2k))^{n-q} (2bk - bm + 2pz)^{q+1} \right.$$

$$\left(-\frac{(2bk - bm + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2bk - bm + 2pz)^2}{4p}\right) + \sum_{q=0}^{n} \left(b\left(k - \frac{m}{2}\right)\right)^{n-q}$$

$$\left. (b (m-2k) + 2pz)^{q+1} \left(-\frac{(b (m-2k) + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(b (m-2k) + 2pz)^2}{4p}\right) \right) -$$

$$\frac{1}{\sqrt{p}} \left(\left(i^m 2^{-m-v-1}\right) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k e^{-\frac{b^2 (m-2k)^2 + c^2 (v-2s)^2 + i m p \pi}{2p}} \binom{m}{k} \left(e^{\frac{(2bk - bm - 2cs + cv)^2}{4p}} \sum_{q=0}^{n} p^{-n-\frac{1}{2}} \left(\left(k - \frac{m}{2}\right) b + \left(s - \frac{v}{2}\right) c \right)^{n-q} \right.\right.$$

$$(-2bk + bm - 2cs + cv + 2pz)^{q+1} \left(-\frac{(-2bk + bm - 2cs + cv + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(-2bk + bm - 2cs + cv + 2pz)^2}{4p}\right) +$$

$$e^{\frac{(-2bk + bm - 2cs + cv)^2}{4p} + i m \pi} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (-2bk + bm + 2cs - cv)^{n-q} (2bk - bm - 2cs + cv + 2pz)^{q+1}$$

$$\left(-\frac{(2bk - bm - 2cs + cv + 2pz)^2}{p} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(2bk - bm - 2cs + cv + 2pz)^2}{4p}\right) +$$

$$\left. e^{\frac{(-2bk + bm - 2cs + cv)^2}{4p}} \sum_{q=0}^{n} 2^{q-n} p^{-n-\frac{1}{2}} (2bk - bm - 2cs + cv)^{n-q} (-2bk + bm + 2cs - cv + 2pz)^{q+1} \right.$$

$$\left(-\frac{(-2\,b\,k+b\,m+2\,c\,s-c\,v+2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.-\frac{(-2\,b\,k+b\,m+2\,c\,s-c\,v+2\,p\,z)^2}{4\,p}\right)+e^{\frac{(2\,b\,k-b\,m-2\,c\,s+c\,v)^2}{4\,p}+i\,m\,\pi}\sum_{q=0}^{n}2^{q-n}\,p^{-n-\frac{1}{2}}$$

$$(b\,(m-2\,k)+c\,(v-2\,s))^{n-q}\left(-\frac{(b\,(m-2\,k)-2\,c\,s+c\,v-2\,p\,z)^2}{p}\right)^{\frac{1}{2}(-q-1)}(2\,b\,k-b\,m+2\,c\,s-c\,v+$$

$$\left.\left.2\,p\,z)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b\,(m-2\,k)-2\,c\,s+c\,v-2\,p\,z)^2}{4\,p}\right)\right)\right)/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n\,e^{p\sqrt{z}}\,\sinh^m(b\,z)\cosh^v(c\,z)\,dz==-i^m\,2^{-m-v+1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\,p^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),\,-p\,\sqrt{z}\right)+$$

$$i^m\,2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}e^{\frac{p^2}{4\,c\,v-8\,c\,s}}\,(c\,(2\,s-v))^{-2\,n}\,(c\,(v-2\,s))^{-2\,(n+1)}$$

$$\left(e^{\frac{p^2}{4\,c\,s-2\,c\,v}}\,(c\,(2\,s-v))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}(-h-k-1)}\right.$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$\left.\left.2\,c\,\sqrt{\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\,(v-2\,s)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(p+2\,c\,(v-2\,s)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\right)+\right.$$

$$(c\,(v-2\,s))^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)+\right.$$

$$2\,c\,(2\,s-v)\sqrt{-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(2\,s-v)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(p+2\,c\,(2\,s-v)\,\sqrt{z}\right)^2}{c\,(8\,s-4\,v)}\right)\Bigg)\Bigg)-$$

$$2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}e^{\frac{p^2}{8\,b\,u-4\,b\,m}}\left(-b^2\,(m-2\,u)^2\right)^{-2\,n-1}$$

$$\Bigg(\left(-b\,(m-2\,u)\right)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p+2\,b\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(p\left(p+2\,b\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(p+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)+2\,b\,(m-2\,u)$$

$$\sqrt{-\frac{\left(p+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(p+2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)\Bigg)+(-1)^m\,e^{\frac{p^2}{2\,b\,m-4\,b\,u}}$$

$$\left(b\,(m-2\,u)\right)^{2\,n}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}\left(p-2\,b\,(m-2\,u)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\Bigg(p\left(p-2\,b\,(m-2\,u)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,\frac{\left(p-2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)-$$

$$2\,b\,(m-2\,u)\sqrt{\frac{\left(p-2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{b\,(m-2\,u)}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\,\frac{\left(p-2\,b\,(m-2\,u)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,u)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{u=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^u\binom{m}{u}\Bigg((-1)^m\,e^{\frac{p^2}{4\,b\,m+8\,c\,s-8\,b\,u-4\,c\,v}}\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}$$

$$\left(p+2\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)\,\sqrt{z}\right)^{h+k}\left(\frac{\left(p+2\,(-b\,m-2\,c\,s+2\,b\,u+c\,v)\,\sqrt{z}\right)^2}{b\,m+2\,c\,s-2\,b\,u-c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(p\left(p+2\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\right.\right.$$

$$\left.\left.\frac{\left(p+2\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\,b\,m+8\,c\,s-8\,b\,u-4\,c\,v}\right)+2\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)\Gamma\left(\frac{1}{2}(h+k+2),\right.\right.$$

$$\left.\left.\frac{\left(p+2\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\,b\,m+8\,c\,s-8\,b\,u-4\,c\,v}\right)\sqrt{\frac{\left(p+2\left(-b\,m-2\,c\,s+2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{b\,m+2\,c\,s-2\,b\,u-c\,v}}\right)+$$

$$(-1)^m\,e^{\frac{p^2}{4\,b\,m-8\,c\,s-8\,b\,u+4\,c\,v}}\left(-b\,m+2\,c\,s+2\,b\,u-c\,v\right)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}$$

$$\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^{h+k}\left(\frac{\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{b\,m-2\,c\,s-2\,b\,u+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ \frac{\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)}\right)-\right.$$

$$\left.2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{\frac{\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{b\,m-2\,c\,s-2\,b\,u+c\,v}}\right.$$

$$\left.\Gamma\left(\frac{1}{2}(h+k+2),\ \frac{\left(p-2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)}\right)\right)+$$

$$e^{\frac{p^2}{-4\,b\,m+8\,c\,s+8\,b\,u-4\,c\,v}}\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}$$

$$\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{b\,m-2\,c\,s-2\,b\,u+c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+k+1),\ -\frac{\left(p+2\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)\sqrt{z}\right)^2}{4\left(b\,m-2\,c\,s-2\,b\,u+c\,v\right)}\right)+\right.$$

$$2\,(b\,m-2\,c\,s-2\,b\,u+c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(p+2\,(b\,m-2\,c\,s-2\,b\,u+c\,v)\,\sqrt{z}\right)^2}{4\,(b\,m-2\,c\,s-2\,b\,u+c\,v)}\right)$$

$$\sqrt{-\frac{\left(p+2\,(b\,m-2\,c\,s-2\,b\,u+c\,v)\,\sqrt{z}\right)^2}{b\,m-2\,c\,s-2\,b\,u+c\,v}}\Bigg)+$$

$$e^{\frac{p^2}{-4\,b\,m-8\,c\,s+8\,b\,u+4\,c\,v}}\,(b\,m+2\,c\,s-2\,b\,u-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,p^{-h-k+2\,n}$$

$$\left(p+2\,(b\,m+2\,c\,s-2\,b\,u-c\,v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(p+2\,(b\,m+2\,c\,s-2\,b\,u-c\,v)\,\sqrt{z}\right)^2}{b\,m+2\,c\,s-2\,b\,u-c\,v}\right)^{\frac{1}{2}(-h-k-1)}\binom{k}{h}\binom{n}{k}$$

$$\left(p\left(p+2\,(b\,m+2\,c\,s-2\,b\,u-c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(p+2\,(b\,m+2\,c\,s-2\,b\,u-c\,v)\,\sqrt{z}\right)^2}{8\,c\,s+4\,b\,(m-2\,u)-4\,c\,v}\right)+\right.$$

$$2\,(b\,m+2\,c\,s-2\,b\,u-c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(p+2\,(b\,m+2\,c\,s-2\,b\,u-c\,v)\,\sqrt{z}\right)^2}{8\,c\,s+4\,b\,(m-2\,u)-4\,c\,v}\right)$$

$$\left.\sqrt{-\frac{\left(p+2\,(b\,m+2\,c\,s-2\,b\,u-c\,v)\,\sqrt{z}\right)^2}{b\,m+2\,c\,s-2\,b\,u-c\,v}}\right)\Bigg)\Bigg/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh^m(b\,z^r)\cosh^v(c\,z)$

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$$\int z^n\,e^{p\,z}\sinh^m\left(b\,z^2\right)\cosh^v(c\,z)\,dz==$$

$$-i^m\,2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\,(-p)^{-n-1}\,\Gamma(n+1,\,-p\,z)-i^m\,2^{-m-v}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}z^{n+1}\,(E_{-n}(-(p+2\,c\,s-c\,v)\,z)+E_{-n}(-(p+c\,(v-2\,s))\,z))-2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}$$

$$\left(\frac{1}{\sqrt{b\,(m-2\,k)}}\left(e^{\frac{p^2}{8\,b\,k-4\,b\,m}}\sum_{q=0}^{n}2^{q-n}\,(b\,(m-2\,k))^{-n-\frac{1}{2}}\,(-p)^{n-q}\,(p+2\,b\,(m-2\,k)\,z)^{q+1}\left(\frac{(p+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\right.\right.$$

$$\Gamma\left(\frac{q+1}{2},\frac{(p+2\,b\,(m-2\,k)\,z)^2}{b\,(8\,k-4\,m)}\right)\Bigg)+\frac{1}{\sqrt{b\,(2\,k-m)}}\Bigg(\Bigg(-1\Big)^m\,e^{\frac{p^2}{4\,b\,m-8\,b\,k}}\sum_{q=0}^{n}2^{q-n}\,(b\,(2\,k-m))^{-n-\frac{1}{2}}\,(-p)^{n-q}$$

$$(p+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(p+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+4\,b\,k\,z-2\,b\,m\,z)^2}{b\,(8\,k-4\,m)}\right)\Bigg)\Bigg)+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(-\frac{1}{\sqrt{b\,(m-2\,k)}}\Bigg(e^{\frac{(p+2\,c\,s-c\,v)^2}{b\,(8\,k-4\,m)}}\sum_{q=0}^{n}2^{q-n}\,(b\,(m-2\,k))^{-n-\frac{1}{2}}\,(c\,(v-2\,s)-p)^{n-q}$$

$$(p+c\,(2\,s-v)+2\,b\,(m-2\,k)\,z)^{q+1}\left(\frac{(p+c\,(2\,s-v)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+c\,(2\,s-v)+2\,b\,(m-2\,k)\,z)^2}{b\,(8\,k-4\,m)}\right)\Bigg)-\frac{1}{\sqrt{b\,(m-2\,k)}}$$

$$\Bigg(e^{\frac{(p+c\,(v-2\,s))^2}{b\,(8\,k-4\,m)}}\sum_{q=0}^{n}2^{q-n}\,(b\,(m-2\,k))^{-n-\frac{1}{2}}\,(-p+2\,c\,s-c\,v)^{n-q}\,(p+c\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^{q+1}$$

$$\left(\frac{(p+c\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(2\,k-m)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+c\,(v-2\,s)+2\,b\,(m-2\,k)\,z)^2}{b\,(8\,k-4\,m)}\right)\Bigg)-$$

$$\frac{1}{\sqrt{b\,(2\,k-m)}}\Bigg(e^{i\,m\,\pi-\frac{(p-2\,c\,s+c\,v)^2}{4\,(2\,b\,k-b\,m)}}\sum_{q=0}^{n}2^{q-n}\,(b\,(2\,k-m))^{-n-\frac{1}{2}}\,(-p+2\,c\,s-c\,v)^{n-q}$$

$$(p-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(p-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p-2\,c\,s+c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,(2\,b\,k-b\,m)}\right)\Bigg)-$$

$$\frac{1}{\sqrt{b\,(2\,k-m)}}\Bigg(e^{i\,m\,\pi-\frac{(p+2\,c\,s-c\,v)^2}{4\,(2\,b\,k-b\,m)}}\sum_{q=0}^{n}2^{q-n}\,(b\,(2\,k-m))^{-n-\frac{1}{2}}\,(c\,(v-2\,s)-p)^{n-q}$$

$$(p+2\,c\,s-c\,v+4\,b\,k\,z-2\,b\,m\,z)^{q+1}\left(-\frac{(p+2\,c\,s-c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{2\,b\,k-b\,m}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\Bigg($$

$$\frac{q+1}{2},-\frac{(p+2\,c\,s-c\,v+4\,b\,k\,z-2\,b\,m\,z)^2}{4\,(2\,b\,k-b\,m)}\Bigg)\Bigg)\Bigg)\Big/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n e^{p z} \sinh^m\left(b \sqrt{z}\right) \cosh^v(c z)\, dz ==$$

$$-i^m 2^{-m-v} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2) (-p)^{-n-1} \Gamma(n+1, -p z) + i^m 2^{-m-v} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(-\Gamma(n+1, -(p + c (v - 2 s)) z) (c (2 s - v) - p)^{-n-1} - (-p - 2 c s + c v)^{-n-1} \Gamma(n+1, -(p + 2 c s - c v) z)\right) +$$

$$2^{-m-2 n-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2)\, p^{-2 (n+1)} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} e^{-\frac{b^2 (m-2 u)^2}{4 p}}$$

$$\left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b (m - 2 u))^{-h-k+2 n} \left(2 \sqrt{z}\ p + b (m - 2 u)\right)^{h+k} \left(-\frac{\left(2 \sqrt{z}\ p + b (m - 2 u)\right)^2}{p} \right)^{\frac{1}{2}(-h-k-1)} \right.$$

$$\binom{k}{h} \binom{n}{k} \left(b (m - 2 u) \left(2 \sqrt{z}\ p + b (m - 2 u)\right) \Gamma\left(\frac{1}{2} (h + k + 1), -\frac{\left(2 \sqrt{z}\ p + b (m - 2 u)\right)^2}{4 p} \right) + \right.$$

$$\left. 2 \sqrt{-\frac{\left(2 \sqrt{z}\ p + b (m - 2 u)\right)^2}{p}}\ p \Gamma\left(\frac{1}{2} (h + k + 2), -\frac{\left(2 \sqrt{z}\ p + b (m - 2 u)\right)^2}{4 p} \right) \right) +$$

$$(-1)^m \sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (-b (m - 2 u))^{-h-k+2 n} \left(-\frac{\left(b (m - 2 u) - 2 p \sqrt{z}\right)^2}{p} \right)^{\frac{1}{2}(-h-k-1)} \left(-b m + 2 b u + 2 p \sqrt{z}\right)^{h+k}$$

$$\left(\binom{k}{h} \binom{n}{k} \left(b (m - 2 u) \left(b (m - 2 u) - 2 p \sqrt{z}\right) \Gamma\left(\frac{1}{2} (h + k + 1), -\frac{\left(b (m - 2 u) - 2 p \sqrt{z}\right)^2}{4 p} \right) + \right. \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(b (m - 2 u) - 2 p \sqrt{z}\right)^2}{p}}\ p \Gamma\left(\frac{1}{2} (h + k + 2), -\frac{\left(b (m - 2 u) - 2 p \sqrt{z}\right)^2}{4 p} \right) \right) \right) +$$

$$2^{-m-2 n-v-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \sum_{u=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^u \binom{m}{u} \left((p - 2 c s + c v)^{-2 (n+1)} e^{-\frac{b^2 (m-2 u)^2}{4 (p-2 c s+c v)}} \left(\sum_{k=0}^{n} \sum_{h=0}^{k} (-1)^{k-h} 4^k (b (m - 2 u))^{-h-k+2 n} \right. \right.$$

$$\left(b\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)+2\,(p-2\,c\,s+c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(b\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\sqrt{-\frac{\left(b\,(m-2\,u)+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}\right)+$$

$$(-1)^m\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}\left(-\frac{\left(b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\left(-b\,m+2\,b\,u+2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^{h+k}\binom{k}{h}\binom{n}{k}$$

$$\left(2\,(p-2\,c\,s+c\,v)\sqrt{-\frac{\left(b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{p-2\,c\,s+c\,v}}\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+k+2),\,-\frac{\left(b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)-b\,(m-2\,u)\left(-b\,m+2\,b\,u+\right.$$

$$\left.\left.\left.2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)-2\,(p-2\,c\,s+c\,v)\,\sqrt{z}\right)^2}{4\,(p-2\,c\,s+c\,v)}\right)\right)\right)+$$

$$e^{-\frac{b^2\,(m-2\,u)^2}{4\,(p+2\,c\,s-c\,v)}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(b\,(m-2\,u))^{-h-k+2\,n}\left(b\,(m-2\,u)+\right.$$

$$\left.2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^{h+k}\left(-\frac{\left(b\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-h-k-1)}$$

$$\binom{k}{h}\binom{n}{k}\left(b\,(m-2\,u)\left(b\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+k+1),\right.\right.$$

$$\left.-\frac{\left(b\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)+2\,(p+2\,c\,s-c\,v)\,\Gamma\left(\frac{1}{2}\,(h+k+2),\right.$$

$$\left.\left.-\frac{\left(b\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)\sqrt{-\frac{\left(b\,(m-2\,u)+2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}\right)+$$

$$(-1)^m\,e^{-\frac{b^2\,(m-2\,u)^2}{4\,(p+2\,c\,s-c\,v)}}\,(p+2\,c\,s-c\,v)^{-2\,(n+1)}\sum_{k=0}^{n}\sum_{h=0}^{k}(-1)^{k-h}\,4^k\,(-b\,(m-2\,u))^{-h-k+2\,n}$$

$$\left(-\frac{\left(b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}\,(-h-k-1)}\left(2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\,-b\,(m-2\,u)\right)^{h+k}$$

$$\binom{k}{h}\binom{n}{k}\left(2\,(p+2\,c\,s-c\,v)\sqrt{-\frac{\left(b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{p+2\,c\,s-c\,v}}\;\Gamma\left(\frac{1}{2}\,(h+k+2),\right.\right.$$

$$\left.\left.-\frac{\left(b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)-b\,(m-2\,u)\left(2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\,-b\,(m-2\,u)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+k+1),\,-\frac{\left(b\,(m-2\,u)-2\,(p+2\,c\,s-c\,v)\,\sqrt{z}\right)^2}{4\,(p+2\,c\,s-c\,v)}\right)\right)\Bigg)\Bigg/;\;m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh^m(b\,z)\,\cosh^v\left(c\,z^r\right)$

01.20.21.4846.01

$$\int z^n\,e^{p\,z}\sinh^m(b\,z)\cosh^v\left(c\,z^2\right)dz==$$

$$-i^m\,2^{-m-v}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\,(-p)^{-n-1}\,\Gamma(n+1,\,-p\,z)-i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\frac{1}{\sqrt{c\,(v-2\,s)}}\left(e^{\frac{p^2}{8\,c\,s-4\,c\,v}}\sum_{q=0}^{n}2^{q-n}\,(-p)^{n-q}\,(c\,(v-2\,s))^{-n-\frac{1}{2}}\,(p+2\,c\,(v-2\,s)\,z)^{q+1}\left(-\frac{(p+2\,c\,(v-2\,s)\,z)^2}{c\,(v-2\,s)}\right)^{\frac{1}{2}\,(-q-1)}\right.\right.$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(p+2c(v-2s)z)^2}{c(8s-4v)}\right)\Bigg)+\frac{1}{\sqrt{c(2s-v)}}\Bigg(e^{\frac{p^2}{4cv-8cs}}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(c(2s-v))^{-n-\frac{1}{2}}$$

$$(p+4csz-2cvz)^{q+1}\left(-\frac{(p+4csz-2cvz)^2}{c(2s-v)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(p+4csz-2cvz)^2}{c(8s-4v)}\right)\Bigg)\Bigg)-$$

$$i^m 2^{-m-v}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}e^{-\frac{1}{2}im\pi}z^{n+1}\left(e^{im\pi}E_{-n}(-(2bk-bm+p)z)+E_{-n}(-(b(m-2k)+p)z)\right)-$$

$$2^{-m-v-1}\sum_{s=0}^{\lfloor\frac{v-1}{2}\rfloor}\binom{v}{s}\sum_{k=0}^{\lfloor\frac{m-1}{2}\rfloor}(-1)^k\binom{m}{k}$$

$$\Bigg(\frac{1}{\sqrt{c(v-2s)}}\Bigg(e^{\frac{(2bk-bm+p)^2}{c(8s-4v)}+im\pi}\sum_{q=0}^{n}2^{q-n}(b(m-2k)-p)^{n-q}(c(v-2s))^{-n-\frac{1}{2}}(2bk-bm+p+2c(v-2s)z)^{q+1}$$

$$\left(-\frac{(2bk-bm+p+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\frac{(b(2k-m)+p+2c(v-2s)z)^2}{c(8s-4v)}\right)\Bigg)+$$

$$\frac{1}{\sqrt{c(v-2s)}}\Bigg(e^{\frac{(b(m-2k)+p)^2}{c(8s-4v)}}\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)-\frac{p}{2}\right)^{n-q}(c(v-2s))^{-n-\frac{1}{2}}(b(m-2k)+p+2c(v-2s)z)^{q+1}$$

$$\left(-\frac{(b(m-2k)+p+2c(v-2s)z)^2}{c(v-2s)}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\Bigg($$

$$\frac{q+1}{2},\frac{(b(m-2k)+p+2c(v-2s)z)^2}{c(8s-4v)}\Bigg)\Bigg)+\frac{1}{\sqrt{c(2s-v)}}$$

$$\Bigg(e^{\frac{(b(m-2k)+p)^2}{4c(v-2s)}}\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)-\frac{p}{2}\right)^{n-q}(c(2s-v))^{-n-\frac{1}{2}}\left(-\frac{(-2bk+bm+p+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$(b(m-2k)+p+4csz-2cvz)^{q+1}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(-2bk+bm+p+4csz-2cvz)^2}{4(2cs-cv)}\right)\Bigg)+$$

$$\frac{1}{\sqrt{c(2s-v)}}\Bigg(e^{\frac{(2bk-bm+p)^2}{4c(v-2s)}+im\pi}\sum_{q=0}^{n}2^{q-n}(b(m-2k)-p)^{n-q}(c(2s-v))^{-n-\frac{1}{2}}$$

$$(2bk-bm+p+4csz-2cvz)^{q+1}\left(-\frac{(2bk-bm+p+4csz-2cvz)^2}{2cs-cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\Bigg($$

$$\frac{q+1}{2},\frac{(2bk-bm+p+4csz-2cvz)^2}{c(8s-4v)}\Bigg)\Bigg)\Bigg)$$

01.20.21.4847.01

$$\int z^n e^{p z} \sinh^m(b z) \cosh^v\left(c \sqrt{z}\right) dz ==$$

$$-2^{-m-v} i^{-m} (-p)^{-n-1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma(n+1, -p z) (1 - m \bmod 2) (1 - v \bmod 2) - 2^{-m-v} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k}$$

$$\left(\Gamma(n+1, (-b(m-2k)-p) z) (-b(m-2k)-p)^{-n-1} + (-1)^m (b(m-2k)-p)^{-n-1} \Gamma(n+1, (b(m-2k)-p) z)\right) +$$

$$2^{-m-2n-v-1} i^{-m} p^{-2(n+1)} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}$$

$$\left(e^{-\frac{c^2 (v-2s)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c(v-2s))^{-h-i+2n} \left(2p\sqrt{z} - c(v-2s)\right)^{h+i} \left(-\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)} \binom{i}{h} \right.$$

$$\binom{n}{i} \left(2p \sqrt{-\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{p}} \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{4p}\right) - \right.$$

$$\left. c(v-2s) \left(2p\sqrt{z} - c(v-2s)\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2p\sqrt{z} - c(v-2s)\right)^2}{4p}\right) \right) +$$

$$e^{-\frac{c^2 (v-2s)^2}{4p}} \sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (c(v-2s))^{-h-i+2n} \left(2\sqrt{z}\, p + c(v-2s)\right)^{h+i} \left(-\frac{\left(2\sqrt{z}\, p + c(v-2s)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h} \binom{n}{i} \left(c(v-2s) \left(2\sqrt{z}\, p + c(v-2s)\right) \Gamma\left(\frac{1}{2}(h+i+1), -\frac{\left(2\sqrt{z}\, p + c(v-2s)\right)^2}{4p}\right) + \right.$$

$$\left. \left. 2 \sqrt{-\frac{\left(2\sqrt{z}\, p + c(v-2s)\right)^2}{p}}\, p\, \Gamma\left(\frac{1}{2}(h+i+2), -\frac{\left(2\sqrt{z}\, p + c(v-2s)\right)^2}{4p}\right) \right) \right) +$$

$$2^{-m-2n-v-1} i^{-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{-\frac{c^2 (v-2s)^2}{4(p-b(m-2k))} - \frac{i m \pi}{2}} \left(\sum_{i=0}^{n} \sum_{h=0}^{i} (-1)^{i-h} 4^i (-c(v-2s))^{-h-i+2n} \right.\right.$$

$$\left. \left. \left(2(p - b(m-2k))\sqrt{z} - c(v-2s)\right)^{h+i} \left(-\frac{\left(2(p - b(m-2k))\sqrt{z} - c(v-2s)\right)^2}{p - b(m-2k)}\right)^{\frac{1}{2}(-h-i-1)} \right.\right.$$

$$\binom{i}{h}\binom{n}{i}\left(2\,(p-b\,(m-2\,k))\sqrt{-\frac{\left(2\,(p-b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{p-b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\right.\right.$$

$$\left.-\frac{\left(2\,(p-b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(p-b\,(m-2\,k))}\right)-c\,(v-2\,s)\left(2\,(p-b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,(p-b\,(m-2\,k))\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(p-b\,(m-2\,k))}\right)\right)(p-b\,(m-2\,k))^{-2\,(n+1)}+$$

$$e^{-\frac{c^2\,(v-2\,s)^2}{4\,(p-b\,(m-2\,k))}-\frac{i\,m\,\pi}{2}}\left(\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s))^{-h-i+2\,n}\left(2\,\sqrt{z}\,\,(p-b\,(m-2\,k))+c\,(v-2\,s)\right)^{h+i}\right.$$

$$\left(-\frac{\left(2\,\sqrt{z}\,\,(p-b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{p-b\,(m-2\,k)}\right)^{\frac{1}{2}\,(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left(c\,(v-2\,s)\left(2\,\sqrt{z}\,\,(p-b\,(m-2\,k))+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.\right.$$

$$\left.-\frac{\left(2\,\sqrt{z}\,\,(p-b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{4\,(p-b\,(m-2\,k))}\right)+2\sqrt{-\frac{\left(2\,\sqrt{z}\,\,(p-b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{p-b\,(m-2\,k)}}$$

$$\left.\left.(p-b\,(m-2\,k))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,\sqrt{z}\,\,(p-b\,(m-2\,k))+c\,(v-2\,s)\right)^2}{4\,(p-b\,(m-2\,k))}\right)\right)\right)$$

$$(p-b\,(m-2\,k))^{-2\,(n+1)}+e^{\frac{i\,m\,\pi}{2}-\frac{c^2\,(v-2\,s)^2}{4\,(b\,(m-2\,k)+p)}}\,(b\,(m-2\,k)+p)^{-2\,(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^{h+i}\left(-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)+p}\right)^{\frac{1}{2}\,(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(2\,(b\,(m-2\,k)+p)\,\sqrt{-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)+p}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\right.\right.$$

$$\left.\left.-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(b\,(m-2\,k)+p)}\right)-c\,(v-2\,s)\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,(b\,(m-2\,k)+p)\,\sqrt{z}\,-c\,(v-2\,s)\right)^2}{4\,(b\,(m-2\,k)+p)}\right)\right)+e^{\frac{i\,m\,\pi}{2}-\frac{c^2\,(v-2\,s)^2}{4\,(b\,(m-2\,k)+p)}}$$

$$(b\,(m-2\,k)+p)^{-2\,(n+1)}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s))^{-h-i+2\,n}\left(2\,\sqrt{z}\,\,(b\,(m-2\,k)+p)+c\,(v-2\,s)\right)^{h+i}$$

$$\left(-\frac{\left(2\,\sqrt{z}\,\,(b\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)+p}\right)^{\frac{1}{2}\,(-h-i-1)}\binom{i}{h}\binom{n}{i}\left(c\,(v-2\,s)\right.$$

$$\left(2\,\sqrt{z}\,\,(b\,(m-2\,k)+p)+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,\sqrt{z}\,\,(b\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{4\,(b\,(m-2\,k)+p)}\right)+$$

$$2\,\sqrt{-\frac{\left(2\,\sqrt{z}\,\,(b\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)+p}}\;(b\,(m-2\,k)+p)$$

$$\left.\left.\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,\sqrt{z}\,\,(b\,(m-2\,k)+p)+c\,(v-2\,s)\right)^2}{4\,(b\,(m-2\,k)+p)}\right)\right)\right/;\,m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z^r}\,\sinh^m(b\,z)\cosh^v\left(c\,z^r\right)$

01.20.21.4848.01

$$\int z^n\,e^{p\,z^2}\,\sinh^m(b\,z)\cosh^v\left(c\,z^2\right)dz==-i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\,z^{n+1}\left(-p\,z^2\right)^{\frac{1}{2}\,(-n-1)}\Gamma\left(\frac{n+1}{2},\,-p\,z^2\right)+$$

$$i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\,z^{n+1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\left(-(p+2\,c\,s-c\,v)\,z^2\right)^{\frac{1}{2}\,(-n-1)}\Gamma\left(\frac{n+1}{2},\,-(p+2\,c\,s-c\,v)\,z^2\right)-\right.$$

$$\left.\left(-(p+c\,(v-2\,s))\,z^2\right)^{\frac{1}{2}\,(-n-1)}\Gamma\left(\frac{n+1}{2},\,-(p+c\,(v-2\,s))\,z^2\right)\right)-$$

$$2^{-m-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}p^{-n-1}\,e^{-\frac{b^2(m-2k)^2}{4p}}\left((-1)^m\sum_{q=0}^{n}2^{q-n}(b(m-2k))^{n-q}(2bk-bm+2pz)^{q+1}\right.$$

$$\left(-\frac{(2bk-bm+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2bk-bm+2pz)^2}{4p}\right)+\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)\right)^{n-q}$$

$$(b(m-2k)+2pz)^{q+1}\left(-\frac{(b(m-2k)+2pz)^2}{p}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b(m-2k)+2pz)^2}{4p}\right)\Bigg)+$$

$$2^{-m-v-1}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\left((-1)^k\binom{m}{k}e^{\frac{1}{4}\left(-\frac{b^2(m-2k)^2}{p+2cs-cv}-\frac{b^2(m-2k)^2}{p+c(v-2s)}\right)}\left(-e^{\frac{b^2(m-2k)^2}{4(p+2cs-cv)}}\sqrt{p+2cs-cv}\right.\right.$$

$$\left(e^{im\pi}\sum_{q=0}^{n}2^{q-n}(b(m-2k))^{n-q}(p-2cs+cv)^{-n-\frac{1}{2}}(2bk-bm+2(p-2cs+cv)z)^{q+1}\right.$$

$$\left(-\frac{(2bk-bm+2(p-2cs+cv)z)^2}{p-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}$$

$$\Gamma\left(\frac{q+1}{2},-\frac{(2bk-bm+2(p-2cs+cv)z)^2}{4(p-2cs+cv)}\right)+\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)\right)^{n-q}(p-2cs+cv)^{-n-\frac{1}{2}}$$

$$(b(m-2k)+2(p-2cs+cv)z)^{q+1}\left(-\frac{(b(m-2k)+2(p-2cs+cv)z)^2}{p-2cs+cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\left.\left.\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(b(m-2k)+2(p-2cs+cv)z)^2}{4(p-2cs+cv)}\right)\right)-\right.$$

$$e^{\frac{b^2(m-2k)^2}{4(p+c(v-2s))}+im\pi}\sqrt{p+c(v-2s)}\sum_{q=0}^{n}2^{q-n}(b(m-2k))^{n-q}(p+2cs-cv)^{-n-\frac{1}{2}}$$

$$(2bk-bm+2(p+2cs-cv)z)^{q+1}\left(-\frac{(2bk-bm+2(p+2cs-cv)z)^2}{p+2cs-cv}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},-\frac{(2bk-bm+2(p+2cs-cv)z)^2}{4(p+2cs-cv)}\right)-$$

$$\left.e^{\frac{b^2(m-2k)^2}{4(p-2cs+cv)}}\sqrt{p-2cs+cv}\sum_{q=0}^{n}\left(b\left(k-\frac{m}{2}\right)\right)^{n-q}(p+2cs-cv)^{-n-\frac{1}{2}}\right)$$

$$(b\,(m-2\,k)+2\,(p+2\,c\,s-c\,v)\,z)^{q+1}\left(-\frac{(b\,(m-2\,k)+2\,(p+2\,c\,s-c\,v)\,z)^2}{p+2\,c\,s-c\,v}\right)^{\frac{1}{2}(-q-1)}$$

$$\binom{n}{q}\Gamma\left(\frac{q+1}{2},\,-\frac{(b\,(m-2\,k)+2\,(p+2\,c\,s-c\,v)\,z)^2}{4\,(p+2\,c\,s-c\,v)}\right)\Bigg)\Bigg/$$

$$\left(\sqrt{p+2\,c\,s-c\,v}\;\sqrt{p+c\,(v-2\,s)}\right)/;\; m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

01.20.21.4849.01

$$\int z^n\,e^{p\sqrt{z}}\,\sinh^m(b\,z)\cosh^v\left(c\,\sqrt{z}\right)dz==$$

$$-2^{-m-v+1}\,i^{-m}\,p^{-2\,(n+1)}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(2\,(n+1),\,-p\,\sqrt{z}\right)(1-m\bmod 2)\,(1-v\bmod 2)-2^{-m-v+1}\,i^{-m}\binom{m}{\frac{m}{2}}(1-m\bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Big(\Gamma\left(2\,(n+1),\,(c\,(v-2\,s)-p)\,\sqrt{z}\right)(c\,(v-2\,s)-p)^{-2\,(n+1)}+(p+c\,(v-2\,s))^{-2\,(n+1)}\,\Gamma\left(2\,(n+1),$$

$$(-p-c\,(v-2\,s))\,\sqrt{z}\right)\Big)+2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\,(-b\,(m-2\,k))^{-2\,(n+1)}\binom{m}{k}$$

$$\left((-1)^m\,e^{\frac{p^2}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,p^{-h-i+2\,n}\left(p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^{h+i}\left(\frac{\left(p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left(p\left(p-2\,b\,(m-2\,k)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,\frac{\left(p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)-\right.$$

$$\left.\left.2\,b\,(m-2\,k)\sqrt{\frac{\left(p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{b\,(m-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,\frac{\left(p-2\,b\,(m-2\,k)\,\sqrt{z}\right)^2}{4\,b\,(m-2\,k)}\right)\right)+\right.$$

$$e^{-\frac{p^2}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,p^{-h-i+2\,n}\left(2\,b\,\sqrt{z}\;(m-2\,k)+p\right)^{h+i}\left(-\frac{\left(2\,b\,\sqrt{z}\;(m-2\,k)+p\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(p\left(2\,b\,\sqrt{z}\;(m-2\,k)+p\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,b\,\sqrt{z}\;(m-2\,k)+p\right)^2}{4\,b\,(m-2\,k)}\right)+\right.$$

$$2\,b\,(m-2\,k)\sqrt{-\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,k)+p\right)^2}{b\,(m-2\,k)}}\,\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,b\,\sqrt{z}\,\,(m-2\,k)+p\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-v-1}\,i^{-m}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}(-b\,(m-2\,k))^{-2\,(n+1)}\binom{v}{s}\Bigg(e^{\frac{(p+c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p+c\,(v-2\,s))^{-h-i+2\,n}\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p+c\,(v-2\,s)\right)^{h+i}$$

$$\left(\frac{\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg((p+c\,(v-2\,s))$$

$$\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,\frac{\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)-$$

$$2\,b\,(m-2\,k)\sqrt{\frac{\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}\,(h+i+2),\,\frac{\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{(p-c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}-\frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c\,(v-2\,s))^{-h-i+2\,n}\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^{h+i}$$

$$\left(\frac{\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg((p-c\,(v-2\,s))$$

$$\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,\frac{\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)-$$

$$2\,b\,(m-2\,k)\sqrt{\frac{\left(-2\,b\,\sqrt{z}\,\,(m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\ \frac{\left(-2\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{(p+c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p+c\,(v-2\,s))^{-h-i+2\,n}\left(2\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^{h+i}$$

$$\left(-\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg(\left(p+c\,(v-2\,s)\right)$$

$$\left(2\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\ -\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)+$$

$$2\,b\,(m-2\,k)\sqrt{-\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}$$

$$\Gamma\left(\frac{1}{2}(h+i+2),\ -\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p+c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)+$$

$$e^{\frac{i\,m\,\pi}{2}-\frac{(p-c\,(v-2\,s))^2}{4\,b\,(m-2\,k)}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(p-c\,(v-2\,s))^{-h-i+2\,n}\left(2\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^{h+i}$$

$$\left(-\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg(\left(p-c\,(v-2\,s)\right)$$

$$\left(2\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}(h+i+1),\ -\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)+$$

$$2\,b\,(m-2\,k)\sqrt{-\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{b\,(m-2\,k)}}\ \Gamma\left(\frac{1}{2}(h+i+2),\right.$$

$$\left.-\frac{\left(2\,b\,\sqrt{z}\ (m-2\,k)+p-c\,(v-2\,s)\right)^2}{4\,b\,(m-2\,k)}\right)\Bigg)\Bigg)\Bigg)\Bigg/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

Involving $z^n\,e^{p\,z}\,\sinh^m\left(b\,z^r\right)\cosh^v\left(c\,z^r\right)$

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$$\int z^n e^{p z} \sinh^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz ==$$

$$-i^m 2^{-m-v} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1 - m \bmod 2) (1 - v \bmod 2) (-p)^{-n-1} \Gamma(n+1, -p z) - i^m 2^{-m-v-1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\frac{1}{\sqrt{c (v-2 s)}} \left(e^{\frac{p^2}{8 c s - 4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (c (v-2 s))^{-n-\frac{1}{2}} (p + 2 c (v-2 s) z)^{q+1} \left(-\frac{(p + 2 c (v-2 s) z)^2}{c (v-2 s)} \right)^{\frac{1}{2}(-q-1)} \right.\right.$$

$$\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p + 2 c (v-2 s) z)^2}{c (8 s - 4 v)} \right) \right) + \frac{1}{\sqrt{c (2 s - v)}} \left(e^{\frac{p^2}{4 c v - 8 c s}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (c (2 s - v))^{-n-\frac{1}{2}} \right.\right.$$

$$\left.\left. (p + 4 c s z - 2 c v z)^{q+1} \left(-\frac{(p + 4 c s z - 2 c v z)^2}{c (2 s - v)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p + 4 c s z - 2 c v z)^2}{c (8 s - 4 v)} \right) \right) \right) -$$

$$2^{-m-v-1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\frac{1}{\sqrt{b (m-2 k)}} \left(e^{\frac{p^2}{8 b k - 4 b m}} \sum_{q=0}^{n} 2^{q-n} (b (m-2 k))^{-n-\frac{1}{2}} (-p)^{n-q} \right.\right.$$

$$\left.\left. (p + 2 b (m-2 k) z)^{q+1} \left(\frac{(p + 2 b (m-2 k) z)^2}{b (2 k - m)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, \frac{(p + 2 b (m-2 k) z)^2}{b (8 k - 4 m)} \right) \right) + \right.$$

$$\left. \frac{1}{\sqrt{b (2 k - m)}} \left(e^{\frac{p^2}{4 b m - 8 b k}} (-1)^m \sum_{q=0}^{n} 2^{q-n} (b (2 k - m))^{-n-\frac{1}{2}} (-p)^{n-q} (p + 4 b k z - 2 b m z)^{q+1} \right.\right.$$

$$\left.\left. \left(-\frac{(p + 4 b k z - 2 b m z)^2}{b (2 k - m)} \right)^{\frac{1}{2}(-q-1)} \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p + 4 b k z - 2 b m z)^2}{b (8 k - 4 m)} \right) \right) \right) +$$

$$2^{-m-v-1} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(-\left(e^{\frac{p^2}{-8 b k + 4 b m - 8 c s + 4 c v} + i m \pi} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (2 b k - b m + 2 c s - c v)^{-n-\frac{1}{2}} \right.\right.\right.$$

$$\left.\left.\left. (p + 2 (2 b k - b m + 2 c s - c v) z)^{q+1} \left(-\frac{(p + 2 (2 b k - b m + 2 c s - c v) z)^2}{2 b k - b m + 2 c s - c v} \right)^{\frac{1}{2}(-q-1)} \right.\right.\right.$$

$$\left.\left.\left. \binom{n}{q} \Gamma\left(\frac{q+1}{2}, -\frac{(p + 2 (2 b k - b m + 2 c s - c v) z)^2}{8 b k - 4 b m + 8 c s - 4 c v} \right) \right) \Big/ \left(\sqrt{2 b k - b m + 2 c s - c v} \right) \right) -$$

$$\left(e^{\frac{p^2}{8 b k - 4 b m + 8 c s - 4 c v}} \sum_{q=0}^{n} 2^{q-n} (-p)^{n-q} (-2 b k + b m - 2 c s + c v)^{-n-\frac{1}{2}} (p + 2 (-2 b k + b m - 2 c s + c v) z)^{q+1} \right.$$

$$\left(-\frac{(p+2(-2bk+bm-2cs+cv)z)^2}{-2bk+bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.\frac{(p+2(-2bk+bm-2cs+cv)z)^2}{8bk-4bm+8cs-4cv}\right)\Big/\left(\sqrt{-2bk+bm-2cs+cv}\right)-$$

$$\left(e^{\frac{p^2}{-8bk+4bm+8cs-4cv}+im\pi}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(2bk-bm-2cs+cv)^{-n-\frac{1}{2}}(p+2(2bk-bm-2cs+cv)z)^{q+1}\right.$$

$$\left(-\frac{(p+2(2bk-bm-2cs+cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\frac{q+1}{2},\right.$$

$$\left.-\frac{(p+2(2bk-bm-2cs+cv)z)^2}{8bk-4bm-8cs+4cv}\right)\Big/\left(\sqrt{2bk-bm-2cs+cv}\right)-$$

$$\left(e^{\frac{p^2}{8bk-4bm-8cs+4cv}}\sum_{q=0}^{n}2^{q-n}(-p)^{n-q}(-2bk+bm+2cs-cv)^{-n-\frac{1}{2}}(p+2(-2bk+bm+2cs-cv)z)^{q+1}\right.$$

$$\left(\frac{(p+2(-2bk+bm+2cs-cv)z)^2}{2bk-bm-2cs+cv}\right)^{\frac{1}{2}(-q-1)}\binom{n}{q}\Gamma\left(\right.$$

$$\left.\frac{q+1}{2},\frac{(p+2(-2bk+bm+2cs-cv)z)^2}{8bk-4bm-8cs+4cv}\right)\Big/$$

$$\left.\left(\sqrt{-2bk+bm+2cs-cv}\right)\right)/;\ m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+\bigwedge n\in\mathbb{N}$$

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$$\int z^n e^{pz}\sinh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == -2^{-m-v}i^{-m}(-p)^{-n-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma(n+1,-pz)(1-m\bmod 2)(1-v\bmod 2)+$$

$$2^{-m-2n-v-1}p^{-2(n+1)}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left((-1)^m e^{-\frac{b^2(m-2k)^2}{4p}}\right.$$

$$\left.\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(-b(m-2k))^{-h-i+2n}\left(2p\sqrt{z}-b(m-2k)\right)^{h+i}\left(-\frac{\left(2p\sqrt{z}-b(m-2k)\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\right.$$

$$\binom{i}{h}\binom{n}{i}\left(2\,p\,\sqrt{-\frac{\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)^2}{p}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)^2}{4\,p}\right)-\right.$$

$$\left.b\,(m-2\,k)\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,p\,\sqrt{z}-b\,(m-2\,k)\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{b^2\,(m-2\,k)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b\,(m-2\,k))^{-h-i+2\,n}\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}\,(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(b\,(m-2\,k)\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+\right.$$

$$\left.\left.2\,\sqrt{-\frac{\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{p}}\;p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b\,(m-2\,k)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)\right)+$$

$$2^{-m-2\,n-\nu-1}\,i^{-m}\,p^{-2\,(n+1)}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{s=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{s}\left(e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-c\,(\nu-2\,s))^{-h-i+2\,n}\right.$$

$$\left.\left(2\,p\,\sqrt{z}-c\,(\nu-2\,s)\right)^{h+i}\left(-\frac{\left(2\,p\,\sqrt{z}-c\,(\nu-2\,s)\right)^2}{p}\right)^{\frac{1}{2}\,(-h-i-1)}\binom{i}{h}\binom{n}{i}\right.$$

$$\left(2\,p\,\sqrt{-\frac{\left(2\,p\,\sqrt{z}-c\,(\nu-2\,s)\right)^2}{p}}\;\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,p\,\sqrt{z}-c\,(\nu-2\,s)\right)^2}{4\,p}\right)-\right.$$

$$\left.c\,(\nu-2\,s)\left(2\,p\,\sqrt{z}-c\,(\nu-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,p\,\sqrt{z}-c\,(\nu-2\,s)\right)^2}{4\,p}\right)\right)+$$

$$e^{-\frac{c^2\,(\nu-2\,s)^2}{4\,p}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(\nu-2\,s))^{-h-i+2\,n}\left(2\,\sqrt{z}\;p+c\,(\nu-2\,s)\right)^{h+i}\left(-\frac{\left(2\,\sqrt{z}\;p+c\,(\nu-2\,s)\right)^2}{p}\right)^{\frac{1}{2}\,(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left(c\,(v-2\,s)\left(2\,\sqrt{z}\;p+c\,(v-2\,s)\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(2\,\sqrt{z}\;p+c\,(v-2\,s)\right)^2}{4\,p}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(2\,\sqrt{z}\;p+c\,(v-2\,s)\right)^2}{p}}\;\;p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(2\,\sqrt{z}\;p+c\,(v-2\,s)\right)^2}{4\,p}\right)\right)+$$

$$2^{-m-2\,n-v-1}\,i^{-m}\,p^{-2\,(n+1)}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(c\,(v-2\,s)-b\,(m-2\,k))^2}{4\,p}-\frac{i\,m\,\pi}{2}}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(c\,(v-2\,s)-b\,(m-2\,k))^{-h-i+2\,n}\right.$$

$$\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((c\,(v-2\,s)-b\,(m-2\,k))\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.\right.$$

$$\left.-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\,\sqrt{-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$\left.p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\right)+e^{\frac{i\,m\,\pi}{2}-\frac{(b\,(m-2\,k)+c\,(v-2\,s))^2}{4\,p}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b\,(m-2\,k)+c\,(v-2\,s))^{-h-i+2\,n}\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b\,(m-2\,k)+c\,(v-2\,s))\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.\right.$$

$$-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\Bigg)+2\sqrt{-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b\,(m-2\,k)+c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)+e^{-\frac{(-b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,p}-\frac{i\,m\,\pi}{2}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(-b\,(m-2\,k)-c\,(v-2\,s))^{-h-i+2\,n}\left(-b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((-b\,(m-2\,k)-c\,(v-2\,s))\left(-b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.$$

$$\left.-\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}$$

$$p\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(-b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)\Bigg)+e^{\frac{i\,m\,\pi}{2}-\frac{(b\,(m-2\,k)-c\,(v-2\,s))^2}{4\,p}}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b\,(m-2\,k)-c\,(v-2\,s))^{-h-i+2\,n}\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\Bigg((b\,(m-2\,k)-c\,(v-2\,s))\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\right.$$

$$\left.-\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{4\,p}\right)+2\sqrt{-\frac{\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2}{p}}\;p$$

$$\left(1,\quad\left(b\,(m-2\,k)-c\,(v-2\,s)+2\,p\,\sqrt{z}\right)^2\right)\Bigg)\Bigg)$$

Involving $z^{\alpha-1}\, e^{p\, z^r}\, \sinh^m(b\, z^r)\cosh^v(c\, z^r)$

01.20.21.4852.01

$$\int z^{\alpha-1}\, e^{p\, z^r} \sinh^m(b\, z^r)\cosh^v(c\, z^r)\, dz == \frac{2^{-m-v}\, z^\alpha}{r}\left(-i^m\,(-p\, z^r)^{-\frac{\alpha}{r}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{\alpha}{r},\, -p\, z^r\right)(m \bmod 2-1)\,(v \bmod 2-1)+\right.$$

$$\binom{v}{\frac{v}{2}}(v \bmod 2-1)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\Gamma\left(\frac{\alpha}{r},\,(2\,b\,k-b\,m-p)\,z^r\right)((2\,b\,k-b\,m-p)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.\left.(-1)^m\,(-(2\,b\,k-b\,m+p)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(2\,b\,k-b\,m+p)\,z^r\right)\right)+i^m\binom{m}{\frac{m}{2}}(m \bmod 2-1)\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(\Gamma\left(\frac{\alpha}{r},\,-(p+2\,c\,s-c\,v)\,z^r\right)(-(p+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}+(-(p+c\,(v-2\,s))\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(p+c\,(v-2\,s))\,z^r\right)\right)+$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(-\Gamma\left(\frac{\alpha}{r},\,(2\,b\,k-b\,m-p-2\,c\,s+c\,v)\,z^r\right)((2\,b\,k-b\,m-p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{i\,m\,\pi}\left(-((-2\,b\,k+b\,m-p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,b\,k+b\,m-p-2\,c\,s+c\,v)\,z^r\right)-\right.$$

$$\left.\left.(-(2\,b\,k-b\,m+p-2\,c\,s+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-(2\,b\,k-b\,m+p-2\,c\,s+c\,v)\,z^r\right)\right)-\right.$$

$$\left.\left.((2\,b\,k-b\,m-p+2\,c\,s-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,b\,k-b\,m-p+2\,c\,s-c\,v)\,z^r\right)\right)\right)\Big/;\, m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

01.20.21.4853.01

$$\int z^n e^{p z^2} \sinh^m\left(b z^2\right) \cosh^v\left(c z^2\right) dz == -2^{-m-v-1} i^{-m} z^{n+1} \left(-p z^2\right)^{\frac{1}{2}(-n-1)} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -p z^2\right) (1 - m \bmod 2) (1 - v \bmod 2) -$$

$$2^{-m-v-1} z^{n+1} \binom{v}{\frac{v}{2}} (1 - v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(\Gamma\left(\frac{n+1}{2}, (-b(m-2k) - p) z^2\right) \left((-b(m-2k) - p) z^2\right)^{\frac{1}{2}(-n-1)} + (-1)^m \left((b(m-2k) - p) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b(m-2k) - p) z^2\right)\right) -$$

$$2^{-m-v-1} i^{-m} z^{n+1} \binom{m}{\frac{m}{2}} (1 - m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(\Gamma\left(\frac{n+1}{2}, (c(v-2s) - p) z^2\right) \left((c(v-2s) - p) z^2\right)^{\frac{1}{2}(-n-1)} + \left((-p - c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-p - c(v-2s)) z^2\right)\right) - 2^{-m-v-1} i^{-m} z^{n+1}$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{\frac{i m \pi}{2}} \Gamma\left(\frac{n+1}{2}, (-b(m-2k) - p + c(v-2s)) z^2\right) \left((-b(m-2k) - p + c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} + e^{-\frac{1}{2} i m \pi} \left((b(m-2k) - p + c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b(m-2k) - p + c(v-2s)) z^2\right) + e^{\frac{i m \pi}{2}} \left((-b(m-2k) - p - c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b(m-2k) - p - c(v-2s)) z^2\right) + e^{-\frac{1}{2} i m \pi} \left((b(m-2k) - p - c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (b(m-2k) - p - c(v-2s)) z^2\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4854.01

$$\int z^n e^{p\sqrt{z}} \sinh^m\left(b\sqrt{z}\right)\cosh^v\left(c\sqrt{z}\right)dz == -2^{-m-v+1} i^{-m} p^{-2(n+1)} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(2(n+1), -p\sqrt{z}\right)(1-m \bmod 2)(1-v \bmod 2) -$$

$$2^{-m-v+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left(\Gamma\left(2(n+1), (-b(m-2k)-p)\sqrt{z}\right)(-b(m-2k)-p)^{-2(n+1)} + \right.$$

$$\left. (-1)^m (b(m-2k)-p)^{-2(n+1)} \Gamma\left(2(n+1), (b(m-2k)-p)\sqrt{z}\right)\right) -$$

$$2^{-m-v+1} i^{-m} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(\Gamma\left(2(n+1), (c(v-2s)-p)\sqrt{z}\right)(c(v-2s)-p)^{-2(n+1)} + \right.$$

$$\left. (-p-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-p-c(v-2s))\sqrt{z}\right)\right) - 2^{-m-v+1} i^{-m}$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s} \left(e^{\frac{i m \pi}{2}} \Gamma\left(2(n+1), (-b(m-2k)-p+c(v-2s))\sqrt{z}\right)(-b(m-2k)-p+c(v-2s))^{-2(n+1)} + \right.$$

$$e^{-\frac{1}{2} i m \pi} (b(m-2k)-p+c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (b(m-2k)-p+c(v-2s))\sqrt{z}\right) +$$

$$e^{\frac{i m \pi}{2}} (-b(m-2k)-p-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-b(m-2k)-p-c(v-2s))\sqrt{z}\right) +$$

$$\left. e^{-\frac{1}{2} i m \pi} (b(m-2k)-p-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (b(m-2k)-p-c(v-2s))\sqrt{z}\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^{\alpha-1} e^{b z^r+e} \sinh^m\left(a z^r+q\right)\cosh^v\left(c z^r+g\right)$

01.20.21.4855.01

$$\int z^{\alpha-1}\, e^{b\, z^r+e} \sinh^m(a\, z^r+q) \cosh^v(c\, z^r+g)\, dz ==$$

$$-\frac{i^m\, 2^{-m-v}\, z^\alpha}{r}\left(e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{\alpha}{r}, -b\, z^r\right)(1-m \bmod 2)\,(1-v \bmod 2)\,(-b\, z^r)^{-\frac{\alpha}{r}} +\right.$$

$$\binom{v}{\frac{v}{2}}(1-v \bmod 2) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k}\left(e^{e+2\,k\,q-m\,q+\frac{i\,m\,\pi}{2}} \Gamma\left(\frac{\alpha}{r}, (-b-2\,a\,k+a\,m)\, z^r\right)((-b-2\,a\,k+a\,m)\, z^r)^{-\frac{\alpha}{r}} +\right.$$

$$\left.\left. e^{e-2\,k\,q+m\,q-\frac{i\,m\,\pi}{2}} ((-b+2\,a\,k-a\,m)\, z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b+2\,a\,k-a\,m)\, z^r\right)\right) +\right.$$

$$\binom{m}{\frac{m}{2}}(1-m \bmod 2) \sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s}\left(e^{e+2\,g\,s-g\,v} \Gamma\left(\frac{\alpha}{r}, (-b-2\,c\,s+c\,v)\, z^r\right)((-b-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}} +\right.$$

$$\left.\left. e^{e-2\,g\,s+g\,v} ((-b+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b+2\,c\,s-c\,v)\, z^r\right)\right) + \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k}\right.$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{s}\left(e^{e+2\,k\,q-m\,q+2\,g\,s-g\,v+\frac{i\,m\,\pi}{2}} \Gamma\left(\frac{\alpha}{r}, (-b-2\,a\,k+a\,m-2\,c\,s+c\,v)\, z^r\right)((-b-2\,a\,k+a\,m-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}} +\right.$$

$$e^{e-2\,k\,q+m\,q+2\,g\,s-g\,v-\frac{i\,m\,\pi}{2}} ((-b+2\,a\,k-a\,m-2\,c\,s+c\,v)\, z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b+2\,a\,k-a\,m-2\,c\,s+c\,v)\, z^r\right) +$$

$$e^{e+2\,k\,q-m\,q-2\,g\,s+g\,v+\frac{i\,m\,\pi}{2}} ((-b-2\,a\,k+a\,m+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}} \Gamma\left(\frac{\alpha}{r}, (-b-2\,a\,k+a\,m+2\,c\,s-c\,v)\, z^r\right) +$$

$$e^{e-2\,k\,q+m\,q-2\,g\,s+g\,v-\frac{i\,m\,\pi}{2}} ((-b+2\,a\,k-a\,m+2\,c\,s-c\,v)\, z^r)^{-\frac{\alpha}{r}}$$

$$\left.\left.\Gamma\left(\frac{\alpha}{r}, (-b+2\,a\,k-a\,m+2\,c\,s-c\,v)\, z^r\right)\right)\right) /;\, m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

01.20.21.4856.01

$$\int z^n e^{b z^2+e} \sinh^m\left(a z^2+q\right) \cosh^v\left(c z^2+g\right) dz ==$$

$$-2^{-m-v-1} i^{-m} e^e z^{n+1} \left(-b z^2\right)^{\frac{1}{2}(-n-1)} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(\frac{n+1}{2}, -b z^2\right) (1-m \bmod 2) (1-v \bmod 2) -$$

$$2^{-m-v-1} z^{n+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left((-1)^m e^{e-(m-2k)q} \Gamma\left(\frac{n+1}{2}, (a(m-2k)-b) z^2\right)\right.$$

$$\left.\left((a(m-2k)-b) z^2\right)^{\frac{1}{2}(-n-1)} + e^{e+(m-2k)q} \left((-b-a(m-2k)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-a(m-2k)) z^2\right)\right) -$$

$$2^{-m-v-1} i^{-m} z^{n+1} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-g(v-2s)} \Gamma\left(\frac{n+1}{2}, (c(v-2s)-b) z^2\right)\left((c(v-2s)-b) z^2\right)^{\frac{1}{2}(-n-1)} +\right.$$

$$\left. e^{e+g(v-2s)} \left((-b-c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-c(v-2s)) z^2\right)\right) - 2^{-m-v-1} i^{-m} z^{n+1} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}$$

$$\left(e^{e-(m-2k)q-g(v-2s)-\frac{i m \pi}{2}} \Gamma\left(\frac{n+1}{2}, (-b+a(m-2k)+c(v-2s)) z^2\right)\left((-b+a(m-2k)+c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} +\right.$$

$$e^{e+(m-2k)q-g(v-2s)+\frac{i m \pi}{2}} \left((-b-a(m-2k)+c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-a(m-2k)+c(v-2s)) z^2\right) +$$

$$e^{e-(m-2k)q+g(v-2s)-\frac{i m \pi}{2}} \left((-b+a(m-2k)-c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b+a(m-2k)-c(v-2s)) z^2\right) +$$

$$\left. e^{e+(m-2k)q+g(v-2s)+\frac{i m \pi}{2}} \left((-b-a(m-2k)-c(v-2s)) z^2\right)^{\frac{1}{2}(-n-1)} \Gamma\left(\frac{n+1}{2}, (-b-a(m-2k)-c(v-2s)) z^2\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

01.20.21.4857.01

$$\int z^n e^{\sqrt{z}\,b+e} \sinh^m\left(\sqrt{z}\,a+q\right) \cosh^v\left(\sqrt{z}\,c+g\right) dz ==$$

$$-2^{-m-v+1} i^{-m} b^{-2(n+1)} e^e \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} \Gamma\left(2(n+1), -b\sqrt{z}\right) (1-m \bmod 2)(1-v \bmod 2) -$$

$$2^{-m-v+1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left((-1)^m e^{e-(m-2k)q} \Gamma\left(2(n+1), (a(m-2k)-b)\sqrt{z}\right) (a(m-2k)-b)^{-2(n+1)} + \right.$$

$$\left. e^{e+(m-2k)q} (-b-a(m-2k))^{-2(n+1)} \Gamma\left(2(n+1), (-b-a(m-2k))\sqrt{z}\right)\right) -$$

$$2^{-m-v+1} i^{-m} \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s} \left(e^{e-g(v-2s)} \Gamma\left(2(n+1), (c(v-2s)-b)\sqrt{z}\right) (c(v-2s)-b)^{-2(n+1)} + \right.$$

$$\left. e^{e+g(v-2s)} (-b-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-b-c(v-2s))\sqrt{z}\right)\right) - 2^{-m-v+1} i^{-m} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{s=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{s}$$

$$\left(e^{e-(m-2k)q-g(v-2s)-\frac{i m \pi}{2}} \Gamma\left(2(n+1), (-b+a(m-2k)+c(v-2s))\sqrt{z}\right) (-b+a(m-2k)+c(v-2s))^{-2(n+1)} + \right.$$

$$e^{e+(m-2k)q-g(v-2s)+\frac{i m \pi}{2}} (-b-a(m-2k)+c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-b-a(m-2k)+c(v-2s))\sqrt{z}\right) +$$

$$e^{e-(m-2k)q+g(v-2s)-\frac{i m \pi}{2}} (-b+a(m-2k)-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-b+a(m-2k)-c(v-2s))\sqrt{z}\right) +$$

$$\left. e^{e+(m-2k)q+g(v-2s)+\frac{i m \pi}{2}} (-b-a(m-2k)-c(v-2s))^{-2(n+1)} \Gamma\left(2(n+1), (-b-a(m-2k)-c(v-2s))\sqrt{z}\right)\right) /; m \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+ \bigwedge n \in \mathbb{N}$$

Involving $z^n e^{b z^r + d z + e} \sinh^m\left(a z^r + p z + q\right) \cosh^v\left(c z^r + f z + g\right)$

01.20.21.4858.01

$$\int z^n e^{b z^2 + d z + e} \sinh^m\left(a z^2 + p z + q\right) \cosh^v\left(c z^2 + f z + g\right) dz == -i^m 2^{-m-v-1} b^{-n-1} e^{e-\frac{d^2}{4b}} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)$$

$$(1-v \bmod 2) \sum_{j=0}^{n} 2^{j-n} (-d)^{n-j} (d+2bz)^{j+1} \left(-\frac{(d+2bz)^2}{b}\right)^{\frac{1}{2}(-j-1)} \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+2bz)^2}{4b}\right) -$$

$$i^m 2^{-m-v-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{(d+(2k-m)p)^2}{4(b+a(2k-m))}+e+(2k-m)q+\frac{i m \pi}{2}} (b+a(2k-m))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d-(2k-m)p)^{n-j} \right.$$

$$(d+(2k-m)p+2(b+a(2k-m))z)^{j+1} \left(-\frac{(d+(2k-m)p+2(b+a(2k-m))z)^2}{b+a(2k-m)}\right)^{\frac{1}{2}(-j-1)}$$

$$\left. \binom{n}{j} \Gamma\left(\frac{j+1}{2}, -\frac{(d+(2k-m)p+2(b+a(2k-m))z)^2}{4(b+a(2k-m))}\right) + \right.$$

$$\left. e^{-\frac{(d+(m-2k)p)^2}{4(b+a(m-2k))}+e+(m-2k)q-\frac{i m \pi}{2}} (b+a(m-2k))^{-n-1} \sum_{j=0}^{n} 2^{j-n} (-d-(m-2k)p)^{n-j} \right.$$

$$(d+(m-2k)\,p+2\,(b+a\,(m-2k))\,z)^{j+1}\left(-\frac{(d+(m-2k)\,p+2\,(b+a\,(m-2k))\,z)^2}{b+a\,(m-2k)}\right)^{\frac{1}{2}(-j-1)}$$

$$\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+(m-2k)\,p+2\,(b+a\,(m-2k))\,z)^2}{4\,(b+a\,(m-2k))}\right)\Bigg)-i^m\,2^{-m-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)$$

$$\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d+f\,(2s-v))^2}{4\,(b+c\,(2s-v))}+e+g\,(2s-v)}\,(b+c\,(2s-v))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(2s-v))^{n-j}\,(d+f\,(2s-v)+2\,(b+c\,(2s-v))\,z)^{j+1}$$

$$\left(-\frac{(d+f\,(2s-v)+2\,(b+c\,(2s-v))\,z)^2}{b+c\,(2s-v)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(2s-v)+2\,(b+c\,(2s-v))\,z)^2}{4\,(b+c\,(2s-v))}\right)+$$

$$e^{-\frac{(d+f\,(v-2s))^2}{4\,(b+c\,(v-2s))}+e+g\,(v-2s)}\,(b+c\,(v-2s))^{-n-1}\sum_{j=0}^{n}2^{j-n}\,(-d-f\,(v-2s))^{n-j}\,(d+f\,(v-2s)+2\,(b+c\,(v-2s))\,z)^{j+1}$$

$$\left(-\frac{(d+f\,(v-2s)+2\,(b+c\,(v-2s))\,z)^2}{b+c\,(v-2s)}\right)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\left(\frac{j+1}{2},-\frac{(d+f\,(v-2s)+2\,(b+c\,(v-2s))\,z)^2}{4\,(b+c\,(v-2s))}\right)\Bigg)-$$

$$i^m\,2^{-m-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(d+(2k-m)\,p+f\,(2s-v))^2}{4\,(b+a\,(2k-m)+c\,(2s-v))}+e+(2k-m)\,q+g\,(2s-v)+\frac{i\,m\,\pi}{2}}\,(b+a\,(2k-m)+c\,(2s-v))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-(2k-m)\,p-f\,(2s-v))^{n-j}\,(d+(2k-m)\,p+f\,(2s-v)+2\,(b+a\,(2k-m)+c\,(2s-v))\,z)^{j+1}$$

$$\Big(-(d+(2k-m)\,p+f\,(2s-v)+2\,(b+a\,(2k-m)+c\,(2s-v))\,z)^2\Big/$$

$$(b+a\,(2k-m)+c\,(2s-v))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\Bigg(\frac{j+1}{2},$$

$$-(d+(2k-m)\,p+f\,(2s-v)+2\,(b+a\,(2k-m)+c\,(2s-v))\,z)^2\Big/(4\,(b+a\,(2k-m)+c\,(2s-v)))\Bigg)+$$

$$e^{-\frac{(d+(m-2k)\,p+f\,(2s-v))^2}{4\,(b+a\,(m-2k)+c\,(2s-v))}+e+(m-2k)\,q+g\,(2s-v)-\frac{i\,m\,\pi}{2}}\,(b+a\,(m-2k)+c\,(2s-v))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-(m-2k)\,p-f\,(2s-v))^{n-j}\,(d+(m-2k)\,p+f\,(2s-v)+2\,(b+a\,(m-2k)+c\,(2s-v))\,z)^{j+1}$$

$$\Big(-(d+(m-2k)\,p+f\,(2s-v)+2\,(b+a\,(m-2k)+c\,(2s-v))\,z)^2\Big/$$

$$(b+a\,(m-2k)+c\,(2s-v))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\Bigg(\frac{j+1}{2},$$

$$-(d+(m-2k)\,p+f\,(2s-v)+2\,(b+a\,(m-2k)+c\,(2s-v))\,z)^2\Big/(4\,(b+a\,(m-2k)+c\,(2s-v)))\Bigg)+$$

$$e^{-\frac{(d+(2k-m)\,p+f\,(v-2s))^2}{4\,(b+a\,(2k-m)+c\,(v-2s))}+e+(2k-m)\,q+g\,(v-2s)+\frac{i\,m\,\pi}{2}}\,(b+a\,(2k-m)+c\,(v-2s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-(2k-m)\,p-f\,(v-2s))^{n-j}\,(d+(2k-m)\,p+f\,(v-2s)+2\,(b+a\,(2k-m)+c\,(v-2s))\,z)^{j+1}$$

$$\Big(-(d+(2k-m)\,p+f\,(v-2s)+2\,(b+a\,(2k-m)+c\,(v-2s))\,z)^2\Big/$$

$$(b+a\,(2\,k-m)+c\,(v-2\,s))^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\Big(\frac{j+1}{2},$$

$$-(d+(2\,k-m)\,p+f\,(v-2\,s)+2\,(b+a\,(2\,k-m)+c\,(v-2\,s))\,z)^2\Big/(4\,(b+a\,(2\,k-m)+c\,(v-2\,s)))\Big)+$$

$$e^{-\frac{(d+(m-2\,k)\,p+f\,(v-2\,s))^2}{4\,(b+a\,(m-2\,k)+c\,(v-2\,s))}+e+(m-2\,k)\,q+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(b+a\,(m-2\,k)+c\,(v-2\,s))^{-n-1}$$

$$\sum_{j=0}^{n}2^{j-n}\,(-d-(m-2\,k)\,p-f\,(v-2\,s))^{n-j}\,(d+(m-2\,k)\,p+f\,(v-2\,s)+2\,(b+a\,(m-2\,k)+c\,(v-2\,s))\,z)^{j+1}$$

$$\Big(-(d+(m-2\,k)\,p+f\,(v-2\,s)+2\,(b+a\,(m-2\,k)+c\,(v-2\,s))\,z)^2\Big/(b+a\,(m-2\,k)+$$

$$c\,(v-2\,s))\Big)^{\frac{1}{2}(-j-1)}\binom{n}{j}\Gamma\Big(\frac{j+1}{2},\,-(d+(m-2\,k)\,p+f\,(v-2\,s)+2\,(b+a\,(m-2\,k)+$$

$$c\,(v-2\,s))\,z)^2\Big/(4\,(b+a\,(m-2\,k)+c\,(v-2\,s)))\Big)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\,e^{\sqrt{z}\,b+d\,z+e}\sinh^m\!\big(\sqrt{z}\,a+p\,z+q\big)\cosh^v\!\big(\sqrt{z}\,c+f\,z+g\big)\,dz==i^m\,2^{-m-2\,n-v-1}\,d^{-2\,n-2}\,e^{e-\frac{b^2}{4\,d}}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}$$

$$(1-m\bmod 2)\,(1-v\bmod 2)\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,b^{-h-i+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;d\,\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)+$$

$$i^m\,2^{-m-2\,n-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{(b+a\,(2\,k-m))^2}{4\,(d+(2\,k-m)\,p)}+e+(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\,(d+(2\,k-m)\,p)^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,(2\,k-m))^{-h-i+2\,n}\left(b+a\,(2\,k-m)+2\,(d+(2\,k-m)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+a\,(2\,k-m)+2\,(d+(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+(2\,k-m)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg((b+a\,(2\,k-m))\left(b+a\,(2\,k-m)+\right.$$

$$\left.2\,(d+(2\,k-m)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\frac{\left(b+a\,(2\,k-m)+2\,(d+(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+(2\,k-m)\,p)}\right)+$$

$$2\sqrt{-\frac{\left(b+a\,(2\,k-m)+2\,(d+(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+(2\,k-m)\,p}}\;(d+(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}\,(h+i+2),\right.$$

$$-\frac{\left(b+a\,(2\,k-m)+2\,(d+(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+(2\,k-m)\,p)}\Bigg)\Bigg)+e^{-\frac{(b+a\,(m-2\,k))^2}{4\,(d+(m-2\,k)\,p)}+e+(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(d+(m-2\,k)\,p)^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,(m-2\,k))^{-h-i+2\,n}\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^{h+i}$$

$$\left(-\frac{\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+(m-2\,k)\,p}\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}\Bigg((b+a\,(m-2\,k))\left(b+a\,(m-2\,k)+\right.$$

$$\left.2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(h+i+1),-\frac{\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+(m-2\,k)\,p)}\right)+$$

$$2\sqrt{-\frac{\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+(m-2\,k)\,p}}\;(d+(m-2\,k)\,p)\,\Gamma\Bigg(\frac{1}{2}\,(h+i+2),$$

$$-\frac{\left(b+a\,(m-2\,k)+2\,(d+(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+(m-2\,k)\,p)}\Bigg)\Bigg)\Bigg)+i^m\,2^{-m-2\,n-v-1}\binom{m}{\frac{m}{2}}$$

$$(1-m \bmod 2)\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\Bigg(e^{-\frac{(b+c\,(2\,s-v))^2}{4\,(d+f\,(2\,s-v))}+e+g\,(2\,s-v)}\,(d+f\,(2\,s-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+c\,(2\,s-v))^{-h-i+2\,n}$$

$$\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\Bigg((b+c\,(2\,s-v))\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(h+i+1),$$

$$-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\Bigg)+2\sqrt{-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{d+f\,(2\,s-v)}}$$

$$(d+f\,(2\,s-v))\,\Gamma\left(\frac{1}{2}\,(h+i+2),-\frac{\left(b+c\,(2\,s-v)+2\,(d+f\,(2\,s-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,s-v))}\right)\Bigg)+$$

$$e^{-\frac{(b+c(v-2s))^2}{4(d+f(v-2s))}+e+g(v-2s)}(d+f(v-2s))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b+c(v-2s))^{-h-i+2n}$$

$$\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^{h+i}\left(-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{d+f(v-2s)}\right)^{\frac{1}{2}(-h-i-1)}$$

$$\binom{i}{h}\binom{n}{i}\left((b+c(v-2s))\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(h+i+1),\right.\right.$$

$$\left.-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{4(d+f(v-2s))}\right)+2\sqrt{-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{d+f(v-2s)}}$$

$$\left.\left.(d+f(v-2s))\Gamma\left(\frac{1}{2}(h+i+2),-\frac{\left(b+c(v-2s)+2(d+f(v-2s))\sqrt{z}\right)^2}{4(d+f(v-2s))}\right)\right)\right)+$$

$$i^m 2^{-m-2n-v-1}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{s=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{s}\left(e^{-\frac{(b+a(2k-m)+c(2s-v))^2}{4(d+(2k-m)p+f(2s-v))}+e+(2k-m)q+g(2s-v)+\frac{imπ}{2}}(d+(2k-m)p+f(2s-v))^{-2n-2}\right.$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i(b+a(2k-m)+c(2s-v))^{-h-i+2n}$$

$$\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^{h+i}\left(-\left(b+a(2k-m)+c(2s-v)+\right.\right.$$

$$\left.\left.2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/(d+(2k-m)p+f(2s-v))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}$$

$$\binom{n}{i}\left((b+a(2k-m)+c(2s-v))\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(h+i+1),-\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+(2k-m)p+f(2s-v)))\right)+2(d+(2k-m)p+f(2s-v))$$

$$\Gamma\left(\frac{1}{2}(h+i+2),-\left(b+a(2k-m)+c(2s-v)+2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+(2k-m)p+f(2s-v)))\right)\sqrt{\left(-\left(b+a(2k-m)+c(2s-v)+\right.\right.}$$

$$\left.\left.\left.2(d+(2k-m)p+f(2s-v))\sqrt{z}\right)^2\Big/(d+(2k-m)p+f(2s-v))\right)\right)+$$

$$e^{-\frac{(b+a(m-2k)+c(2s-v))^2}{4(d+(m-2k)p+f(2s-v))}+e+(m-2k)q+g(2s-v)-\frac{imπ}{2}}(d+(m-2k)p+f(2s-v))^{-2n-2}\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}4^i$$

$$(b+a(m-2k)+c(2s-v))^{-h-i+2n}\left(b+a(m-2k)+c(2s-v)+2(d+(m-2k)p+f(2s-v))\right.$$

$$\sqrt{z}\Big)^{h+i}\left(-\left(b+a\,(m-2\,k)+c\,(2\,s-v)+2\,(d+(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/$$

$$(d+(m-2\,k)\,p+f\,(2\,s-v))\Big)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+a\,(m-2\,k)+c\,(2\,s-v))\left(b+a\,(m-2\,k)+c\,(2\,s-v)+2\,(d+(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\left(b+a\,(m-2\,k)+c\,(2\,s-v)+2\,(d+(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+(m-2\,k)\,p+f\,(2\,s-v)))\right)+2\,(d+(m-2\,k)\,p+f\,(2\,s-v))$$

$$\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\left(b+a\,(m-2\,k)+c\,(2\,s-v)+2\,(d+(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+(m-2\,k)\,p+f\,(2\,s-v)))\right)\sqrt{\left(-\left(b+a\,(m-2\,k)+c\,(2\,s-v)+\right.\right.}$$

$$\left.\left.2\,(d+(m-2\,k)\,p+f\,(2\,s-v))\,\sqrt{z}\right)^2\Big/(d+(m-2\,k)\,p+f\,(2\,s-v))\right)\Big)+$$

$$e^{-\frac{(b+a\,(2\,k-m)+c\,(v-2\,s))^2}{4\,(d+(2\,k-m)\,p+f\,(v-2\,s))}+e+(2\,k-m)\,q+g\,(v-2\,s)+\frac{i\,m\,\pi}{2}}\,(d+(2\,k-m)\,p+f\,(v-2\,s))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,(2\,k-m)+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+(2\,k-m)\,p+f\,(v-2\,s))\right)^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$

$$\left((b+a\,(2\,k-m)+c\,(v-2\,s))\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+(2\,k-m)\,p+f\,(v-2\,s)))\right)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))$$

$$\Gamma\left(\frac{1}{2}\,(h+i+2),\,-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+(2\,k-m)\,p+f\,(v-2\,s)))\right)\sqrt{\left(-\left(b+a\,(2\,k-m)+c\,(v-2\,s)+\right.\right.}$$

$$\left.\left.2\,(d+(2\,k-m)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/(d+(2\,k-m)\,p+f\,(v-2\,s))\right)\Big)+$$

$$e^{-\frac{(b+a\,(m-2\,k)+c\,(v-2\,s))^2}{4\,(d+(m-2\,k)\,p+f\,(v-2\,s))}+e+(m-2\,k)\,q+g\,(v-2\,s)-\frac{i\,m\,\pi}{2}}\,(d+(m-2\,k)\,p+f\,(v-2\,s))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{h=0}^{i}(-1)^{i-h}\,4^i\,(b+a\,(m-2\,k)+c\,(v-2\,s))^{-h-i+2\,n}$$

$$\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^{h+i}$$

$$\left(-\left(b+a\,(m-2\,k)+c\,(v-2\,s)+2\,(d+(m-2\,k)\,p+f\,(v-2\,s))\,\sqrt{z}\right)^2\Big/\right.$$

$$(d+(m-2k)\,p+f\,(v-2s))^{\frac{1}{2}(-h-i-1)}\binom{i}{h}\binom{n}{i}$$
$$\left((b+a\,(m-2k)+c\,(v-2s))\left(b+a\,(m-2k)+c\,(v-2s)+2\,(d+(m-2k)\,p+f\,(v-2s))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(h+i+1),\,-\left(b+a\,(m-2k)+c\,(v-2s)+2\,(d+(m-2k)\,p+f\,(v-2s))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+(m-2k)\,p+f\,(v-2s)))\right)+2\,(d+(m-2k)\,p+f\,(v-2s))\,\Gamma\left(\frac{1}{2}\,(h+i+2),\right.$$
$$-\left(b+a\,(m-2k)+c\,(v-2s)+2\,(d+(m-2k)\,p+f\,(v-2s))\,\sqrt{z}\right)^2\Big/(4\,(d+(m-2k)\,p+$$
$$\left.f\,(v-2s)))\right)\sqrt{\left(-\left(b+a\,(m-2k)+c\,(v-2s)+2\,(d+(m-2k)\,p+f\,(v-2s))\right.\right.}$$
$$\left.\left.\sqrt{z}\right)^2\Big/(d+(m-2k)\,p+f\,(v-2s))\right)\Bigg)\Bigg/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving functions of the direct function, hyperbolic, exponential and trigonometric functions

Involving powers of the direct function, hyperbolic, exponential and trigonometric functions

Involving sin, sinh and exp

Involving $e^{b\,z^r+e}\sin(a\,z^r+q)\sinh(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int e^{b z^r+e} \sin(a z^r+q) \sinh(w z^r+t) \cosh^v(c z^r+g)\, dz ==$$

$$-\frac{1}{r}\left(i\, 2^{-v-2} z \binom{v}{\frac{v}{2}}\left(-e^{e+i q+t}\, \Gamma\left(\frac{1}{r}, (-b-i a-w) z^r\right)((-b-i a-w) z^r)^{-1/r}+\right.\right.$$
$$e^{e-i q+t}((-b+i a-w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b+i a-w) z^r\right)+e^{e+i q-t}((-b-i a+w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b-i a+w) z^r\right)-$$
$$\left.\left.e^{e-i q-t}((-b+i a+w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b+i a+w) z^r\right)\right)(1-v \bmod 2)\right)-$$

$$\frac{1}{r}\left(i\, 2^{-v-2} z \sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(-e^{e+2 g h+i q+t-g v}\, \Gamma\left(\frac{1}{r}, (-b-2 c h-i a+c v-w) z^r\right)((-b-2 c h-i a+c v-w) z^r)^{-1/r}+\right.\right.$$
$$e^{e+2 g h-i q+t-g v}((-b-2 c h+i a+c v-w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b-2 c h+i a+c v-w) z^r\right)-$$
$$e^{e-2 g h+i q+t+g v}((-b+2 c h-i a-c v-w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b+2 c h-i a-c v-w) z^r\right)+$$
$$e^{e-2 g h-i q+t+g v}((-b+2 c h+i a-c v-w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b+2 c h+i a-c v-w) z^r\right)+$$
$$e^{e+2 g h+i q-t-g v}((-b-2 c h-i a+c v+w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b-2 c h-i a+c v+w) z^r\right)-$$
$$e^{e+2 g h-i q-t-g v}((-b-2 c h+i a+c v+w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b-2 c h+i a+c v+w) z^r\right)+$$
$$e^{e-2 g h+i q-t+g v}((-b+2 c h-i a-c v+w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b+2 c h-i a-c v+w) z^r\right)-$$
$$\left.\left.e^{e-2 g h-i q-t+g v}((-b+2 c h+i a-c v+w) z^r)^{-1/r}\, \Gamma\left(\frac{1}{r}, (-b+2 c h+i a-c v+w) z^r\right)\right)\right) /; v \in \mathbb{N}^+$$

Involving $e^{b z^r+d z+e} \sin(a z^r+p z+q) \sinh(w z^r+s z+t) \cosh^v(c z^r+f z+g)$

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$$\int e^{b z^2+d z+e} \sin(a z^2+p z+q) \sinh(w z^2+s z+t) \cosh^v(c z^2+f z+g)\, dz ==$$

$$-i\, 2^{-v-3}\left(-\left(e^{-\frac{(d-i p-s)^2}{4(b-i a-w)}+e-i q-t}(d-i p-s+2(b-i a-w) z)\, \Gamma\left(\frac{1}{2}, -\frac{(d-i p-s+2(b-i a-w) z)^2}{4(b-i a-w)}\right)\right)\right/$$
$$\left((b-i a-w)\sqrt{-\frac{(d-i p-s+2(b-i a-w) z)^2}{b-i a-w}}\right)+$$

$$\frac{e^{-\frac{(d+i\,p-s)^2}{4\,(b+i\,a-w)}+e+i\,q-t}\,(d+i\,p-s+2\,(b+i\,a-w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+i\,p-s+2\,(b+i\,a-w)\,z)^2}{4\,(b+i\,a-w)}\right)}{(b+i\,a-w)\sqrt{-\frac{(d+i\,p-s+2\,(b+i\,a-w)\,z)^2}{b+i\,a-w}}}+$$

$$\left(e^{-\frac{(d-i\,p+s)^2}{4\,(b-i\,a+w)}+e-i\,q+t}\,(d-i\,p+s+2\,(b-i\,a+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d-i\,p+s+2\,(b-i\,a+w)\,z)^2}{4\,(b-i\,a+w)}\right)\right)\Big/$$

$$\left((b-i\,a+w)\sqrt{-\frac{(d-i\,p+s+2\,(b-i\,a+w)\,z)^2}{b-i\,a+w}}\right)-$$

$$\left(\frac{e^{-\frac{(d+i\,p+s)^2}{4\,(b+i\,a+w)}+e+i\,q+t}\,(d+i\,p+s+2\,(b+i\,a+w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+i\,p+s+2\,(b+i\,a+w)\,z)^2}{4\,(b+i\,a+w)}\right)}{(b+i\,a+w)\sqrt{-\frac{(d+i\,p+s+2\,(b+i\,a+w)\,z)^2}{b+i\,a+w}}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)-$$

$$i\,2^{-\nu-3}\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-\left(e^{-\frac{(d-i\,p-s+f\,(2\,h-\nu))^2}{4\,(b-i\,a+c\,(2\,h-\nu)-w)}+e-i\,q-t+g\,(2\,h-\nu)}\,(d-i\,p-s+f\,(2\,h-\nu)+2\,(b-i\,a+c\,(2\,h-\nu)-w)\,z)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-i\,p-s+f\,(2\,h-\nu)+2\,(b-i\,a+c\,(2\,h-\nu)-w)\,z)^2}{4\,(b-i\,a+c\,(2\,h-\nu)-w)}\right)\right)\Big/$$

$$\left((b-i\,a+c\,(2\,h-\nu)-w)\sqrt{-\frac{(d-i\,p-s+f\,(2\,h-\nu)+2\,(b-i\,a+c\,(2\,h-\nu)-w)\,z)^2}{b-i\,a+c\,(2\,h-\nu)-w}}\right)+$$

$$\left(e^{-\frac{(d+i\,p-s+f\,(2\,h-\nu))^2}{4\,(b+i\,a+c\,(2\,h-\nu)-w)}+e+i\,q-t+g\,(2\,h-\nu)}\,(d+i\,p-s+f\,(2\,h-\nu)+2\,(b+i\,a+c\,(2\,h-\nu)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+i\,p-s+f\,(2\,h-\nu)+2\,(b+i\,a+c\,(2\,h-\nu)-w)\,z)^2}{4\,(b+i\,a+c\,(2\,h-\nu)-w)}\right)\right)\Big/$$

$$\left((b+i\,a+c\,(2\,h-\nu)-w)\sqrt{-\frac{(d+i\,p-s+f\,(2\,h-\nu)+2\,(b+i\,a+c\,(2\,h-\nu)-w)\,z)^2}{b+i\,a+c\,(2\,h-\nu)-w}}\right)-$$

$$\left(e^{-\frac{(d-i\,p-s+f\,(\nu-2\,h))^2}{4\,(b-i\,a+c\,(\nu-2\,h)-w)}+e-i\,q-t+g\,(\nu-2\,h)}\,(d-i\,p-s+f\,(\nu-2\,h)+2\,(b-i\,a+c\,(\nu-2\,h)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-i\,p-s+f\,(\nu-2\,h)+2\,(b-i\,a+c\,(\nu-2\,h)-w)\,z)^2}{4\,(b-i\,a+c\,(\nu-2\,h)-w)}\right)\right)\Big/$$

$$\left((b-i\,a+c\,(\nu-2\,h)-w)\sqrt{-\frac{(d-i\,p-s+f\,(\nu-2\,h)+2\,(b-i\,a+c\,(\nu-2\,h)-w)\,z)^2}{b-i\,a+c\,(\nu-2\,h)-w}}\right)+$$

$$\left(e^{-\frac{(d+i\,p-s+f\,(v-2\,h))^2}{4\,(b+i\,a\,+c\,(v-2\,h)-w)}+e+i\,q-t+g\,(v-2\,h)}\,(d+i\,p-s+f\,(v-2\,h)+2\,(b+i\,a\,+c\,(v-2\,h)-w)\,z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+i\,p-s+f\,(v-2\,h)+2\,(b+i\,a\,+c\,(v-2\,h)-w)\,z)^2}{4\,(b+i\,a\,+c\,(v-2\,h)-w)}\right)\right)\Big/$$
$$\left((b+i\,a\,+c\,(v-2\,h)-w)\sqrt{-\frac{(d+i\,p-s+f\,(v-2\,h)+2\,(b+i\,a\,+c\,(v-2\,h)-w)\,z)^2}{b+i\,a\,+c\,(v-2\,h)-w}}\right)+$$
$$\left(e^{-\frac{(d-i\,p+s+f\,(2\,h-v))^2}{4\,(b-i\,a\,+c\,(2\,h-v)+w)}+e-i\,q+t+g\,(2\,h-v)}\,(d-i\,p+s+f\,(2\,h-v)+2\,(b-i\,a\,+c\,(2\,h-v)+w)\,z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-i\,p+s+f\,(2\,h-v)+2\,(b-i\,a\,+c\,(2\,h-v)+w)\,z)^2}{4\,(b-i\,a\,+c\,(2\,h-v)+w)}\right)\right)\Big/$$
$$\left((b-i\,a\,+c\,(2\,h-v)+w)\sqrt{-\frac{(d-i\,p+s+f\,(2\,h-v)+2\,(b-i\,a\,+c\,(2\,h-v)+w)\,z)^2}{b-i\,a\,+c\,(2\,h-v)+w}}\right)-$$
$$\left(e^{-\frac{(d+i\,p+s+f\,(2\,h-v))^2}{4\,(b+i\,a\,+c\,(2\,h-v)+w)}+e+i\,q+t+g\,(2\,h-v)}\,(d+i\,p+s+f\,(2\,h-v)+2\,(b+i\,a\,+c\,(2\,h-v)+w)\,z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+i\,p+s+f\,(2\,h-v)+2\,(b+i\,a\,+c\,(2\,h-v)+w)\,z)^2}{4\,(b+i\,a\,+c\,(2\,h-v)+w)}\right)\right)\Big/$$
$$\left((b+i\,a\,+c\,(2\,h-v)+w)\sqrt{-\frac{(d+i\,p+s+f\,(2\,h-v)+2\,(b+i\,a\,+c\,(2\,h-v)+w)\,z)^2}{b+i\,a\,+c\,(2\,h-v)+w}}\right)+$$
$$\left(e^{-\frac{(d-i\,p+s+f\,(v-2\,h))^2}{4\,(b-i\,a\,+c\,(v-2\,h)+w)}+e-i\,q+t+g\,(v-2\,h)}\,(d-i\,p+s+f\,(v-2\,h)+2\,(b-i\,a\,+c\,(v-2\,h)+w)\,z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-i\,p+s+f\,(v-2\,h)+2\,(b-i\,a\,+c\,(v-2\,h)+w)\,z)^2}{4\,(b-i\,a\,+c\,(v-2\,h)+w)}\right)\right)\Big/$$
$$\left((b-i\,a\,+c\,(v-2\,h)+w)\sqrt{-\frac{(d-i\,p+s+f\,(v-2\,h)+2\,(b-i\,a\,+c\,(v-2\,h)+w)\,z)^2}{b-i\,a\,+c\,(v-2\,h)+w}}\right)-$$
$$\left(e^{-\frac{(d+i\,p+s+f\,(v-2\,h))^2}{4\,(b+i\,a\,+c\,(v-2\,h)+w)}+e+i\,q+t+g\,(v-2\,h)}\,(d+i\,p+s+f\,(v-2\,h)+2\,(b+i\,a\,+c\,(v-2\,h)+w)\,z)\right.$$
$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+i\,p+s+f\,(v-2\,h)+2\,(b+i\,a\,+c\,(v-2\,h)+w)\,z)^2}{4\,(b+i\,a\,+c\,(v-2\,h)+w)}\right)\right)\Big/$$
$$\left.\left((b+i\,a\,+c\,(v-2\,h)+w)\sqrt{-\frac{(d+i\,p+s+f\,(v-2\,h)+2\,(b+i\,a\,+c\,(v-2\,h)+w)\,z)^2}{b+i\,a\,+c\,(v-2\,h)+w}}\right)\right)/;\,v\in\mathbb{N}^+$$

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$$\int e^{\sqrt{z}\ b+e+d\,z}\sin\left(\sqrt{z}\ a+q+p\,z\right)\sinh\left(t+s\,z+w\sqrt{z}\right)\cosh^{v}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-v-3}\,i\left(\left(e^{-\frac{(b+i\,a-w)^2}{4\,(d+i\,p-s)}+e+i\,q-t}\left(2\,e^{\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\sqrt{z}\right)^2}{4\,(d+i\,p-s)}}\sqrt{-\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\sqrt{z}\right)^2}{d+i\,p-s}}\ (d+i\,p-s)+\right.\right.\right.$$

$$\left.\left.\left.(b+i\,a-w)\left(b+i\,a-w+2\,(d+i\,p-s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\sqrt{z}\right)^2}{4\,(d+i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d+i\,p-s)^2\sqrt{-\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\sqrt{z}\right)^2}{d+i\,p-s}}\right)-$$

$$\left(e^{-\frac{(b+-i\,a-w)^2}{4\,(d-i\,p-s)}+e-i\,q-t}\left(2\,e^{\frac{\left(b+-i\,a-w+2\,(d-i\,p-s)\sqrt{z}\right)^2}{4\,(d-i\,p-s)}}\sqrt{-\frac{\left(b+-i\,a-w+2\,(d-i\,p-s)\sqrt{z}\right)^2}{d-i\,p-s}}\ (d-i\,p-s)+\right.\right.$$

$$\left.\left.(b+-i\,a-w)\left(b+-i\,a-w+2\,(d-i\,p-s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+-i\,a-w+2\,(d-i\,p-s)\sqrt{z}\right)^2}{4\,(d-i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d-i\,p-s)^2\sqrt{-\frac{\left(b+-i\,a-w+2\,(d-i\,p-s)\sqrt{z}\right)^2}{d-i\,p-s}}\right)+$$

$$-\left(e^{-\frac{(b+i\,a+w)^2}{4\,(d+i\,p+s)}+e+i\,q+t}\left(2\,e^{\frac{\left(b+i\,a+w+2\,(d+i\,p+s)\sqrt{z}\right)^2}{4\,(d+i\,p+s)}}\sqrt{-\frac{\left(b+i\,a+w+2\,(d+i\,p+s)\sqrt{z}\right)^2}{d+i\,p+s}}\ (d+i\,p+s)+\right.\right.$$

$$\left.\left.(b+i\,a+w)\left(b+i\,a+w+2\,(d+i\,p+s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+i\,a+w+2\,(d+i\,p+s)\sqrt{z}\right)^2}{4\,(d+i\,p+s)}\right)\right)\right)\Big/$$

$$\left((d+i\,p+s)^2\sqrt{-\frac{\left(b+i\,a+w+2\,(d+i\,p+s)\sqrt{z}\right)^2}{d+i\,p+s}}\right)+$$

$$\left(e^{-\frac{(b+-i\,a+w)^2}{4(d-i\,p+s)}+e-i\,q+t}\left(2\,e^{\frac{\left(b+-i\,a+w+2(d-i\,p+s)\sqrt{z}\right)^2}{4(d-i\,p+s)}}\sqrt{-\frac{\left(b+-i\,a+w+2(d-i\,p+s)\sqrt{z}\right)^2}{d-i\,p+s}}\,(d-i\,p+s)+\right.\right.$$

$$\left.\left.(b+-i\,a+w)\left(b+-i\,a+w+2(d-i\,p+s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+-i\,a+w+2(d-i\,p+s)\sqrt{z}\right)^2}{4(d-i\,p+s)}\right)\right)\Big/$$

$$\left((d-i\,p+s)^2\sqrt{-\frac{\left(b+-i\,a+w+2(d-i\,p+s)\sqrt{z}\right)^2}{d-i\,p+s}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-3}\,i\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(\left(e^{-\frac{(b+i\,a+c(2h-\nu)-w)^2}{4(d+i\,p-s+f(2h-\nu))}+e+i\,q-t+g(2h-\nu)}\left((b+i\,a+c(2h-\nu)-w)\right.\right.\right.$$

$$\left.\left.\left(b+i\,a+c(2h-\nu)-w+2(d+i\,p-s+f(2h-\nu))\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.\right.$$

$$\left.\left.\left.-\frac{\left(b+i\,a+c(2h-\nu)-w+2(d+i\,p-s+f(2h-\nu))\sqrt{z}\right)^2}{4(d+i\,p-s+f(2h-\nu))}\right)+2\,e^{\frac{\left(b+i\,a+c(2h-\nu)-w+2(d+i\,p-s+f(2h-\nu))\sqrt{z}\right)^2}{4(d+i\,p-s+f(2h-\nu))}}\right.\right.$$

$$\left.\left.(d+i\,p-s+f(2h-\nu))\sqrt{-\frac{\left(b+i\,a+c(2h-\nu)-w+2(d+i\,p-s+f(2h-\nu))\sqrt{z}\right)^2}{d+i\,p-s+f(2h-\nu)}}\right)\Big/\right.$$

$$\left.\left((d+i\,p-s+f(2h-\nu))^2\sqrt{-\frac{\left(b+i\,a+c(2h-\nu)-w+2(d+i\,p-s+f(2h-\nu))\sqrt{z}\right)^2}{d+i\,p-s+f(2h-\nu)}}\right)-\right.$$

$$\left(e^{-\frac{(b-i\,a+c(2h-\nu)-w)^2}{4(d-i\,p-s+f(2h-\nu))}+e-i\,q-t+g(2h-\nu)}\right.$$

$$\left.\left((b-i\,a+c(2h-\nu)-w)\left(b-i\,a+c(2h-\nu)-w+2(d-i\,p-s+f(2h-\nu))\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.\right.$$

$$-\frac{\left(b-i\,a+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}\Bigg]+2\,e^{\frac{\left(b-i\,a+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}}$$

$$(d-i\,p-s+f\,(2\,h-v))\sqrt{-\frac{\left(b-i\,a+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(2\,h-v)}}\Bigg)\Bigg/$$

$$\left((d-i\,p-s+f\,(2\,h-v))^2\sqrt{-\frac{\left(b-i\,a+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(2\,h-v)}}\right)-$$

$$\left(e^{-\frac{(b+i\,a+c\,(2\,h-v)+w)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}+e+i\,q+t+g\,(2\,h-v)}\right.$$

$$\left((b+i\,a+c\,(2\,h-v)+w)\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$-\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}\Bigg]+2\,e^{\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}}$$

$$(d+i\,p+s+f\,(2\,h-v))\sqrt{-\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}}\Bigg)\Bigg/$$

$$\left((d+i\,p+s+f\,(2\,h-v))^2\sqrt{-\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(b-i\,a+c\,(2\,h-v)+w)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}+e-i\,q+t+g\,(2\,h-v)}\right.$$

$$\left((b-i\,a+c\,(2\,h-v)+w)\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}\Bigg]+2\,e^{\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}}$$

$$(d-i\,p+s+f\,(2\,h-v))\sqrt{-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(2\,h-v)}}\Bigg)\Bigg)\Bigg/$$

$$\left((d-i\,p+s+f\,(2\,h-v))^2\sqrt{-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(b+i\,a+c\,(v-2\,h)-w)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}+e+i\,q-t+g\,(v-2\,h)}\right.$$

$$\left((b+i\,a+c\,(v-2\,h)-w)\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}\right]+2\,e^{\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}}$$

$$(d+i\,p-s+f\,(v-2\,h))\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p-s+f\,(v-2\,h)}}\Bigg)\Bigg)\Bigg/$$

$$\left((d+i\,p-s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p-s+f\,(v-2\,h)}}\right)-$$

$$\left(e^{-\frac{(b-i\,a+c\,(v-2\,h)-w)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}+e-i\,q-t+g\,(v-2\,h)}\right.$$

$$\left((b-i\,a+c\,(v-2\,h)-w)\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$-\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}\Bigg]+2\,e^{\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}}$$

$$(d-i\,p-s+f\,(v-2\,h))\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(v-2\,h)}}\Bigg)\Bigg/$$

$$\left((d-i\,p-s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(v-2\,h)}}\right)-$$

$$\left(e^{-\frac{(b+i\,a+c\,(v-2\,h)+w)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}+e+i\,q+t+g\,(v-2\,h)}\right.$$

$$\left((b+i\,a+c\,(v-2\,h)+w)\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}\right]+2\,e^{\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}}$$

$$(d+i\,p+s+f\,(v-2\,h))\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}}\Bigg)\Bigg/$$

$$\left((d+i\,p+s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}}\right)+$$

$$\left(e^{-\frac{(b-i\,a+c\,(v-2\,h)+w)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}+e-i\,q+t+g\,(v-2\,h)}\right.$$

$$\left((b-i\,a+c\,(v-2\,h)+w)\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}\Bigg]+2\,e^{\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}}$$

$$(d-i\,p+s+f\,(v-2\,h))\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(v-2\,h)}}\Bigg)\Bigg/$$

$$\left((d-i\,p+s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(v-2\,h)}}\right)/;\ v\in\mathbb{N}^+$$

Involving powers of sin, powers of sinh and exp

Involving $e^{b\,z^r+e}\sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int e^{b\,z^r+e}\sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)\,dz==$$

$$-\frac{i^u\,2^{-m-u-v}\,e^e\,z\,(-b\,z^r)^{-1/r}\,(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{r},-b\,z^r\right)-$$

$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{e+2\,i\,k\,q-i\,m\,q+\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{1}{r},(-b-2\,i\,a\,k+i\,a\,m)\,z^r\right)\right.$$

$$\left.((-b-2\,i\,a\,k+i\,a\,m)\,z^r)^{-1/r}+e^{e-2\,i\,k\,q+i\,m\,q-\frac{i\,m\,\pi}{2}}\,((-b+2\,i\,a\,k-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,i\,a\,k-i\,a\,m)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{e+2\,g\,h-g\,v}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,h+c\,v)\,z^r\right)\right.$$

$$\left.((-b-2\,c\,h+c\,v)\,z^r)^{-1/r}+e^{e-2\,g\,h+g\,v}\,((-b+2\,c\,h-c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,h-c\,v)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{e+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{1}{r},(-b-2\,k\,w+u\,w)\,z^r\right)\right.$$

$$\left.((-b-2\,k\,w+u\,w)\,z^r)^{-1/r}+e^{e-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((-b+2\,k\,w-u\,w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,k\,w-u\,w)\,z^r\right)\right)-$$

$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{e+2\,g\,h+2\,i\,k\,q-i\,m\,q-g\,v+\frac{i\,m\,\pi}{2}}\right.$$

$$\left.\Gamma\left(\frac{1}{r},(-b-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v)\,z^r\right)((-b-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v)\,z^r)^{-1/r}+\right.$$

$$\left.e^{e+2\,g\,h-2\,i\,k\,q+i\,m\,q-g\,v-\frac{i\,m\,\pi}{2}}\,((-b-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v)\,z^r\right)+\right.$$

$$e^{e-2gh+2ikq-imq+gv+\frac{im\pi}{2}}((-b+2ch-2iak+iam-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch-2iak+iam-cv)z^r\right)+$$
$$e^{e-2gh-2ikq+imq+gv-\frac{im\pi}{2}}((-b+2ch+2iak-iam-cv)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b+2ch+2iak-iam-cv)z^r\right)\Bigg)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{v}{\frac{v}{2}}(1-v\bmod 2)$$
$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{e+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+\frac{im\pi}{2}}\Gamma\left(\frac{1}{r},(-b-2iak+iam-2jw+uw)z^r\right)$$
$$((-b-2iak+iam-2jw+uw)z^r)^{-1/r}+e^{e-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-\frac{im\pi}{2}}$$
$$((-b+2iak-iam-2jw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2iak-iam-2jw+uw)z^r\right)+$$
$$e^{e+2ikq-imq-2jt+tu-\frac{i\pi u}{2}+\frac{im\pi}{2}}((-b-2iak+iam+2jw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b-2iak+iam+2jw-uw)z^r\right)+e^{e-2ikq+imq-2jt+tu-\frac{i\pi u}{2}-\frac{im\pi}{2}}$$
$$((-b+2iak-iam+2jw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2iak-iam+2jw-uw)z^r\right)\Bigg)-$$
$$\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{e+2gh+2kt-tu+\frac{i\pi u}{2}-gv}$$
$$\Gamma\left(\frac{1}{r},(-b-2ch+cv-2kw+uw)z^r\right)((-b-2ch+cv-2kw+uw)z^r)^{-1/r}+$$
$$e^{e-2gh+2kt-tu+\frac{i\pi u}{2}+gv}((-b+2ch-cv-2kw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch-cv-2kw+uw)z^r\right)+$$
$$e^{e+2gh-2kt+tu-gv-\frac{i\pi u}{2}}((-b-2ch+cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b-2ch+cv+2kw-uw)z^r\right)+$$
$$e^{e-2gh-2kt+tu+gv-\frac{i\pi u}{2}}((-b+2ch-cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch-cv+2kw-uw)z^r\right)\Bigg)-$$
$$\frac{i^u\,2^{-m-u-v}\,z}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{e+2gh+2ikq-imq+2jt-tu+\frac{i\pi u}{2}-gv+\frac{im\pi}{2}}\Gamma\left(\frac{1}{r},(-b-2ch-\right.$$
$$\left.2iak+iam+cv-2jw+uw)z^r\right)((-b-2ch-2iak+iam+cv-2jw+uw)z^r)^{-1/r}+$$
$$e^{e+2gh-2ikq+imq+2jt-tu+\frac{i\pi u}{2}-gv-\frac{im\pi}{2}}((-b-2ch+2iak-iam+cv-2jw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b-2ch+2iak-iam+cv-2jw+uw)z^r\right)+$$
$$e^{e-2gh+2ikq-imq+2jt-tu+\frac{i\pi u}{2}+gv+\frac{im\pi}{2}}((-b+2ch-2iak+iam-cv-2jw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b+2ch-2iak+iam-cv-2jw+uw)z^r\right)+$$
$$e^{e-2gh-2ikq+imq+2jt-tu+\frac{i\pi u}{2}+gv-\frac{im\pi}{2}}((-b+2ch+2iak-iam-cv-2jw+uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},(-b+2ch+2iak-iam-cv-2jw+uw)z^r\right)+$$
$$e^{e+2gh+2ikq-imq-2jt+tu-gv-\frac{i\pi u}{2}+\frac{im\pi}{2}}((-b-2ch-2iak+iam+cv+2jw-uw)z^r)^{-1/r}$$

$$\Gamma\left(\frac{1}{r}, (-b-2ch-2iak+iam+cv+2jw-uw)z^r\right)+$$
$$e^{e+2gh-2ikq+imq-2jt+tu-gv-\frac{i\pi u}{2}-\frac{im\pi}{2}}((-b-2ch+2iak-iam+cv+2jw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r}, (-b-2ch+2iak-iam+cv+2jw-uw)z^r\right)+$$
$$e^{e-2gh+2ikq-imq-2jt+tu+gv-\frac{i\pi u}{2}+\frac{im\pi}{2}}((-b+2ch-2iak+iam-cv+2jw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r}, (-b+2ch-2iak+iam-cv+2jw-uw)z^r\right)+$$
$$e^{e-2gh-2ikq+imq-2jt+tu+gv-\frac{i\pi u}{2}-\frac{im\pi}{2}}((-b+2ch+2iak-iam-cv+2jw-uw)z^r)^{-1/r}$$
$$\Gamma\left(\frac{1}{r}, (-b+2ch+2iak-iam-cv+2jw-uw)z^r\right)\Big)/; m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{b z^r+d z+e}\sin^m(a z^r+p z+q)\sinh^u(w z^r+s z+t)\cosh^v(c z^r+f z+g)$

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$$\int e^{b z^2+d z+e}\sin^m(a z^2+p z+q)\sinh^u(w z^2+s z+t)\cosh^v(c z^2+f z+g)\,dz ==$$
$$-\frac{i^u 2^{-m-u-v-1} e^{e-\frac{d^2}{4b}}(d+2bz)(1-m \bmod 2)(1-u \bmod 2)(1-v \bmod 2)}{b\sqrt{-\frac{(d+2bz)^2}{b}}}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{2}, -\frac{(d+2bz)^2}{4b}\right)-$$
$$i^u 2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u \bmod 2)(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{(d+i(2k-m)p)^2}{4(b+ai(2k-m))}+e+i(2k-m)q+\frac{im\pi}{2}}\right.$$
$$\left.(d+i(2k-m)p+2(b+ai(2k-m))z)\Gamma\left(\frac{1}{2}, -\frac{(d+i(2k-m)p+2(b+ai(2k-m))z)^2}{4(b+ai(2k-m))}\right)\right)\Big/$$
$$\left((b+ai(2k-m))\sqrt{-\frac{(d+i(2k-m)p+2(b+ai(2k-m))z)^2}{b+ai(2k-m)}}\right)+\left(e^{-\frac{(d+i(m-2k)p)^2}{4(b+ai(m-2k))}+e+i(m-2k)q-\frac{im\pi}{2}}\right.$$
$$\left.(d+i(m-2k)p+2(b+ai(m-2k))z)\Gamma\left(\frac{1}{2}, -\frac{(d+i(m-2k)p+2(b+ai(m-2k))z)^2}{4(b+ai(m-2k))}\right)\right)\Big/$$
$$\left((b+ai(m-2k))\sqrt{-\frac{(d+i(m-2k)p+2(b+ai(m-2k))z)^2}{b+ai(m-2k)}}\right)\Big)-$$
$$i^u 2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}$$
$$\left(\left(e^{-\frac{(d+f(2h-v))^2}{4(b+c(2h-v))}+e+g(2h-v)}(d+f(2h-v)+2(b+c(2h-v))z)\Gamma\left(\frac{1}{2}, -\frac{(d+f(2h-v)+2(b+c(2h-v))z)^2}{4(b+c(2h-v))}\right)\right)\Big/\right.$$

$$\left((b+c\,(2\,h-v))\,\sqrt{-\frac{(d+f\,(2\,h-v)+2\,(b+c\,(2\,h-v))\,z)^2}{b+c\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(d+f\,(v-2\,h))^2}{4\,(b+c\,(v-2\,h))}+e-g\,(2\,h-v)}\,(d+f\,(v-2\,h)+2\,(b+c\,(v-2\,h))\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f\,(v-2\,h)+2\,(b+c\,(v-2\,h))\,z)^2}{4\,(b+c\,(v-2\,h))}\right)\right)\Big/$$

$$\left((b+c\,(v-2\,h))\,\sqrt{-\frac{(d+f\,(v-2\,h)+2\,(b+c\,(v-2\,h))\,z)^2}{b+c\,(v-2\,h)}}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}$$

$$\left(\left(e^{-\frac{(d+s\,(2\,k-u))^2}{4\,(b+(2\,k-u)\,w)}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\,(d+s\,(2\,k-u)+2\,(b+(2\,k-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+s\,(2\,k-u)+2\,(b+(2\,k-u)\,w)\,z)^2}{4\,(b+(2\,k-u)\,w)}\right)\right)\Big/\right.$$

$$\left((b+(2\,k-u)\,w)\,\sqrt{-\frac{(d+s\,(2\,k-u)+2\,(b+(2\,k-u)\,w)\,z)^2}{b+(2\,k-u)\,w}}\right)+\left(e^{-\frac{(d+s\,(u-2\,k))^2}{4\,(b+(u-2\,k)\,w)}+e+t\,(u-2\,k)-\frac{i\,\pi\,u}{2}}\right.$$

$$\left.(d+s\,(u-2\,k)+2\,(b+(u-2\,k)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+s\,(u-2\,k)+2\,(b+(u-2\,k)\,w)\,z)^2}{4\,(b+(u-2\,k)\,w)}\right)\right)\Big/$$

$$\left.\left((b+(u-2\,k)\,w)\,\sqrt{-\frac{(d+s\,(u-2\,k)+2\,(b+(u-2\,k)\,w)\,z)^2}{b+(u-2\,k)\,w}}\right)\right)-i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(d+i\,(2\,k-m)\,p+f\,(2\,h-v))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v))}+e+i\,(2\,k-m)\,q+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+\right.\right.\right.$$

$$\left.\left.\left.c\,(2\,h-v))\,z)\,\Gamma\left(\frac{1}{2},-(d+i\,(2\,k-m)\,p+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v))\,z)^2\Big/\right.\right.\right.$$

$$\left.\left.\left.(4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)))\right)\right)\Big/\left((b+a\,i\,(2\,k-m)+c\,(2\,h-v))\,\sqrt{\left(-(d+i\,(2\,k-m)\,p+\right.\right.\right.$$

$$\left.\left.\left.f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v))\,z)^2\Big/(b+a\,i\,(2\,k-m)+c\,(2\,h-v))\right)\right)+$$

$$\left(e^{-\frac{(d+i\,(m-2\,k)\,p+f\,(2\,h-v))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v))}+e+i\,(m-2\,k)\,q+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v))\,z)\right.$$

$$\Gamma\left(\frac{1}{2},-(d+i\,(m-2\,k)\,p+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v))\,z)^2\Big/\right.$$

$$\left.\left.(4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)))\right)\right)\Big/\left((b+a\,i\,(m-2\,k)+c\,(2\,h-v))\,\sqrt{\left(-(d+i\,(m-2\,k)\,p+\right.\right.$$

$$\left.\left.f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v))\,z)^2\Big/(b+a\,i\,(m-2\,k)+c\,(2\,h-v))\right)\right)+$$

$$\left(e^{-\frac{(d+i\,(2\,k-m)\,p+f\,(v-2\,h))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h))}+e+i\,(2\,k-m)\,q+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h))\,z)\right.$$

$$\Gamma\left(\frac{1}{2}, -(d+i\,(2\,k-m)\,p+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h))\,z)^2\Big/\right.$$
$$\left.(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)))\right)\Big/\left((b+a\,i\,(2\,k-m)+c\,(v-2\,h))\,\sqrt{\left(-(d+i\,(2\,k-m)\,p+\right.\right.}$$
$$\left.\left.f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h))\,z)^2\Big/(b+a\,i\,(2\,k-m)+c\,(v-2\,h))\right)\right)+$$
$$\left(e^{-\frac{(d+i\,(m-2\,k)\,p+f\,(v-2\,h))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h))}+e+i\,(m-2\,k)\,q+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h))\,z)\right.$$
$$\Gamma\left(\frac{1}{2}, -(d+i\,(m-2\,k)\,p+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h))\,z)^2\Big/\right.$$
$$\left.(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)))\right)\Big/\left((b+a\,i\,(m-2\,k)+c\,(v-2\,h))\,\sqrt{\left(-(d+i\,(m-2\,k)\,p+\right.\right.}$$
$$\left.\left.\left.f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h))\,z)^2\Big/(b+a\,i\,(m-2\,k)+c\,(v-2\,h))\right)\right)\right)-$$

$$i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(2\,j-u))^2}{4\,(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{1}{2}\,i\,\pi\,(m+u)}\right.\right.$$
$$(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+2\,(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)\,\Gamma\left(\frac{1}{2}, -(d+i\,(2\,k-m)\,p+\right.$$
$$\left.s\,(2\,j-u)+2\,(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^2\Big/(4\,(b+a\,i\,(2\,k-m)+(2\,j-u)\,w))\right)\Big/$$
$$\left((b+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,\sqrt{\left(-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+2\,(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^2\Big/\right.}\right.$$
$$\left.\left.(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)\right)\right)+\left(e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(2\,j-u))^2}{4\,(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{1}{2}\,i\,\pi\,(u-m)}\right.$$
$$(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)\,\Gamma\left(\frac{1}{2}, -(d+i\,(m-2\,k)\,p+\right.$$
$$\left.s\,(2\,j-u)+2\,(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/(4\,(b+a\,i\,(m-2\,k)+(2\,j-u)\,w))\right)\Big/$$
$$\left((b+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,\sqrt{\left(-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2\Big/\right.}\right.$$
$$\left.\left.(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)\right)\right)+\left(e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(u-2\,j))^2}{4\,(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)}+e+i\,(2\,k-m)\,q+\frac{1}{2}\,i\,\pi\,(m-u)+t\,(u-2\,j)}\right.$$
$$(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)\,\Gamma\left(\frac{1}{2}, -(d+i\,(2\,k-m)\,p+\right.$$
$$\left.s\,(u-2\,j)+2\,(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/(4\,(b+a\,i\,(2\,k-m)+(u-2\,j)\,w))\right)\Big/$$
$$\left((b+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,\sqrt{\left(-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2\Big/\right.}\right.$$
$$\left.\left.(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)\right)\right)+\left(e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(u-2\,j))^2}{4\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{1}{2}\,i\,\pi\,(m+u)}\right.$$
$$(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)\,\Gamma\left(\frac{1}{2}, -(d+i\,(m-2\,k)\,p+\right.$$
$$\left.s\,(u-2\,j)+2\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/(4\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w))\right)\Big/$$
$$\left((b+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,\sqrt{\left(-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/\right.}\right.$$

$$(b+a\,i\,(m-2\,k)+(u-2\,j)\,w))\Big)\Big)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(\Bigg(e^{-\frac{(d+s\,(2\,k-u)+f\,(2\,h-v))^2}{4\,(b+c\,(2\,h-v)+(2\,k-u)\,w)}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$(d+s\,(2\,k-u)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(2\,k-u)\,w)\,z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-\frac{(d+s\,(2\,k-u)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2}{4\,(b+c\,(2\,h-v)+(2\,k-u)\,w)}\Bigg)\Bigg)\Big/\Big((b+c\,(2\,h-v)+(2\,k-u)\,w)$$

$$\sqrt{\left(-(d+s\,(2\,k-u)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2\Big/(b+c\,(2\,h-v)+(2\,k-u)\,w)\right)}\Big)+$$

$$\Bigg(e^{-\frac{(d+s\,(2\,k-u)+f\,(v-2\,h))^2}{4\,(b+c\,(v-2\,h)+(2\,k-u)\,w)}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(d+s\,(2\,k-u)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(2\,k-u)\,w)\,z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-\frac{(d+s\,(2\,k-u)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2}{4\,(b+c\,(v-2\,h)+(2\,k-u)\,w)}\Bigg)\Bigg)\Big/\Big((b+c\,(v-2\,h)+(2\,k-u)\,w)$$

$$\sqrt{\left(-(d+s\,(2\,k-u)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2\Big/(b+c\,(v-2\,h)+(2\,k-u)\,w)\right)}\Big)+$$

$$\Bigg(e^{-\frac{(d+s\,(u-2\,k)+f\,(2\,h-v))^2}{4\,(b+c\,(2\,h-v)+(u-2\,k)\,w)}+e+t\,(u-2\,k)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,k)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(u-2\,k)\,w)\,z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-\frac{(d+s\,(u-2\,k)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(u-2\,k)\,w)\,z)^2}{4\,(b+c\,(2\,h-v)+(u-2\,k)\,w)}\Bigg)\Bigg)\Big/\Big((b+c\,(2\,h-v)+(u-2\,k)\,w)$$

$$\sqrt{\left(-(d+s\,(u-2\,k)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(u-2\,k)\,w)\,z)^2\Big/(b+c\,(2\,h-v)+(u-2\,k)\,w)\right)}\Big)+$$

$$\Bigg(e^{-\frac{(d+s\,(u-2\,k)+f\,(v-2\,h))^2}{4\,(b+c\,(v-2\,h)+(u-2\,k)\,w)}+e+t\,(u-2\,k)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,k)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(u-2\,k)\,w)\,z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-\frac{(d+s\,(u-2\,k)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(u-2\,k)\,w)\,z)^2}{4\,(b+c\,(v-2\,h)+(u-2\,k)\,w)}\Bigg)\Bigg)\Big/\Big((b+c\,(v-2\,h)+(u-2\,k)\,w)$$

$$\sqrt{\left(-(d+s\,(u-2\,k)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(u-2\,k)\,w)\,z)^2\Big/(b+c\,(v-2\,h)+(u-2\,k)\,w)\right)}\Big)\Big)-$$

$$i^u\,2^{-m-u-v-1}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(\Bigg(e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}$$

$$(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\Big/$$

$$(4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w))\Bigg)\Bigg)\Big/\Big((b+a\,i\,(2\,k-m)+c\,(2\,h-v)+$$

$$(2\,j-u)\,w)\,\sqrt{\left(-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+\right.}$$

$$\left.c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\Big/(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\right)}\Big)+$$

$$\Bigg(e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$

$$f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w))\Big)\Big/\big((b+a\,i\,(m-2\,k)+c\,(2\,h-v)+$$
$$(2\,j-u)\,w)\,\sqrt{\big(-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+$$
$$c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\big/(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\big)}\big)+$$
$$\Big(e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+$$
$$f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w))\Big)\Big/\big((b+a\,i\,(2\,k-m)+c\,(v-2\,h)+$$
$$(2\,j-u)\,w)\,\sqrt{\big(-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+$$
$$c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\big/(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\big)}\big)+$$
$$\Big(e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$
$$f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w))\Big)\Big/\big((b+a\,i\,(m-2\,k)+c\,(v-2\,h)+$$
$$(2\,j-u)\,w)\,\sqrt{\big(-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+$$
$$c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\big/(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\big)}\big)+$$
$$\Big(e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$
$$f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w))\Big)\Big/\big((b+a\,i\,(2\,k-m)+c\,(2\,h-v)+$$
$$(u-2\,j)\,w)\,\sqrt{\big(-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+$$
$$c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\big/(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\big)}\big)+$$
$$\Big(e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+$$
$$f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)\,\Gamma\Big(\frac{1}{2},$$
$$-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w))\Big)\Big/\big((b+a\,i\,(m-2\,k)+c\,(2\,h-v)+$$
$$(u-2\,j)\,w)\,\sqrt{\big(-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+$$

$$c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\Big)\Big)+$$

$$\left(e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.$$

$$f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.\left.-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/\right.\right.$$

$$\left.\left.(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w))\right)\right)\Big/\Big((b+a\,i\,(2\,k-m)+c\,(v-2\,h)+$$

$$(u-2\,j)\,w)\,\sqrt{\big(-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+$$

$$c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\big)}\Big)+$$

$$\left(e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.$$

$$f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.\left.-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/\right.\right.$$

$$\left.\left.(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w))\right)\right)\Big/$$

$$\Big((b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,\sqrt{\big(-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+$$

$$f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\big)}\Big)\Big/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int e^{\sqrt{z}\,b+d\,z+e}\sin^m\left(\sqrt{z}\,a+p\,z+q\right)\sinh^u\left(w\,\sqrt{z}+s\,z+t\right)\cosh^v\left(\sqrt{z}\,c+f\,z+g\right)dz=\frac{1}{d^2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}}$$

$$\left(i^u\,2^{-m-u-v-1}\,e^{e-\frac{b^2}{4\,d}}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}\left(2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\;e^{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}}\,d+b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right.$$

$$\left.(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)\right)+i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)$$

$$(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(\left(\left(e^{-\frac{(b+a\,i\,(2\,k-m))^2}{4\,(d+i\,(2\,k-m)\,p)}+e+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\left(2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}}\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\;(d+i\,(2\,k-m)\,p)+(b+a\,i\,(2\,k-m))\,(b+\right.\right.\right.\right.$$

$$a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\Big)\,\Gamma\left(\frac{1}{2},-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)\Bigg)\Bigg)\Bigg/$$

$$\left((d+i\,(2\,k-m)\,p)^2\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(b+a\,i\,(m-2\,k))^2}{4\,(d+i\,(m-2\,k)\,p)}+e+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\left(2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}}\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\right.\right.$$

$$(d+i\,(m-2\,k)\,p)+(b+a\,i\,(m-2\,k))\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)\right)\Bigg/$$

$$\left.\left((d+i\,(m-2\,k)\,p)^2\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\right)\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{(b+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\right.\right.$$

$$\left(2\,e^{\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u))}}\sqrt{-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{d+s\,(2\,k-u)}}\;(d+s\,(2\,k-u))+(b+(2\,k-u)\,w)\right.$$

$$\left.\left.\left.\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u))}\right)\right)\right)\Bigg/$$

$$\left((d+s\,(2\,k-u))^2\sqrt{-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{d+s\,(2\,k-u)}}\right)+\left(e^{-\frac{(b+(u-2\,k)\,w)^2}{4\,(d+s\,(u-2\,k))}+e+t\,(u-2\,k)-\frac{i\,\pi\,u}{2}}\right.$$

$$\left(2\, e^{\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}}\sqrt{-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{d+s(u-2k)}}\,(d+s(u-2k))+(b+(u-2k)w)\right.$$

$$\left.\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}\right)\right)\Big/$$

$$\left((d+s(u-2k))^2\sqrt{-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{d+s(u-2k)}}\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(b+c(2h-v))^2}{4(d+f(2h-v))}+e+g(2h-v)}\right.\right.$$

$$\left(2\, e^{\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{4(d+f(2h-v))}}\sqrt{-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{d+f(2h-v)}}\,(d+f(2h-v))+(b+c(2h-v))\right.$$

$$\left.\left.\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{4(d+f(2h-v))}\right)\right)\Big/$$

$$\left((d+f(2h-v))^2\sqrt{-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{d+f(2h-v)}}\right)+\left(e^{-\frac{(b+c(v-2h))^2}{4(d+f(v-2h))}+e-g(2h-v)}\right.$$

$$\left(2\, e^{\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{4(d+f(v-2h))}}\sqrt{-\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{d+f(v-2h)}}\,(d+f(v-2h))+(b+c(v-2h))\right.$$

$$\left.\left.\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{4(d+f(v-2h))}\right)\right)\Big/$$

$$\left.\left.\left((d+f(v-2h))^2\sqrt{-\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{d+f(v-2h)}}\right)+i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}\right.\right.$$

$$(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(b+a\,i\,(2k-m)+(2j-u)w)^2}{4(d+i\,(2k-m)p+s(2j-u))}+e+i\,(2k-m)q+t(2j-u)+\frac{1}{2}i\pi(m+u)}\right.\right.$$
$$\left((b+a\,i\,(2k-m)+(2j-u)w)\left(b+a\,i\,(2k-m)+(2j-u)w+2(d+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},-\left(b+a\,i\,(2k-m)+(2j-u)w+2(d+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4(d+i\,(2k-m)p+s(2j-u)))\right)+2e^{\frac{\left(b+a\,i\,(2k-m)+(2j-u)w+2(d+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(d+i\,(2k-m)p+s(2j-u))}}$$
$$(d+i\,(2k-m)p+s(2j-u))\sqrt{\left(-\left(b+a\,i\,(2k-m)+(2j-u)w+\right.\right.}$$
$$\left.\left.\left.2(d+i\,(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(d+i\,(2k-m)p+s(2j-u))\right)\right)\Big/$$
$$\left((d+i\,(2k-m)p+s(2j-u))^2\sqrt{\left(-\left(b+a\,i\,(2k-m)+(2j-u)w+2(d+i\,(2k-m)p+\right.\right.\right.\right.$$
$$\left.\left.\left.\left.s(2j-u))\sqrt{z}\right)^2\Big/(d+i\,(2k-m)p+s(2j-u))\right)\right)+$$
$$\left(e^{-\frac{(b+a\,i\,(m-2k)+(2j-u)w)^2}{4(d+i\,(m-2k)p+s(2j-u))}+e+i\,(m-2k)q+t(2j-u)+\frac{1}{2}i\pi(u-m)}\left((b+a\,i\,(m-2k)+(2j-u)w)\right.\right.$$
$$\left(b+a\,i\,(m-2k)+(2j-u)w+2(d+i\,(m-2k)p+s(2j-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$
$$\left.-\left(b+a\,i\,(m-2k)+(2j-u)w+2(d+i\,(m-2k)p+s(2j-u))\sqrt{z}\right)^2\Big/(4(d+i\,(m-2k)p+\right.$$
$$\left.s(2j-u)))\right)+2e^{\frac{\left(b+a\,i\,(m-2k)+(2j-u)w+2(d+i\,(m-2k)p+s(2j-u))\sqrt{z}\right)^2}{4(d+i\,(m-2k)p+s(2j-u))}}(d+i\,(m-2k)p+s(2j-u))$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2k)+(2j-u)w+2(d+i\,(m-2k)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.(d+i\,(m-2k)p+s(2j-u))\right)\right)\Big/\left((d+i\,(m-2k)p+s(2j-u))^2\right.$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2k)+(2j-u)w+2(d+i\,(m-2k)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.}$$
$$\left.(d+i\,(m-2k)p+s(2j-u))\right)+\left(e^{-\frac{(b+a\,i\,(2k-m)+(u-2j)w)^2}{4(d+i\,(2k-m)p+s(u-2j))}+e+i\,(2k-m)q+\frac{1}{2}i\pi(m-u)+t(u-2j)}\right.$$
$$\left((b+a\,i\,(2k-m)+(u-2j)w)\left(b+a\,i\,(2k-m)+(u-2j)w+2(d+i\,(2k-m)p+s(u-2j))\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},-\left(b+a\,i\,(2k-m)+(u-2j)w+2(d+i\,(2k-m)p+s(u-2j))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4(d+i\,(2k-m)p+s(u-2j)))\right)+2e^{\frac{\left(b+a\,i\,(2k-m)+(u-2j)w+2(d+i\,(2k-m)p+s(u-2j))\sqrt{z}\right)^2}{4(d+i\,(2k-m)p+s(u-2j))}}$$
$$(d+i\,(2k-m)p+s(u-2j))\sqrt{\left(-\left(b+a\,i\,(2k-m)+(u-2j)w+\right.\right.}$$

$$2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)\Big/$$

$$\Big((d+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+$$

$$s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$\Big(e^{-\frac{(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{1}{2}\,i\,\pi\,(m+u)}\Big(\big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w\big)$$

$$\big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2},\,-\big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))}}$$

$$(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\Big(-\big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+$$

$$2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big/$$

$$\Big((d+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\,\sqrt{\Big(-\big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+$$

$$s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Big(\Big(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}$$

$$\Big((b+a\,i\,(2\,k-m)+c\,(2\,h-v))\,\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2},\,-\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v)))\Big)+2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))}}$$

$$(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+$$

$$2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)\Big)\Big/$$

$$\Big((d+i\,(2\,k-m)\,p+f\,(2\,h-v))^2\,\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+$$

$$f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)\Big)+$$

$$\Big(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}\Big(\big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)\big)\,\big(b+a\,i\,(m-2\,k)+$$

$$c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2},\,-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+$$
$$2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v)))\Big)+2$$
$$e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))}}\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))$$
$$\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$
$$(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\Big)\Big)\Big/\Big((d+i\,(m-2\,k)\,p+f\,(2\,h-v))^2$$
$$\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$
$$(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\Big)\Big)+\Bigg(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}$$
$$\Big((b+a\,i\,(2\,k-m)+c\,(v-2\,h))\,\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2},\,-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h)))\Big)+2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))}}$$
$$(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+$$
$$2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\Big)\Big)\Big/$$
$$\Big((d+i\,(2\,k-m)\,p+f\,(v-2\,h))^2\,\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+$$
$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\Big)\Big)+$$
$$\Bigg(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\Bigg(\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)\Big)\,\Big(b+a\,i\,(m-2\,k)+$$
$$c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2},\,-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$
$$(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h)))\Big)+2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))}}$$
$$(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+$$
$$2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\Big)\Big)\Big/$$
$$\Big((d+i\,(m-2\,k)\,p+f\,(v-2\,h))^2\,\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+$$

$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\Big)\Big)+$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(\Bigg(e^{-\frac{(b+c\,(2\,h-v)+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u)+f\,(2\,h-v))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$\Bigg((b+c\,(2\,h-v)+(2\,k-u)\,w)\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2},-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(d+s\,(2\,k-u)+f\,(2\,h-v)))\Big)+2\,e^{\frac{\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u)+f\,(2\,h-v))}}$$

$$(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{\Big(-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+\right.}$$

$$\left.2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\,(d+s\,(2\,k-u)+f\,(2\,h-v))\Big)\Big)\Big/$$

$$\Big((d+s\,(2\,k-u)+f\,(2\,h-v))^2\,\sqrt{\Big(-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/}$$

$$(d+s\,(2\,k-u)+f\,(2\,h-v))\Big)\Big)+\Bigg(e^{-\frac{(b+c\,(2\,h-v)+(u-2\,k)\,w)^2}{4\,(d+s\,(u-2\,k)+f\,(2\,h-v))}+e+t\,(u-2\,k)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}$$

$$\Bigg((b+c\,(2\,h-v)+(u-2\,k)\,w)\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2},-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(d+s\,(u-2\,k)+f\,(2\,h-v)))\Big)+2\,e^{\frac{\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+s\,(u-2\,k)+f\,(2\,h-v))}}$$

$$(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{\Big(-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+\right.}$$

$$\left.2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\,(d+s\,(u-2\,k)+f\,(2\,h-v))\Big)\Big)\Big/$$

$$\Big((d+s\,(u-2\,k)+f\,(2\,h-v))^2\,\sqrt{\Big(-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/}$$

$$(d+s\,(u-2\,k)+f\,(2\,h-v))\Big)\Big)+\Bigg(e^{-\frac{(b+c\,(v-2\,h)+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u)+f\,(v-2\,h))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}$$

$$\Bigg((b+c\,(v-2\,h)+(2\,k-u)\,w)\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2},-\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(d+s\,(2\,k-u)+f\,(v-2\,h)))\Big)+2\,e^{\frac{\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u)+f\,(v-2\,h))}}$$

$$(d+s(2k-u)+f(v-2h))\sqrt{\left(-\left(b+c(v-2h)+(2k-u)w+2(d+s(2k-u)+f(v-2h))\sqrt{z}\right)^2\Big/(d+s(2k-u)+f(v-2h))\right)}\Bigg)\Bigg/$$
$$\left((d+s(2k-u)+f(v-2h))^2\sqrt{\left(-\left(b+c(v-2h)+(2k-u)w+2(d+s(2k-u)+f(v-2h))\sqrt{z}\right)^2\Big/(d+s(2k-u)+f(v-2h))\right)}\right)+\Bigg(e^{-\frac{(b+c(v-2h)+(u-2k)w)^2}{4(d+s(u-2k)+f(v-2h))}+e+t(u-2k)+g(v-2h)-\frac{i\pi u}{2}}$$
$$\Bigg((b+c(v-2h)+(u-2k)w)\left(b+c(v-2h)+(u-2k)w+2(d+s(u-2k)+f(v-2h))\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b+c(v-2h)+(u-2k)w+2(d+s(u-2k)+f(v-2h))\sqrt{z}\right)^2\Big/(4(d+s(u-2k)+f(v-2h)))\right)+2e^{\frac{\left(b+c(v-2h)+(u-2k)w+2(d+s(u-2k)+f(v-2h))\sqrt{z}\right)^2}{4(d+s(u-2k)+f(v-2h))}}$$
$$(d+s(u-2k)+f(v-2h))\sqrt{\left(-\left(b+c(v-2h)+(u-2k)w+2(d+s(u-2k)+f(v-2h))\sqrt{z}\right)^2\Big/(d+s(u-2k)+f(v-2h))\right)}\Bigg)\Bigg/$$
$$\left((d+s(u-2k)+f(v-2h))^2\sqrt{\left(-\left(b+c(v-2h)+(u-2k)w+2(d+s(u-2k)+f(v-2h))\sqrt{z}\right)^2\Big/(d+s(u-2k)+f(v-2h))\right)}\right)\Bigg)+$$
$$i^u\,2^{-m-u-v-1}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(\Bigg(e^{-\frac{(b+a\,i(2k-m)+c(2h-v)+(2j-u)w)^2}{4(d+i(2k-m)p+s(2j-u)+f(2h-v))}+e+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+g(2h-v)+\frac{im\pi}{2}}$$
$$\Bigg((b+a\,i(2k-m)+c(2h-v)+(2j-u)w)\left(b+a\,i(2k-m)+c(2h-v)+(2j-u)w+2(d+i(2k-m)p+s(2j-u)+f(2h-v))\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b+a\,i(2k-m)+c(2h-v)+(2j-u)w+2(d+i(2k-m)p+s(2j-u)+f(2h-v))\sqrt{z}\right)^2\Big/(4(d+i(2k-m)p+s(2j-u)+f(2h-v)))\right)+$$
$$2e^{\frac{\left(b+a\,i(2k-m)+c(2h-v)+(2j-u)w+2(d+i(2k-m)p+s(2j-u)+f(2h-v))\sqrt{z}\right)^2}{4(d+i(2k-m)p+s(2j-u)+f(2h-v))}}(d+i(2k-m)p+s(2j-u)+f(2h-v))$$
$$\sqrt{\left(-\left(b+a\,i(2k-m)+c(2h-v)+(2j-u)w+2(d+i(2k-m)p+s(2j-u)+f(2h-v))\sqrt{z}\right)^2\Big/(d+i(2k-m)p+s(2j-u)+f(2h-v))\right)}\Bigg)\Bigg/$$
$$\left((d+i(2k-m)p+s(2j-u)+f(2h-v))^2\sqrt{\left(-\left(b+a\,i(2k-m)+c(2h-v)+(2j-u)w+\right.\right.\right.$$

$$2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+$$
$$f\,(2\,h-v))\Big)\Big)+\Bigg(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}$$
$$\Bigg((b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\,\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+$$
$$(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2},-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$
$$f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\Big)+$$
$$2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))}}\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))$$
$$\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$
$$f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\Big)}\Bigg)\Bigg)\Big/$$
$$\Big((d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))^2\,\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+$$
$$2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$
$$f\,(2\,h-v))\Big)}+\Bigg(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}$$
$$\Bigg((b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+$$
$$(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2},-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$
$$f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\Big)+$$
$$2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$
$$\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$
$$f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\Big)}\Bigg)\Bigg)\Big/$$
$$\Big((d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2\,\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+$$
$$2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$
$$f\,(2\,h-v))\Big)}+\Bigg(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}$$

$$\left((b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.$$
$$\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.}$$
$$\left.\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right)\Bigg)\Bigg/$$
$$\left((d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+\right.\right.\right.$$
$$\left.\left.\left.2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.\right.$$
$$\left.\left.\left.f\,(2\,h-v)\right)\right)\right)+\left(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\right.$$

$$\left((b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.$$
$$\left.(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2},-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$
$$\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.}$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\right)\Bigg)\Bigg/$$
$$\left((d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))^2\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+\right.\right.\right.$$
$$\left.\left.\left.2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.\right.$$
$$\left.\left.\left.f\,(v-2\,h)\right)\right)\right)+\left(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\right.$$

$$\left((b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.$$
$$\left.(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}, -\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.}$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\right)\right)\Big/$$
$$\left((d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))^2\,\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+\right.\right.\right.}$$
$$\left.\left.\left.2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.\right.$$
$$\left.\left.\left.f\,(v-2\,h)\right)\right)\right)+\left(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\right.$$
$$\left(\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w\right)\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.$$
$$\left.\left.(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}, -\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$
$$\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.}$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)\right)\Big/$$
$$\left((d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2\,\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.\right.}$$
$$\left.\left.\left.(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.\right.\right.$$
$$\left.\left.\left.\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)\right)+$$
$$\left(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\right.\left(\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.$$
$$\left.\left.(u-2\,j)\,w\right)\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+\right.\right.$$
$$\left.\left.2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$
$$-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.$$
$$\left.\left.\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)+2$$
$$e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$

$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.\right.$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)\Bigg|\Bigg/$$
$$\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)^2\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.}$$
$$\left.\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.\left.\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)\right|/;\ m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving cos, sinh and exp

Involving $e^{b\,z^r+e}\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int e^{b\,z^r+e}\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh^v(c\,z^r+g)\,dz==$$
$$\frac{1}{r}\left(2^{-v-2}\,z\binom{v}{\frac{v}{2}}\left(-e^{e+i\,q+t}\,\Gamma\left(\frac{1}{r},(-b-i\,a-w)\,z^r\right)((-b-i\,a-w)\,z^r)^{-1/r}-\right.\right.$$
$$e^{e-i\,q+t}\,((-b+i\,a-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+i\,a-w)\,z^r\right)+e^{e+i\,q-t}\,((-b-i\,a+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-i\,a+w)\,z^r\right)+$$
$$\left.\left.e^{e-i\,q-t}\,((-b+i\,a+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+i\,a+w)\,z^r\right)\right)(1-v\bmod 2)\right)+$$
$$\frac{1}{r}\,2^{-v-2}\,z\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(-e^{e+2\,g\,h+i\,q+t-g\,v}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,h-i\,a+c\,v-w)\,z^r\right)((-b-2\,c\,h-i\,a+c\,v-w)\,z^r)^{-1/r}-\right.$$
$$e^{e+2\,g\,h-i\,q+t-g\,v}\,((-b-2\,c\,h+i\,a+c\,v-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,h+i\,a+c\,v-w)\,z^r\right)-$$
$$e^{e-2\,g\,h+i\,q+t+g\,v}\,((-b+2\,c\,h-i\,a-c\,v-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,h-i\,a-c\,v-w)\,z^r\right)-$$
$$e^{e-2\,g\,h-i\,q+t+g\,v}\,((-b+2\,c\,h+i\,a-c\,v-w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,h+i\,a-c\,v-w)\,z^r\right)+$$
$$e^{e+2\,g\,h+i\,q-t-g\,v}\,((-b-2\,c\,h-i\,a+c\,v+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,h-i\,a+c\,v+w)\,z^r\right)+$$
$$e^{e+2\,g\,h-i\,q-t-g\,v}\,((-b-2\,c\,h+i\,a+c\,v+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,h+i\,a+c\,v+w)\,z^r\right)+$$
$$e^{e-2\,g\,h+i\,q-t+g\,v}\,((-b+2\,c\,h-i\,a-c\,v+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,h-i\,a-c\,v+w)\,z^r\right)+$$
$$\left.e^{e-2\,g\,h-i\,q-t+g\,v}\,((-b+2\,c\,h+i\,a-c\,v+w)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,c\,h+i\,a-c\,v+w)\,z^r\right)\right)/;\ v\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\cos(a\,z^r+p\,z+q)\sinh(w\,z^r+s\,z+t)\cosh^v(c\,z^r+f\,z+g)$

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$$\int e^{b z^2+d z+e} \cos\left(a z^2+p z+q\right) \sinh\left(w z^2+s z+t\right) \cosh^{\nu}\left(c z^2+f z+g\right) dz ==$$

$$2^{-\nu-3}\left(\left(e^{-\frac{(d-i p-s)^2}{4 (b-i a-w)}+e-i q-t} (d-i p-s+2 (b-i a-w) z) \Gamma\left(\frac{1}{2}, -\frac{(d-i p-s+2 (b-i a-w) z)^2}{4 (b-i a-w)}\right)\right)\Big/ \left((b-i a-w) \sqrt{-\frac{(d-i p-s+2 (b-i a-w) z)^2}{b-i a-w}}\right)+ \frac{e^{-\frac{(d+i p-s)^2}{4 (b+i a-w)}+e+i q-t} (d+i p-s+2 (b+i a-w) z) \Gamma\left(\frac{1}{2}, -\frac{(d+i p-s+2 (b+i a-w) z)^2}{4 (b+i a-w)}\right)}{(b+i a-w) \sqrt{-\frac{(d+i p-s+2 (b+i a-w) z)^2}{b+i a-w}}}- \left(e^{-\frac{(d-i p+s)^2}{4 (b-i a+w)}+e-i q+t} (d-i p+s+2 (b-i a+w) z) \Gamma\left(\frac{1}{2}, -\frac{(d-i p+s+2 (b-i a+w) z)^2}{4 (b-i a+w)}\right)\right)\Big/ \left((b-i a+w) \sqrt{-\frac{(d-i p+s+2 (b-i a+w) z)^2}{b-i a+w}}\right)- \frac{e^{-\frac{(d+i p+s)^2}{4 (b+i a+w)}+e+i q+t} (d+i p+s+2 (b+i a+w) z) \Gamma\left(\frac{1}{2}, -\frac{(d+i p+s+2 (b+i a+w) z)^2}{4 (b+i a+w)}\right)}{(b+i a+w) \sqrt{-\frac{(d+i p+s+2 (b+i a+w) z)^2}{b+i a+w}}}\right)\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)+$$

$$2^{-\nu-3} \sum_{k=0}^{\left\lfloor \frac{\nu-1}{2} \right\rfloor} \binom{\nu}{k}\left(\left(e^{-\frac{(d-i p-s+f (2 k-\nu))^2}{4 (b-i a+c (2 k-\nu)-w)}+e-i q-t+g (2 k-\nu)} (d-i p-s+f (2 k-\nu)+2 (b-i a+c (2 k-\nu)-w) z) \Gamma\left(\frac{1}{2}, -\frac{(d-i p-s+f (2 k-\nu)+2 (b-i a+c (2 k-\nu)-w) z)^2}{4 (b-i a+c (2 k-\nu)-w)}\right)\right)\Big/ \left((b-i a+c (2 k-\nu)-w) \sqrt{-\frac{(d-i p-s+f (2 k-\nu)+2 (b-i a+c (2 k-\nu)-w) z)^2}{b-i a+c (2 k-\nu)-w}}\right)+ \left(e^{-\frac{(d+i p-s+f (2 k-\nu))^2}{4 (b+i a+c (2 k-\nu)-w)}+e+i q-t+g (2 k-\nu)} (d+i p-s+f (2 k-\nu)+2 (b+i a+c (2 k-\nu)-w) z) \Gamma\left(\frac{1}{2}, -\frac{(d+i p-s+f (2 k-\nu)+2 (b+i a+c (2 k-\nu)-w) z)^2}{4 (b+i a+c (2 k-\nu)-w)}\right)\right)\Big/ \left((b+i a+c (2 k-\nu)-w) \sqrt{-\frac{(d+i p-s+f (2 k-\nu)+2 (b+i a+c (2 k-\nu)-w) z)^2}{b+i a+c (2 k-\nu)-w}}\right)\right)$$

$$\left((b+i\,a\,+c\,(2\,k-v)-w)\sqrt{-\frac{(d+i\,p-s+f\,(2\,k-v)+2\,(b+i\,a\,+c\,(2\,k-v)-w)\,z)^2}{b+i\,a\,+c\,(2\,k-v)-w}}\right)+$$

$$\left(e^{-\frac{(d-i\,p-s+f\,(v-2\,k))^2}{4\,(b-i\,a\,+c\,(v-2\,k)-w)}+e-i\,q-t+g\,(v-2\,k)}\,(d-i\,p-s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-i\,p-s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)-w)\,z)^2}{4\,(b-i\,a\,+c\,(v-2\,k)-w)}\right)\right)\Big/$$

$$\left((b-i\,a\,+c\,(v-2\,k)-w)\sqrt{-\frac{(d-i\,p-s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)-w)\,z)^2}{b-i\,a\,+c\,(v-2\,k)-w}}\right)+$$

$$\left(e^{-\frac{(d+i\,p-s+f\,(v-2\,k))^2}{4\,(b+i\,a\,+c\,(v-2\,k)-w)}+e+i\,q-t+g\,(v-2\,k)}\,(d+i\,p-s+f\,(v-2\,k)+2\,(b+i\,a\,+c\,(v-2\,k)-w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+i\,p-s+f\,(v-2\,k)+2\,(b+i\,a\,+c\,(v-2\,k)-w)\,z)^2}{4\,(b+i\,a\,+c\,(v-2\,k)-w)}\right)\right)\Big/$$

$$\left((b+i\,a\,+c\,(v-2\,k)-w)\sqrt{-\frac{(d+i\,p-s+f\,(v-2\,k)+2\,(b+i\,a\,+c\,(v-2\,k)-w)\,z)^2}{b+i\,a\,+c\,(v-2\,k)-w}}\right)-$$

$$\left(e^{-\frac{(d-i\,p+s+f\,(2\,k-v))^2}{4\,(b-i\,a\,+c\,(2\,k-v)+w)}+e-i\,q+t+g\,(2\,k-v)}\,(d-i\,p+s+f\,(2\,k-v)+2\,(b-i\,a\,+c\,(2\,k-v)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-i\,p+s+f\,(2\,k-v)+2\,(b-i\,a\,+c\,(2\,k-v)+w)\,z)^2}{4\,(b-i\,a\,+c\,(2\,k-v)+w)}\right)\right)\Big/$$

$$\left((b-i\,a\,+c\,(2\,k-v)+w)\sqrt{-\frac{(d-i\,p+s+f\,(2\,k-v)+2\,(b-i\,a\,+c\,(2\,k-v)+w)\,z)^2}{b-i\,a\,+c\,(2\,k-v)+w}}\right)-$$

$$\left(e^{-\frac{(d+i\,p+s+f\,(2\,k-v))^2}{4\,(b+i\,a\,+c\,(2\,k-v)+w)}+e+i\,q+t+g\,(2\,k-v)}\,(d+i\,p+s+f\,(2\,k-v)+2\,(b+i\,a\,+c\,(2\,k-v)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+i\,p+s+f\,(2\,k-v)+2\,(b+i\,a\,+c\,(2\,k-v)+w)\,z)^2}{4\,(b+i\,a\,+c\,(2\,k-v)+w)}\right)\right)\Big/$$

$$\left((b+i\,a\,+c\,(2\,k-v)+w)\sqrt{-\frac{(d+i\,p+s+f\,(2\,k-v)+2\,(b+i\,a\,+c\,(2\,k-v)+w)\,z)^2}{b+i\,a\,+c\,(2\,k-v)+w}}\right)-$$

$$\left(e^{-\frac{(d-i\,p+s+f\,(v-2\,k))^2}{4\,(b-i\,a\,+c\,(v-2\,k)+w)}+e-i\,q+t+g\,(v-2\,k)}\,(d-i\,p+s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d-i\,p+s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)+w)\,z)^2}{4\,(b-i\,a\,+c\,(v-2\,k)+w)}\right)\right)\Big/$$

$$\left((b-i\,a\,+c\,(v-2\,k)+w)\sqrt{-\frac{(d-i\,p+s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)+w)\,z)^2}{b-i\,a\,+c\,(v-2\,k)+w}}\right)-$$

$$\left(e^{-\frac{(d+i\,p+s+f\,(v-2\,k))^2}{4\,(b+i\,a\,+c\,(v-2\,k)+w)}+e+i\,q+t+g\,(v-2\,k)}\,(d+i\,p+s+f\,(v-2\,k)+2\,(b+i\,a\,+c\,(v-2\,k)+w)\,z)\right.$$

$$\left.\Gamma\left(\frac{1}{2},-\frac{(d+i\,p+s+f\,(v-2\,k)+2\,(b+i\,a\,+c\,(v-2\,k)+w)\,z)^2}{4\,(b+i\,a\,+c\,(v-2\,k)+w)}\right)\right)\Big/$$

$$\left((b+i\,a\,+c\,(v-2\,k)+w)\sqrt{-\frac{(d+i\,p+s+f\,(v-2\,k)+2\,(b+i\,a\,+c\,(v-2\,k)+w)\,z)^2}{b+i\,a\,+c\,(v-2\,k)+w}}\right)\Big);\,v\in\mathbb{N}^+$$

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$$\int e^{\sqrt{z}\,b+e+d\,z}\cos\left(\sqrt{z}\,a+q+p\,z\right)\sinh\left(t+s\,z+w\,\sqrt{z}\right)\cosh^{v}\left(\sqrt{z}\,c+g+f\,z\right)dz=$$

$$-2^{-v-3}\left(\left(e^{-\frac{(b+i\,a-w)^2}{4\,(d+i\,p-s)}+e+i\,q-t}\left(2\,e^{\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+i\,p-s)}}\sqrt{-\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\,\sqrt{z}\right)^2}{d+i\,p-s}}\,(d+i\,p-s)+\right.\right.\right.$$

$$\left.\left.\left.(b+i\,a-w)\left(b+i\,a-w+2\,(d+i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\,\sqrt{z}\right)^2}{4\,(d+i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d+i\,p-s)^2\sqrt{-\frac{\left(b+i\,a-w+2\,(d+i\,p-s)\,\sqrt{z}\right)^2}{d+i\,p-s}}\right)+$$

$$\left(e^{-\frac{(b-i\,a-w)^2}{4\,(d-i\,p-s)}+e-i\,q-t}\left(2\,e^{\frac{\left(b-i\,a-w+2\,(d-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-i\,p-s)}}\sqrt{-\frac{\left(b-i\,a-w+2\,(d-i\,p-s)\,\sqrt{z}\right)^2}{d-i\,p-s}}\,(d-i\,p-s)+\right.\right.$$

$$\left.\left.(b-i\,a-w)\left(b-i\,a-w+2\,(d-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-i\,a-w+2\,(d-i\,p-s)\,\sqrt{z}\right)^2}{4\,(d-i\,p-s)}\right)\right)\right)\Big/$$

$$\left((d-i\,p-s)^2\sqrt{-\frac{\left(b-i\,a-w+2\,(d-i\,p-s)\,\sqrt{z}\right)^2}{d-i\,p-s}}\right)-$$

$$\left(e^{-\frac{(b+i a+w)^2}{4(d+i p+s)}+e+i q+t}\left(2 e^{\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{4(d+i p+s)}}\sqrt{-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{d+i p+s}}\,(d+i p+s)+\right.\right.$$

$$\left.\left.(b+i a+w)\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{4(d+i p+s)}\right)\right)\Big/$$

$$\left((d+i p+s)^2\sqrt{-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{d+i p+s}}\right)-$$

$$\left(e^{-\frac{(b-i a+w)^2}{4(d-i p+s)}+e-i q+t}\left(2 e^{\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{4(d-i p+s)}}\sqrt{-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{d-i p+s}}\,(d-i p+s)+\right.\right.$$

$$\left.\left.(b-i a+w)\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{4(d-i p+s)}\right)\right)\Big/$$

$$\left.\left((d-i p+s)^2\sqrt{-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{d-i p+s}}\right)\right)\binom{v}{\frac{v}{2}}(1-v \bmod 2)-$$

$$2^{-v-3}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(b+i a+c(2h-v)-w)^2}{4(d+i p-s+f(2h-v))}+e+i q-t+g(2h-v)}\left((b+i a+c(2h-v)-w)\right.\right.\right.$$

$$\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.$$

$$\left.-\frac{\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)^2}{4(d+i p-s+f(2h-v))}\right)+2 e^{\frac{\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)^2}{4(d+i p-s+f(2h-v))}}$$

$$\left.\left.\left.(d+i p-s+f(2h-v))\sqrt{-\frac{\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)^2}{d+i p-s+f(2h-v)}}\right)\right)\Big/\right.$$

$$\left((d+i\,p-s+f\,(2\,h-v))^2\sqrt{-\frac{\left(b+i\,a\,+c\,(2\,h-v)-w+2\,(d+i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p-s+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(b-i\,a+c\,(2\,h-v)-w)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}+e-i\,q-t+g\,(2\,h-v)}\right.$$

$$\left((b-i\,a\,+c\,(2\,h-v)-w)\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}\right)+2\,e^{\frac{\left(b-i\,a+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}}$$

$$\left.\left.(d-i\,p-s+f\,(2\,h-v))\sqrt{-\frac{\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(2\,h-v)}}\right)\right)\Big/$$

$$\left((d-i\,p-s+f\,(2\,h-v))^2\sqrt{-\frac{\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(2\,h-v)}}\right)-$$

$$\left(e^{-\frac{(b+i\,a+c\,(2\,h-v)+w)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}+e+i\,q+t+g\,(2\,h-v)}\right.$$

$$\left((b+i\,a\,+c\,(2\,h-v)+w)\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}\right)+2\,e^{\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}}$$

$$\left.\left.(d+i\,p+s+f\,(2\,h-v))\sqrt{-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}}\right)\right)\Big/$$

$$\left((d+i\,p+s+f\,(2\,h-v))^2\sqrt{-\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}}\right)-$$

$$\left(e^{-\frac{(b-i\,a+c\,(2\,h-v)+w)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}+e-i\,q+t+g\,(2\,h-v)}\right.$$

$$\left((b-i\,a+c\,(2\,h-v)+w)\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}\right)+2\,e^{\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}}$$

$$\left.\left.(d-i\,p+s+f\,(2\,h-v))\sqrt{-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(2\,h-v)}}\right)\right)\Big/$$

$$\left((d-i\,p+s+f\,(2\,h-v))^2\sqrt{-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(2\,h-v)}}\right)+$$

$$\left(e^{-\frac{(b+i\,a+c\,(v-2\,h)-w)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}+e+i\,q-t+g\,(v-2\,h)}\right.$$

$$\left((b+i\,a+c\,(v-2\,h)-w)\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}}$$

$$\left.\left.(d+i\,p-s+f\,(v-2\,h))\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p-s+f\,(v-2\,h)}}\right)\right)\Big/$$

$$\left((d+i\,p-s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p-s+f\,(v-2\,h)}}\right)+$$

$$\left(e^{-\frac{(b-i\,a+c\,(v-2\,h)-w)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}+e-i\,q-t+g\,(v-2\,h)}\right.$$

$$\left((b-i\,a+c\,(v-2\,h)-w)\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}}$$

$$\left.\left.(d-i\,p-s+f\,(v-2\,h))\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(v-2\,h)}}\right)\right)\Big/$$

$$\left((d-i\,p-s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(v-2\,h)}}\right)-$$

$$\left(e^{-\frac{(b+i\,a+c\,(v-2\,h)+w)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}+e+i\,q+t+g\,(v-2\,h)}\right.$$

$$\left((b+i\,a+c\,(v-2\,h)+w)\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}}$$

$$\left.\left.(d+i\,p+s+f\,(v-2\,h))\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}}\right)\right)\Big/$$

$$\left((d+i\,p+s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}}\right)-$$

$$\left(e^{-\frac{(b-i\,a+c\,(v-2\,h)+w)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}+e-i\,q+t+g\,(v-2\,h)}\right.$$

$$\left((b-i\,a+c\,(v-2\,h)+w)\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\right.\right.$$

$$\left.\left.-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}\right)+2\,e^{\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}}$$

$$\left.(d-i\,p+s+f\,(v-2\,h))\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(v-2\,h)}}\right)\Big/$$

$$\left.\left((d-i\,p+s+f\,(v-2\,h))^2\sqrt{-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(v-2\,h)}}\right)\right)/;\,v\in\mathbb{N}^+$$

Involving powers of cos, powers of sinh and exp

Involving $e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)\,dz==$$

$$-\frac{i^u\,2^{-m-u-v}\,e^e\,z\,(-b\,z^r)^{-1/r}\,(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{r},-b\,z^r\right)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}$$

$$(1-u\bmod 2)\,(1-v\bmod 2)\sum_{h=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{h}\left(e^{e+2\,i\,h\,q-i\,m\,q}\,\Gamma\left(\frac{1}{r},(-b-2\,i\,a\,h+i\,a\,m)\,z^r\right)((-b-2\,i\,a\,h+i\,a\,m)\,z^r)^{-1/r}+\right.$$

$$\left.e^{e-2\,i\,h\,q+i\,m\,q}\,((-b+2\,i\,a\,h-i\,a\,m)\,z^r)^{-1/r}\,\Gamma\left(\frac{1}{r},(-b+2\,i\,a\,h-i\,a\,m)\,z^r\right)\right)-\frac{i^u\,2^{-m-u-v}\,z}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}$$

$$(1-m\bmod 2)\,(1-u\bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{e+2\,g\,h-g\,v}\,\Gamma\left(\frac{1}{r},(-b-2\,c\,h+c\,v)\,z^r\right)((-b-2\,c\,h+c\,v)\,z^r)^{-1/r}+\right.$$

$$e^{e-2gh+gv}((-b+2ch-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch-cv)z^r\right)\Big)-\frac{i^u 2^{-m-u-v}z}{r}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)$$

$$(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Big(e^{e+2kt-tu+\frac{i\pi u}{2}}\Gamma\left(\frac{1}{r},(-b-2kw+uw)z^r\right)((-b-2kw+uw)z^r)^{-1/r}+$$

$$e^{e-2kt+tu-\frac{i\pi u}{2}}((-b+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2kw-uw)z^r\right)\Big)-\frac{i^u 2^{-m-u-v}z}{r}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}$$

$$\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\Big(e^{e+2gh+2ijq-imq-gv}\Gamma\left(\frac{1}{r},(-b-2ch-2iaj+iam+cv)z^r\right)((-b-2ch-2iaj+iam+cv)z^r)^{-1/r}+$$

$$e^{e+2gh-2ijq+imq-gv}((-b-2ch+2iaj-iam+cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b-2ch+2iaj-iam+cv)z^r\right)+$$

$$e^{e-2gh+2ijq-imq+gv}((-b+2ch-2iaj+iam-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch-2iaj+iam-cv)z^r\right)+$$

$$e^{e-2gh-2ijq+imq+gv}((-b+2ch+2iaj-iam-cv)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch+2iaj-iam-cv)z^r\right)\Big)-$$

$$\frac{i^u 2^{-m-u-v}z}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\Big(e^{e+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}\Gamma\Big(\frac{1}{r},$$

$$(-b-2iaj+iam-2kw+uw)z^r\Big)((-b-2iaj+iam-2kw+uw)z^r)^{-1/r}+e^{e-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}$$

$$((-b+2iaj-iam-2kw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2iaj-iam-2kw+uw)z^r\right)+$$

$$e^{e+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}((-b-2iaj+iam+2kw-uw)z^r)^{-1/r}\Gamma\Big(\frac{1}{r},$$

$$(-b-2iaj+iam+2kw-uw)z^r\Big)+e^{e-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}((-b+2iaj-iam+2kw-uw)z^r)^{-1/r}$$

$$\Gamma\left(\frac{1}{r},(-b+2iaj-iam+2kw-uw)z^r\right)\Big)-\frac{i^u 2^{-m-u-v}z}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Big(e^{e+2gh+2kt-tu+\frac{i\pi u}{2}-gv}\Gamma\left(\frac{1}{r},(-b-2ch+cv-2kw+uw)z^r\right)((-b-2ch+cv-2kw+uw)z^r)^{-1/r}+$$

$$e^{e-2gh+2kt-tu+\frac{i\pi u}{2}+gv}((-b+2ch-cv-2kw+uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch-cv-2kw+uw)z^r\right)+$$

$$e^{e+2gh-2kt+tu-gv-\frac{i\pi u}{2}}((-b-2ch+cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b-2ch+cv+2kw-uw)z^r\right)+$$

$$e^{e-2gh-2kt+tu+gv-\frac{i\pi u}{2}}((-b+2ch-cv+2kw-uw)z^r)^{-1/r}\Gamma\left(\frac{1}{r},(-b+2ch-cv+2kw-uw)z^r\right)\Big)-$$

$$\frac{i^u 2^{-m-u-v}z}{r}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Big(e^{e+2gh+2ijq-imq+2kt-tu+\frac{i\pi u}{2}-gv}\Gamma\Big(\frac{1}{r},(-b-2ch-2iaj+$$

$$i\,a\,m+c\,v-2\,k\,w+u\,w)\,z^r\Big)\left((-b-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v-2\,k\,w+u\,w)\,z^r\right)^{-1/r}+$$
$$e^{e+2\,g\,h-2\,i\,j\,q+i\,m\,q+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}-g\,v}\left((-b-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v-2\,k\,w+u\,w)\,z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},\,(-b-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v-2\,k\,w+u\,w)\,z^r\right)+e^{e-2\,g\,h+2\,i\,j\,q-i\,m\,q+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}+g\,v}$$
$$\left((-b+2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v-2\,k\,w+u\,w)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},\,(-b+2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v-2\,k\,w+\right.$$
$$\left.u\,w)\,z^r\right)+e^{e-2\,g\,h-2\,i\,j\,q+i\,m\,q+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}+g\,v}\left((-b+2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v-2\,k\,w+u\,w)\,z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},\,(-b+2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v-2\,k\,w+u\,w)\,z^r\right)+e^{e+2\,g\,h+2\,i\,j\,q-i\,m\,q-2\,k\,t+t\,u-g\,v-\frac{i\,\pi\,u}{2}}$$
$$\left((-b-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v+2\,k\,w-u\,w)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},\,(-b-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v+2\,k\,w-\right.$$
$$\left.u\,w)\,z^r\right)+e^{e+2\,g\,h-2\,i\,j\,q+i\,m\,q-2\,k\,t+t\,u-g\,v-\frac{i\,\pi\,u}{2}}\left((-b-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v+2\,k\,w-u\,w)\,z^r\right)^{-1/r}$$
$$\Gamma\left(\frac{1}{r},\,(-b-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v+2\,k\,w-u\,w)\,z^r\right)+e^{e-2\,g\,h+2\,i\,j\,q-i\,m\,q-2\,k\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}}$$
$$\left((-b+2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r\right)^{-1/r}\Gamma\left(\frac{1}{r},\,(-b+2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v+2\,k\,w-\right.$$
$$\left.u\,w)\,z^r\right)+e^{e-2\,g\,h-2\,i\,j\,q+i\,m\,q-2\,k\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}}\left((-b+2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r\right)^{-1/r}$$
$$\left.\Gamma\left(\frac{1}{r},\,(-b+2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r\right)\right)/;\,m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $e^{b\,z^r+d\,z+e}\cos^m\left(a\,z^r+p\,z+q\right)\sinh^u\left(w\,z^r+s\,z+t\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int e^{b\,z^2+d\,z+e}\cos^m\left(a\,z^2+p\,z+q\right)\sinh^u\left(w\,z^2+s\,z+t\right)\cosh^v\left(c\,z^2+f\,z+g\right)d\!\left[z\right]==$$
$$-\frac{i^u\,2^{-m-u-v-1}\,(d+2\,b\,z)\,(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)}{b\,\sqrt{-\frac{(d+2\,b\,z)^2}{b}}}\,e^{e-\frac{d^2}{4\,b}}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}\Gamma\left(\frac{1}{2},\,-\frac{(d+2\,b\,z)^2}{4\,b}\right)-$$
$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(\left(e^{-\frac{(d+i\,(2\,j-m)\,p)^2}{4\,(b+a\,i\,(2\,j-m))}+e+i\,(2\,j-m)\,q}\right.\right.$$
$$\left.\left.(d+i\,(2\,j-m)\,p+2\,(b+a\,i\,(2\,j-m))\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(d+i\,(2\,j-m)\,p+2\,(b+a\,i\,(2\,j-m))\,z)^2}{4\,(b+a\,i\,(2\,j-m))}\right)\right)\Big/$$
$$\left((b+a\,i\,(2\,j-m))\sqrt{-\frac{(d+i\,(2\,j-m)\,p+2\,(b+a\,i\,(2\,j-m))\,z)^2}{b+a\,i\,(2\,j-m)}}\right)+\left(e^{-\frac{(d+i\,(m-2\,j)\,p)^2}{4\,(b+a\,i\,(m-2\,j))}+e+i\,(m-2\,j)\,q}\right.$$
$$\left.\left.(d+i\,(m-2\,j)\,p+2\,(b+a\,i\,(m-2\,j))\,z)\,\Gamma\left(\frac{1}{2},\,-\frac{(d+i\,(m-2\,j)\,p+2\,(b+a\,i\,(m-2\,j))\,z)^2}{4\,(b+a\,i\,(m-2\,j))}\right)\right)\Big/$$

$$\left((b+a\,i\,(m-2\,j))\sqrt{-\frac{(d+i\,(m-2\,j)\,p+2\,(b+a\,i\,(m-2\,j))\,z)^2}{b+a\,i\,(m-2\,j)}}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)\,(1-u \bmod 2)\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}$$

$$\left(\left(e^{-\frac{(d+f\,(2\,j-v))^2}{4\,(b+c\,(2\,j-v))}+e+g\,(2\,j-v)}\,(d+f\,(2\,j-v)+2\,(b+c\,(2\,j-v))\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f\,(2\,j-v)+2\,(b+c\,(2\,j-v))\,z)^2}{4\,(b+c\,(2\,j-v))}\right)\right)\Big/$$

$$\left((b+c\,(2\,j-v))\sqrt{-\frac{(d+f\,(2\,j-v)+2\,(b+c\,(2\,j-v))\,z)^2}{b+c\,(2\,j-v)}}\right)+$$

$$\left(\left(e^{-\frac{(d+f\,(v-2\,j))^2}{4\,(b+c\,(v-2\,j))}+e+g\,(v-2\,j)}\,(d+f\,(v-2\,j)+2\,(b+c\,(v-2\,j))\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+f\,(v-2\,j)+2\,(b+c\,(v-2\,j))\,z)^2}{4\,(b+c\,(v-2\,j))}\right)\right)\Big/$$

$$\left((b+c\,(v-2\,j))\sqrt{-\frac{(d+f\,(v-2\,j)+2\,(b+c\,(v-2\,j))\,z)^2}{b+c\,(v-2\,j)}}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}$$

$$\left(\left(e^{-\frac{(d+s\,(2\,i-u))^2}{4\,(b+(2\,i-u)\,w)}+e+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\,(d+s\,(2\,i-u)+2\,(b+(2\,i-u)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+s\,(2\,i-u)+2\,(b+(2\,i-u)\,w)\,z)^2}{4\,(b+(2\,i-u)\,w)}\right)\right)\Big/$$

$$\left((b+(2\,i-u)\,w)\sqrt{-\frac{(d+s\,(2\,i-u)+2\,(b+(2\,i-u)\,w)\,z)^2}{b+(2\,i-u)\,w}}\right)+$$

$$\left(\left(e^{-\frac{(d+s\,(u-2\,i))^2}{4\,(b+(u-2\,i)\,w)}+e+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,i)+2\,(b+(u-2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},-\frac{(d+s\,(u-2\,i)+2\,(b+(u-2\,i)\,w)\,z)^2}{4\,(b+(u-2\,i)\,w)}\right)\right)\Big/$$

$$\left((b+(u-2\,i)\,w)\sqrt{-\frac{(d+s\,(u-2\,i)+2\,(b+(u-2\,i)\,w)\,z)^2}{b+(u-2\,i)\,w}}\right)\Bigg)-i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\Bigg(\Bigg(e^{-\frac{(d+i\,(2\,k-m)\,p+f\,(2\,j-v))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(2\,j-v))}+e+i\,(2\,k-m)\,q+g\,(2\,j-v)}\,(d+i\,(2\,k-m)\,p+f\,(2\,j-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,j-v))$$

$$z)\,\Gamma\Bigg(\frac{1}{2},-(d+i\,(2\,k-m)\,p+f\,(2\,j-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,j-v))\,z)^2\Big/$$

$$(4\,(b+a\,i\,(2\,k-m)+c\,(2\,j-v)))\Bigg)\Bigg)\Big/\left((b+a\,i\,(2\,k-m)+c\,(2\,j-v))\sqrt{\left(-(d+i\,(2\,k-m)\,p+\right.\right.$$

$$f\,(2\,j-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,j-v))\,z)^2\Big/(b+a\,i\,(2\,k-m)+c\,(2\,j-v))\Big)\Big)+$$

$$\Bigg(e^{-\frac{(d+i\,(m-2\,k)\,p+f\,(2\,j-v))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(2\,j-v))}+e+i\,(m-2\,k)\,q+g\,(2\,j-v)}\,(d+i\,(m-2\,k)\,p+f\,(2\,j-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,j-v))\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+i\,(m-2\,k)\,p+f\,(2\,j-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,j-v))\,z)^2\Big/$$

$$(4\,(b+a\,i\,(m-2\,k)+c\,(2\,j-v)))\Big)\Big/\Big((b+a\,i\,(m-2\,k)+c\,(2\,j-v))\,\sqrt{\big(-(d+i\,(m-2\,k)\,p+$$

$$f\,(2\,j-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,j-v))\,z)^2\Big/(b+a\,i\,(m-2\,k)+c\,(2\,j-v))\big)}\Big)+$$

$$\Bigg(e^{-\frac{(d+i\,(2\,k-m)\,p+f\,(v-2\,j))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,j))}+e+i\,(2\,k-m)\,q+g\,(v-2\,j)}\,(d+i\,(2\,k-m)\,p+f\,(v-2\,j)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,j))\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+i\,(2\,k-m)\,p+f\,(v-2\,j)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,j))\,z)^2\Big/$$

$$(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,j)))\Big)\Big/\Big((b+a\,i\,(2\,k-m)+c\,(v-2\,j))\,\sqrt{\big(-(d+i\,(2\,k-m)\,p+$$

$$f\,(v-2\,j)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,j))\,z)^2\Big/(b+a\,i\,(2\,k-m)+c\,(v-2\,j))\big)}\Big)+$$

$$\Bigg(e^{-\frac{(d+i\,(m-2\,k)\,p+f\,(v-2\,j))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))}+e+i\,(m-2\,k)\,q+g\,(v-2\,j)}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,j)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+i\,(m-2\,k)\,p+f\,(v-2\,j)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^2\Big/$$

$$(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j)))\Big)\Big/\Big((b+a\,i\,(m-2\,k)+c\,(v-2\,j))\,\sqrt{\big(-(d+i\,(m-2\,k)\,p+$$

$$f\,(v-2\,j)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^2\Big/(b+a\,i\,(m-2\,k)+c\,(v-2\,j))\big)}\Big)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\Bigg(\Bigg(e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(2\,i-u))^2}{4\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)}+e+i\,(2\,j-m)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}$$

$$(d+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/$$

$$(4\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w))\Big)\Big/\Big((b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,\sqrt{\big(-(d+i\,(2\,j-m)\,p+$$

$$s\,(2\,i-u)+2\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\big)}\Big)+$$

$$\Bigg(e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+e+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\,(d+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)$$

$$\Gamma\Big(\frac{1}{2},\,-(d+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/$$

$$(4\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w))\Big)\Big/\Big((b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,\sqrt{\big(-(d+i\,(m-2\,j)\,p+$$

$$s\,(2\,i-u)+2\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\big)}\Big)+$$

$$\Bigg(e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+e+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)$$

$$\Gamma\left(\frac{1}{2}, -(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w))\right)\Big/\left((b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,\sqrt{\left(-(d+i\,(2\,j-m)\,p+\right.\right.}$$
$$\left.\left.s\,(u-2\,i)+2\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\right)\right)+$$
$$\left(e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+e+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)\right.$$
$$\Gamma\left(\frac{1}{2}, -(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/\right.$$
$$\left.(4\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w))\right)\Big/\left((b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,\sqrt{\left(-(d+i\,(m-2\,j)\,p+\right.\right.}$$
$$\left.\left.s\,(u-2\,i)+2\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\right)\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(\left(e^{-\frac{(d+s\,(2\,i-u)+f\,(2\,j-v))^2}{4\,(b+c\,(2\,j-v)+(2\,i-u)\,w)}+e+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}+g\,(2\,j-v)}\right.\right.$$
$$(d+s\,(2\,i-u)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(2\,i-u)\,w)\,z)$$
$$\left.\Gamma\left(\frac{1}{2}, -\frac{(d+s\,(2\,i-u)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(2\,i-u)\,w)\,z)^2}{4\,(b+c\,(2\,j-v)+(2\,i-u)\,w)}\right)\right)\Big/$$
$$\left((b+c\,(2\,j-v)+(2\,i-u)\,w)\,\sqrt{-\frac{(d+s\,(2\,i-u)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(2\,i-u)\,w)\,z)^2}{b+c\,(2\,j-v)+(2\,i-u)\,w}}\right)+$$
$$\left(e^{-\frac{(d+s\,(2\,i-u)+f\,(v-2\,j))^2}{4\,(b+c\,(v-2\,j)+(2\,i-u)\,w)}+e+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,j)}\,(d+s\,(2\,i-u)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(2\,i-u)\,w)\,z)\right.$$
$$\left.\Gamma\left(\frac{1}{2}, -\frac{(d+s\,(2\,i-u)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(2\,i-u)\,w)\,z)^2}{4\,(b+c\,(v-2\,j)+(2\,i-u)\,w)}\right)\right)\Big/$$
$$\left((b+c\,(v-2\,j)+(2\,i-u)\,w)\,\sqrt{-\frac{(d+s\,(2\,i-u)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(2\,i-u)\,w)\,z)^2}{b+c\,(v-2\,j)+(2\,i-u)\,w}}\right)+$$
$$\left(e^{-\frac{(d+s\,(u-2\,i)+f\,(2\,j-v))^2}{4\,(b+c\,(2\,j-v)+(u-2\,i)\,w)}+e+t\,(u-2\,i)+g\,(2\,j-v)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,i)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(u-2\,i)\,w)\,z)\right.$$
$$\left.\Gamma\left(\frac{1}{2}, -\frac{(d+s\,(u-2\,i)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(u-2\,i)\,w)\,z)^2}{4\,(b+c\,(2\,j-v)+(u-2\,i)\,w)}\right)\right)\Big/$$
$$\left((b+c\,(2\,j-v)+(u-2\,i)\,w)\,\sqrt{-\frac{(d+s\,(u-2\,i)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(u-2\,i)\,w)\,z)^2}{b+c\,(2\,j-v)+(u-2\,i)\,w}}\right)+$$
$$\left(e^{-\frac{(d+s\,(u-2\,i)+f\,(v-2\,j))^2}{4\,(b+c\,(v-2\,j)+(u-2\,i)\,w)}+e+t\,(u-2\,i)+g\,(v-2\,j)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,i)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(u-2\,i)\,w)\,z)\right.$$

$$\Gamma\left(\frac{1}{2}, -\frac{(d+s(u-2i)+f(v-2j)+2(b+c(v-2j)+(u-2i)w)z)^2}{4(b+c(v-2j)+(u-2i)w)}\right)\Bigg/$$

$$\left((b+c(v-2j)+(u-2i)w)\sqrt{-\frac{(d+s(u-2i)+f(v-2j)+2(b+c(v-2j)+(u-2i)w)z)^2}{b+c(v-2j)+(u-2i)w}}\right)-$$

$$i^u\,2^{-m-u-v-1}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\Bigg(\Bigg(e^{-\frac{(d+i(2j-m)p+s(2i-u)+f(2k-v))^2}{4(b+ai(2j-m)+c(2k-v)+(2i-u)w)}+e+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)}$$

$$(d+i(2j-m)p+s(2i-u)+f(2k-v)+2(b+ai(2j-m)+c(2k-v)+(2i-u)w)z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-(d+i(2j-m)p+s(2i-u)+f(2k-v)+2(b+ai(2j-m)+c(2k-v)+(2i-u)w)z)^2\Big/$$

$$(4(b+ai(2j-m)+c(2k-v)+(2i-u)w))\Bigg)\Bigg/\Big((b+ai(2j-m)+c(2k-v)+(2i-u)w)$$

$$\sqrt{\left(-(d+i(2j-m)p+s(2i-u)+f(2k-v)+2(b+ai(2j-m)+c(2k-v)+(2i-u)w)z)^2\Big/\right.}$$
$$\left.(b+ai(2j-m)+c(2k-v)+(2i-u)w)\right)\Big)+$$

$$\Bigg(e^{-\frac{(d+i(m-2j)p+s(2i-u)+f(2k-v))^2}{4(b+ai(m-2j)+c(2k-v)+(2i-u)w)}+e+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)}(d+i(m-2j)p+s(2i-u)+$$

$$f(2k-v)+2(b+ai(m-2j)+c(2k-v)+(2i-u)w)z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-(d+i(m-2j)p+s(2i-u)+f(2k-v)+2(b+ai(m-2j)+c(2k-v)+(2i-u)w)z)^2\Big/$$

$$(4(b+ai(m-2j)+c(2k-v)+(2i-u)w))\Bigg)\Bigg/\Big((b+ai(m-2j)+c(2k-v)+(2i-u)w)$$

$$\sqrt{\left(-(d+i(m-2j)p+s(2i-u)+f(2k-v)+2(b+ai(m-2j)+c(2k-v)+(2i-u)w)z)^2\Big/\right.}$$
$$\left.(b+ai(m-2j)+c(2k-v)+(2i-u)w)\right)\Big)+$$

$$\Bigg(e^{-\frac{(d+i(2j-m)p+s(2i-u)+f(v-2k))^2}{4(b+ai(2j-m)+c(v-2k)+(2i-u)w)}+e+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}+g(v-2k)}(d+i(2j-m)p+s(2i-u)+$$

$$f(v-2k)+2(b+ai(2j-m)+c(v-2k)+(2i-u)w)z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-(d+i(2j-m)p+s(2i-u)+f(v-2k)+2(b+ai(2j-m)+c(v-2k)+(2i-u)w)z)^2\Big/$$

$$(4(b+ai(2j-m)+c(v-2k)+(2i-u)w))\Bigg)\Bigg/\Big((b+ai(2j-m)+c(v-2k)+(2i-u)w)$$

$$\sqrt{\left(-(d+i(2j-m)p+s(2i-u)+f(v-2k)+2(b+ai(2j-m)+c(v-2k)+(2i-u)w)z)^2\Big/\right.}$$
$$\left.(b+ai(2j-m)+c(v-2k)+(2i-u)w)\right)\Big)+$$

$$\Bigg(e^{-\frac{(d+i(m-2j)p+s(2i-u)+f(v-2k))^2}{4(b+ai(m-2j)+c(v-2k)+(2i-u)w)}+e+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}+g(v-2k)}(d+i(m-2j)p+s(2i-u)+$$

$$f(v-2k)+2(b+ai(m-2j)+c(v-2k)+(2i-u)w)z)\,\Gamma\Bigg(\frac{1}{2},$$

$$-(d+i(m-2j)p+s(2i-u)+f(v-2k)+2(b+ai(m-2j)+c(v-2k)+(2i-u)w)z)^2\Big/$$

$$(4(b+ai(m-2j)+c(v-2k)+(2i-u)w))\Bigg)\Bigg/\Big((b+ai(m-2j)+c(v-2k)+(2i-u)w)$$

$$\sqrt{\left(-(d+i(m-2j)p+s(2i-u)+f(v-2k)+2(b+ai(m-2j)+c(v-2k)+(2i-u)w)z)^2\Big/\right.}$$

$$(b + a\,i\,(m - 2\,j) + c\,(v - 2\,k) + (2\,i - u)\,w))) +$$

$$\left(e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)}+e+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}\,(d + i\,(2\,j - m)\,p + s\,(u - 2\,i) +\right.$$

$$f\,(2\,k - v) + 2\,(b + a\,i\,(2\,j - m) + c\,(2\,k - v) + (u - 2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.\left.-(d + i\,(2\,j - m)\,p + s\,(u - 2\,i) + f\,(2\,k - v) + 2\,(b + a\,i\,(2\,j - m) + c\,(2\,k - v) + (u - 2\,i)\,w)\,z)^2\Big/\right.\right.$$

$$\left.\left.(4\,(b + a\,i\,(2\,j - m) + c\,(2\,k - v) + (u - 2\,i)\,w))\right)\right)\Big/\Big((b + a\,i\,(2\,j - m) + c\,(2\,k - v) + (u - 2\,i)\,w)$$

$$\sqrt{\left(-(d + i\,(2\,j - m)\,p + s\,(u - 2\,i) + f\,(2\,k - v) + 2\,(b + a\,i\,(2\,j - m) + c\,(2\,k - v) + (u - 2\,i)\,w)\,z)^2\Big/\right.}$$
$$\left.(b + a\,i\,(2\,j - m) + c\,(2\,k - v) + (u - 2\,i)\,w))\right) +$$

$$\left(e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)}+e+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}\,(d + i\,(m - 2\,j)\,p + s\,(u - 2\,i) +\right.$$

$$f\,(2\,k - v) + 2\,(b + a\,i\,(m - 2\,j) + c\,(2\,k - v) + (u - 2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.\left.-(d + i\,(m - 2\,j)\,p + s\,(u - 2\,i) + f\,(2\,k - v) + 2\,(b + a\,i\,(m - 2\,j) + c\,(2\,k - v) + (u - 2\,i)\,w)\,z)^2\Big/\right.\right.$$

$$\left.\left.(4\,(b + a\,i\,(m - 2\,j) + c\,(2\,k - v) + (u - 2\,i)\,w))\right)\right)\Big/\Big((b + a\,i\,(m - 2\,j) + c\,(2\,k - v) + (u - 2\,i)\,w)$$

$$\sqrt{\left(-(d + i\,(m - 2\,j)\,p + s\,(u - 2\,i) + f\,(2\,k - v) + 2\,(b + a\,i\,(m - 2\,j) + c\,(2\,k - v) + (u - 2\,i)\,w)\,z)^2\Big/\right.}$$
$$\left.(b + a\,i\,(m - 2\,j) + c\,(2\,k - v) + (u - 2\,i)\,w))\right) +$$

$$\left(e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k))^2}{4\,(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)}+e+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}\,(d + i\,(2\,j - m)\,p + s\,(u - 2\,i) +\right.$$

$$f\,(v - 2\,k) + 2\,(b + a\,i\,(2\,j - m) + c\,(v - 2\,k) + (u - 2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.\left.-(d + i\,(2\,j - m)\,p + s\,(u - 2\,i) + f\,(v - 2\,k) + 2\,(b + a\,i\,(2\,j - m) + c\,(v - 2\,k) + (u - 2\,i)\,w)\,z)^2\Big/\right.\right.$$

$$\left.\left.(4\,(b + a\,i\,(2\,j - m) + c\,(v - 2\,k) + (u - 2\,i)\,w))\right)\right)\Big/\Big((b + a\,i\,(2\,j - m) + c\,(v - 2\,k) + (u - 2\,i)\,w)$$

$$\sqrt{\left(-(d + i\,(2\,j - m)\,p + s\,(u - 2\,i) + f\,(v - 2\,k) + 2\,(b + a\,i\,(2\,j - m) + c\,(v - 2\,k) + (u - 2\,i)\,w)\,z)^2\Big/\right.}$$
$$\left.(b + a\,i\,(2\,j - m) + c\,(v - 2\,k) + (u - 2\,i)\,w))\right) +$$

$$\left(e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k))^2}{4\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)}+e+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}\,(d + i\,(m - 2\,j)\,p + s\,(u - 2\,i) +\right.$$

$$f\,(v - 2\,k) + 2\,(b + a\,i\,(m - 2\,j) + c\,(v - 2\,k) + (u - 2\,i)\,w)\,z)\,\Gamma\left(\frac{1}{2},\right.$$

$$\left.\left.-(d + i\,(m - 2\,j)\,p + s\,(u - 2\,i) + f\,(v - 2\,k) + 2\,(b + a\,i\,(m - 2\,j) + c\,(v - 2\,k) + (u - 2\,i)\,w)\,z)^2\Big/\right.\right.$$

$$\left.\left.(4\,(b + a\,i\,(m - 2\,j) + c\,(v - 2\,k) + (u - 2\,i)\,w))\right)\right)\Big/\Big((b + a\,i\,(m - 2\,j) + c\,(v - 2\,k) + (u - 2\,i)\,w)$$

$$\sqrt{\left(-(d + i\,(m - 2\,j)\,p + s\,(u - 2\,i) + f\,(v - 2\,k) + 2\,(b + a\,i\,(m - 2\,j) + c\,(v - 2\,k) + (u - 2\,i)\,w)\,z)^2\Big/\right.}$$
$$\left.\left.(b + a\,i\,(m - 2\,j) + c\,(v - 2\,k) + (u - 2\,i)\,w))\right)\right/;\, m \in \mathbb{N}^+ \bigwedge u \in \mathbb{N}^+ \bigwedge v \in \mathbb{N}^+$$

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$$\int e^{\sqrt{z}\ b+e+d\,z}\cos^m\left(\sqrt{z}\ a+q+p\,z\right)\sinh^u\left(t+s\,z+w\,\sqrt{z}\ \right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz == \frac{1}{d^2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}}$$

$$\left(i^u\,2^{-m-u-v-1}\,e^{e-\frac{b^2}{4\,d}}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}\left(2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ e^{\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}}\,d+b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right.$$

$$\left.(1-m \bmod 2)\,(1-u \bmod 2)\,(1-v \bmod 2)\right)+i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u \bmod 2)\,(1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(\left(e^{-\frac{(b+a\,i\,(2\,k-m))^2}{4\,(d+i\,(2\,k-m)\,p)}+e+i\,(2\,k-m)\,q}\left(2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}}\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\right.\right.\right.$$

$$\left.\left.\left.(d+i\,(2\,k-m)\,p)+(b+a\,i\,(2\,k-m))\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\right.\right.\right.$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)\right)\right)\Big/$$

$$\left(\left(d+i\,(2\,k-m)\,p\right)^2\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\right)+$$

$$\left(e^{-\frac{(b+a\,i\,(m-2\,k))^2}{4\,(d+i\,(m-2\,k)\,p)}+e+i\,(m-2\,k)\,q}\left(2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}}\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\right.\right.$$

$$\left.\left.(d+i\,(m-2\,k)\,p)+(b+a\,i\,(m-2\,k))\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\left.\left.\Gamma\left(\frac{1}{2},-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)\right)\right)\Big/$$

$$\left.\left(\left(d+i\,(m-2\,k)\,p\right)^2\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\right)\right)+$$

$$i^u\, 2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(\left(e^{-\frac{(b+(2k-u)w)^2}{4(d+s(2k-u))}+e+t(2k-u)+\frac{i\pi u}{2}}\right.\right.$$

$$\left(2e^{\frac{\left(b+(2k-u)w+2(d+s(2k-u))\sqrt{z}\right)^2}{4(d+s(2k-u))}}\sqrt{-\frac{\left(b+(2k-u)w+2(d+s(2k-u))\sqrt{z}\right)^2}{d+s(2k-u)}}\,(d+s(2k-u))+(b+(2k-u)w)\right.$$

$$\left.\left.\left.\left(b+(2k-u)w+2(d+s(2k-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+(2k-u)w+2(d+s(2k-u))\sqrt{z}\right)^2}{4(d+s(2k-u))}\right)\right)\right)\Big/$$

$$\left((d+s(2k-u))^2\sqrt{-\frac{\left(b+(2k-u)w+2(d+s(2k-u))\sqrt{z}\right)^2}{d+s(2k-u)}}\right)+\left(e^{-\frac{(b+(u-2k)w)^2}{4(d+s(u-2k))}+e+t(u-2k)-\frac{i\pi u}{2}}\right.$$

$$\left(2e^{\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}}\sqrt{-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{d+s(u-2k)}}\,(d+s(u-2k))+(b+(u-2k)w)\right.$$

$$\left.\left.\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}\right)\right)\right)\Big/$$

$$\left.\left((d+s(u-2k))^2\sqrt{-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{d+s(u-2k)}}\right)\right)+$$

$$i^u\, 2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)\,(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(b+c(2h-v))^2}{4(d+f(2h-v))}+e+g(2h-v)}\right.\right.$$

$$\left(2e^{\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{4(d+f(2h-v))}}\sqrt{-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{d+f(2h-v)}}\,(d+f(2h-v))+(b+c(2h-v))\right.$$

$$\left.\left.\left.\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{4(d+f(2h-v))}\right)\right)\right)\Big/$$

$$\left((d+f(2h-v))^2\sqrt{-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{d+f(2h-v)}}\right)+\left(e^{-\frac{(b+c(v-2h))^2}{4(d+f(v-2h))}+e-g(2h-v)}\right.$$

$$\left(2e^{\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{4(d+f(v-2h))}}\sqrt{-\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{d+f(v-2h)}}\ (d+f(v-2h))+(b+c(v-2h))\right.$$

$$\left.\left.\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{4(d+f(v-2h))}\right)\right)\right)\Big/$$

$$\left((d+f(v-2h))^2\sqrt{-\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{d+f(v-2h)}}\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(\left(e^{-\frac{(b+a\,i(2k-m)+(2j-u)w)^2}{4(d+i(2k-m)p+s(2j-u))}+e+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}\right.\right.$$

$$\left((b+a\,i(2k-m)+(2j-u)w)\left(b+a\,i(2k-m)+(2j-u)w+2(d+i(2k-m)p+s(2j-u))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2},-\left(b+a\,i(2k-m)+(2j-u)w+2(d+i(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+i(2k-m)p+s(2j-u)))\right)+2e^{\frac{\left(b+a\,i(2k-m)+(2j-u)w+2(d+i(2k-m)p+s(2j-u))\sqrt{z}\right)^2}{4(d+i(2k-m)p+s(2j-u))}}$$

$$(d+i(2k-m)p+s(2j-u))\sqrt{\left(-\left(b+a\,i(2k-m)+(2j-u)w+\right.\right.$$

$$\left.\left.\left.2(d+i(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(d+i(2k-m)p+s(2j-u))\right)}\right)\Big/$$

$$\left((d+i(2k-m)p+s(2j-u))^2\sqrt{\left(-\left(b+a\,i(2k-m)+(2j-u)w+2(d+i(2k-m)p+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.s(2j-u))\sqrt{z}\right)^2\Big/(d+i(2k-m)p+s(2j-u))\right)}\right)+$$

$$\left(e^{-\frac{(b+a\,i(m-2k)+(2j-u)w)^2}{4(d+i(m-2k)p+s(2j-u))}+e+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}}\left((b+a\,i(m-2k)+(2j-u)w)\left(b+a\,i(m-2k)+\right.\right.\right.$$

$$\left.\left.\left.(2j-u)w+2(d+i(m-2k)p+s(2j-u))\sqrt{z}\right)\Gamma\left(\frac{1}{2},-\left(b+a\,i(m-2k)+(2j-u)w+\right.\right.\right.$$

$$\left.\left.\left.2(d+i(m-2k)p+s(2j-u))\sqrt{z}\right)^2\Big/(4(d+i(m-2k)p+s(2j-u)))\right)+2\right.$$

$$\left.e^{\frac{\left(b+a\,i(m-2k)+(2j-u)w+2(d+i(m-2k)p+s(2j-u))\sqrt{z}\right)^2}{4(d+i(m-2k)p+s(2j-u))}}(d+i(m-2k)p+s(2j-u))\right.$$

$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.\left.(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\right)\Big/\left((d+i\,(m-2\,k)\,p+s\,(2\,j-u))^2\right.$$

$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.}$$

$$\left.(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)+\left(e^{-\frac{(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e+i\,(2\,k-m)\,q-\frac{i\,\pi\,u}{2}+t\,(u-2\,j)}\right.$$

$$\left(\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w\right)\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2},\,-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))}}$$

$$(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.\right.}$$

$$\left.\left.2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\Big)\Big/$$

$$\left((d+i\,(2\,k-m)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)\right)+$$

$$\left(e^{-\frac{(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+i\,(m-2\,k)\,q-\frac{i\,\pi\,u}{2}+t\,(u-2\,j)}\left(\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w\right)\left(b+a\,i\,(m-2\,k)+\right.\right.\right.$$

$$\left.\left.\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\right.\right.$$

$$\Gamma\left(\frac{1}{2},\,-\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)))\right)+2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))}}$$

$$(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+\right.\right.}$$

$$\left.\left.2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\Big)\Big/$$

$$\left((d+i\,(m-2\,k)\,p+s\,(u-2\,j))^2\,\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+\right.\right.\right.\right.$$

$$\left.\left.\left.\left.s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)\right)\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+g\,(2\,h-v)}\right.\right.$$

$$\left((b+a\,i\,(2\,k-m)+c\,(2\,h-v))\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},\,-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v)))\right)+2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))}}$$
$$(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\right)\Bigg)\Bigg/$$
$$\left((d+i\,(2\,k-m)\,p+f\,(2\,h-v))^2\,\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+\right.\right.\right.\right.$$
$$\left.\left.\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\right)\right)+$$
$$\left(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+g\,(2\,h-v)}\left((b+a\,i\,(m-2\,k)+c\,(2\,h-v))\left(b+a\,i\,(m-2\,k)+\right.\right.\right.$$
$$\left.\left.\left.c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2},\,-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.\right.$$
$$\left.\left.\left.2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v)))\right)+2$$
$$e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))}}\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.}$$
$$\left.\left.\left.(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\right)\right)\Bigg)\Bigg/\left((d+i\,(m-2\,k)\,p+f\,(2\,h-v))^2\right.$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.}$$
$$\left.(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\right)\Bigg)+\left(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+g\,(v-2\,h)}\right.$$

$$\left((b+a\,i\,(2\,k-m)+c\,(v-2\,h))\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},\,-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h)))\right)+2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))}}$$
$$(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\right)\Bigg)\Bigg/$$

$$\left((d+i\,(2\,k-m)\,p+f\,(v-2\,h))^2\,\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+\right.\right.\right.$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\right)\right)+$$
$$\left(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+g\,(v-2\,h)}\left((b+a\,i\,(m-2\,k)+c\,(v-2\,h))\left(b+a\,i\,(m-2\,k)+\right.\right.\right.$$
$$\left.\left.\left.c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h)))\right)+2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))}}$$
$$(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.}$$
$$\left.\left.\left.\left.2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\right)\right)\Big/$$
$$\left((d+i\,(m-2\,k)\,p+f\,(v-2\,h))^2\,\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+\right.\right.\right.$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\right)\right)+$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(\left(e^{-\frac{(b+c\,(2\,h-v)+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u)+f\,(2\,h-v))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}\right.\right.$$
$$\left(\left(b+c\,(2\,h-v)+(2\,k-u)\,w\right)\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$
$$\left.(4\,(d+s\,(2\,k-u)+f\,(2\,h-v)))\right)+2\,e^{\frac{\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u)+f\,(2\,h-v))}}$$
$$(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{\left(-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+\right.\right.}$$
$$\left.\left.\left.\left.2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(d+s\,(2\,k-u)+f\,(2\,h-v))\right)\right)\Big/$$
$$\left((d+s\,(2\,k-u)+f\,(2\,h-v))^2\,\sqrt{\left(-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.\right.$$
$$\left.\left.(d+s\,(2\,k-u)+f\,(2\,h-v))\right)\right)+\left(e^{-\frac{(b+c\,(2\,h-v)+(u-2\,k)\,w)^2}{4\,(d+s\,(u-2\,k)+f\,(2\,h-v))}+e+t\,(u-2\,k)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\right.$$
$$\left(\left(b+c\,(2\,h-v)+(u-2\,k)\,w\right)\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2},-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(d+s\,(u-2\,k)+f\,(2\,h-v)))\Big)+2\,e^{\frac{\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+s\,(u-2\,k)+f\,(2\,h-v))}}$$

$$(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{\Big(-\big(b+c\,(2\,h-v)+(u-2\,k)\,w+$$

$$2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/(d+s\,(u-2\,k)+f\,(2\,h-v))\Big)}\Big)\Big/$$

$$\Big((d+s\,(u-2\,k)+f\,(2\,h-v))^2\,\sqrt{\Big(-\big(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$

$$(d+s\,(u-2\,k)+f\,(2\,h-v))\Big)}\Big)+\Bigg(e^{-\frac{(b+c\,(v-2\,h)+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u)+f\,(v-2\,h))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}$$

$$\Big((b+c\,(v-2\,h)+(2\,k-u)\,w)\,\big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2},-\big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d+s\,(2\,k-u)+f\,(v-2\,h)))\Big)+2\,e^{\frac{\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u)+f\,(v-2\,h))}}$$

$$(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{\Big(-\big(b+c\,(v-2\,h)+(2\,k-u)\,w+$$

$$2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/(d+s\,(2\,k-u)+f\,(v-2\,h))\Big)}\Big)\Big/$$

$$\Big((d+s\,(2\,k-u)+f\,(v-2\,h))^2\,\sqrt{\Big(-\big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$(d+s\,(2\,k-u)+f\,(v-2\,h))\Big)}\Big)+\Bigg(e^{-\frac{(b+c\,(v-2\,h)+(u-2\,k)\,w)^2}{4\,(d+s\,(u-2\,k)+f\,(v-2\,h))}+e+t\,(u-2\,k)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}$$

$$\Big((b+c\,(v-2\,h)+(u-2\,k)\,w)\,\big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2},-\big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(d+s\,(u-2\,k)+f\,(v-2\,h)))\Big)+2\,e^{\frac{\left(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+s\,(u-2\,k)+f\,(v-2\,h))}}$$

$$(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{\Big(-\big(b+c\,(v-2\,h)+(u-2\,k)\,w+$$

$$2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/(d+s\,(u-2\,k)+f\,(v-2\,h))\Big)}\Big)\Big/$$

$$\Big((d+s\,(u-2\,k)+f\,(v-2\,h))^2\,\sqrt{\Big(-\big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+$$

$$f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/(d+s\,(u-2\,k)+f\,(v-2\,h))\Big)}\Big)+$$

$$i^u\, 2^{-m-u-v-1} \sum_{h=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{h} \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{k} \sum_{j=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^j \binom{u}{j} \left(\left(e^{-\frac{(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w)^2}{4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))}+e+i\,(2k-m)\,q+t\,(2j-u)+\frac{i\pi u}{2}+g\,(2h-v)} \right.\right.$$

$$\left((b + a\,i\,(2k-m) + c\,(2h-v) + (2j-u)\,w)\,\big(b + a\,i\,(2k-m) + c\,(2h-v) + \right.$$

$$(2j-u)\,w + 2\,(d + i\,(2k-m)\,p + s\,(2j-u) + f\,(2h-v))\,\sqrt{z}\,\big)$$

$$\Gamma\Big(\frac{1}{2}, -\big(b + a\,i\,(2k-m) + c\,(2h-v) + (2j-u)\,w + 2\,(d + i\,(2k-m)\,p + s\,(2j-u) +$$

$$\left. f\,(2h-v))\,\sqrt{z}\,\big)^2 \Big/ (4\,(d + i\,(2k-m)\,p + s\,(2j-u) + f\,(2h-v)))\Big) +$$

$$2\,e^{\frac{\left(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))}}\,(d + i\,(2k-m)\,p + s\,(2j-u) + f\,(2h-v))$$

$$\sqrt{\Big(-\big(b + a\,i\,(2k-m) + c\,(2h-v) + (2j-u)\,w + 2\,(d + i\,(2k-m)\,p + s\,(2j-u) +$$

$$\left.\left. f\,(2h-v))\,\sqrt{z}\,\big)^2 \Big/ (d + i\,(2k-m)\,p + s\,(2j-u) + f\,(2h-v))\Big)}\right)\Big/$$

$$\Big((d + i\,(2k-m)\,p + s\,(2j-u) + f\,(2h-v))^2\,\sqrt{\Big(-\big(b + a\,i\,(2k-m) + c\,(2h-v) +$$

$$(2j-u)\,w + 2\,(d + i\,(2k-m)\,p + s\,(2j-u) + f\,(2h-v))$$

$$\sqrt{z}\,\big)^2 \Big/ (d + i\,(2k-m)\,p + s\,(2j-u) + f\,(2h-v))\Big)\Big) +$$

$$\left(e^{-\frac{(b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w)^2}{4\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))}+e+i\,(m-2k)\,q+t\,(2j-u)+\frac{i\pi u}{2}+g\,(2h-v)} \right.\left((b + a\,i\,(m-2k) + c\,(2h-v) + (2j-u)\,w)\,\big(b + \right.$$

$$a\,i\,(m-2k) + c\,(2h-v) + (2j-u)\,w + 2\,(d + i\,(m-2k)\,p + s\,(2j-u) + f\,(2h-v))\,\sqrt{z}\,\big)$$

$$\Gamma\Big(\frac{1}{2}, -\big(b + a\,i\,(m-2k) + c\,(2h-v) + (2j-u)\,w + 2\,(d + i\,(m-2k)\,p + s\,(2j-u) +$$

$$\left. f\,(2h-v))\,\sqrt{z}\,\big)^2 \Big/ (4\,(d + i\,(m-2k)\,p + s\,(2j-u) + f\,(2h-v)))\Big) +$$

$$2\,e^{\frac{\left(b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))}}\,(d + i\,(m-2k)\,p + s\,(2j-u) + f\,(2h-v))$$

$$\sqrt{\Big(-\big(b + a\,i\,(m-2k) + c\,(2h-v) + (2j-u)\,w + 2\,(d + i\,(m-2k)\,p + s\,(2j-u) +$$

$$\left.\left. f\,(2h-v))\,\sqrt{z}\,\big)^2 \Big/ (d + i\,(m-2k)\,p + s\,(2j-u) + f\,(2h-v))\Big)}\right)\Big/$$

$$\Big((d + i\,(m-2k)\,p + s\,(2j-u) + f\,(2h-v))^2\,\sqrt{\Big(-\big(b + a\,i\,(m-2k) + c\,(2h-v) +$$

$$(2j-u)\,w + 2\,(d + i\,(m-2k)\,p + s\,(2j-u) + f\,(2h-v))$$

$$\sqrt{z}\,\big)^2 \Big/ (d + i\,(m-2k)\,p + s\,(2j-u) + f\,(2h-v))\Big)\Big) +$$

$$\left(e^{-\frac{(b+a\,i\,(2k-m)+c\,(2h-v)+(u-2j)\,w)^2}{4\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(2h-v))}+e+i\,(2k-m)\,q+t\,(u-2j)+g\,(2h-v)-\frac{i\pi u}{2}} \right.\left((b + a\,i\,(2k-m) + c\,(2h-v) + (u-2j)\,w)\,\big(b + \right.$$

$$a\,i\,(2k-m) + c\,(2h-v) + (u-2j)\,w + 2\,(d + i\,(2k-m)\,p + s\,(u-2j) + f\,(2h-v))\,\sqrt{z}\,\big)$$

$$\Gamma\left(\frac{1}{2}, -\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$
$$\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.}$$
$$\left.\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right)\right)\Big/$$
$$\left((d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+\right.\right.\right.$$
$$\left.\left.\left.(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.\right.\right.$$
$$\left.\left.\left.\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right)\right)+$$
$$\left(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\left((b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\left(b+\right.\right.\right.$$
$$\left.\left.\left.a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}, -\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}}(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.}$$
$$\left.\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right)\right)\Big/$$
$$\left((d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.\right.$$
$$\left.\left.\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.\right.\right.$$
$$\left.\left.\left.\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right)\right)+$$
$$\left(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\left((b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\left(b+\right.\right.\right.$$
$$\left.\left.\left.a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}, -\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$
$$\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.}$$

$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+$$
$$(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$
$$\sqrt{z}\Big)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\Bigg(\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w\Big)\Big(b+$$
$$a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2},-\big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$
$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)+$$
$$2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}}\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)$$
$$\sqrt{\Big(-\big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$
$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+$$
$$(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$
$$\sqrt{z}\Big)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\Bigg(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\Bigg(\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w\Big)\Big(b+$$
$$a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\Big)$$
$$\Gamma\Big(\frac{1}{2},-\big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$
$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\Big)+$$
$$2\,e^{\frac{\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)$$
$$\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$
$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\Big)\Big)\Big/$$

$$\Big(\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)^2\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+$$
$$(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$
$$\sqrt{z}\Big)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$\left(e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\left((b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\right.\right.$$
$$\Gamma\left(\frac{1}{2},-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)+$$
$$2\,e^{\frac{\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}}(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$
$$\left.\left.\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)}\right)\Big/$$
$$\left((d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)}\right)\Big/;\ m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving rational functions of the direct function, hyperbolic, exponential and trigonometric functions

Involving sin, sinh and exp

Involving $\frac{e^{p\,z}\sin(e\,z)\sinh(d\,z)}{a+b\cosh(c\,z)}$

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$$\int \frac{e^{p z} \sin(e z) \sinh(d z)}{a + b \cosh(c z)} dz ==$$
$$\frac{1}{4} i \left(\frac{1}{b \sqrt{a^2 - b^2}\ (c - d + i e + p)} \left(e^{(c-d+i e+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - d + i e + p}{c}, 1; \frac{-d + i e + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right. \right.$$
$$\left. \left. \left. \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c - d + i e + p}{c}, 1; \frac{-d + i e + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) +$$
$$\frac{1}{b \sqrt{a^2 - b^2}\ (c + d - i e + p)} \left(e^{(c+d-i e+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c + d - i e + p}{c}, 1; \frac{d - i e + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$
$$\left. \left. \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c + d - i e + p}{c}, 1; \frac{d - i e + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) -$$
$$\frac{1}{b \sqrt{a^2 - b^2}\ (c + d + i e + p)} \left(e^{(c+d+i e+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c + d + i e + p}{c}, 1; \frac{d + i e + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$
$$\left. \left. \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c + d + i e + p}{c}, 1; \frac{d + i e + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) -$$
$$\frac{1}{b \sqrt{a^2 - b^2}\ (c - d - i e + p)} \left(e^{(c-d-i e+p) z} \left(\left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - d - i e + p}{c}, 1; \frac{-d - i e + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right.$$
$$\left. \left. \left. \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c - d - i e + p}{c}, 1; \frac{-d - i e + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) \right) \right) \right)$$

Involving $e^{p z} \sin(e z) \sinh(d z) (a + b \cosh(c z))^{-n}$

01.20.21.4873.01

$$\int \frac{e^{p z} \sin(e z) \sinh(d z)}{(a + b \cosh(c z))^2} dz == \frac{1}{4} i$$
$$\left(\frac{1}{b \left(a^2 - b^2\right)^{3/2} (c - d + i e + p)} \left(e^{(c-d+i e+p) z} \left(a \left(a + \sqrt{a^2 - b^2} \right) {}_2F_1\left(\frac{c - d + i e + p}{c}, 1; \frac{-d + i e + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) + \right. \right. \right.$$
$$\left. \left. \left. a \left(\sqrt{a^2 - b^2} - a \right) {}_2F_1\left(\frac{c - d + i e + p}{c}, 1; \frac{-d + i e + p}{c} + 2; -\frac{b e^{c z}}{a + \sqrt{a^2 - b^2}} \right) + \right. \right.$$
$$\left. \left. \left(b^2 - a^2 \right) \left({}_2F_1\left(\frac{c - d + i e + p}{c}, 2; \frac{-d + i e + p}{c} + 2; \frac{b e^{c z}}{\sqrt{a^2 - b^2} - a} \right) - \right. \right. \right.$$

$$
{}_2F_1\left(\frac{c-d+i\,e+p}{c},\,2;\,\frac{-d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\Bigg)-
$$

$$
a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d+i\,e+p}{c},\,2;\,\frac{-d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\right.
$$

$$
\left.\left(\frac{c-d+i\,e+p}{c},\,2;\,\frac{-d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)+
$$

$$
\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-i\,e+p)}\left(e^{(c+d-i\,e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.
$$

$$
a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+
$$

$$
\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\right.\right.
$$

$$
\left.\left.-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.
$$

$$
\left.\left.\left.{}_2F_1\left(\frac{c+d-i\,e+p}{c},\,2;\,\frac{d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+i\,e+p)}
$$

$$
\left(e^{(c+d+i\,e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,1;\,\frac{d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.
$$

$$
a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,1;\,\frac{d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+
$$

$$
\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+i\,e+p}{c},\,2;\,\frac{d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.
$$

$$
\left.{}_2F_1\left(\frac{c+d+i\,e+p}{c},\,2;\,\frac{d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-
$$

$$
a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d+i\,e+p}{c},\,2;\,\frac{d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.
$$

$$\left.{}_2F_1\left(\frac{c+d+i\,e+p}{c},\,2;\,\frac{d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\Bigg)\Bigg)\Bigg)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-i\,e+p)}$$

$$\left(e^{(c-d-i\,e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},\,1;\,\frac{-d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},\,1;\,\frac{-d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-i\,e+p}{c},\,2;\,\frac{-d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$

$$\left.{}_2F_1\left(\frac{c-d-i\,e+p}{c},\,2;\,\frac{-d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$

$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d-i\,e+p}{c},\,2;\,\frac{-d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{c-d-i\,e+p}{c},\,2;\,\frac{-d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)\right)$$

Involving $\frac{e^{p\,z}\sin(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4874.01

$$\int \frac{e^{p z} \sin(e z) \sinh(d z)}{a + b \cosh^2(c z)}\, dz ==$$
$$\frac{1}{4} i \left(\left(e^{(2c+d+ie+p)z}\left(\left(2a-2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{d+ie+p}{2c}+1,\ 1;\ \frac{d+ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\right.\right.\right.$$
$$\left.\left.\left.\left(-2a-2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(\frac{d+ie+p}{2c}+1,\ 1;\ \frac{d+ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\ b\sqrt{a+b}\ (2c+d+ie+p)\right)+\left(e^{(2c-d-ie+p)z}\left(\left(2a-2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{-d-ie+p}{2c}+1,\ 1;\right.\right.\right.$$
$$\left.\left.\frac{-d-ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(\frac{-d-ie+p}{2c}+1,\right.$$
$$\left.\left.\left.1;\ \frac{-d-ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\ b\sqrt{a+b}\ (2c-d-ie+p)\right)-$$
$$\left(e^{(2c-d+ie+p)z}\left(\left(2a-2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,\ 1;\ \frac{-d+ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\right.\right.$$
$$\left.\left.\left.\left(-2a-2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,\ 1;\ \frac{-d+ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/$$
$$\left(\sqrt{a}\ b\sqrt{a+b}\ (2c-d+ie+p)\right)-\left(e^{(2c+d-ie+p)z}\left(\left(2a-2\sqrt{a+b}\ \sqrt{a}+b\right)\right.\right.$$
$${}_2F_1\left(\frac{d-ie+p}{2c}+1,\ 1;\ \frac{d-ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\ \sqrt{a}-b\right)$$
$$\left.\left.{}_2F_1\left(\frac{d-ie+p}{2c}+1,\ 1;\ \frac{d-ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\ b\sqrt{a+b}\ (2c+d-ie+p)\right)\Big)$$

Involving $e^{p z} \sin(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.4875.01

$$\int \frac{e^{p z} \sin(e z) \sinh(d z)}{\left(a + b \cosh^2(c z)\right)^2}\, dz == \frac{1}{4} i \left(\left(e^{(2c+d+ie+p)z}\right.\right.$$
$$\left(-(2a+b)\left(-2a+2\sqrt{a+b}\ \sqrt{a}-b\right){}_2F_1\left(\frac{d+ie+p}{2c}+1,\ 1;\ \frac{d+ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\right.$$
$$(-2a-b)\left(2a+2\sqrt{a+b}\ \sqrt{a}+b\right){}_2F_1\left(\frac{d+ie+p}{2c}+1,\ 1;\ \frac{d+ie+p}{2c}+2;\ -\frac{b e^{2cz}}{2a-2\sqrt{a+b}\ \sqrt{a}+b}\right)+$$
$$2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\ a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{d+ie+p}{2c}+1,\ 2;\ \frac{d+ie+p}{2c}+\right.\right.$$
$$\left.\left.2;\ -\frac{b e^{2cz}}{2a+2\sqrt{a+b}\ \sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\ a+2b\sqrt{a}+b\sqrt{a+b}\right)\right.$$

$$
{}_2F_1\left(\frac{d+i\,e+p}{2\,c}+1,\,2;\,\frac{d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c+d+i\,e+p)\right)+\Bigg(e^{(2\,c-d-i\,e+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)
$$

$$
{}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,1;\,\frac{-d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,1;\,\frac{-d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,2;\,\frac{-d-i\,e+p}{2\,c}+\right.
$$

$$
\left.2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)
$$

$$
{}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,2;\,\frac{-d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-d-i\,e+p)\right)-\Bigg(e^{(2\,c-d+i\,e+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)
$$

$$
{}_2F_1\left(\frac{-d+i\,e+p}{2\,c}+1,\,1;\,\frac{-d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d+i\,e+p}{2\,c}+1,\,1;\,\frac{-d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{-d+i\,e+p}{2\,c}+1,\,2;\,\frac{-d+i\,e+p}{2\,c}+\right.
$$

$$
\left.2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)
$$

$$
{}_2F_1\left(\frac{-d+i\,e+p}{2\,c}+1,\,2;\,\frac{-d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-d+i\,e+p)\right)-\Bigg(e^{(2\,c+d-i\,e+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)
$$

$$
{}_2F_1\left(\frac{d-i\,e+p}{2\,c}+1,\,1;\,\frac{d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-i\,e+p}{2\,c}+1,\,1;\,\frac{d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d-i\,e+p}{2\,c}+1,\,2;\,\frac{d-i\,e+p}{2\,c}+2;\right.
$$

$$
\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d-i\,e+p}{2\,c}+\right.
$$

$$
\left.\frac{d-i\,e+p}{\qquad\qquad}\qquad\qquad\frac{b\,e^{2\,c\,z}}{\qquad\qquad}\right)\Bigg)\Bigg)\Bigg/\left(\qquad\qquad\right)
$$

Involving sin, rational functions of sinh and exp

Involving $e^{p z} \sin(d z) (a \sinh(e z) + b \cosh(e z))^{-n}$

01.20.21.4876.01

$$\int \frac{e^{p z} \sin(d z)}{a \sinh(e z) + b \cosh(e z)} dz == -\frac{i}{a-b} \left(\frac{e^{(e-i d+p) z}}{e - i d + p} {}_2F_1\left(\frac{e - i d + p}{2 e}, 1; \frac{3 e - i d + p}{2 e}; \frac{(a+b) e^{2 e z}}{a-b} \right) - \frac{e^{(e+i d+p) z}}{e + i d + p} {}_2F_1\left(\frac{e + i d + p}{2 e}, 1; \frac{3 e + i d + p}{2 e}; \frac{(a+b) e^{2 e z}}{a-b} \right) \right)$$

01.20.21.4877.01

$$\int \frac{e^{p z} \sin(d z)}{(a \sinh(e z) + b \cosh(e z))^2} dz == -\frac{2 i}{(a-b)^2} \left(\frac{e^{(2 e+i d+p) z}}{2 e + i d + p} {}_2F_1\left(\frac{i d + p}{2 e} + 1, 2; \frac{i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{a-b} \right) - \frac{e^{(2 e-i d+p) z}}{2 e - i d + p} {}_2F_1\left(\frac{-i d + p}{2 e} + 1, 2; \frac{-i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{a-b} \right) \right)$$

Involving $e^{p z} \sin(d z) (a + b \sinh(e z) + c \cosh(e z))^{-n}$

01.20.21.4878.01

$$\int \frac{e^{p z} \sin(d z)}{a + b \sinh(e z) + c \cosh(e z)} dz == -\frac{1}{2} i \left(\left(e^{(e-i d+p) z} \left(\left(a + \sqrt{a^2 + b^2 - c^2} \right) {}_2F_1\left(\frac{e - i d + p}{e}, 1; \frac{-i d + p}{e} + 2; \frac{(b+c) e^{e z}}{\sqrt{a^2 + b^2 - c^2} - a} \right) + \left(\sqrt{a^2 + b^2 - c^2} - a \right) {}_2F_1\left(\frac{e - i d + p}{e}, 1; \frac{-i d + p}{e} + 2; -\frac{(b+c) e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}} \right) \right) \right) \Big/ \left((b-c) \sqrt{a^2 + b^2 - c^2} (e - i d + p) \right) - \left(e^{(e+i d+p) z} \left(\left(a + \sqrt{a^2 + b^2 - c^2} \right) {}_2F_1\left(\frac{e + i d + p}{e}, 1; \frac{i d + p}{e} + 2; \frac{(b+c) e^{e z}}{\sqrt{a^2 + b^2 - c^2} - a} \right) + \left(\sqrt{a^2 + b^2 - c^2} - a \right) {}_2F_1\left(\frac{e + i d + p}{e}, 1; \frac{i d + p}{e} + 2; -\frac{(b+c) e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}} \right) \right) \right) \Big/ \left((b-c) \sqrt{a^2 + b^2 - c^2} (e + i d + p) \right) \right)$$

01.20.21.4879.01

$$\int \frac{e^{p z} \sin(d z)}{(a + b \sinh(e z) + c \cosh(e z))^2} dz == -\frac{1}{2} i \left(\left(e^{(e+i d+p) z} \left({}_2F_1\left(\frac{e + i d + p}{e}, 2; \frac{i d + p}{e} + 2; \frac{(b+c) e^{e z}}{\sqrt{a^2 + b^2 - c^2} - a} \right) a^2 - {}_2F_1\left(\frac{e + i d + p}{e}, 2; \frac{i d + p}{e} + 2; -\frac{(b+c) e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}} \right) a^2 + \left(a - \sqrt{a^2 + b^2 - c^2} \right) {}_2F_1\left(\frac{e + i d + p}{e}, 1; \frac{i d + p}{e} + 2; -\frac{(b+c) e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}} \right) \right) \right) \right)$$

$$\left(a+\sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{e+i\,d\ +p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)a+\right.$$

$$\sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{e+i\,d\ +p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e+i\,d\ +p}{e},\,1;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)+$$

$$b^2\,{}_2F_1\left(\frac{e+i\,d\ +p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)-$$

$$c^2\,{}_2F_1\left(\frac{e+i\,d\ +p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)-$$

$$b^2\,{}_2F_1\left(\frac{e+i\,d\ +p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$\left.c^2\,{}_2F_1\left(\frac{e+i\,d\ +p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\Big/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e+i\,d\ +p)\right)-$$

$$\left(e^{(e-i\,d+p)\,z}\left({}_2F_1\left(\frac{e-i\,d\ +p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)a^2-\right.\right.$$

$${}_2F_1\left(\frac{e-i\,d\ +p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a^2+$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-i\,d\ +p}{e},\,1;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{e-i\,d\ +p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)a+$$

$$\sqrt{a^2+b^2-c^2}\ {}_2F_1\left(\frac{e-i\,d\ +p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\left(\frac{e-i\,d\ +p}{e},\,1;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\ -a}\right)+$$

$$b^2\,{}_2F_1\left(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\,-a}\right)-$$

$$c^2\,{}_2F_1\left(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\,-a}\right)-$$

$$b^2\,{}_2F_1\left(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$c^2\,{}_2F_1\left(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e-i\,d\,+p)\right)\Bigg)$$

Involving $e^{p\,z}\sin(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{-n}$

01.20.21.4880.01

$$\int\frac{e^{p\,z}\sin(d\,z)}{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\,dz==$$

$$-\frac{1}{2}\,i\left(\left(i\,e^{(2\,e-i\,d\,+p)\,z}\left(\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,1;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2}\right)-\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,1;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{b}\,(a+b)\,(2\,e-i\,d\,+p)\right)-$$

$$\left(i\,e^{(2\,e+i\,d\,+p)\,z}\left(\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,1;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2}\right)-\right.\right.$$

$$\left.\left.\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,1;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{b}\,(a+b)\,(2\,e+i\,d\,+p)\right)\Bigg)$$

01.20.21.4881.01

$$\int \frac{e^{p z} \sin(d z)}{\left(a \sinh^2(e z) + b \cosh^2(e z)\right)^2} dz ==$$

$$-\frac{1}{2} i \left(\left(i e^{(2e - i d + p) z} \left((a-b)\, {}_2F_1\left(\frac{-i d + p}{2 e} + 1, 1; \frac{-i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} - i \sqrt{b}\right)^2} \right) \left(\sqrt{a} + i \sqrt{b}\right)^2 - \right.\right.\right.$$

$$\left(\sqrt{a} - i \sqrt{b}\right)^2 (a-b)\, {}_2F_1\left(\frac{-i d + p}{2 e} + 1, 1; \frac{-i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} + i \sqrt{b}\right)^2} \right) -$$

$$2 i \sqrt{a} \sqrt{b} \left({}_2F_1\left(\frac{-i d + p}{2 e} + 1, 2; \frac{-i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} - i \sqrt{b}\right)^2} \right) \left(\sqrt{a} + i \sqrt{b}\right)^2 + \left(\sqrt{a} - i \sqrt{b}\right)^2 \right.$$

$$\left.\left.\left.\left. {}_2F_1\left(\frac{-i d + p}{2 e} + 1, 2; \frac{-i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} + i \sqrt{b}\right)^2} \right) \right) \right) \right) \Big/ \left(2 a^{3/2} b^{3/2} (a+b) (2 e - i d + p)\right) -$$

$$\left(i e^{(2 e + i d + p) z} \left((a-b)\, {}_2F_1\left(\frac{i d + p}{2 e} + 1, 1; \frac{i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} - i \sqrt{b}\right)^2} \right) \left(\sqrt{a} + i \sqrt{b}\right)^2 - \right.\right.$$

$$\left(\sqrt{a} - i \sqrt{b}\right)^2 (a-b)\, {}_2F_1\left(\frac{i d + p}{2 e} + 1, 1; \frac{i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} + i \sqrt{b}\right)^2} \right) -$$

$$2 i \sqrt{a} \sqrt{b} \left({}_2F_1\left(\frac{i d + p}{2 e} + 1, 2; \frac{i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} - i \sqrt{b}\right)^2} \right) \left(\sqrt{a} + i \sqrt{b}\right)^2 + \right.$$

$$\left.\left.\left.\left. \left(\sqrt{a} - i \sqrt{b}\right)^2 {}_2F_1\left(\frac{i d + p}{2 e} + 1, 2; \frac{i d + p}{2 e} + 2; \frac{(a+b) e^{2 e z}}{\left(\sqrt{a} + i \sqrt{b}\right)^2} \right) \right) \right) \right) \Big/ \left(2 a^{3/2} b^{3/2} (a+b) (2 e + i d + p)\right) \right)$$

Involving $e^{p z} \sin(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{-n}$

01.20.21.4882.01

$$\int \frac{e^{p z} \sin(d z)}{a + b \sinh^2(e z) + c \cosh^2(e z)}\, dz ==$$

$$-\frac{1}{2} i \left(\left(e^{(2e+i d+p) z} \left(\left(2a - b + c + 2\sqrt{(a-b)(a+c)}\right) {}_2F_1\left(\frac{i d + p}{2e} + 1, 1; \frac{i d + p}{2e} + 2; \frac{(b+c) e^{2ez}}{-2a + b - c + 2\sqrt{(a-b)(a+c)}} \right) + \left(-2a + b - c + 2\sqrt{(a-b)(a+c)}\right) {}_2F_1\left(\frac{i d + p}{2e} + 1, 1; \frac{i d + p}{2e} + 2; \frac{(b+c) e^{2ez}}{-2a + b - c - 2\sqrt{(a-b)(a+c)}} \right) \right) \right) \Big/ \left(\sqrt{(a-b)(a+c)}\ (b+c)(2e + i d + p) \right) - \left(e^{(2e-i d+p) z} \left(\left(2a - b + c + 2\sqrt{(a-b)(a+c)}\right) {}_2F_1\left(\frac{-i d + p}{2e} + 1, 1; \frac{-i d + p}{2e} + 2; \frac{(b+c) e^{2ez}}{-2a + b - c + 2\sqrt{(a-b)(a+c)}} \right) + \left(-2a + b - c + 2\sqrt{(a-b)(a+c)}\right) {}_2F_1\left(\frac{-i d + p}{2e} + 1, 1; \frac{-i d + p}{2e} + 2; \frac{(b+c) e^{2ez}}{-2a + b - c - 2\sqrt{(a-b)(a+c)}} \right) \right) \right) \Big/ \left(\sqrt{(a-b)(a+c)}\ (b+c)(2e - i d + p) \right) \right)$$

01.20.21.4883.01

$$\int \frac{e^{p z} \sinh(d z)}{\left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^2} dz ==$$

$$\frac{1}{2}\left(\left((b+c)\, e^{(-d+2e+p)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}} - \right.\right.\right.$$

$$\left.\left.\left.\frac{{}_2F_1\left(\frac{p-d}{2e}+1,\,2;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}} - \right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{p-d}{2e}+1,\,1;\,\frac{p-d}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Bigg/$$

$$\left(2\left((a-b)(a+c)\right)^{3/2}(-d+2e+p)\right) - \left((b+c)\, e^{(d+2e+p)z}\left(2\sqrt{(a-b)(a+c)}\right.\right.$$

$$\left.\left(\frac{{}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}} - \frac{{}_2F_1\left(\frac{d+p}{2e}+1,\,2;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.$$

$$\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}} - \right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{d+p}{2e}+1,\,1;\,\frac{d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Bigg/\left(2\left((a-b)(a+c)\right)^{3/2}(d+2e+p)\right)\right)$$

Involving $e^{p z} \sin(d z)\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{-n}$

01.20.21.4884.01

$$\int \frac{e^{p z} \sin(d z)}{a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)}\, dz ==$$

$$-\frac{1}{2} i \left(\left((a+2b+c)\, e^{(2e-i d+p) z} \left(\left(-a+c+2\sqrt{b^2-a c}\right) {}_2F_1\left(\frac{-i d+p}{2e}+1, 1; \frac{-i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}} \right) + \left(a-c+2\sqrt{b^2-a c}\right) {}_2F_1\left(\frac{-i d+p}{2e}+1, 1; \frac{-i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}} \right) \right) \right) \Big/ \left(\sqrt{b^2-a c} \left(a-c+2\sqrt{b^2-a c}\right) \left(-a+c+2\sqrt{b^2-a c}\right) (2e - i d + p) \right) - \left((a+2b+c)\, e^{(2e+i d+p) z} \left(\left(-a+c+2\sqrt{b^2-a c}\right) {}_2F_1\left(\frac{i d+p}{2e}+1, 1; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}} \right) + \left(a-c+2\sqrt{b^2-a c}\right) {}_2F_1\left(\frac{i d+p}{2e}+1, 1; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}} \right) \right) \right) \Big/ \left(\sqrt{b^2-a c} \left(a-c+2\sqrt{b^2-a c}\right) \left(-a+c+2\sqrt{b^2-a c}\right) (2e + i d + p) \right) \right)$$

01.20.21.4885.01

$$\int \frac{e^{p z} \sin(d z)}{\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^2}\, dz ==$$

$$-\frac{1}{2} i \left(\left((a+2b+c)\, e^{(2e+i d+p) z} \left(4\, {}_2F_1\left(\frac{i d+p}{2e}+1, 2; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}} \right) b^2 - 4\, {}_2F_1\left(\frac{i d+p}{2e}+1, 2; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}} \right) b^2 + (a-c) \left(-a+c+2\sqrt{b^2-a c}\right) {}_2F_1\left(\frac{i d+p}{2e}+1, 1; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}} \right) + (a-c) \left(a-c+2\sqrt{b^2-a c}\right) {}_2F_1\left(\frac{i d+p}{2e}+1, 1; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}} \right) - 4 a c\, {}_2F_1\left(\frac{i d+p}{2e}+1, 2; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}} \right) - 2 a \sqrt{b^2-a c}\; {}_2F_1\left(\frac{i d+p}{2e}+1, 2; \frac{i d+p}{2e}+2; \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}} \right) + \right.$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e+i\,d\,+p)\right)-$$

$$\left((a+2\,b+c)\,e^{(2\,e-i\,d+p)\,z}\left(4\,{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-\right.\right.$$

$$4\,{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+$$

$$(a-c)\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,1;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$(a-c)\left(a-c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,1;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e-i\,d+p)\right)$$

Involving cos, sinh and exp

Involving $\frac{e^{p\,z}\cos(e\,z)\sinh(d\,z)}{a+b\cosh(c\,z)}$

01.20.21.4886.01

$$\int\frac{e^{p\,z}\cos(e\,z)\sinh(d\,z)}{a+b\cosh(c\,z)}\,dz==$$

$$\frac{1}{4}\left(\frac{1}{b\sqrt{a^2-b^2}\;(c+d+i\,e+p)}\left(e^{(c+d+i\,e+p)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,1;\,\frac{d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+i\,e+p}{c},\,1;\,\frac{d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)+$$

$$\frac{1}{b\sqrt{a^2-b^2}\;(c+d-i\,e+p)}\left(e^{(c+d-i\,e+p)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-i\,e+p}{c},\,1;\,\frac{d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\frac{1}{b\sqrt{a^2-b^2}\;(c-d+i\,e+p)}$$

$$\left(e^{(c-d+i\,e+p)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+i\,e+p}{c},\,1;\,\frac{-d+i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+i\,e+p}{c},\,1;\,\frac{-d+i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-$$

$$\frac{1}{b\sqrt{a^2-b^2}\;(c-d-i\,e+p)}\left(e^{(c-d-i\,e+p)\,z}\left(\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},\,1;\,\frac{-d-i\,e+p}{c}+2;\,\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$\left.\left.\left.\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},\,1;\,\frac{-d-i\,e+p}{c}+2;\,-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $e^{p z} \cos(e z) \sinh(d z) (a + b \cosh(c z))^{-n}$

01.20.21.4887.01

$$\int \frac{e^{p z} \cos(e z) \sinh(d z)}{(a + b \cosh(c z))^2} dz ==$$

$$\frac{1}{4}\left(\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d+i e+p)}\left(e^{(c+d+i e+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d+i e+p}{c}, 1; \frac{d+i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d+i e+p}{c}, 1; \frac{d+i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d+i e+p}{c}, 2; \frac{d+i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$

$$\left.{}_2F_1\left(\frac{c+d+i e+p}{c}, 2; \frac{d+i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d+i e+p}{c}, 2;\right.\right.$$

$$\left.\left.\left.\left.\frac{d+i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+{}_2F_1\left(\frac{c+d+i e+p}{c}, 2; \frac{d+i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)+$$

$$\frac{1}{b\left(a^2-b^2\right)^{3/2}(c+d-i e+p)}\left(e^{(c+d-i e+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c+d-i e+p}{c}, 1; \frac{d-i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c+d-i e+p}{c}, 1; \frac{d-i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c+d-i e+p}{c}, 2; \frac{d-i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)-{}_2F_1\left(\frac{c+d-i e+p}{c}, 2; \frac{d-i e+p}{c}+2;\right.\right.$$

$$\left.\left.-\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)-a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c+d-i e+p}{c}, 2; \frac{d-i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$

$$\left.\left.\left.\left.{}_2F_1\left(\frac{c+d-i e+p}{c}, 2; \frac{d-i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d+i e+p)}$$

$$\left(e^{(c-d+i e+p) z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c}+2; \frac{b e^{c z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$

$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d+i e+p}{c}, 1; \frac{-d+i e+p}{c}+2; -\frac{b e^{c z}}{a+\sqrt{a^2-b^2}}\right)+$$

$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d+i\,e+p}{c},2;\frac{-d+i\,e+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\left.{}_2F_1\left(\frac{c-d+i\,e+p}{c},2;\frac{-d+i\,e+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d+i\,e+p}{c},2;\frac{-d+i\,e+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\left.\left.{}_2F_1\left(\frac{c-d+i\,e+p}{c},2;\frac{-d+i\,e+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)-\frac{1}{b\left(a^2-b^2\right)^{3/2}(c-d-i\,e+p)}$$
$$\left(e^{(c-d-i\,e+p)\,z}\left(a\left(a+\sqrt{a^2-b^2}\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},1;\frac{-d-i\,e+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.\right.$$
$$a\left(\sqrt{a^2-b^2}-a\right){}_2F_1\left(\frac{c-d-i\,e+p}{c},1;\frac{-d-i\,e+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)+$$
$$\left(b^2-a^2\right)\left({}_2F_1\left(\frac{c-d-i\,e+p}{c},2;\frac{-d-i\,e+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)-\right.$$
$$\left.{}_2F_1\left(\frac{c-d-i\,e+p}{c},2;\frac{-d-i\,e+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)-$$
$$a\sqrt{a^2-b^2}\left({}_2F_1\left(\frac{c-d-i\,e+p}{c},2;\frac{-d-i\,e+p}{c}+2;\frac{b\,e^{c\,z}}{\sqrt{a^2-b^2}-a}\right)+\right.$$
$$\left.\left.\left.{}_2F_1\left(\frac{c-d-i\,e+p}{c},2;\frac{-d-i\,e+p}{c}+2;-\frac{b\,e^{c\,z}}{a+\sqrt{a^2-b^2}}\right)\right)\right)\right)$$

Involving $\frac{e^{p\,z}\cos(e\,z)\sinh(d\,z)}{a+b\cosh^2(c\,z)}$

01.20.21.4888.01

$$\int \frac{e^{p z} \cos(e z) \sinh(d z)}{a + b \cosh^2(c z)}\, dz ==$$
$$\frac{1}{4}\left(\left(e^{(2c-d+ie+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,1;\frac{-d+ie+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,1;\frac{-d+ie+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c-d+ie+p)\right)+\left(e^{(2c-d-ie+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-ie+p}{2c}+1,1;\frac{-d-ie+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d-ie+p}{2c}+1,1;\frac{-d-ie+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c-d-ie+p)\right)-\left(e^{(2c+d+ie+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+ie+p}{2c}+1,1;\frac{d+ie+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d+ie+p}{2c}+1,1;\frac{d+ie+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c+d+ie+p)\right)-\left(e^{(2c+d-ie+p)z}\left(\left(2a-2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-ie+p}{2c}+1,1;\frac{d-ie+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(-2a-2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{d-ie+p}{2c}+1,1;\frac{d-ie+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)\right)\right)\Big/\left(\sqrt{a}\,b\sqrt{a+b}\,(2c+d-ie+p)\right)\right)$$

Involving $e^{p z} \cos(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{-n}$

01.20.21.4889.01

$$\int \frac{e^{p z} \cos(e z) \sinh(d z)}{\left(a + b \cosh^2(c z)\right)^2}\, dz == \frac{1}{4}\left(\left(e^{(2c-d+ie+p)z}\left(-(2a+b)\left(-2a+2\sqrt{a+b}\,\sqrt{a}-b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,1;\frac{-d+ie+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+(-2a-b)\left(2a+2\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,1;\frac{-d+ie+p}{2c}+2;-\frac{b e^{2cz}}{2a-2\sqrt{a+b}\,\sqrt{a}+b}\right)+2\sqrt{a}\left(\left(-2a^{3/2}+2\sqrt{a+b}\,a-2b\sqrt{a}+b\sqrt{a+b}\right){}_2F_1\left(\frac{-d+ie+p}{2c}+1,2;\frac{-d+ie+p}{2c}+2;-\frac{b e^{2cz}}{2a+2\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2a^{3/2}+2\sqrt{a+b}\,a+2b\sqrt{a}+b\sqrt{a+b}\right)\right)\right)\right)$$

$$
{}_2F_1\left(\frac{-d+i\,e+p}{2\,c}+1,\,2;\,\frac{-d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-d+i\,e+p)\right)+\Bigg(e^{(2\,c-d-i\,e+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)
$$

$$
{}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,1;\,\frac{-d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,1;\,\frac{-d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,2;\,\frac{-d-i\,e+p}{2\,c}+\right.
$$

$$
\left.2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)
$$

$$
{}_2F_1\left(\frac{-d-i\,e+p}{2\,c}+1,\,2;\,\frac{-d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c-d-i\,e+p)\right)-\Bigg(e^{(2\,c+d+i\,e+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)
$$

$$
{}_2F_1\left(\frac{d+i\,e+p}{2\,c}+1,\,1;\,\frac{d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d+i\,e+p}{2\,c}+1,\,1;\,\frac{d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d+i\,e+p}{2\,c}+1,\,2;\,\frac{d+i\,e+p}{2\,c}+\right.
$$

$$
\left.2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right)
$$

$$
{}_2F_1\left(\frac{d+i\,e+p}{2\,c}+1,\,2;\,\frac{d+i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)\Bigg)\Bigg)\Bigg)\Bigg)\Bigg/
$$

$$
\left(2\,a^{3/2}\,b\,(a+b)^{3/2}\,(2\,c+d+i\,e+p)\right)-\Bigg(e^{(2\,c+d-i\,e+p)\,z}\Bigg(-(2\,a+b)\left(-2\,a+2\,\sqrt{a+b}\,\sqrt{a}-b\right)
$$

$$
{}_2F_1\left(\frac{d-i\,e+p}{2\,c}+1,\,1;\,\frac{d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
(-2\,a-b)\left(2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b\right){}_2F_1\left(\frac{d-i\,e+p}{2\,c}+1,\,1;\,\frac{d-i\,e+p}{2\,c}+2;\,-\frac{b\,e^{2\,c\,z}}{2\,a-2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+
$$

$$
2\,\sqrt{a}\,\Bigg(\left(-2\,a^{3/2}+2\,\sqrt{a+b}\,a-2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d-i\,e+p}{2\,c}+1,\,2;\,\frac{d-i\,e+p}{2\,c}+2;\right.
$$

$$
\left.-\frac{b\,e^{2\,c\,z}}{2\,a+2\,\sqrt{a+b}\,\sqrt{a}+b}\right)+\left(2\,a^{3/2}+2\,\sqrt{a+b}\,a+2\,b\,\sqrt{a}+b\,\sqrt{a+b}\right){}_2F_1\left(\frac{d-i\,e+p}{2\,c}+\right.
$$

$$
\left.\frac{d-i\,e+p}{\qquad\qquad}\qquad\qquad\frac{b\,e^{2\,c\,z}}{\qquad\qquad}\right)\Bigg)\Bigg)\Bigg)\Bigg/\left(\qquad\qquad\right)
$$

Involving cos, rational functions of sinh and exp

Involving $e^{p z} \cos(d z) (a \sinh(e z) + b \cosh(e z))^{-n}$

01.20.21.4890.01

$$\int \frac{e^{p z} \cos(d z)}{a \sinh(e z) + b \cosh(e z)} dz == -\frac{1}{a-b}$$
$$\left(\frac{e^{(e-i d+p) z}}{e-i d+p} {}_2F_1\left(\frac{e-i d+p}{2e}, 1; \frac{3e-i d+p}{2e}; \frac{(a+b) e^{2 e z}}{a-b}\right) + \frac{e^{(e+i d+p) z}}{e+i d+p} {}_2F_1\left(\frac{e+i d+p}{2e}, 1; \frac{3e+i d+p}{2e}; \frac{(a+b) e^{2 e z}}{a-b}\right)\right)$$

01.20.21.4891.01

$$\int \frac{e^{p z} \cos(d z)}{(a \sinh(e z) + b \cosh(e z))^2} dz == \frac{2}{(a-b)^2}\left(\frac{e^{(2e-i d+p) z}}{2e-i d+p} {}_2F_1\left(\frac{-i d+p}{2e}+1, 2; \frac{-i d+p}{2e}+2; \frac{(a+b) e^{2 e z}}{a-b}\right) + \right.$$
$$\left.\frac{e^{(2e+i d+p) z}}{2e+i d+p} {}_2F_1\left(\frac{i d+p}{2e}+1, 2; \frac{i d+p}{2e}+2; \frac{(a+b) e^{2 e z}}{a-b}\right)\right)$$

Involving $e^{p z} \cos(d z) (a + b \sinh(e z) + c \cosh(e z))^{-n}$

01.20.21.4892.01

$$\int \frac{e^{p z} \cos(d z)}{a + b \sinh(e z) + c \cosh(e z)} dz ==$$
$$\frac{1}{2}\left(-\left(e^{(e-i d+p) z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right) {}_2F_1\left(\frac{e-i d+p}{e}, 1; \frac{-i d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right) + \left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.\right.$$
$$\left.\left.\left. {}_2F_1\left(\frac{e-i d+p}{e}, 1; \frac{-i d+p}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right) \Big/ \left((b-c)\sqrt{a^2+b^2-c^2}\,(e-i d+p)\right) -$$
$$\left(e^{(e+i d+p) z}\left(\left(a+\sqrt{a^2+b^2-c^2}\right) {}_2F_1\left(\frac{e+i d+p}{e}, 1; \frac{i d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right) + \left(\sqrt{a^2+b^2-c^2}-a\right)\right.\right.$$
$$\left.\left. {}_2F_1\left(\frac{e+i d+p}{e}, 1; \frac{i d+p}{e}+2; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right)\right)\right) \Big/ \left((b-c)\sqrt{a^2+b^2-c^2}\,(e+i d+p)\right)$$

01.20.21.4893.01

$$\int \frac{e^{p z} \cos(d z)}{(a + b \sinh(e z) + c \cosh(e z))^2} dz ==$$
$$\frac{1}{2}\left(\left(e^{(e-i d+p) z}\left({}_2F_1\left(\frac{e-i d+p}{e}, 2; \frac{-i d+p}{e}+2; \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right) a^2 - {}_2F_1\left(\frac{e-i d+p}{e}, 2; \frac{-i d+p}{e}+2;\right.\right.\right.\right.$$
$$\left.\left.\left.\left. -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}\right) a^2 + \left(a-\sqrt{a^2+b^2-c^2}\right) {}_2F_1\left(\frac{e-i d+p}{e}, 1; \frac{-i d+p}{e}+2;\right.\right.\right.\right.$$

$$-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\Bigg)a+\sqrt{a^2+b^2-c^2}\;{}_2F_1\Bigg(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\Bigg)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\Bigg(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\Bigg)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\Bigg(\frac{e-i\,d\,+p}{e},\,1;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\Bigg)+$$

$$b^2\,{}_2F_1\Bigg(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\Bigg)-$$

$$c^2\,{}_2F_1\Bigg(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\Bigg)-$$

$$b^2\,{}_2F_1\Bigg(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\Bigg)+$$

$$c^2\,{}_2F_1\Bigg(\frac{e-i\,d\,+p}{e},\,2;\,\frac{-i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\Bigg)\Bigg)\Bigg)\Bigg/$$

$$\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e-i\,d\,+p)\right)+\Bigg(e^{(e+i\,d+p)\,z}\Bigg({}_2F_1\Bigg(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\Bigg)a^2-$$

$${}_2F_1\Bigg(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\Bigg)a^2+$$

$$\left(a-\sqrt{a^2+b^2-c^2}\right){}_2F_1\Bigg(\frac{e+i\,d\,+p}{e},\,1;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\Bigg)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\Bigg(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\Bigg)a+$$

$$\sqrt{a^2+b^2-c^2}\;{}_2F_1\Bigg(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\Bigg)a-$$

$$a\left(a+\sqrt{a^2+b^2-c^2}\right){}_2F_1\Bigg(\frac{e+i\,d\,+p}{e},\,1;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\;-a}\Bigg)+$$

$$b^2\,{}_2F_1\left(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\,-a}\right)-$$

$$c^2\,{}_2F_1\left(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,\frac{(b+c)\,e^{e\,z}}{\sqrt{a^2+b^2-c^2}\,-a}\right)-$$

$$b^2\,{}_2F_1\left(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)+$$

$$c^2\,{}_2F_1\left(\frac{e+i\,d\,+p}{e},\,2;\,\frac{i\,d+p}{e}+2;\,-\frac{(b+c)\,e^{e\,z}}{a+\sqrt{a^2+b^2-c^2}}\right)\Bigg)\Bigg)\Bigg/\left((b-c)\left(a^2+b^2-c^2\right)^{3/2}(e+i\,d\,+p)\right)$$

Involving $e^{p\,z}\cos(d\,z)\left(a\sinh^2(e\,z)+b\cosh^2(e\,z)\right)^{-n}$

01.20.21.4894.01

$$\int\frac{e^{p\,z}\cos(d\,z)}{a\sinh^2(e\,z)+b\cosh^2(e\,z)}\,dz==$$

$$\frac{1}{2}\left(-\left(i\,e^{(2\,e-i\,d\,+p)\,z}\left(\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2\,{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,1;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2}\right)-\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2\right.\right.\right.$$

$$\left.\left.\left.{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,1;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{b}\,(a+b)\,(2\,e-i\,d\,+p)\right)-$$

$$\left(i\,e^{(2\,e+i\,d\,+p)\,z}\left(\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2\,{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,1;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2}\right)-\right.\right.$$

$$\left.\left.\left(\sqrt{a}\,-i\,\sqrt{b}\right)^2\,{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,1;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+b)\,e^{2\,e\,z}}{\left(\sqrt{a}\,+i\,\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(\sqrt{a}\,\sqrt{b}\,(a+b)\,(2\,e+i\,d\,+p)\right)\Bigg)$$

01.20.21.4895.01

$$\int \frac{e^{p z}\cos(d z)}{\left(a\sinh^2(e z)+b\cosh^2(e z)\right)^2}\,dz ==$$

$$\frac{1}{2}\left(-\left(i\,e^{(2e-i d+p)z}\left((a-b)\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\,1;\,\frac{-i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\,1;\,\frac{-i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-2i\sqrt{a}\sqrt{b}\left({}_2F_1\left(\frac{-i d+p}{2e}+1,\,2;\,\frac{-i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2+\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\,2;\,\frac{-i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(2a^{3/2}b^{3/2}(a+b)(2e-i d+p)\right)-\left(i\,e^{(2e+i d+p)z}\left((a-b)\,{}_2F_1\left(\frac{i d+p}{2e}+1,\,1;\,\frac{i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2-\left(\sqrt{a}-i\sqrt{b}\right)^2(a-b)\,{}_2F_1\left(\frac{i d+p}{2e}+1,\,1;\,\frac{i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)-2i\sqrt{a}\sqrt{b}\left({}_2F_1\left(\frac{i d+p}{2e}+1,\,2;\,\frac{i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}-i\sqrt{b}\right)^2}\right)\left(\sqrt{a}+i\sqrt{b}\right)^2+\left(\sqrt{a}-i\sqrt{b}\right)^2\,{}_2F_1\left(\frac{i d+p}{2e}+1,\,2;\,\frac{i d+p}{2e}+2;\,\frac{(a+b)\,e^{2ez}}{\left(\sqrt{a}+i\sqrt{b}\right)^2}\right)\right)\right)\Big/\left(2a^{3/2}b^{3/2}(a+b)(2e+i d+p)\right)\right)$$

Involving $e^{p z}\cos(d z)\left(a+b\sinh^2(e z)+c\cosh^2(e z)\right)^{-n}$

01.20.21.4896.01

$$\int \frac{e^{p z} \cos(d z)}{a + b \sinh^2(e z) + c \cosh^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(\left(e^{(2e-i d+p)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{-i d+p}{2e}+1,\,1;\,\frac{-i d+p}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{-i d+p}{2e}+1,\,1;\,\frac{-i d+p}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a-b)(a+c)}\;(b+c)(2e-i d+p)\right)+\left(e^{(2e+i d+p)z}\left(\left(2a-b+c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{i d+p}{2e}+1,\,1;\,\frac{i d+p}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\left(-2a+b-c+2\sqrt{(a-b)(a+c)}\right){}_2F_1\left(\frac{i d+p}{2e}+1,\,1;\,\frac{i d+p}{2e}+2;\,\frac{(b+c)e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)\right)\right)\Big/\left(\sqrt{(a-b)(a+c)}\;(b+c)(2e+i d+p)\right)\right)$$

01.20.21.4897.01

$$\int \frac{e^{p z} \cos(d z)}{\left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^2} dz ==$$

$$\frac{1}{2}\left(-\left(\left((b+c)\, e^{(2e-i d+p)z}\left(2\sqrt{(a-b)(a+c)}\left(\frac{{}_2F_1\left(\frac{-i d+p}{2e}+1,\,2;\,\frac{-i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.\right.\right.\right.$$

$$\left.\left.\left.\left.\frac{{}_2F_1\left(\frac{-i d+p}{2e}+1,\,2;\,\frac{-i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.\right.\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\,1;\,\frac{-i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\,1;\,\frac{-i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Bigg/$$

$$\left(2\left((a-b)(a+c)\right)^{3/2}(2e-i d+p)\right)-\left((b+c)\, e^{(2e+i d+p)z}\left(2\sqrt{(a-b)(a+c)}\right.\right.$$

$$\left.\left(\frac{{}_2F_1\left(\frac{i d+p}{2e}+1,\,2;\,\frac{i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\frac{{}_2F_1\left(\frac{i d+p}{2e}+1,\,2;\,\frac{i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)+\right.$$

$$\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{i d+p}{2e}+1,\,1;\,\frac{i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c-2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c+2\sqrt{(a-b)(a+c)}}-\right.$$

$$\left.\left.\left.\frac{(2a-b+c)\,{}_2F_1\left(\frac{i d+p}{2e}+1,\,1;\,\frac{i d+p}{2e}+2;\,\frac{(b+c)\,e^{2ez}}{-2a+b-c+2\sqrt{(a-b)(a+c)}}\right)}{2a-b+c-2\sqrt{(a-b)(a+c)}}\right)\right)\Bigg/\left(2\left((a-b)(a+c)\right)^{3/2}(2e+i d+p)\right)\right)$$

Involving $e^{p z}\cos(d z)\left(a\sinh^2(e z)+b\sinh(2ez)+c\cosh^2(e z)\right)^{-n}$

01.20.21.4898.01

$$\int \frac{e^{p z} \cos(d z)}{a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)}\, dz ==$$

$$\frac{1}{2}\left(-\left((a+2b+c)\, e^{(2e-i d+p)z}\left(\left(-a+c+2\sqrt{b^2-a c}\right){}_2F_1\left(\frac{-i d+p}{2e}+1,\, 1;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}}\right)+\right.\right.\right.$$

$$\left.\left.\left.\left(a-c+2\sqrt{b^2-a c}\right){}_2F_1\left(\frac{-i d+p}{2e}+1,\, 1;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}}\right)\right)\right)\Bigg/$$

$$\left(\sqrt{b^2-a c}\left(a-c+2\sqrt{b^2-a c}\right)\left(-a+c+2\sqrt{b^2-a c}\right)(2e-i d+p)\right)-$$

$$\left((a+2b+c)\, e^{(2e+i d+p)z}\left(\left(-a+c+2\sqrt{b^2-a c}\right){}_2F_1\left(\frac{i d+p}{2e}+1,\, 1;\, \frac{i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}}\right)+\right.\right.$$

$$\left.\left.\left(a-c+2\sqrt{b^2-a c}\right){}_2F_1\left(\frac{i d+p}{2e}+1,\, 1;\, \frac{i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}}\right)\right)\right)\Bigg/$$

$$\left.\left(\sqrt{b^2-a c}\left(a-c+2\sqrt{b^2-a c}\right)\left(-a+c+2\sqrt{b^2-a c}\right)(2e+i d+p)\right)\right)$$

01.20.21.4899.01

$$\int \frac{e^{p z} \cos(d z)}{\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^2}\, dz ==$$

$$\frac{1}{2}\left(\left((a+2b+c)\, e^{(2e-i d+p)z}\left(4\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\, 2;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}}\right)b^2-\right.\right.\right.$$

$$4\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\, 2;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}}\right)b^2+$$

$$(a-c)\left(-a+c+2\sqrt{b^2-a c}\right){}_2F_1\left(\frac{-i d+p}{2e}+1,\, 1;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}}\right)+$$

$$(a-c)\left(a-c+2\sqrt{b^2-a c}\right){}_2F_1\left(\frac{-i d+p}{2e}+1,\, 1;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c-2\sqrt{b^2-a c}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(\frac{-i d+p}{2e}+1,\, 2;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}}\right)-$$

$$\left.\left.2\,a\sqrt{b^2-a c}\;{}_2F_1\left(\frac{-i d+p}{2e}+1,\, 2;\, \frac{-i d+p}{2e}+2;\, \frac{(a+2b+c)\, e^{2ez}}{a-c+2\sqrt{b^2-a c}}\right)+\right.\right.$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{-i\,d+p}{2\,e}+1,\,2;\,\frac{-i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e-i\,d\,+p)\right)+$$

$$\left((a+2\,b+c)\,e^{(2\,e+i\,d+p)\,z}\left(4\,{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)b^2-\right.\right.$$

$$4\,{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)b^2+$$

$$(a-c)\left(-a+c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,1;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$(a-c)\left(a-c+2\,\sqrt{b^2-a\,c}\right){}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,1;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$4\,a\,c\,{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c+2\,\sqrt{b^2-a\,c}}\right)+$$

$$4\,a\,c\,{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)-$$

$$2\,a\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)+$$

$$2\,c\,\sqrt{b^2-a\,c}\;{}_2F_1\left(\frac{i\,d+p}{2\,e}+1,\,2;\,\frac{i\,d+p}{2\,e}+2;\,\frac{(a+2\,b+c)\,e^{2\,e\,z}}{a-c-2\,\sqrt{b^2-a\,c}}\right)\Bigg)\Bigg)\Bigg/$$

$$\left(2\left(b^2-a\,c\right)^{3/2}\left(a-c+2\,\sqrt{b^2-a\,c}\right)\left(-a+c+2\,\sqrt{b^2-a\,c}\right)(2\,e+i\,d+p)\right)$$

Involving algebraic functions of the direct function, hyperbolic, exponential and trigonometric functions

Involving sin, sinh and exp

Involving $e^{p\,z}\,\sin(e\,z)\,\sinh(d\,z)\,(a+b\,\cosh(c\,z))^{\beta}$

01.20.21.4900.01

$$\int e^{p z} \sin(e z) \sinh(d z) (a + b \cosh(c z))^{\beta} \, dz ==$$

$$\frac{1}{4} i \left(\frac{1}{-d + i e + p - c \beta} \left(e^{(-d+i e+p) z} \left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right)^{-\beta} \left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1 \right)^{-\beta} \left(a + \frac{1}{2} b e^{-c z} \left(1 + e^{2 c z} \right) \right)^{\beta} \right.\right.$$

$$\left. F_1 \left(\frac{-d + i e + p - c \beta}{c}; -\beta, -\beta; \frac{-d + i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right) \right) -$$

$$\frac{1}{d + i e + p - c \beta} \left(e^{(d+i e+p) z} \left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right)^{-\beta} \left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1 \right)^{-\beta} \left(a + \frac{1}{2} b e^{-c z} \left(1 + e^{2 c z} \right) \right)^{\beta} \right.$$

$$\left. F_1 \left(\frac{d + i e + p - c \beta}{c}; -\beta, -\beta; \frac{d + i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right) \right) +$$

$$\frac{1}{d - i e + p - c \beta} \left(e^{(d-i e+p) z} \left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right)^{-\beta} \left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1 \right)^{-\beta} \left(a + \frac{1}{2} b e^{-c z} \left(1 + e^{2 c z} \right) \right)^{\beta} \right.$$

$$\left. F_1 \left(\frac{d - i e + p - c \beta}{c}; -\beta, -\beta; \frac{d - i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right) \right) -$$

$$\frac{1}{-d - i e + p - c \beta} \left(e^{(-d-i e+p) z} \left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right)^{-\beta} \left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1 \right)^{-\beta} \left(a + \frac{1}{2} b e^{-c z} \left(1 + e^{2 c z} \right) \right)^{\beta} \right.$$

$$\left.\left. F_1 \left(\frac{-d - i e + p - c \beta}{c}; -\beta, -\beta; \frac{-d - i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a} \right) \right) \right)$$

Involving $e^{p z} \sin(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{\beta}$

01.20.21.4901.01

$$\int e^{p z} \sin(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{\beta} dz ==$$

$$\frac{1}{4} i \left(\frac{1}{-d + i e + p - 2 c \beta} \left(e^{(-d+i e+p) z} \left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \right.\right.$$
$$\left(\frac{1}{4} b e^{-2 c z} \left(1 + e^{2 c z}\right)^2 + a \right)^{\beta} F_1 \left(\frac{-d + i e + p}{2 c} - \beta; -\beta, -\beta; \frac{-d + i e + p}{2 c} - \beta + 1; \right.$$
$$\left.\left. - \frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, - \frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}} \right) \right) + \frac{1}{d - i e + p - 2 c \beta}$$
$$\left(e^{(d-i e+p) z} \left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(1 + e^{2 c z}\right)^2 + a \right)^{\beta} \right.$$
$$\left. F_1 \left(\frac{d - i e + p}{2 c} - \beta; -\beta, -\beta; \frac{d - i e + p}{2 c} - \beta + 1; - \frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, - \frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}} \right) \right) -$$
$$\frac{1}{d + i e + p - 2 c \beta} \left(e^{(d+i e+p) z} \left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \right.$$
$$\left(\frac{1}{4} b e^{-2 c z} \left(1 + e^{2 c z}\right)^2 + a \right)^{\beta} F_1 \left(\frac{d + i e + p}{2 c} - \beta; -\beta, -\beta; \frac{d + i e + p}{2 c} - \beta + 1; \right.$$
$$\left.\left. - \frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, - \frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}} \right) \right) - \frac{1}{-d - i e + p - 2 c \beta}$$
$$\left(e^{(-d-i e+p) z} \left(\frac{e^{2 c z} b}{2 a + b - 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \left(\frac{e^{2 c z} b}{2 a + b + 2 \sqrt{a (a+b)}} + 1 \right)^{-\beta} \left(\frac{1}{4} b e^{-2 c z} \left(1 + e^{2 c z}\right)^2 + a \right)^{\beta} \right.$$
$$\left.\left. F_1 \left(\frac{-d - i e + p}{2 c} - \beta; -\beta, -\beta; \frac{-d - i e + p}{2 c} - \beta + 1; - \frac{b e^{2 c z}}{2 a + b + 2 \sqrt{a (a+b)}}, - \frac{b e^{2 c z}}{2 a + b - 2 \sqrt{a (a+b)}} \right) \right) \right)$$

Involving sin, algebraic functions of sinh and exp

Involving $e^{p z} \sin(d z) (a \sinh(e z) + b \cosh(e z))^{\beta}$

01.20.21.4902.01

$$\int e^{p z} \sin(d z) (a \sinh(e z) + b \cosh(e z))^{\beta} dz ==$$
$$-\frac{1}{2} i \left(\frac{1}{i d - p + e \beta} \left(2^{-\beta} e^{(-i d+p) z} \left(\frac{e^{2 e z} (a+b)}{b-a} + 1 \right)^{-\beta} \left(e^{-e z} \left(a \left(-1 + e^{2 e z} \right) + b \left(1 + e^{2 e z} \right) \right) \right)^{\beta} \right.\right.$$
$$\left. {}_2F_1 \left(\frac{-i d + p - e \beta}{2 e}, -\beta; \frac{1}{2} \left(\frac{-i d + p}{e} - \beta + 2 \right); \frac{(a+b) e^{2 e z}}{a-b} \right) \right) - \frac{1}{-i d - p + e \beta} \left(2^{-\beta} e^{(i d+p) z} \left(\frac{e^{2 e z} (a+b)}{b-a} + 1 \right)^{-\beta} \right.$$
$$\left.\left. \left(e^{-e z} \left(a \left(-1 + e^{2 e z} \right) + b \left(1 + e^{2 e z} \right) \right) \right)^{\beta} {}_2F_1 \left(\frac{i d + p - e \beta}{2 e}, -\beta; \frac{1}{2} \left(\frac{i d + p}{e} - \beta + 2 \right); \frac{(a+b) e^{2 e z}}{a-b} \right) \right) \right)$$

Involving $e^{p z} \sin(d z) (a + b \sinh(e z) + c \cosh(e z))^{\beta}$

01.20.21.4903.01

$$\int e^{p z} \sin(d z) (a + b \sinh(e z) + c \cosh(e z))^{\beta} dz == -\frac{1}{2} i \left(\frac{1}{i d - p + e \beta} \right.$$
$$\left(2^{-\beta} e^{(-i d+p) z} \left(1 - \frac{(b+c) e^{e z}}{\sqrt{a^2 + b^2 - c^2} - a} \right)^{-\beta} \left(\frac{e^{e z} (b+c)}{a + \sqrt{a^2 + b^2 - c^2}} + 1 \right)^{-\beta} \left(e^{-e z} \left(2 e^{e z} a + c e^{2 e z} + c + b \left(-1 + e^{2 e z} \right) \right) \right)^{\beta} \right.$$
$$\left. F_1 \left(\frac{-i d + p}{e} - \beta; -\beta, -\beta; \frac{-i d + p}{e} - \beta + 1; -\frac{(b+c) e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}}, \frac{(b+c) e^{e z}}{\sqrt{a^2 + b^2 - c^2} - a} \right) \right) - \frac{1}{-i d - p + e \beta}$$
$$\left(2^{-\beta} e^{(i d+p) z} \left(1 - \frac{(b+c) e^{e z}}{\sqrt{a^2 + b^2 - c^2} - a} \right)^{-\beta} \left(\frac{e^{e z} (b+c)}{a + \sqrt{a^2 + b^2 - c^2}} + 1 \right)^{-\beta} \left(e^{-e z} \left(2 e^{e z} a + c e^{2 e z} + c + b \left(-1 + e^{2 e z} \right) \right) \right)^{\beta} \right.$$
$$\left.\left. F_1 \left(\frac{i d + p}{e} - \beta; -\beta, -\beta; \frac{i d + p}{e} - \beta + 1; -\frac{(b+c) e^{e z}}{a + \sqrt{a^2 + b^2 - c^2}}, \frac{(b+c) e^{e z}}{\sqrt{a^2 + b^2 - c^2} - a} \right) \right) \right)$$

Involving $e^{p z} \sin(d z) \left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{\beta}$

01.20.21.4904.01

$$\int e^{p z} \sin(d z) \left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{\beta} dz == -\frac{1}{2} i \left(\frac{1}{i d - p + 2 e \beta}\right.$$
$$\left(4^{-\beta} e^{(-i d+p) z} \left(1 - \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)^{-\beta} \left(\frac{e^{2 e z} (a+b)}{-a + b + 2\sqrt{-a b}} + 1\right)^{-\beta} \left(e^{-2 e z} \left(a \left(-1 + e^{2 e z}\right)^2 + b \left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}\right.$$
$$\left. F_1\left(\frac{-i d + p}{2 e} - \beta; -\beta, -\beta; \frac{-i d + p}{2 e} - \beta + 1; -\frac{(a+b) e^{2 e z}}{-a + b + 2\sqrt{-a b}}, \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)\right) - \frac{1}{-i d - p + 2 e \beta}$$
$$\left(4^{-\beta} e^{(i d+p) z} \left(1 - \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)^{-\beta} \left(\frac{e^{2 e z} (a+b)}{-a + b + 2\sqrt{-a b}} + 1\right)^{-\beta} \left(e^{-2 e z} \left(a \left(-1 + e^{2 e z}\right)^2 + b \left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}\right.$$
$$\left. \left. F_1\left(\frac{i d + p}{2 e} - \beta; -\beta, -\beta; \frac{i d + p}{2 e} - \beta + 1; -\frac{(a+b) e^{2 e z}}{-a + b + 2\sqrt{-a b}}, \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)\right)\right)$$

Involving $e^{p z} \sin(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta}$

01.20.21.4905.01

$$\int e^{p z} \sin(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta} dz ==$$
$$-\frac{1}{2} i \left(\frac{1}{i d - p + 2 e \beta} \left(4^{-\beta} e^{(-i d+p) z} \left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta} \left(\frac{e^{2 e z} (b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2 e z} \left(b \left(-1 + e^{2 e z}\right)^2 + 4 a e^{2 e z} + c \left(1 + e^{2 e z}\right)^2\right)\right)^{\beta} F_1\left(\frac{-i d + p}{2 e} - \beta; -\beta, -\beta;\right.$$
$$\left.\left.\frac{-i d + p}{2 e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\right) -$$
$$\frac{1}{-i d - p + 2 e \beta} \left(4^{-\beta} e^{(i d+p) z} \left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta} \left(\frac{e^{2 e z} (b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.$$
$$\left(e^{-2 e z} \left(b \left(-1 + e^{2 e z}\right)^2 + 4 a e^{2 e z} + c \left(1 + e^{2 e z}\right)^2\right)\right)^{\beta}$$
$$\left. \left. F_1\left(\frac{i d + p}{2 e} - \beta; -\beta, -\beta; \frac{i d + p}{2 e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\right)\right)$$

Involving $e^{p z} \sin(d z) \left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{\beta}$

01.20.21.4906.01

$$\int e^{p z} \sin(d z) \left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{\beta} dz ==$$

$$-\frac{1}{2} i \left(\frac{1}{i d - p + 2 e \beta} \left(4^{-\beta} e^{(-i d + p) z} \left(1 - \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2 \sqrt{b^2 - a c}} \right)^{-\beta} \left(\frac{e^{2 e z} (a + 2 b + c)}{-a + c + 2 \sqrt{b^2 - a c}} + 1 \right)^{-\beta} \right.\right.$$

$$\left(e^{-2 e z} \left(a \left(-1 + e^{2 e z}\right)^2 + \left(1 + e^{2 e z}\right) \left(2 b \left(-1 + e^{2 e z}\right) + c \left(1 + e^{2 e z}\right)\right)\right)\right)^{\beta}$$

$$\left. F_1 \left(\frac{-i d + p}{2 e} - \beta; -\beta, -\beta; \frac{-i d + p}{2 e} - \beta + 1; -\frac{(a + 2 b + c) e^{2 e z}}{-a + c + 2 \sqrt{b^2 - a c}}, \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2 \sqrt{b^2 - a c}} \right) \right) -$$

$$\frac{1}{-i d - p + 2 e \beta} \left(4^{-\beta} e^{(i d + p) z} \left(1 - \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2 \sqrt{b^2 - a c}} \right)^{-\beta} \left(\frac{e^{2 e z} (a + 2 b + c)}{-a + c + 2 \sqrt{b^2 - a c}} + 1 \right)^{-\beta} \right.$$

$$\left(e^{-2 e z} \left(a \left(-1 + e^{2 e z}\right)^2 + \left(1 + e^{2 e z}\right) \left(2 b \left(-1 + e^{2 e z}\right) + c \left(1 + e^{2 e z}\right)\right)\right)\right)^{\beta}$$

$$\left. \left. F_1 \left(\frac{i d + p}{2 e} - \beta; -\beta, -\beta; \frac{i d + p}{2 e} - \beta + 1; -\frac{(a + 2 b + c) e^{2 e z}}{-a + c + 2 \sqrt{b^2 - a c}}, \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2 \sqrt{b^2 - a c}} \right) \right) \right)$$

Involving cos, sinh and exp

Involving $e^{p z} \cos(e z) \sinh(d z) (a + b \cosh(c z))^{\beta}$

01.20.21.4907.01

$$\int e^{p z} \cos(e z) \sinh(d z) (a + b \cosh(c z))^{\beta} dz ==$$

$$\frac{1}{4}\left(\frac{1}{d + i e + p - c \beta}\left(e^{(d+i e+p) z}\left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)^{-\beta}\left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}\right.\right.$$

$$\left.F_1\left(\frac{d + i e + p - c \beta}{c}; -\beta, -\beta; \frac{d + i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)\right) +$$

$$\frac{1}{d - i e + p - c \beta}\left(e^{(d-i e+p) z}\left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)^{-\beta}\left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{d - i e + p - c \beta}{c}; -\beta, -\beta; \frac{d - i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)\right) -$$

$$\frac{1}{-d + i e + p - c \beta}\left(e^{(-d+i e+p) z}\left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)^{-\beta}\left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}\right.$$

$$\left.F_1\left(\frac{-d + i e + p - c \beta}{c}; -\beta, -\beta; \frac{-d + i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)\right) -$$

$$\frac{1}{-d - i e + p - c \beta}\left(e^{(-d-i e+p) z}\left(1 - \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)^{-\beta}\left(\frac{2 e^{c z} b}{2 a + \sqrt{4 a^2 - 4 b^2}} + 1\right)^{-\beta}\left(a + \frac{1}{2} b e^{-c z}\left(1 + e^{2 c z}\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{-d - i e + p - c \beta}{c}; -\beta, -\beta; \frac{-d - i e + p - c \beta}{c} + 1; -\frac{2 b e^{c z}}{2 a + \sqrt{4 a^2 - 4 b^2}}, \frac{2 b e^{c z}}{\sqrt{4 a^2 - 4 b^2} - 2 a}\right)\right)\right)$$

Involving $e^{p z} \cos(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{\beta}$

01.20.21.4908.01

$$\int e^{p z} \cos(e z) \sinh(d z) \left(a + b \cosh^2(c z)\right)^{\beta} dz ==$$

$$\frac{1}{4}\left(\frac{1}{d + i e + p - 2 c \beta}\left(e^{(d+i e+p) z}\left(\frac{e^{2 c z} b}{2 a + b - 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}\right.\right.$$
$$\left.F_1\left(\frac{d + i e + p}{2 c} - \beta; -\beta, -\beta; \frac{d + i e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right) +$$
$$\frac{1}{d - i e + p - 2 c \beta}\left(e^{(d-i e+p) z}\left(\frac{e^{2 c z} b}{2 a + b - 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\right.$$
$$\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta} F_1\left(\frac{d - i e + p}{2 c} - \beta; -\beta, -\beta;\right.$$
$$\left.\left.\frac{d - i e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right) -$$
$$\frac{1}{-d + i e + p - 2 c \beta}\left(e^{(-d+i e+p) z}\left(\frac{e^{2 c z} b}{2 a + b - 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\right.$$
$$\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta} F_1\left(\frac{-d + i e + p}{2 c} - \beta; -\beta, -\beta; \frac{-d + i e + p}{2 c} - \beta + 1;\right.$$
$$\left.\left.-\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right) - \frac{1}{-d - i e + p - 2 c \beta}$$
$$\left(e^{(-d-i e+p) z}\left(\frac{e^{2 c z} b}{2 a + b - 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\left(\frac{e^{2 c z} b}{2 a + b + 2\sqrt{a (a+b)}} + 1\right)^{-\beta}\left(\frac{1}{4} b e^{-2 c z}\left(1 + e^{2 c z}\right)^2 + a\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{-d - i e + p}{2 c} - \beta; -\beta, -\beta; \frac{-d - i e + p}{2 c} - \beta + 1; -\frac{b e^{2 c z}}{2 a + b + 2\sqrt{a (a+b)}}, -\frac{b e^{2 c z}}{2 a + b - 2\sqrt{a (a+b)}}\right)\right)\right)$$

Involving cos, algebraic functions of sinh and exp

Involving $e^{p z} \cos(d z) (a \sinh(e z) + b \cosh(e z))^{\beta}$

01.20.21.4909.01

$$\int e^{p z} \cos(d z) (a \sinh(e z) + b \cosh(e z))^{\beta} dz ==$$

$$\frac{1}{2}\left(-\frac{1}{i d - p + e \beta}\left(2^{-\beta} e^{(-i d+p) z}\left(\frac{e^{2 e z} (a+b)}{b-a}+1\right)^{-\beta}\left(e^{-e z}\left(a\left(-1+e^{2 e z}\right)+b\left(1+e^{2 e z}\right)\right)\right)^{\beta}\right.\right.$$

$$\left.{}_2F_1\left(\frac{-i d + p - e \beta}{2 e}, -\beta; \frac{1}{2}\left(\frac{-i d + p}{e} - \beta + 2\right); \frac{(a+b) e^{2 e z}}{a-b}\right)\right) -$$

$$\frac{1}{-i d - p + e \beta}\left(2^{-\beta} e^{(i d+p) z}\left(\frac{e^{2 e z} (a+b)}{b-a}+1\right)^{-\beta}\left(e^{-e z}\left(a\left(-1+e^{2 e z}\right)+b\left(1+e^{2 e z}\right)\right)\right)^{\beta}\right.$$

$$\left.\left.{}_2F_1\left(\frac{i d + p - e \beta}{2 e}, -\beta; \frac{1}{2}\left(\frac{i d + p}{e} - \beta + 2\right); \frac{(a+b) e^{2 e z}}{a-b}\right)\right)\right)$$

Involving $e^{p z} \cos(d z) (a + b \sinh(e z) + c \cosh(e z))^{\beta}$

01.20.21.4910.01

$$\int e^{p z} \cos(d z) (a + b \sinh(e z) + c \cosh(e z))^{\beta} dz ==$$

$$\frac{1}{2}\left(-\frac{1}{i d - p + e \beta}\left(2^{-\beta} e^{(-i d+p) z}\left(1-\frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{e z} (b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\right.\right.$$

$$\left(e^{-e z}\left(2 e^{e z} a + c e^{2 e z} + c + b\left(-1+e^{2 e z}\right)\right)\right)^{\beta} F_1\left(\frac{-i d + p}{e} - \beta; -\beta, -\beta;\right.$$

$$\left.\left.\frac{-i d + p}{e} - \beta + 1; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}, \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)\right) - \frac{1}{-i d - p + e \beta}$$

$$\left(2^{-\beta} e^{(i d+p) z}\left(1-\frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)^{-\beta}\left(\frac{e^{e z} (b+c)}{a+\sqrt{a^2+b^2-c^2}}+1\right)^{-\beta}\left(e^{-e z}\left(2 e^{e z} a + c e^{2 e z} + c + b\left(-1+e^{2 e z}\right)\right)\right)^{\beta}\right.$$

$$\left.\left.F_1\left(\frac{i d + p}{e} - \beta; -\beta, -\beta; \frac{i d + p}{e} - \beta + 1; -\frac{(b+c) e^{e z}}{a+\sqrt{a^2+b^2-c^2}}, \frac{(b+c) e^{e z}}{\sqrt{a^2+b^2-c^2}-a}\right)\right)\right)$$

Involving $e^{p z} \cos(d z) \left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{\beta}$

01.20.21.4911.01

$$\int e^{p z} \cos(d z) \left(a \sinh^2(e z) + b \cosh^2(e z)\right)^{\beta} dz ==$$

$$\frac{1}{2}\left(-\frac{1}{i d - p + 2 e \beta}\left(4^{-\beta} e^{(-i d+p) z}\left(1 - \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)^{-\beta}\left(\frac{e^{2 e z}(a+b)}{-a+b+2\sqrt{-a b}} + 1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2 e z}\left(a\left(-1+e^{2 e z}\right)^2 + b\left(1+e^{2 e z}\right)^2\right)\right)^{\beta} F_1\left(\frac{-i d + p}{2 e} - \beta; -\beta, -\beta;\right.$$
$$\left.\left.\frac{-i d + p}{2 e} - \beta + 1; -\frac{(a+b) e^{2 e z}}{-a+b+2\sqrt{-a b}}, \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)\right) - \frac{1}{-i d - p + 2 e \beta}$$
$$\left(4^{-\beta} e^{(i d+p) z}\left(1 - \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)^{-\beta}\left(\frac{e^{2 e z}(a+b)}{-a+b+2\sqrt{-a b}} + 1\right)^{-\beta}\left(e^{-2 e z}\left(a\left(-1+e^{2 e z}\right)^2 + b\left(1+e^{2 e z}\right)^2\right)\right)^{\beta}\right.$$
$$\left.\left.F_1\left(\frac{i d + p}{2 e} - \beta; -\beta, -\beta; \frac{i d + p}{2 e} - \beta + 1; -\frac{(a+b) e^{2 e z}}{-a+b+2\sqrt{-a b}}, \frac{(a+b) e^{2 e z}}{a - b + 2\sqrt{-a b}}\right)\right)\right)$$

Involving $e^{p z} \cos(d z)\left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta}$

01.20.21.4912.01

$$\int e^{p z} \cos(d z) \left(a + b \sinh^2(e z) + c \cosh^2(e z)\right)^{\beta} dz ==$$

$$\frac{1}{2}\left(-\frac{1}{i d - p + 2 e \beta}\left(4^{-\beta} e^{(-i d+p) z}\left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2 e z}(b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.\right.$$
$$\left(e^{-2 e z}\left(b\left(-1+e^{2 e z}\right)^2 + 4 a e^{2 e z} + c\left(1+e^{2 e z}\right)^2\right)\right)^{\beta} F_1\left(\frac{-i d + p}{2 e} - \beta; -\beta, -\beta;\right.$$
$$\left.\left.\frac{-i d + p}{2 e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\right) -$$
$$\frac{1}{-i d - p + 2 e \beta}\left(4^{-\beta} e^{(i d+p) z}\left(1 - \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)^{-\beta}\left(\frac{e^{2 e z}(b+c)}{2 a - b + c + 2\sqrt{(a-b)(a+c)}} + 1\right)^{-\beta}\right.$$
$$\left(e^{-2 e z}\left(b\left(-1+e^{2 e z}\right)^2 + 4 a e^{2 e z} + c\left(1+e^{2 e z}\right)^2\right)\right)^{\beta}$$
$$\left.\left.F_1\left(\frac{i d + p}{2 e} - \beta; -\beta, -\beta; \frac{i d + p}{2 e} - \beta + 1; \frac{(b+c) e^{2 e z}}{-2 a + b - c - 2\sqrt{(a-b)(a+c)}}, \frac{(b+c) e^{2 e z}}{-2 a + b - c + 2\sqrt{(a-b)(a+c)}}\right)\right)\right)$$

Involving $e^{p z} \cos(d z)\left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{\beta}$

01.20.21.4913.01

$$\int e^{p z} \cos(d z) \left(a \sinh^2(e z) + b \sinh(2 e z) + c \cosh^2(e z)\right)^{\beta} dz ==$$

$$\frac{1}{2}\left(-\frac{1}{i d - p + 2 e \beta}\left(4^{-\beta} e^{(-i d+p) z}\left(1 - \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2\sqrt{b^2 - a c}}\right)^{-\beta}\left(\frac{e^{2 e z}(a + 2 b + c)}{-a + c + 2\sqrt{b^2 - a c}} + 1\right)^{-\beta}\right.\right.$$

$$\left(e^{-2 e z}\left(a\left(-1 + e^{2 e z}\right)^2 + \left(1 + e^{2 e z}\right)\left(2 b\left(-1 + e^{2 e z}\right) + c\left(1 + e^{2 e z}\right)\right)\right)\right)^{\beta}$$

$$F_1\left(\frac{-i d + p}{2 e} - \beta; -\beta, -\beta; \frac{-i d + p}{2 e} - \beta + 1; -\frac{(a + 2 b + c) e^{2 e z}}{-a + c + 2\sqrt{b^2 - a c}}, \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2\sqrt{b^2 - a c}}\right)\Bigg) -$$

$$\frac{1}{-i d - p + 2 e \beta}\left(4^{-\beta} e^{(i d+p) z}\left(1 - \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2\sqrt{b^2 - a c}}\right)^{-\beta}\left(\frac{e^{2 e z}(a + 2 b + c)}{-a + c + 2\sqrt{b^2 - a c}} + 1\right)^{-\beta}\right.$$

$$\left(e^{-2 e z}\left(a\left(-1 + e^{2 e z}\right)^2 + \left(1 + e^{2 e z}\right)\left(2 b\left(-1 + e^{2 e z}\right) + c\left(1 + e^{2 e z}\right)\right)\right)\right)^{\beta}$$

$$\left.\left.F_1\left(\frac{i d + p}{2 e} - \beta; -\beta, -\beta; \frac{i d + p}{2 e} - \beta + 1; -\frac{(a + 2 b + c) e^{2 e z}}{-a + c + 2\sqrt{b^2 - a c}}, \frac{(a + 2 b + c) e^{2 e z}}{a - c + 2\sqrt{b^2 - a c}}\right)\right)\right)$$

Involving functions of the direct function, hyperbolic, trigonometric and a power functions

Involving powers of the direct function, hyperbolic, trigonometric and a power functions

Involving sin, sinh and power

Involving $z^{\alpha-1} \sin(a z^r + q) \sinh(w z^r + t) \cosh^v(c z^r + g)$

01.20.21.4914.01

$$\int z^{\alpha-1}\sin(a z^r+q)\sinh(w z^r+t)\cosh^{\nu}(c z^r+g)\,dz ==$$

$$-\frac{1}{r}\left(i\,2^{-\nu-2}z^{\alpha}\binom{\nu}{\frac{\nu}{2}}\left(-e^{i q+t}\Gamma\left(\frac{\alpha}{r},(-i a-w)z^r\right)((-i a-w)z^r)^{-\frac{\alpha}{r}}+e^{t-i q}((i a-w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(i a-w)z^r\right)+\right.\right.$$

$$\left.\left.e^{i q-t}((-i a+w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-i a+w)z^r\right)-e^{-i q-t}((i a+w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(i a+w)z^r\right)\right)(1-\nu \bmod 2)\right)-$$

$$\frac{1}{r}\left(i\,2^{-\nu-2}z^{\alpha}\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-e^{2 g h+i q+t-g\nu}\Gamma\left(\frac{\alpha}{r},(-2 c h-i a+c\nu-w)z^r\right)((-2 c h-i a+c\nu-w)z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$e^{2 g h-i q+t-g\nu}((-2 c h+i a+c\nu-w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-2 c h+i a+c\nu-w)z^r\right)-$$

$$e^{-2 g h+i q+t+g\nu}((2 c h-i a-c\nu-w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(2 c h-i a-c\nu-w)z^r\right)+$$

$$e^{-2 g h-i q+t+g\nu}((2 c h+i a-c\nu-w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(2 c h+i a-c\nu-w)z^r\right)+$$

$$e^{2 g h+i q-t-g\nu}((-2 c h-i a+c\nu+w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-2 c h-i a+c\nu+w)z^r\right)-$$

$$e^{2 g h-i q-t-g\nu}((-2 c h+i a+c\nu+w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-2 c h+i a+c\nu+w)z^r\right)+$$

$$e^{-2 g h+i q-t+g\nu}((2 c h-i a-c\nu+w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(2 c h-i a-c\nu+w)z^r\right)-$$

$$\left.\left.e^{-2 g h-i q-t+g\nu}((2 c h+i a-c\nu+w)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(2 c h+i a-c\nu+w)z^r\right)\right)\right)/;\nu\in\mathbb{N}^+$$

Involving $z^n\ \sin(a z^r+p z+q)\sinh(w z^r+s z+t)\cosh^{\nu}(c z^r+f z+g)$

01.20.21.4915.01

$$\int z^n\sin(a z^2+p z+q)\sinh(w z^2+s z+t)\cosh^{\nu}(c z^2+f z+g)\,dz ==$$

$$-i\,2^{-\nu-3}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(-e^{-\frac{(-i p-s)^2}{4(-i a-w)}-i q-t}\left(\sum_{i=0}^{n}2^{i-n}(i p+s)^{n-i}(-i p-s+2(-i a-w)z)^{i+1}\right.\right.$$

$$\left.\left.\left(-\frac{(-i p-s+2(-i a-w)z)^2}{-i a-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(-i p-s+2(-i a-w)z)^2}{4(-i a-w)}\right)\right)(-i a-w)^{-n-1}+\right.$$

$$e^{-\frac{(i p-s)^2}{4(i a-w)}+i q-t}(i a-w)^{-n-1}\sum_{i=0}^{n}2^{i-n}(s-i p)^{n-i}(i p-s+2(i a-w)z)^{i+1}\left(-\frac{(i p-s+2(i a-w)z)^2}{i a-w}\right)^{\frac{1}{2}(-i-1)}$$

$$\left.\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(i p-s+2(i a-w)z)^2}{4(i a-w)}\right)+e^{-\frac{(s-i p)^2}{4(-i a+w)}-i q+t}(-i a+w)^{-n-1}\right.$$

$$\sum_{i=0}^{n} 2^{i-n} (i\,p-s)^{n-i} (-i\,p+s+2\,(-i\,a+w)\,z)^{i+1} \left(-\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{-i\,a+w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{4\,(-i\,a+w)}\right) - e^{-\frac{(i\,p+s)^2}{4\,(i\,a+w)}+i\,q+t} (i\,a+w)^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-i\,p-s)^{n-i}$$

$$(i\,p+s+2\,(i\,a+w)\,z)^{i+1} \left(-\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{i\,a+w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{4\,(i\,a+w)}\right) -$$

$$i\,2^{-v-3} \sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{h} \left(-e^{-\frac{(-i\,p-s+f\,(2\,h-v))^2}{4\,(-i\,a+c\,(2\,h-v)-w)}-i\,q-t+g\,(2\,h-v)} \left(\sum_{i=0}^{n} 2^{i-n} (i\,p+s-f\,(2\,h-v))^{n-i} (-i\,p-s+f\,(2\,h-v)+\right.\right.$$

$$2\,(-i\,a+c\,(2\,h-v)-w)\,z)^{i+1} \left(-\frac{(-i\,p-s+f\,(2\,h-v)+2\,(-i\,a+c\,(2\,h-v)-w)\,z)^2}{-i\,a+c\,(2\,h-v)-w}\right)^{\frac{1}{2}(-i-1)}$$

$$\left.\left.\binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(-i\,p-s+f\,(2\,h-v)+2\,(-i\,a+c\,(2\,h-v)-w)\,z)^2}{4\,(-i\,a+c\,(2\,h-v)-w)}\right)\right)\right.$$

$$(-i\,a+c\,(2\,h-v)-w)^{-n-1} + e^{-\frac{(i\,p-s+f\,(2\,h-v))^2}{4\,(i\,a+c\,(2\,h-v)-w)}+i\,q-t+g\,(2\,h-v)} (i\,a+c\,(2\,h-v)-w)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} (-i\,p+s-f\,(2\,h-v))^{n-i} (i\,p-s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)-w)\,z)^{i+1}$$

$$\left(-\frac{(i\,p-s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)-w)\,z)^2}{i\,a+c\,(2\,h-v)-w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{(i\,p-s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)-w)\,z)^2}{4\,(i\,a+c\,(2\,h-v)-w)}\right) -$$

$$e^{-\frac{(-i\,p-s+f\,(v-2\,h))^2}{4\,(-i\,a+c\,(v-2\,h)-w)}-i\,q-t+g\,(v-2\,h)} (-i\,a+c\,(v-2\,h)-w)^{-n-1} \sum_{i=0}^{n} 2^{i-n} (i\,p+s-f\,(v-2\,h))^{n-i}$$

$$(-i\,p-s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)-w)\,z)^{i+1}$$

$$\left(-\frac{(-i\,p-s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)-w)\,z)^2}{-i\,a+c\,(v-2\,h)-w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{(-i\,p-s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)-w)\,z)^2}{4\,(-i\,a+c\,(v-2\,h)-w)}\right) + e^{-\frac{(i\,p-s+f\,(v-2\,h))^2}{4\,(i\,a+c\,(v-2\,h)-w)}+i\,q-t+g\,(v-2\,h)}$$

$$(i\,a+c\,(v-2\,h)-w)^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-i\,p+s-f\,(v-2\,h))^{n-i} (i\,p-s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)-w)\,z)^{i+1}$$

$$\left(-\frac{(i\,p-s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)-w)\,z)^2}{i\,a+c\,(v-2\,h)-w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(i\,p-s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)-w)\,z)^2}{4\,(i\,a+c\,(v-2\,h)-w)}\right)+$$

$$e^{-\frac{(-i\,p+s+f\,(2\,h-v))^2}{4\,(-i\,a+c\,(2\,h-v)+w)}-i\,q+t+g\,(2\,h-v)}\,(-i\,a+c\,(2\,h-v)+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(i\,p-s-f\,(2\,h-v))^{n-i}$$

$$(-i\,p+s+f\,(2\,h-v)+2\,(-i\,a+c\,(2\,h-v)+w)\,z)^{i+1}$$

$$\left(-\frac{(-i\,p+s+f\,(2\,h-v)+2\,(-i\,a+c\,(2\,h-v)+w)\,z)^2}{-i\,a+c\,(2\,h-v)+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(-i\,p+s+f\,(2\,h-v)+2\,(-i\,a+c\,(2\,h-v)+w)\,z)^2}{4\,(-i\,a+c\,(2\,h-v)+w)}\right)-e^{-\frac{(i\,p+s+f\,(2\,h-v))^2}{4\,(i\,a+c\,(2\,h-v)+w)}+i\,q+t+g\,(2\,h-v)}$$

$$(i\,a+c\,(2\,h-v)+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-i\,p-s-f\,(2\,h-v))^{n-i}\,(i\,p+s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)+w)\,z)^{i+1}$$

$$\left(-\frac{(i\,p+s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)+w)\,z)^2}{i\,a+c\,(2\,h-v)+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(i\,p+s+f\,(2\,h-v)+2\,(i\,a+c\,(2\,h-v)+w)\,z)^2}{4\,(i\,a+c\,(2\,h-v)+w)}\right)+$$

$$e^{-\frac{(-i\,p+s+f\,(v-2\,h))^2}{4\,(-i\,a+c\,(v-2\,h)+w)}-i\,q+t+g\,(v-2\,h)}\,(-i\,a+c\,(v-2\,h)+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(i\,p-s-f\,(v-2\,h))^{n-i}$$

$$(-i\,p+s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)+w)\,z)^{i+1}$$

$$\left(-\frac{(-i\,p+s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)+w)\,z)^2}{-i\,a+c\,(v-2\,h)+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(-i\,p+s+f\,(v-2\,h)+2\,(-i\,a+c\,(v-2\,h)+w)\,z)^2}{4\,(-i\,a+c\,(v-2\,h)+w)}\right)-e^{-\frac{(i\,p+s+f\,(v-2\,h))^2}{4\,(i\,a+c\,(v-2\,h)+w)}+i\,q+t+g\,(v-2\,h)}$$

$$(i\,a+c\,(v-2\,h)+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-i\,p-s-f\,(v-2\,h))^{n-i}\,(i\,p+s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)+w)\,z)^{i+1}$$

$$\left(-\frac{(i\,p+s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)+w)\,z)^2}{i\,a+c\,(v-2\,h)+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(i\,p+s+f\,(v-2\,h)+2\,(i\,a+c\,(v-2\,h)+w)\,z)^2}{4\,(i\,a+c\,(v-2\,h)+w)}\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

01.20.21.4916.01

$$\int z^n \sin\left(\sqrt{z}\ a+q+p\,z\right)\sinh\left(t+s\,z+w\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\ c+g+f\,z\right)dz ==$$

$$2^{-2n-\nu-3}\,i\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(-e^{-\frac{(-i\,a-w)^2}{4(-i\,p-s)}-i\,q-t}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a-w)^{-i-l+2n}\right.\right.$$

$$\left(-i\,a-w+2\,(-i\,p-s)\sqrt{z}\right)^{i+l}\left(-\frac{\left(-i\,a-w+2\,(-i\,p-s)\sqrt{z}\right)^2}{-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a-w)\left(-i\,a-w+2\,(-i\,p-s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-i\,a-w+2\,(-i\,p-s)\sqrt{z}\right)^2}{4\,(-i\,p-s)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(-i\,a-w+2\,(-i\,p-s)\sqrt{z}\right)^2}{-i\,p-s}}\ (-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-i\,a-w+2\,(-i\,p-s)\sqrt{z}\right)^2}{4\,(-i\,p-s)}\right)\right)\right)$$

$$(-i\,p-s)^{-2n-2}+e^{-\frac{(i\,a-w)^2}{4(i\,p-s)}+i\,q-t}\,(i\,p-s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a-w)^{-i-l+2n}\left(i\,a-w+2\,(i\,p-s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a-w+2\,(i\,p-s)\sqrt{z}\right)^2}{i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a-w)\left(i\,a-w+2\,(i\,p-s)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(i\,a-w+2\,(i\,p-s)\sqrt{z}\right)^2}{4\,(i\,p-s)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(i\,a-w+2\,(i\,p-s)\sqrt{z}\right)^2}{i\,p-s}}\ (i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(i\,a-w+2\,(i\,p-s)\sqrt{z}\right)^2}{4\,(i\,p-s)}\right)\right)+$$

$$e^{-\frac{(-i\,a+w)^2}{4(s-i\,p)}-i\,q+t}\,(s-i\,p)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+w)^{-i-l+2n}\left(-i\,a+w+2\,(s-i\,p)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+w+2\,(s-i\,p)\sqrt{z}\right)^2}{s-i\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+w)\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^2}{4\,(s-i\,p)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^2}{s-i\,p}}\;(s-i\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^2}{4\,(s-i\,p)}\right)\right)-$$

$$e^{-\frac{(i\,a+w)^2}{4\,(i\,p+s)}+i\,q+t}\,(i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+w)^{-i-l+2\,n}\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{i\,p+s}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a+w)\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{4\,(i\,p+s)}\right)+\right.$$

$$\left.\left.2\sqrt{-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{i\,p+s}}\;(i\,p+s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{4\,(i\,p+s)}\right)\right)\right)+$$

$$2^{-2\,n-\nu-3}\,i\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-e^{-\frac{(-i\,a+c\,(2\,h-\nu)-w)^2}{4\,(-i\,p-s+f\,(2\,h-\nu))}-i\,q-t+g\,(2\,h-\nu)}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+c\,(2\,h-\nu)-w)^{-i-l+2\,n}\right.\right.$$

$$\left(-i\,a+c\,(2\,h-\nu)-w+2\,(-i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+c\,(2\,h-\nu)-w+2\,(-i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2\,h-\nu)}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+c\,(2\,h-\nu)-w)\left(-i\,a+c\,(2\,h-\nu)-w+2\,(-i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-i\,a+c\,(2\,h-\nu)-w+2\,(-i\,p-s+f\,(2\,h-\nu))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(2\,h-\nu))}\right)+2\right.$$

$$(-i\,p-s+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-i\,a+c\,(2\,h-v)-w+2\,(-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(2\,h-v))}\right)$$

$$\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)-w+2\,(-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2\,h-v)}}\Bigg)\Bigg)$$

$$(-i\,p-s+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(i\,a+c\,(2\,h-v)-w)^2}{4\,(i\,p-s+f\,(2\,h-v))}+i\,q-t+g\,(2\,h-v)}\,(i\,p-s+f\,(2\,h-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+c\,(2\,h-v)-w)^{-i-l+2\,n}\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,p-s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a+c\,(2\,h-v)-w)\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}\,(i+l+1),\,-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(2\,h-v))}\right)+$$

$$2\,(i\,p-s+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(2\,h-v))}\right)$$

$$\left.\sqrt{-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,p-s+f\,(2\,h-v)}}\right)+$$

$$e^{-\frac{(-i\,a+c\,(2\,h-v)+w)^2}{4\,(-i\,p+s+f\,(2\,h-v))}-i\,q+t+g\,(2\,h-v)}\,(-i\,p+s+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+c\,(2\,h-v)+w)^{-i-l+2\,n}$$

$$\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+c\,(2\,h-v)+w)\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}(i+l+1),\ -\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}\Bigg)+$$

$$2\,(-i\,p+s+f\,(2\,h-v))\,\Gamma\Bigg(\frac{1}{2}(i+l+2),\ -\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}\Bigg)$$

$$\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}}\Bigg)-$$

$$e^{-\frac{(i\,a+c\,(2\,h-v)+w)^2}{4\,(i\,p+s+f\,(2\,h-v))}+i\,q+t+g\,(2\,h-v)}\,(i\,p+s+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+c\,(2\,h-v)+w)^{-i-l+2\,n}$$

$$\left(i\,a+c\,(2\,h-v)+w+2\,(i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+c\,(2\,h-v)+w+2\,(i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,p+s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((i\,a+c\,(2\,h-v)+w)\left(i\,a+c\,(2\,h-v)+w+2\,(i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),\ -\frac{\left(i\,a+c\,(2\,h-v)+w+2\,(i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(2\,h-v))}\Bigg)+$$

$$2\,(i\,p+s+f\,(2\,h-v))\,\Gamma\Bigg(\frac{1}{2}(i+l+2),\ -\frac{\left(i\,a+c\,(2\,h-v)+w+2\,(i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(2\,h-v))}\Bigg)$$

$$\sqrt{-\frac{\left(i\,a+c\,(2\,h-v)+w+2\,(i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,p+s+f\,(2\,h-v)}}\Bigg)-$$

$$e^{-\frac{(-i\,a+c\,(v-2\,h)-w)^2}{4\,(-i\,p-s+f\,(v-2\,h))}-i\,q-t+g\,(v-2\,h)}\,(-i\,p-s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+c\,(v-2\,h)-w)^{-i-l+2\,n}$$

$$\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+c\,(v-2\,h)-w)\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(v-2\,h))}\right)+2\,(-i\,p-s+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(v-2\,h))}\right)\sqrt{-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(v-2\,h)}}\right)+$$

$$e^{-\frac{(i\,a+c\,(v-2\,h)-w)^2}{4\,(i\,p-s+f\,(v-2\,h))}+i\,q-t+g\,(v-2\,h)}\,(i\,p-s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+c\,(v-2\,h)-w)^{-i-l+2\,n}$$

$$\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p-s+f\,(v-2\,h)}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a+c\,(v-2\,h)-w)\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(v-2\,h))}\right)+2\,(i\,p-s+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(v-2\,h))}\right)\sqrt{-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p-s+f\,(v-2\,h)}}\right)+$$

$$e^{-\frac{(-i\,a+c\,(v-2\,h)+w)^2}{4\,(-i\,p+s+f\,(v-2\,h))}-i\,q+t+g\,(v-2\,h)}\,(-i\,p+s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+c\,(v-2\,h)+w)^{-i-l+2\,n}$$

$$\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+c\,(v-2\,h)+w)\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(v-2\,h))}\right)+2\,(-i\,p+s+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(v-2\,h))}\right)\sqrt{-\frac{\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(v-2\,h)}}\right)-$$

$$e^{-\frac{(i\,a+c\,(v-2\,h)+w)^2}{4\,(i\,p+s+f\,(v-2\,h))}+i\,q+t+g\,(v-2\,h)}\,(i\,p+s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+c\,(v-2\,h)+w)^{-i-l+2\,n}$$

$$\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p+s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a+c\,(v-2\,h)+w)\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(v-2\,h))}\right)+2\,(i\,p+s+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p+s+f\,(v-2\,h))}\right)\sqrt{-\frac{\left(i\,a+c\,(v-2\,h)+w+2\,(i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p+s+f\,(v-2\,h)}}\right)\Big/;\ n\in\mathbb{N}\wedge v\in\mathbb{Z}\wedge v>0$$

Involving powers of sin, powers of sinh and power

Involving $z^{\alpha-1}\sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int z^{\alpha-1}\sin^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)\,dz ==$$

$$-\frac{(i^u\,2^{-m-u-v}\,z^\alpha)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(m \bmod 2-1)\,(u \bmod 2-1)\,(v \bmod 2-1)}{\alpha}-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-i\,q\,m+\frac{i\,\pi\,m}{2}+2\,i\,k\,q}\,\Gamma\left(\frac{\alpha}{r},(i\,a\,m-2\,i\,a\,k)\,z^r\right)\right.\right.$$

$$\left.\left.((i\,a\,m-2\,i\,a\,k)\,z^r)^{-\frac{\alpha}{r}}+e^{i\,q\,m-\frac{i\,\pi\,m}{2}-2\,i\,k\,q}\,((2\,i\,a\,k-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,i\,a\,k-i\,a\,m)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)\,(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2\,g\,h-g\,v}\,\Gamma\left(\frac{\alpha}{r},(c\,v-2\,c\,h)\,z^r\right)((c\,v-2\,c\,h)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$\left.\left.e^{g\,v-2\,g\,h}\,((2\,c\,h-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,h-c\,v)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{2\,k\,t-u\,t+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{\alpha}{r},(u\,w-2\,k\,w)\,z^r\right)\right.\right.$$

$$\left.\left.((u\,w-2\,k\,w)\,z^r)^{-\frac{\alpha}{r}}+e^{-2\,k\,t+u\,t-\frac{i\,\pi\,u}{2}}\,((2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,k\,w-u\,w)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2\,g\,h+2\,i\,k\,q-i\,m\,q-g\,v+\frac{i\,m\,\pi}{2}}\right.\right.$$

$$\Gamma\left(\frac{\alpha}{r},(-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v)\,z^r\right)((-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v)\,z^r)^{-\frac{\alpha}{r}}+$$

$$e^{2\,g\,h-2\,i\,k\,q+i\,m\,q-g\,v-\frac{i\,m\,\pi}{2}}((-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v)\,z^r\right)+$$

$$e^{-2\,g\,h+2\,i\,k\,q-i\,m\,q+g\,v+\frac{i\,m\,\pi}{2}}((2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v)\,z^r\right)+$$

$$\left.\left.e^{-2\,g\,h-2\,i\,k\,q+i\,m\,q+g\,v-\frac{i\,m\,\pi}{2}}((2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-i q m+\frac{i\pi m}{2}+2 i k q+2 j t-t u+\frac{i\pi u}{2}}\right.\right.$$
$$\Gamma\left(\frac{\alpha}{r},(-2 a i k+i a m-2 j w+u w)\,z^r\right)((-2 a i k+i a m-2 j w+u w)\,z^r)^{-\frac{\alpha}{r}}+$$
$$e^{i q m-\frac{i\pi m}{2}-2 i k q+2 j t-t u+\frac{i\pi u}{2}}((2 i a k-i a m-2 j w+u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2 i a k-i a m-2 j w+u w)\,z^r\right)+$$
$$e^{-i q m+\frac{i\pi m}{2}+2 i k q-2 j t+t u-\frac{i\pi u}{2}}((-2 a i k+i a m+2 j w-u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2 a i k+i a m+2 j w-u w)\,z^r\right)+$$
$$\left.\left.e^{i q m-\frac{i\pi m}{2}-2 i k q-2 j t+t u-\frac{i\pi u}{2}}((2 i a k-i a m+2 j w-u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2 i a k-i a m+2 j w-u w)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2 g h+2 k t-t u+\frac{i\pi u}{2}-g v}\right.\right.$$
$$\Gamma\left(\frac{\alpha}{r},(-2 c h+c v-2 k w+u w)\,z^r\right)((-2 c h+c v-2 k w+u w)\,z^r)^{-\frac{\alpha}{r}}+$$
$$e^{-2 g h+2 k t-t u+\frac{i\pi u}{2}+g v}((2 c h-c v-2 k w+u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2 c h-c v-2 k w+u w)\,z^r\right)+$$
$$e^{2 g h-2 k t+t u-g v-\frac{i\pi u}{2}}((-2 c h+c v+2 k w-u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2 c h+c v+2 k w-u w)\,z^r\right)+$$
$$\left.\left.e^{-2 g h-2 k t+t u+g v-\frac{i\pi u}{2}}((2 c h-c v+2 k w-u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2 c h-c v+2 k w-u w)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2 g h+2 i k q-i m q+2 j t-t u+\frac{i\pi u}{2}-g v+\frac{i m\pi}{2}}\,\Gamma\left(\frac{\alpha}{r},\right.\right.\right.$$
$$(-2 c h-2 i a k+i a m+c v-2 j w+u w)\,z^r\Big)((-2 c h-2 i a k+i a m+c v-2 j w+u w)\,z^r)^{-\frac{\alpha}{r}}+$$
$$e^{2 g h-2 i k q+i m q+2 j t-t u+\frac{i\pi u}{2}-g v-\frac{i m\pi}{2}}((-2 c h+2 i a k-i a m+c v-2 j w+u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\Big($$
$$\frac{\alpha}{r},(-2 c h+2 i a k-i a m+c v-2 j w+u w)\,z^r\Big)+e^{-2 g h+2 i k q-i m q+2 j t-t u+\frac{i\pi u}{2}+g v+\frac{i m\pi}{2}}$$
$$((2 c h-2 i a k+i a m-c v-2 j w+u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2 c h-2 i a k+i a m-c v-2 j w+u w)\,z^r\right)+$$
$$e^{-2 g h-2 i k q+i m q+2 j t-t u+\frac{i\pi u}{2}+g v-\frac{i m\pi}{2}}((2 c h+2 i a k-i a m-c v-2 j w+u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\Big($$
$$\frac{\alpha}{r},(2 c h+2 i a k-i a m-c v-2 j w+u w)\,z^r\Big)+e^{2 g h+2 i k q-i m q-2 j t+t u-g v-\frac{i\pi u}{2}+\frac{i m\pi}{2}}$$
$$((-2 c h-2 i a k+i a m+c v+2 j w-u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2 c h-2 i a k+i a m+c v+2 j w-u w)\right.$$
$$\left.z^r\right)+e^{2 g h-2 i k q+i m q-2 j t+t u-g v-\frac{i\pi u}{2}-\frac{i m\pi}{2}}((-2 c h+2 i a k-i a m+c v+2 j w-u w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\Big($$
$$\frac{\alpha}{r},(-2 c h+2 i a k-i a m+c v+2 j w-u w)\,z^r\Big)+e^{-2 g h+2 i k q-i m q-2 j t+t u+g v-\frac{i\pi u}{2}+\frac{i m\pi}{2}}$$

$$((2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r\right)+$$

$$e^{-2\,g\,h-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,((2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\right.$$

$$\left.(2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r\right)\Bigg)\Bigg/;\,m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0\wedge v\in\mathbb{Z}\wedge v>0$$

Involving $z^n\,\sin^m(a\,z^r+p\,z+q)\sinh^u(w\,z^r+s\,z+t)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^n\sin^m\left(a\,z^2+p\,z+q\right)\sinh^u\left(w\,z^2+s\,z+t\right)\cosh^v\left(c\,z^2+f\,z+g\right)dz==$$

$$\frac{\left(i^u\,2^{-m-u-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)}{n+1}-$$

$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\left(e^{-\frac{i\,(2\,k-m)\,p^2}{4\,a}+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\right.$$

$$\left(\sum_{i=0}^{n}2^{i-n}\,(-i\,(2\,k-m)\,p)^{n-i}\,(i\,(2\,k-m)\,p+2\,a\,i\,(2\,k-m)\,z)^{i+1}\left(\frac{i\,(i\,(2\,k-m)\,p+2\,a\,i\,(2\,k-m)\,z)^2}{a\,(2\,k-m)}\right)^{\frac{1}{2}(-i-1)}\right.$$

$$\left.\left.\binom{n}{i}\,\Gamma\left(\frac{i+1}{2},\,\frac{i\,(i\,(2\,k-m)\,p+2\,a\,i\,(2\,k-m)\,z)^2}{4\,a\,(2\,k-m)}\right)\right)(i\,a\,(2\,k-m))^{-n-1}+\right.$$

$$e^{-\frac{i\,(m-2\,k)\,p^2}{4\,a}+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}\,(i\,a\,(m-2\,k))^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-i\,(m-2\,k)\,p)^{n-i}\,(i\,(m-2\,k)\,p+2\,a\,i\,(m-2\,k)\,z)^{i+1}$$

$$\left(\frac{i\,(i\,(m-2\,k)\,p+2\,a\,i\,(m-2\,k)\,z)^2}{a\,(m-2\,k)}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\,\Gamma\left(\frac{i+1}{2},\,\frac{i\,(i\,(m-2\,k)\,p+2\,a\,i\,(m-2\,k)\,z)^2}{4\,a\,(m-2\,k)}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{g\,(2\,h-v)-\frac{f^2\,(2\,h-v)}{4\,c}}\right.$$

$$\left(\sum_{i=0}^{n}2^{i-n}\,(-f\,(2\,h-v))^{n-i}\,(f\,(2\,h-v)+2\,c\,z\,(2\,h-v))^{i+1}\left(-\frac{(f\,(2\,h-v)+2\,c\,z\,(2\,h-v))^2}{c\,(2\,h-v)}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\right.$$

$$\left.\left.\Gamma\left(\frac{i+1}{2},\,-\frac{(f\,(2\,h-v)+2\,c\,z\,(2\,h-v))^2}{4\,c\,(2\,h-v)}\right)\right)(c\,(2\,h-v))^{-n-1}+e^{g\,(v-2\,h)-\frac{f^2\,(v-2\,h)}{4\,c}}\,(c\,(v-2\,h))^{-n-1}\right.$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-f\left(v-2h\right)\right)^{n-i} \left(f\left(v-2h\right)+2cz\left(v-2h\right)\right)^{i+1} \left(-\frac{\left(f\left(v-2h\right)+2cz\left(v-2h\right)\right)^{2}}{c\left(v-2h\right)}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{\left(f\left(v-2h\right)+2cz\left(v-2h\right)\right)^{2}}{4c\left(v-2h\right)}\right)\Bigg) - i^{u} 2^{-m-u-v-1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)$$

$$(1-v \bmod 2) \sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor} (-1)^{k} \binom{u}{k} \Bigg(e^{-\frac{(2k-u)s^{2}}{4w}+t(2k-u)+\frac{i\pi u}{2}} \Bigg(\sum_{i=0}^{n} 2^{i-n} \left(-s\left(2k-u\right)\right)^{n-i} \left(s\left(2k-u\right)+2wz\left(2k-u\right)\right)^{i+1}$$

$$\left(-\frac{\left(s\left(2k-u\right)+2wz\left(2k-u\right)\right)^{2}}{\left(2k-u\right)w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{\left(s\left(2k-u\right)+2wz\left(2k-u\right)\right)^{2}}{4\left(2k-u\right)w}\right)\Bigg) \left(\left(2k-u\right)w\right)^{-n-1} +$$

$$e^{-\frac{(u-2k)s^{2}}{4w}-\frac{i\pi u}{2}+t(u-2k)} \left(\left(u-2k\right)w\right)^{-n-1} \sum_{i=0}^{n} 2^{i-n} \left(-s\left(u-2k\right)\right)^{n-i} \left(s\left(u-2k\right)+2wz\left(u-2k\right)\right)^{i+1}$$

$$\left(-\frac{\left(s\left(u-2k\right)+2wz\left(u-2k\right)\right)^{2}}{\left(u-2k\right)w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{\left(s\left(u-2k\right)+2wz\left(u-2k\right)\right)^{2}}{4\left(u-2k\right)w}\right)\Bigg) -$$

$$i^{u} 2^{-m-u-v-1} \binom{u}{\frac{u}{2}} (1-u \bmod 2) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^{k} \binom{m}{k} \sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{h} \Bigg(e^{-\frac{(i(2k-m)p+f(2h-v))^{2}}{4(ai(2k-m)+c(2h-v))}+i(2k-m)q+g(2h-v)+\frac{im\pi}{2}}$$

$$\Bigg(\sum_{i=0}^{n} 2^{i-n} \left(-i\left(2k-m\right)p-f\left(2h-v\right)\right)^{n-i} \left(i\left(2k-m\right)p+f\left(2h-v\right)+2\left(ai\left(2k-m\right)+c\left(2h-v\right)\right)z\right)^{i+1}$$

$$\left(-\left(i\left(2k-m\right)p+f\left(2h-v\right)+2\left(ai\left(2k-m\right)+c\left(2h-v\right)\right)z\right)^{2} \Big/ \left(ai\left(2k-m\right)+c\left(2h-v\right)\right)\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{\left(i\left(2k-m\right)p+f\left(2h-v\right)+2\left(ai\left(2k-m\right)+c\left(2h-v\right)\right)z\right)^{2}}{4\left(ai\left(2k-m\right)+c\left(2h-v\right)\right)}\right)\Bigg)$$

$$\left(ai\left(2k-m\right)+c\left(2h-v\right)\right)^{-n-1} + e^{-\frac{(i(m-2k)p+f(2h-v))^{2}}{4(ai(m-2k)+c(2h-v))}+i(m-2k)q+g(2h-v)-\frac{im\pi}{2}} \left(ai\left(m-2k\right)+c\left(2h-v\right)\right)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-i\left(m-2k\right)p-f\left(2h-v\right)\right)^{n-i} \left(i\left(m-2k\right)p+f\left(2h-v\right)+2\left(ai\left(m-2k\right)+c\left(2h-v\right)\right)z\right)^{i+1}$$

$$\left(-\frac{\left(i\left(m-2k\right)p+f\left(2h-v\right)+2\left(ai\left(m-2k\right)+c\left(2h-v\right)\right)z\right)^{2}}{ai\left(m-2k\right)+c\left(2h-v\right)}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{\left(i\left(m-2k\right)p+f\left(2h-v\right)+2\left(ai\left(m-2k\right)+c\left(2h-v\right)\right)z\right)^{2}}{4\left(ai\left(m-2k\right)+c\left(2h-v\right)\right)}\right) +$$

$$e^{-\frac{(i(2k-m)p+f(v-2h))^{2}}{4(ai(2k-m)+c(v-2h))}+i(2k-m)q+g(v-2h)+\frac{im\pi}{2}} \left(ai\left(2k-m\right)+c\left(v-2h\right)\right)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-i\left(2k-m\right)p-f\left(v-2h\right)\right)^{n-i} \left(i\left(2k-m\right)p+f\left(v-2h\right)+2\left(ai\left(2k-m\right)+c\left(v-2h\right)\right)z\right)^{i+1}$$

$$\left(-\frac{(i\,(2\,k-m)\,p+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h))\,z)^2}{a\,i\,(2\,k-m)+c\,(v-2\,h)}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(i\,(2\,k-m)\,p+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h))\,z)^2}{4\,(a\,i\,(2\,k-m)+c\,(v-2\,h))}\right)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p+f\,(v-2\,h))^2}{4\,(a\,i\,(m-2\,k)+c\,(v-2\,h))}+i\,(m-2\,k)\,q+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(a\,i\,(m-2\,k)+c\,(v-2\,h))^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(m-2\,k)\,p-f\,(v-2\,h))^{n-i}\,(i\,(m-2\,k)\,p+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h))\,z)^{i+1}$$

$$\left(-\frac{(i\,(m-2\,k)\,p+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h))\,z)^2}{a\,i\,(m-2\,k)+c\,(v-2\,h)}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(i\,(m-2\,k)\,p+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h))\,z)^2}{4\,(a\,i\,(m-2\,k)+c\,(v-2\,h))}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-\frac{(i\,(2\,k-m)\,p+s\,(2\,j-u))^2}{4\,(a\,i\,(2\,k-m)+(2\,j-u)\,w)}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}$$

$$\Bigg(\sum_{i=0}^{n}2^{i-n}\,(-i\,(2\,k-m)\,p-s\,(2\,j-u))^{n-i}\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+2\,(a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^{i+1}$$

$$\left(-(i\,(2\,k-m)\,p+s\,(2\,j-u)+2\,(a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^2\Big/(a\,i\,(2\,k-m)+(2\,j-u)\,w)\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(i\,(2\,k-m)\,p+s\,(2\,j-u)+2\,(a\,i\,(2\,k-m)+(2\,j-u)\,w)\,z)^2}{4\,(a\,i\,(2\,k-m)+(2\,j-u)\,w)}\right)\Bigg)$$

$$(a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-n-1}+e^{-\frac{(i\,(m-2\,k)\,p+s\,(2\,j-u))^2}{4\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(m-2\,k)\,p-s\,(2\,j-u))^{n-i}\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^{i+1}$$

$$\left(-\frac{(i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2}{a\,i\,(m-2\,k)+(2\,j-u)\,w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(i\,(m-2\,k)\,p+s\,(2\,j-u)+2\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)\,z)^2}{4\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)}\right)+$$

$$e^{-\frac{(i\,(2\,k-m)\,p+s\,(u-2\,j))^2}{4\,(a\,i\,(2\,k-m)+(u-2\,j)\,w)}+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(2\,k-m)\,p-s\,(u-2\,j))^{n-i}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^{i+1}$$

$$\left(-\frac{(i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2}{a\,i\,(2\,k-m)+(u-2\,j)\,w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{(i\,(2\,k-m)\,p+s\,(u-2\,j)+2\,(a\,i\,(2\,k-m)+(u-2\,j)\,w)\,z)^2}{4\,(a\,i\,(2\,k-m)+(u-2\,j)\,w)}\right)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p+s\,(u-2\,j))^2}{4\,(a\,i\,(m-2\,k)+(u-2\,j)\,w)}+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n}\,(-i\,(m-2\,k)\,p-s\,(u-2\,j))^{n-i}\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^{i+1}$$

$$\left(-\frac{(i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2}{a\,i\,(m-2\,k)+(u-2\,j)\,w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{(i\,(m-2\,k)\,p+s\,(u-2\,j)+2\,(a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2}{4\,(a\,i\,(m-2\,k)+(u-2\,j)\,w)}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{-\frac{(s\,(2\,k-u)+f\,(2\,h-v))^2}{4\,(c\,(2\,h-v)+(2\,k-u)\,w)}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$\left(\sum_{i=0}^{n} 2^{i-n}\,(-s\,(2\,k-u)-f\,(2\,h-v))^{n-i}\,(s\,(2\,k-u)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(2\,k-u)\,w)\,z)^{i+1}\right.$$

$$\left(-\frac{(s\,(2\,k-u)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2}{c\,(2\,h-v)+(2\,k-u)\,w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\left.\Gamma\left(\frac{i+1}{2}, -\frac{(s\,(2\,k-u)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2}{4\,(c\,(2\,h-v)+(2\,k-u)\,w)}\right)\right)$$

$$(c\,(2\,h-v)+(2\,k-u)\,w)^{-n-1}+e^{-\frac{(s\,(2\,k-u)+f\,(v-2\,h))^2}{4\,(c\,(v-2\,h)+(2\,k-u)\,w)}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(c\,(v-2\,h)+(2\,k-u)\,w)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n}\,(-s\,(2\,k-u)-f\,(v-2\,h))^{n-i}\,(s\,(2\,k-u)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(2\,k-u)\,w)\,z)^{i+1}$$

$$\left(-\frac{(s\,(2\,k-u)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2}{c\,(v-2\,h)+(2\,k-u)\,w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{(s\,(2\,k-u)+f\,(v-2\,h)+2\,(c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2}{4\,(c\,(v-2\,h)+(2\,k-u)\,w)}\right)+$$

$$e^{-\frac{(s\,(u-2\,k)+f\,(2\,h-v))^2}{4\,(c\,(2\,h-v)+(u-2\,k)\,w)}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(2\,h-v)}\,(c\,(2\,h-v)+(u-2\,k)\,w)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n}\,(-s\,(u-2\,k)-f\,(2\,h-v))^{n-i}\,(s\,(u-2\,k)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(u-2\,k)\,w)\,z)^{i+1}$$

$$\left(-\frac{(s\,(u-2\,k)+f\,(2\,h-v)+2\,(c\,(2\,h-v)+(u-2\,k)\,w)\,z)^2}{c\,(2\,h-v)+(u-2\,k)\,w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(s(u-2k)+f(2h-v)+2(c(2h-v)+(u-2k)w)z)^2}{4(c(2h-v)+(u-2k)w)}\right)+$$

$$e^{-\frac{(s(u-2k)+f(v-2h))^2}{4(c(v-2h)+(u-2k)w)}-\frac{i\pi u}{2}+t(u-2k)+g(v-2h)}(c(v-2h)+(u-2k)w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(-s(u-2k)-f(v-2h))^{n-i}(s(u-2k)+f(v-2h)+2(c(v-2h)+(u-2k)w)z)^{i+1}$$

$$\left(-\frac{(s(u-2k)+f(v-2h)+2(c(v-2h)+(u-2k)w)z)^2}{c(v-2h)+(u-2k)w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\left.\Gamma\left(\frac{i+1}{2},-\frac{(s(u-2k)+f(v-2h)+2(c(v-2h)+(u-2k)w)z)^2}{4(c(v-2h)+(u-2k)w)}\right)\right)-$$

$$i^u\,2^{-m-u-v-1}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(i(2k-m)p+s(2j-u)+f(2h-v))^2}{4(ai(2k-m)+c(2h-v)+(2j-u)w)}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+g(2h-v)+\frac{im\pi}{2}}\right.$$

$$\left(\sum_{i=0}^{n}2^{i-n}(-i(2k-m)p-s(2j-u)-f(2h-v))^{n-i}\right.$$

$$(i(2k-m)p+s(2j-u)+f(2h-v)+2(ai(2k-m)+c(2h-v)+(2j-u)w)z)^{i+1}$$

$$\left(-(i(2k-m)p+s(2j-u)+f(2h-v)+2(ai(2k-m)+c(2h-v)+(2j-u)w)z)^2\right/$$

$$(ai(2k-m)+c(2h-v)+(2j-u)w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$

$$\left.\left.-(i(2k-m)p+s(2j-u)+f(2h-v)+2(ai(2k-m)+c(2h-v)+(2j-u)w)z)^2\right/\right.$$

$$\left.\left.(4(ai(2k-m)+c(2h-v)+(2j-u)w))\right)\right)(ai(2k-m)+c(2h-v)+(2j-u)w)^{-n-1}+$$

$$e^{-\frac{(i(m-2k)p+s(2j-u)+f(2h-v))^2}{4(ai(m-2k)+c(2h-v)+(2j-u)w)}+i(m-2k)q+t(2j-u)+\frac{i\pi u}{2}+g(2h-v)-\frac{im\pi}{2}}(ai(m-2k)+c(2h-v)+(2j-u)w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(-i(m-2k)p-s(2j-u)-f(2h-v))^{n-i}$$

$$(i(m-2k)p+s(2j-u)+f(2h-v)+2(ai(m-2k)+c(2h-v)+(2j-u)w)z)^{i+1}$$

$$\left(-(i(m-2k)p+s(2j-u)+f(2h-v)+2(ai(m-2k)+c(2h-v)+(2j-u)w)z)^2\right/$$

$$(ai(m-2k)+c(2h-v)+(2j-u)w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$

$$\left.-(i(m-2k)p+s(2j-u)+f(2h-v)+2(ai(m-2k)+c(2h-v)+(2j-u)w)z)^2\right/$$

$$\left.(4(ai(m-2k)+c(2h-v)+(2j-u)w))\right)+$$

$$e^{-\frac{(i(2k-m)p+s(2j-u)+f(v-2h))^2}{4(ai(2k-m)+c(v-2h)+(2j-u)w)}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+g(v-2h)+\frac{im\pi}{2}}(ai(2k-m)+c(v-2h)+(2j-u)w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}(-i(2k-m)p-s(2j-u)-f(v-2h))^{n-i}$$

$$(i(2k-m)p+s(2j-u)+f(v-2h)+2(ai(2k-m)+c(v-2h)+(2j-u)w)z)^{i+1}$$

$$\left(-(i(2k-m)p+s(2j-u)+f(v-2h)+2(ai(2k-m)+c(v-2h)+(2j-u)w)z)^2\right/$$

$$(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},$$
$$-(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w))\Big)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))^2}{4\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(m-2\,k)\,p-s\,(2\,j-u)-f\,(v-2\,h))^{n-i}$$
$$(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^{i+1}$$
$$\Big(-(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\Big/$$
$$(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},$$
$$-(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w))\Big)+$$

$$e^{-\frac{(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2}{4\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(2\,k-m)\,p-s\,(u-2\,j)-f\,(2\,h-v))^{n-i}$$
$$(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\Big(-(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},$$
$$-(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w))\Big)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2}{4\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(m-2\,k)\,p-s\,(u-2\,j)-f\,(2\,h-v))^{n-i}$$
$$(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\Big(-(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},$$
$$-(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/$$
$$(4\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w))\Big)+$$

$$e^{-\frac{(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(2\,k-m)\,p-s\,(u-2\,j)-f\,(v-2\,h))^{n-i}$$
$$(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\Big(-(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},$$

$$-(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(4\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w))\Big)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-i\,(m-2\,k)\,p-s\,(u-2\,j)-f\,(v-2\,h))^{n-i}$$

$$(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^{i+1}$$

$$\Big(-(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/$$

$$(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w))^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Big(\frac{i+1}{2},\,-(i\,(m-2\,k)\,p+s\,(u-2\,j)+$$

$$f\,(v-2\,h)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/(4\,(a\,i\,(m-2\,k)+$$

$$c\,(v-2\,h)+(u-2\,j)\,w))\Big)\Big)\Big/;\,n\in\mathbb{N}\wedge m\in\mathbb{Z}\wedge m>0\wedge u\in\mathbb{Z}\wedge u>0\wedge v\in\mathbb{Z}\wedge v>0$$

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$$\int z^n\sin^m\Big(\sqrt{z}\;a+p\,z+q\Big)\sinh^u\Big(w\,\sqrt{z}\;+s\,z+t\Big)\cosh^v\Big(\sqrt{z}\;c+f\,z+g\Big)\,dz==$$

$$\frac{i^u\,2^{-m-u-v}\,z^{n+1}\,(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)}{n+1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)$$

$$\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\Bigg(e^{-\frac{i\,(2\,k-m)\,a^2}{4\,p}+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a\,(2\,k-m))^{-i-l+2\,n}\Big(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\;(2\,k-m)\Big)^{i+l}$$

$$\Bigg(\frac{i\Big(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\;(2\,k-m)\Big)^2}{(2\,k-m)\,p}\Bigg)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg(a\,i\,(2\,k-m)$$

$$\Big(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\;(2\,k-m)\Big)\,\Gamma\Bigg(\frac{1}{2}\,(i+l+1),\,\frac{i\Big(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\;(2\,k-m)\Big)^2}{4\,(2\,k-m)\,p}\Bigg)+2$$

$$i\,(2\,k-m)\,p\,\sqrt{\frac{i\Big(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\;(2\,k-m)\Big)^2}{(2\,k-m)\,p}}\;\Gamma\Bigg(\frac{1}{2}\,(i+l+2),$$

$$\frac{i\Big(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\;(2\,k-m)\Big)^2}{4\,(2\,k-m)\,p}\Bigg)\Bigg)\Bigg)(i\,(2\,k-m)\,p)^{-2\,n-2}+e^{-\frac{i\,(m-2\,k)\,a^2}{4\,p}+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}$$

$$(i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(i\,a\,(m-2\,k))^{-i-l+2\,n}\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\,\,(m-2\,k)\right)^{i+l}$$

$$\left(\frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\,\,(m-2\,k)\right)^{2}}{(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(a\,i\,(m-2\,k)\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\,\,(m-2\,k)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),\,\frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\,\,(m-2\,k)\right)^{2}}{4\,(m-2\,k)\,p}\right)+2\,i\,(m-2\,k)\,p$$

$$\left.\left.\sqrt{\frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\,\,(m-2\,k)\right)^{2}}{(m-2\,k)\,p}}\;\Gamma\left(\frac{1}{2}(i+l+2),\,\frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\,\,(m-2\,k)\right)^{2}}{4\,(m-2\,k)\,p}\right)\right)\right)+$$

$$2^{-m-2\,n-u-v-1}\,i^{u}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^{k}\binom{u}{k}\left(e^{-\frac{(2\,k-u)\,w^{2}}{4\,s}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,((2\,k-u)\,w)^{-i-l+2\,n}\left(w\,(2\,k-u)+2\,s\,\sqrt{z}\,\,(2\,k-u)\right)^{i+l}\right.$$

$$\left(-\frac{\left(w\,(2\,k-u)+2\,s\,\sqrt{z}\,\,(2\,k-u)\right)^{2}}{s\,(2\,k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((2\,k-u)\,w\left(w\,(2\,k-u)+2\,s\,\sqrt{z}\,\,(2\,k-u)\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\frac{\left(w\,(2\,k-u)+2\,s\,\sqrt{z}\,\,(2\,k-u)\right)^{2}}{4\,s\,(2\,k-u)}\right)+2\,s\,(2\,k-u)$$

$$\left.\left.\left.\sqrt{-\frac{\left(w\,(2\,k-u)+2\,s\,\sqrt{z}\,\,(2\,k-u)\right)^{2}}{s\,(2\,k-u)}}\;\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(w\,(2\,k-u)+2\,s\,\sqrt{z}\,\,(2\,k-u)\right)^{2}}{4\,s\,(2\,k-u)}\right)\right)\right)$$

$$(s\,(2\,k-u))^{-2\,n-2}+e^{-\frac{(u-2\,k)\,w^{2}}{4\,s}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)}\,(s\,(u-2\,k))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,((u-2\,k)\,w)^{-i-l+2\,n}$$

$$\left(w\,(u-2\,k)+2\,s\,\sqrt{z}\,\,(u-2\,k)\right)^{i+l}\left(-\frac{\left(w\,(u-2\,k)+2\,s\,\sqrt{z}\,\,(u-2\,k)\right)^{2}}{s\,(u-2\,k)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((u-2\,k)\,w\right.$$

$$\left(w\,(u-2\,k)+2\,s\,\sqrt{z}\;(u-2\,k)\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(w\,(u-2\,k)+2\,s\,\sqrt{z}\;(u-2\,k)\right)^2}{4\,s\,(u-2\,k)}\right)+2\,s\,(u-2\,k)$$

$$\sqrt{-\frac{\left(w\,(u-2\,k)+2\,s\,\sqrt{z}\;(u-2\,k)\right)^2}{s\,(u-2\,k)}}\;\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(w\,(u-2\,k)+2\,s\,\sqrt{z}\;(u-2\,k)\right)^2}{4\,s\,(u-2\,k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{g\,(2\,h-v)-\frac{c^2\,(2\,h-v)}{4\,f}}\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c\,(2\,h-v))^{-i-l+2\,n}$$

$$\left(c\,(2\,h-v)+2\,f\,\sqrt{z}\;(2\,h-v)\right)^{i+l}\left(-\frac{\left(c\,(2\,h-v)+2\,f\,\sqrt{z}\;(2\,h-v)\right)^2}{f\,(2\,h-v)}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg(c\,(2\,h-v)$$

$$\left(c\,(2\,h-v)+2\,f\,\sqrt{z}\;(2\,h-v)\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(c\,(2\,h-v)+2\,f\,\sqrt{z}\;(2\,h-v)\right)^2}{4\,f\,(2\,h-v)}\right)+2\,f\,(2\,h-v)$$

$$\sqrt{-\frac{\left(c\,(2\,h-v)+2\,f\,\sqrt{z}\;(2\,h-v)\right)^2}{f\,(2\,h-v)}}\;\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(c\,(2\,h-v)+2\,f\,\sqrt{z}\;(2\,h-v)\right)^2}{4\,f\,(2\,h-v)}\right)\Bigg)\Bigg)$$

$$(f\,(2\,h-v))^{-2\,n-2}+e^{g\,(v-2\,h)-\frac{c^2\,(v-2\,h)}{4\,f}}\,(f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c\,(v-2\,h))^{-i-l+2\,n}$$

$$\left(c\,(v-2\,h)+2\,f\,\sqrt{z}\;(v-2\,h)\right)^{i+l}\left(-\frac{\left(c\,(v-2\,h)+2\,f\,\sqrt{z}\;(v-2\,h)\right)^2}{f\,(v-2\,h)}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg(c\,(v-2\,h)$$

$$\left(c\,(v-2\,h)+2\,f\,\sqrt{z}\;(v-2\,h)\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(c\,(v-2\,h)+2\,f\,\sqrt{z}\;(v-2\,h)\right)^2}{4\,f\,(v-2\,h)}\right)+2\,f\,(v-2\,h)$$

$$\sqrt{-\frac{\left(c\,(v-2\,h)+2\,f\,\sqrt{z}\;(v-2\,h)\right)^2}{f\,(v-2\,h)}}\;\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(c\,(v-2\,h)+2\,f\,\sqrt{z}\;(v-2\,h)\right)^2}{4\,f\,(v-2\,h)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-\frac{(a\,i\,(2\,k-m)+(2\,j-u)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u))}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-i-l+2\,n}\right.$$
$$\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}\left(-\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.$$
$$\left.\left.2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)\right)\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left(\left(a\,i\,(2\,k-m)+(2\,j-u)\,w\right)\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.\left.\left(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\right)+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.\left(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\sqrt{\left(-\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.\right.$$
$$\left.\left.\left.\left.2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)\right)\right)}\right)\Bigg)$$

$$(i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}+e^{-\frac{(a\,i\,(m-2\,k)+(2\,j-u)\,w)^{2}}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}$$
$$(i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}\left(-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.$$
$$\left.\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)\right)\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left(\left(a\,i\,(m-2\,k)+(2\,j-u)\,w\right)\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.\left.\left(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\right)+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\right.$$
$$\left.\left(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\sqrt{\left(-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.\right.$$
$$\left.\left.\left.\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{2}\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)\right)\right)}\right)\Bigg)+$$
$$e^{-\frac{(a\,i\,(2\,k-m)+(u-2\,j)\,w)^{2}}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j))}+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}$$
$$(a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$(i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(2\,k-m)+(u-2\,j)\,w)\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.}$$

$$\left.2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j))}+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$

$$\Big(-\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$

$$(i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(m-2\,k)+(u-2\,j)\,w)\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\left(a\,i\,(m-2\,k)+(u-2\,j)\,w+\right.}$$

$$\left.2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Big(e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(i\,(2\,k-m)\,p+f\,(2\,h-v))}+i\,(2\,k-m)\,q+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}$$

$$\Big(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(2\,h-v))^{-i-l+2\,n}\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\right.$$

$$\left.\sqrt{z}\right)^{i+l}\Big(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(2\,k-m)+c\,(2\,h-v))\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+f\,(2\,h-v)))\right)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+f\,(2\,h-v)))\right)\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+\right.\right.}$$
$$\left.\left.2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+f\,(2\,h-v))\right)\Bigg)$$

$$(i\,(2\,k-m)\,p+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(i\,(m-2\,k)\,p+f\,(2\,h-v))}+i\,(m-2\,k)\,q+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}$$
$$(i\,(m-2\,k)\,p+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2\,k)+c\,(2\,h-v))^{-i-l+2\,n}$$
$$\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.$$
$$\left.\left.2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(m-2\,k)+c\,(2\,h-v))\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+f\,(2\,h-v)))\right)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+f\,(2\,h-v)))\right)\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.}$$
$$\left.\left.2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+f\,(2\,h-v))\right)\Bigg)+$$

$$e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))}+i\,(2\,k-m)\,q+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\,(i\,(2\,k-m)\,p+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$
$$(a\,i\,(2\,k-m)+c\,(v-2\,h))^{-i-l+2\,n}\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(2\,k-m)\,p+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(2\,k-m)+c\,(v-2\,h))\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+f\,(v-2\,h)))\right)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(i\,(2\,k-m)\,p+f\,(v-2\,h)))\Big)\sqrt{\Big(-\big(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/(i\,(2\,k-m)\,p+f\,(v-2\,h))\Big)}+$$

$$e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(i\,(m-2\,k)\,p+f\,(v-2\,h))}+i\,(m-2\,k)\,q+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(i\,(m-2\,k)\,p+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(a\,i\,(m-2\,k)+c\,(v-2\,h))^{-i-l+2\,n}\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\big)^{i+l}$$

$$\Big(-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$(i\,(m-2\,k)\,p+f\,(v-2\,h))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(m-2\,k)+c\,(v-2\,h))\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+f\,(v-2\,h)))\Big)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+f\,(v-2\,h)))\Big)\sqrt{\Big(-\big(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\big)^2\Big/(i\,(m-2\,k)\,p+f\,(v-2\,h))\Big)}\Big)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{-\frac{(c\,(2\,h-v)+(2\,k-u)\,w)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$\Big(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c\,(2\,h-v)+(2\,k-u)\,w)^{-i-l+2\,n}$$

$$\big(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\big)^{i+l}$$

$$\Big(-\big(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\big)^2\Big/(s\,(2\,k-u)+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Big((c\,(2\,h-v)+(2\,k-u)\,w)\big(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\big(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\big)^2\Big/$$

$$(4\,(s\,(2\,k-u)+f\,(2\,h-v)))\Big)+2\,(s\,(2\,k-u)+f\,(2\,h-v))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),$$

$$-\big(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\big)^2\Big/(4\,(s\,(2\,k-u)+f\,(2\,h-v)))\Big)$$

$$\sqrt{\Big(-\big(2\,\sqrt{z}\;(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\big)^2\Big/(s\,(2\,k-u)+f\,(2\,h-v))\Big)}\Big)\Bigg)$$

$$(s\,(2\,k-u)+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(c\,(2\,h-v)+(u-2\,k)\,w)^2}{4\,(s\,(u-2\,k)+f\,(2\,h-v))}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(2\,h-v)}\,(s\,(u-2\,k)+f\,(2\,h-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c\,(2\,h-v)+(u-2\,k)\,w)^{-i-l+2\,n}$$

$$\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^{i+l}$$

$$\left(-\frac{\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2}{s\,(u-2\,k)+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((c\,(2\,h-v)+(u-2\,k)\,w)\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2\Big/\right.$$

$$\left.(4\,(s\,(u-2\,k)+f\,(2\,h-v)))\right)+2\,(s\,(u-2\,k)+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$\left.\left.-\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2\Big/(4\,(s\,(u-2\,k)+f\,(2\,h-v)))\right)\right.$$

$$\left.\sqrt{\left(-\left(2\,\sqrt{z}\;(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2\Big/(s\,(u-2\,k)+f\,(2\,h-v))\right)}\right)+$$

$$e^{-\frac{(c\,(v-2\,h)+(2\,k-u)\,w)^2}{4\,(s\,(2\,k-u)+f\,(v-2\,h))}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(s\,(2\,k-u)+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(c\,(v-2\,h)+(2\,k-u)\,w)^{-i-l+2\,n}\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{s\,(2\,k-u)+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((c\,(v-2\,h)+(2\,k-u)\,w)\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(s\,(2\,k-u)+f\,(v-2\,h)))\right)+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$\left.\left.-\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(4\,(s\,(2\,k-u)+f\,(v-2\,h)))\right)\right.$$

$$\left.\sqrt{\left(-\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(s\,(2\,k-u)+f\,(v-2\,h))\right)}\right)+$$

$$e^{-\frac{(c\,(v-2\,h)+(u-2\,k)\,w)^2}{4\,(s\,(u-2\,k)+f\,(v-2\,h))}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(v-2\,h)}\,(s\,(u-2\,k)+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(c\,(v-2\,h)+(u-2\,k)\,w)^{-i-l+2\,n}\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{s\,(u-2\,k)+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((c\,(v-2\,h)+(u-2\,k)\,w)\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(s\,(u-2\,k)+f\,(v-2\,h)))\right)+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$
$$\left.\left.-\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(4\,(s\,(u-2\,k)+f\,(v-2\,h)))\right)\right.$$
$$\left.\left.\sqrt{\left(-\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(s\,(u-2\,k)+f\,(v-2\,h))\right)}\right)\right)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}\right.$$
$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)^{-i-l+2\,n}\right.$$
$$\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+\right.\right.$$
$$\left.2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$
$$\left.-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right.\right.$$
$$\left.\left.\sqrt{z}\right)^2\Big/(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\right)+$$
$$2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+\right.\right.$$
$$\left.(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(i\,(2\,k-m)$$
$$\left.p+s\,(2\,j-u)+f\,(2\,h-v)))\right)\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\right.\right.}$$
$$\left.\left.w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+\right.$$
$$\left.\left.\left.s\,(2\,j-u)+f\,(2\,h-v))\right)\right)\right)(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))^{-2\,n-2}+$$
$$e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+\right.\right.$$
$$\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(m-2\,k)+\right.\right.$$
$$\left.\left.c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.\left.(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\right)+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\right)$$
$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.}$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)+$$
$$e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+\right.\right.$$
$$\left.2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(2\,k-m)+\right.\right.$$
$$\left.\left.c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.\left.(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\right)+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\right)$$
$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.}$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)+$$

$$e^{-\frac{(a i (m-2k)+c(2h-v)+(u-2j)w)^2}{4(i(m-2k)p+s(u-2j)+f(2h-v))}+i(m-2k)q+t(u-2j)+g(2h-v)-\frac{i\pi u}{2}-\frac{im\pi}{2}} (i(m-2k)p+s(u-2j)+f(2h-v))^{-2n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i (a i (m-2k)+c(2h-v)+(u-2j)w)^{-i-l+2n}$$
$$\left(a i (m-2k)+c(2h-v)+(u-2j)w+2(i(m-2k)p+s(u-2j)+f(2h-v))\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a i (m-2k)+c(2h-v)+(u-2j)w+2(i(m-2k)p+s(u-2j)+f(2h-v))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i(m-2k)p+s(u-2j)+f(2h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a i (m-2k)+c(2h-v)+(u-2j)w)\left(a i (m-2k)+c(2h-v)+(u-2j)w+\right.\right.$$
$$\left.2(i(m-2k)p+s(u-2j)+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\left(a i (m-2k)+\right.\right.$$
$$\left.\left.c(2h-v)+(u-2j)w+2(i(m-2k)p+s(u-2j)+f(2h-v))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4(i(m-2k)p+s(u-2j)+f(2h-v)))\right)+2(i(m-2k)p+s(u-2j)+f(2h-v))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),-\left(a i (m-2k)+c(2h-v)+(u-2j)w+2(i(m-2k)p+s(u-2j)+\right.\right.$$
$$\left.\left.f(2h-v))\sqrt{z}\right)^2\Big/(4(i(m-2k)p+s(u-2j)+f(2h-v)))\right)$$
$$\sqrt{\left(-\left(a i (m-2k)+c(2h-v)+(u-2j)w+2(i(m-2k)p+s(u-2j)+\right.\right.}$$
$$\left.\left.f(2h-v))\sqrt{z}\right)^2\Big/(i(m-2k)p+s(u-2j)+f(2h-v))\right)\Big)+$$
$$e^{-\frac{(a i (2k-m)+c(v-2h)+(2j-u)w)^2}{4(i(2k-m)p+s(2j-u)+f(v-2h))}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}+g(v-2h)+\frac{im\pi}{2}} (i(2k-m)p+s(2j-u)+f(v-2h))^{-2n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i (a i (2k-m)+c(v-2h)+(2j-u)w)^{-i-l+2n}$$
$$\left(a i (2k-m)+c(v-2h)+(2j-u)w+2(i(2k-m)p+s(2j-u)+f(v-2h))\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a i (2k-m)+c(v-2h)+(2j-u)w+2(i(2k-m)p+s(2j-u)+f(v-2h))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i(2k-m)p+s(2j-u)+f(v-2h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a i (2k-m)+c(v-2h)+(2j-u)w)\left(a i (2k-m)+c(v-2h)+(2j-u)w+\right.\right.$$
$$\left.2(i(2k-m)p+s(2j-u)+f(v-2h))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\left(a i (2k-m)+\right.\right.$$
$$\left.\left.c(v-2h)+(2j-u)w+2(i(2k-m)p+s(2j-u)+f(v-2h))\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4(i(2k-m)p+s(2j-u)+f(v-2h)))\right)+2(i(2k-m)p+s(2j-u)+f(v-2h))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),-\left(a i (2k-m)+c(v-2h)+(2j-u)w+2(i(2k-m)p+s(2j-u)+\right.\right.$$
$$\left.\left.f(v-2h))\sqrt{z}\right)^2\Big/(4(i(2k-m)p+s(2j-u)+f(v-2h)))\right)$$

$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.}$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\right)+$$

$$e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+\right.\right.$$

$$\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(m-2\,k)+\right.\right.$$

$$\left.\left.c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)))\right)+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.$$

$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\right)$$

$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.}$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\right)+$$

$$e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+\right.\right.$$

$$\left.2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(2\,k-m)+\right.\right.$$

$$\left.\left.c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)))\right)+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$

$$\Gamma\left(\frac{1}{2}(i+l+2),\ -\left(a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\right)\right)$$

$$\sqrt{\left(-\left(a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)^2\Big/\left(i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h)\right)\right)}+$$

$$e^{-\frac{(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w)^2}{4\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))}+i\,(m-2k)\,q+t\,(u-2j)+g\,(v-2h)-\frac{i\pi u}{2}-\frac{i\,m\pi}{2}}\left(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h)\right)^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w)^{-i-l+2n}$$

$$\left(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)^2\Big/\left(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h)\right)\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w)\left(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\left(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\right)\right)+$$

$$2\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\,\Gamma\left(\frac{1}{2}(i+l+2),\ -\left(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)^2\Big/\left(4\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\right)\right)\sqrt{\left(-\left(a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w+2\,(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\right)^2\Big/\left(i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h)\right)\right)}\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\wedge m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving cos, sinh and power

Involving $z^{\alpha-1}\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int z^{\alpha-1}\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$\frac{1}{r}\left(2^{-\nu-2}\binom{\nu}{\frac{\nu}{2}}\left(-e^{i\,q+t}\,\Gamma\left(\frac{\alpha}{r},(-i\,a-w)\,z^r\right)((-i\,a-w)\,z^r)^{-\frac{\alpha}{r}}-e^{t-i\,q}\,((i\,a-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,a-w)\,z^r\right)+\right.\right.$$

$$\left.\left.e^{i\,q-t}\,((-i\,a+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-i\,a+w)\,z^r\right)+e^{-i\,q-t}\,((i\,a+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(i\,a+w)\,z^r\right)\right)(1-\nu\bmod 2)\,z^{\alpha}\right)+$$

$$\frac{1}{r}\,2^{-\nu-2}\,z^{\alpha}\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-e^{2\,g\,h+i\,q+t-g\,\nu}\,\Gamma\left(\frac{\alpha}{r},(-2\,c\,h-i\,a+c\,\nu-w)\,z^r\right)((-2\,c\,h-i\,a+c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}-\right.$$

$$e^{2\,g\,h-i\,q+t-g\,\nu}\,((-2\,c\,h+i\,a+c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2\,c\,h+i\,a+c\,\nu-w)\,z^r\right)-$$

$$e^{-2\,g\,h+i\,q+t+g\,\nu}\,((2\,c\,h-i\,a-c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,h-i\,a-c\,\nu-w)\,z^r\right)-$$

$$e^{-2\,g\,h-i\,q+t+g\,\nu}\,((2\,c\,h+i\,a-c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,h+i\,a-c\,\nu-w)\,z^r\right)+e^{2\,g\,h+i\,q-t-g\,\nu}$$

$$((-2\,c\,h-i\,a+c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-2\,c\,h-i\,a+c\,\nu+w)\,z^r\right)+e^{2\,g\,h-i\,q-t-g\,\nu}\,((-2\,c\,h+i\,a+c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-2\,c\,h+i\,a+c\,\nu+w)\,z^r\right)+e^{-2\,g\,h+i\,q-t+g\,\nu}\,((2\,c\,h-i\,a-c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,h-i\,a-c\,\nu+w)\,z^r\right)+$$

$$\left.e^{-2\,g\,h-i\,q-t+g\,\nu}\,((2\,c\,h+i\,a-c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(2\,c\,h+i\,a-c\,\nu+w)\,z^r\right)\right)/;\,\nu\in\mathbb{N}^+$$

Involving $z^n\cos(a\,z^r+p\,z+q)\sinh(w\,z^r+s\,z+t)\cosh^{\nu}(c\,z^r+f\,z+g)$

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$$\int z^n\cos(a\,z^2+p\,z+q)\sinh(w\,z^2+s\,z+t)\cosh^{\nu}(c\,z^2+f\,z+g)\,dz ==$$

$$2^{-\nu-3}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{-\frac{(-i\,p-s)^2}{4(-i\,a-w)}-i\,q-t}\left(\sum_{l=0}^{n}2^{l-n}\,(i\,p+s)^{n-l}\,(-i\,p-s+2\,(-i\,a-w)\,z)^{l+1}\right.\right.$$

$$\left.\left(-\frac{(-i\,p-s+2\,(-i\,a-w)\,z)^2}{-i\,a-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-i\,p-s+2\,(-i\,a-w)\,z)^2}{4\,(-i\,a-w)}\right)\right)(-i\,a-w)^{-n-1}+$$

$$e^{-\frac{(i\,p-s)^2}{4(i\,a-w)}+i\,q-t}\,(i\,a-w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(s-i\,p)^{n-l}\,(i\,p-s+2\,(i\,a-w)\,z)^{l+1}\left(-\frac{(i\,p-s+2\,(i\,a-w)\,z)^2}{i\,a-w}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(i\,p-s+2\,(i\,a-w)\,z)^2}{4\,(i\,a-w)}\right)-e^{-\frac{(s-i\,p)^2}{4(-i\,a+w)}-i\,q+t}\,(-i\,a+w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(i\,p-s)^{n-l}\,(-i\,p+s+2\,(-i\,a+w)\,z)^{l+1}\left(-\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{-i\,a+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\left.\Gamma\left(\frac{l+1}{2},-\frac{(-i\,p+s+2\,(-i\,a+w)\,z)^2}{4\,(-i\,a+w)}\right)-e^{-\frac{(i\,p+s)^2}{4(i\,a+w)}+i\,q+t}\,(i\,a+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-i\,p-s)^{n-l}\right.$$

$$(i\,p+s+2\,(i\,a+w)\,z)^{l+1}\left(-\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{i\,a+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(i\,p+s+2\,(i\,a+w)\,z)^2}{4\,(i\,a+w)}\right)\Bigg)+$$

$$2^{-v-3}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{(-i\,p-s+f\,(2\,k-v))^2}{4\,(-i\,a+c\,(2\,k-v)-w)}-i\,q-t+g\,(2\,k-v)}\Bigg(\sum_{l=0}^{n}2^{l-n}\,(i\,p+s-f\,(2\,k-v))^{n-l}\,(-i\,p-s+f\,(2\,k-v)+$$

$$2\,(-i\,a+c\,(2\,k-v)-w)\,z)^{l+1}\left(-\frac{(-i\,p-s+f\,(2\,k-v)+2\,(-i\,a+c\,(2\,k-v)-w)\,z)^2}{-i\,a+c\,(2\,k-v)-w}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(-i\,p-s+f\,(2\,k-v)+2\,(-i\,a+c\,(2\,k-v)-w)\,z)^2}{4\,(-i\,a+c\,(2\,k-v)-w)}\right)\Bigg)$$

$$(-i\,a+c\,(2\,k-v)-w)^{-n-1}+e^{-\frac{(i\,p-s+f\,(2\,k-v))^2}{4\,(i\,a+c\,(2\,k-v)-w)}+i\,q-t+g\,(2\,k-v)}\,(i\,a+c\,(2\,k-v)-w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,p+s-f\,(2\,k-v))^{n-l}\,(i\,p-s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)-w)\,z)^{l+1}$$

$$\left(-\frac{(i\,p-s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)-w)\,z)^2}{i\,a+c\,(2\,k-v)-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,p-s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)-w)\,z)^2}{4\,(i\,a+c\,(2\,k-v)-w)}\right)+$$

$$e^{-\frac{(-i\,p-s+f\,(v-2\,k))^2}{4\,(-i\,a+c\,(v-2\,k)-w)}-i\,q-t+g\,(v-2\,k)}\,(-i\,a+c\,(v-2\,k)-w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(i\,p+s-f\,(v-2\,k))^{n-l}$$

$$(-i\,p-s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)-w)\,z)^{l+1}$$

$$\left(-\frac{(-i\,p-s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)-w)\,z)^2}{-i\,a+c\,(v-2\,k)-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(-i\,p-s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)-w)\,z)^2}{4\,(-i\,a+c\,(v-2\,k)-w)}\right)+e^{-\frac{(i\,p-s+f\,(v-2\,k))^2}{4\,(i\,a+c\,(v-2\,k)-w)}+i\,q-t+g\,(v-2\,k)}$$

$$(i\,a+c\,(v-2\,k)-w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-i\,p+s-f\,(v-2\,k))^{n-l}\,(i\,p-s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)-w)\,z)^{l+1}$$

$$\left(-\frac{(i\,p-s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)-w)\,z)^2}{i\,a+c\,(v-2\,k)-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,p-s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)-w)\,z)^2}{4\,(i\,a+c\,(v-2\,k)-w)}\right)-$$

$$e^{-\frac{(-i\,p+s+f\,(2\,k-v))^2}{4\,(-i\,a+c\,(2\,k-v)+w)}-i\,q+t+g\,(2\,k-v)}\,(-i\,a+c\,(2\,k-v)+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(i\,p-s-f\,(2\,k-v))^{n-l}$$

$$(-i\,p+s+f\,(2\,k-v)+2\,(-i\,a+c\,(2\,k-v)+w)\,z)^{l+1}$$

$$\left(-\frac{(-i\,p+s+f\,(2\,k-v)+2\,(-i\,a+c\,(2\,k-v)+w)\,z)^2}{-i\,a+c\,(2\,k-v)+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(-i\,p+s+f\,(2\,k-v)+2\,(-i\,a+c\,(2\,k-v)+w)\,z)^2}{4\,(-i\,a+c\,(2\,k-v)+w)}\right)-e^{-\frac{(i\,p+s+f\,(2\,k-v))^2}{4\,(i\,a+c\,(2\,k-v)+w)}+i\,q+t+g\,(2\,k-v)}$$

$$(i\,a+c\,(2\,k-v)+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-i\,p-s-f\,(2\,k-v))^{n-l}\,(i\,p+s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)+w)\,z)^{l+1}$$

$$\left(-\frac{(i\,p+s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)+w)\,z)^2}{i\,a+c\,(2\,k-v)+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,p+s+f\,(2\,k-v)+2\,(i\,a+c\,(2\,k-v)+w)\,z)^2}{4\,(i\,a+c\,(2\,k-v)+w)}\right)-$$

$$e^{-\frac{(-i\,p+s+f\,(v-2\,k))^2}{4\,(-i\,a+c\,(v-2\,k)+w)}-i\,q+t+g\,(v-2\,k)}\,(-i\,a+c\,(v-2\,k)+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(i\,p-s-f\,(v-2\,k))^{n-l}$$

$$(-i\,p+s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)+w)\,z)^{l+1}$$

$$\left(-\frac{(-i\,p+s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)+w)\,z)^2}{-i\,a+c\,(v-2\,k)+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(-i\,p+s+f\,(v-2\,k)+2\,(-i\,a+c\,(v-2\,k)+w)\,z)^2}{4\,(-i\,a+c\,(v-2\,k)+w)}\right)-e^{-\frac{(i\,p+s+f\,(v-2\,k))^2}{4\,(i\,a+c\,(v-2\,k)+w)}+i\,q+t+g\,(v-2\,k)}$$

$$(i\,a+c\,(v-2\,k)+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-i\,p-s-f\,(v-2\,k))^{n-l}\,(i\,p+s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)+w)\,z)^{l+1}$$

$$\left(-\frac{(i\,p+s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)+w)\,z)^2}{i\,a+c\,(v-2\,k)+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,p+s+f\,(v-2\,k)+2\,(i\,a+c\,(v-2\,k)+w)\,z)^2}{4\,(i\,a+c\,(v-2\,k)+w)}\right)\Big/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos\left(\sqrt{z}\;a+q+p\,z\right)\sinh\left(t+s\,z+w\,\sqrt{z}\;\right)\cosh^v\left(\sqrt{z}\;c+g+f\,z\right)dz==$$

$$-2^{-2\,n-v-3}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\left(e^{-\frac{(-i\,a-w)^2}{4\,(-i\,p-s)}-i\,q-t}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a-w)^{-i-l+2\,n}\right.\right.$$

$$\left.\left.\left(-i\,a-w+2\,(-i\,p-s)\,\sqrt{z}\;\right)^{i+l}\left(-\frac{\left(-i\,a-w+2\,(-i\,p-s)\,\sqrt{z}\;\right)^2}{-i\,p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\right.\right.$$

$$\left((-i\,a-w)\left(-i\,a-w+2\,(-i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-i\,a-w+2\,(-i\,p-s)\,\sqrt{z}\right)^2}{4\,(-i\,p-s)}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(-i\,a-w+2\,(-i\,p-s)\,\sqrt{z}\right)^2}{-i\,p-s}}\;(-i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-i\,a-w+2\,(-i\,p-s)\,\sqrt{z}\right)^2}{4\,(-i\,p-s)}\right)\right)$$

$$(-i\,p-s)^{-2\,n-2}+e^{-\frac{(i\,a-w)^2}{4\,(i\,p-s)}+i\,q-t}\,(i\,p-s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a-w)^{-i-l+2\,n}\left(i\,a-w+2\,(i\,p-s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a-w+2\,(i\,p-s)\,\sqrt{z}\right)^2}{i\,p-s}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a-w)\left(i\,a-w+2\,(i\,p-s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(i\,a-w+2\,(i\,p-s)\,\sqrt{z}\right)^2}{4\,(i\,p-s)}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(i\,a-w+2\,(i\,p-s)\,\sqrt{z}\right)^2}{i\,p-s}}\;(i\,p-s)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(i\,a-w+2\,(i\,p-s)\,\sqrt{z}\right)^2}{4\,(i\,p-s)}\right)\right)-$$

$$e^{-\frac{(-i\,a+w)^2}{4\,(s-i\,p)}-i\,q+t}\,(s-i\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+w)^{-i-l+2\,n}\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^2}{s-i\,p}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+w)\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^2}{4\,(s-i\,p)}\right)+\right.$$

$$\left.2\,\sqrt{-\frac{\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^2}{s-i\,p}}\;(s-i\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(-i\,a+w+2\,(s-i\,p)\,\sqrt{z}\right)^2}{4\,(s-i\,p)}\right)\right)-$$

$$e^{-\frac{(i\,a+w)^2}{4\,(i\,p+s)}+i\,q+t}\,(i\,p+s)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+w)^{-i-l+2\,n}\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{i\,p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a+w)\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{4\,(i\,p+s)}\right)+\right.$$

$$\left.2\sqrt{-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{i\,p+s}}\;(i\,p+s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(i\,a+w+2\,(i\,p+s)\,\sqrt{z}\right)^2}{4\,(i\,p+s)}\right)\right)-$$

$$2^{-2n-v-3}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{-\frac{(-i\,a+c\,(2h-v)-w)^2}{4\,(-i\,p-s+f\,(2h-v))}-i\,q-t+g\,(2h-v)}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+c\,(2h-v)-w)^{-i-l+2n}\right.\right.$$

$$\left(-i\,a+c\,(2h-v)-w+2\,(-i\,p-s+f\,(2h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+c\,(2h-v)-w+2\,(-i\,p-s+f\,(2h-v))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+c\,(2h-v)-w)\left(-i\,a+c\,(2h-v)-w+2\,(-i\,p-s+f\,(2h-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(-i\,a+c\,(2h-v)-w+2\,(-i\,p-s+f\,(2h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(2h-v))}\right)+2$$

$$(-i\,p-s+f\,(2h-v))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-i\,a+c\,(2h-v)-w+2\,(-i\,p-s+f\,(2h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p-s+f\,(2h-v))}\right)$$

$$\left.\left.\sqrt{-\frac{\left(-i\,a+c\,(2h-v)-w+2\,(-i\,p-s+f\,(2h-v))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(2h-v)}}\right)\right)$$

$$(-i\,p-s+f\,(2h-v))^{-2n-2}+e^{-\frac{(i\,a+c\,(2h-v)-w)^2}{4\,(i\,p-s+f\,(2h-v))}+i\,q-t+g\,(2h-v)}\,(i\,p-s+f\,(2h-v))^{-2n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+c\,(2h-v)-w)^{-i-l+2n}\left(i\,a+c\,(2h-v)-w+2\,(i\,p-s+f\,(2h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,p-s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((i\,a+c\,(2\,h-v)-w)\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(i+l+1),-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(2\,h-v))}\right)+$$

$$2\,(i\,p-s+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(2\,h-v))}\right)$$

$$\left.\sqrt{-\frac{\left(i\,a+c\,(2\,h-v)-w+2\,(i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{i\,p-s+f\,(2\,h-v)}}\right)-$$

$$e^{-\frac{(-i\,a+c\,(2\,h-v)+w)^2}{4\,(-i\,p+s+f\,(2\,h-v))}-i\,q+t+g\,(2\,h-v)}\,(-i\,p+s+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+c\,(2\,h-v)+w)^{-i-l+2\,n}$$

$$\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((-i\,a+c\,(2\,h-v)+w)\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\left.\frac{1}{2}(i+l+1),-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}\right)+$$

$$2\,(-i\,p+s+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(2\,h-v))}\right)$$

$$\left.\sqrt{-\frac{\left(-i\,a+c\,(2\,h-v)+w+2\,(-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(2\,h-v)}}\right)-$$

$$e^{-\frac{(i a+c (2 h-v)+w)^2}{4 (i p+s+f (2 h-v))}+i q+t+g (2 h-v)} (i p+s+f (2 h-v))^{-2 n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l} 4^i (i a+c (2 h-v)+w)^{-i-l+2 n}$$

$$\left(i a+c (2 h-v)+w+2 (i p+s+f (2 h-v)) \sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i a+c (2 h-v)+w+2 (i p+s+f (2 h-v)) \sqrt{z}\right)^2}{i p+s+f (2 h-v)}\right)^{\frac{1}{2} (-i-l-1)} \binom{i}{l} \binom{n}{i}$$

$$\left((i a+c (2 h-v)+w) \left(i a+c (2 h-v)+w+2 (i p+s+f (2 h-v)) \sqrt{z}\right) \Gamma\left(\right.\right.$$

$$\left.\frac{1}{2} (i+l+1), -\frac{\left(i a+c (2 h-v)+w+2 (i p+s+f (2 h-v)) \sqrt{z}\right)^2}{4 (i p+s+f (2 h-v))}\right)+$$

$$2 (i p+s+f (2 h-v)) \Gamma\left(\frac{1}{2} (i+l+2), -\frac{\left(i a+c (2 h-v)+w+2 (i p+s+f (2 h-v)) \sqrt{z}\right)^2}{4 (i p+s+f (2 h-v))}\right)$$

$$\left.\sqrt{-\frac{\left(i a+c (2 h-v)+w+2 (i p+s+f (2 h-v)) \sqrt{z}\right)^2}{i p+s+f (2 h-v)}}\right)+$$

$$e^{-\frac{(-i a+c (v-2 h)-w)^2}{4 (-i p-s+f (v-2 h))}-i q-t+g (v-2 h)} (-i p-s+f (v-2 h))^{-2 n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l} 4^i (-i a+c (v-2 h)-w)^{-i-l+2 n}$$

$$\left(-i a+c (v-2 h)-w+2 (-i p-s+f (v-2 h)) \sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i a+c (v-2 h)-w+2 (-i p-s+f (v-2 h)) \sqrt{z}\right)^2}{-i p-s+f (v-2 h)}\right)^{\frac{1}{2} (-i-l-1)} \binom{i}{l} \binom{n}{i}$$

$$\left((-i a+c (v-2 h)-w) \left(-i a+c (v-2 h)-w+2 (-i p-s+f (v-2 h)) \sqrt{z}\right) \Gamma\left(\right.\right.$$

$$\left.\frac{1}{2} (i+l+1), -\frac{\left(-i a+c (v-2 h)-w+2 (-i p-s+f (v-2 h)) \sqrt{z}\right)^2}{4 (-i p-s+f (v-2 h))}\right)+$$

$$2 (-i p-s+f (v-2 h)) \Gamma\left(\frac{1}{2} (i+l+2), -\frac{\left(-i a+c (v-2 h)-w+2 (-i p-s+f (v-2 h)) \sqrt{z}\right)^2}{4 (-i p-s+f (v-2 h))}\right)$$

$$\sqrt{-\frac{\left(-i\,a+c\,(v-2\,h)-w+2\,(-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p-s+f\,(v-2\,h)}}\Bigg)+$$

$$e^{-\frac{(i\,a+c\,(v-2\,h)-w)^2}{4\,(i\,p-s+f\,(v-2\,h))}+i\,q-t+g\,(v-2\,h)}\,(i\,p-s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a+c\,(v-2\,h)-w)^{-i-l+2\,n}$$

$$\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p-s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((i\,a+c\,(v-2\,h)-w)\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),\,-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(v-2\,h))}\Bigg)+$$

$$2\,(i\,p-s+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}(i+l+2),\,-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(i\,p-s+f\,(v-2\,h))}\right)$$

$$\sqrt{-\frac{\left(i\,a+c\,(v-2\,h)-w+2\,(i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{i\,p-s+f\,(v-2\,h)}}\Bigg)-$$

$$e^{-\frac{(-i\,a+c\,(v-2\,h)+w)^2}{4\,(-i\,p+s+f\,(v-2\,h))}-i\,q+t+g\,(v-2\,h)}\,(-i\,p+s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(-i\,a+c\,(v-2\,h)+w)^{-i-l+2\,n}$$

$$\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{-i\,p+s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((-i\,a+c\,(v-2\,h)+w)\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),\,-\frac{\left(-i\,a+c\,(v-2\,h)+w+2\,(-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(-i\,p+s+f\,(v-2\,h))}\Bigg)+$$

$$2(-i p+s+f(v-2h))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(-i a+c(v-2h)+w+2(-i p+s+f(v-2h))\sqrt{z}\right)^2}{4(-i p+s+f(v-2h))}\right)$$

$$\sqrt{-\frac{\left(-i a+c(v-2h)+w+2(-i p+s+f(v-2h))\sqrt{z}\right)^2}{-i p+s+f(v-2h)}}\Bigg)-$$

$$e^{-\frac{(i a+c(v-2h)+w)^2}{4(i p+s+f(v-2h))}+i q+t+g(v-2h)}(i p+s+f(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i a+c(v-2h)+w)^{-i-l+2n}$$

$$\left(i a+c(v-2h)+w+2(i p+s+f(v-2h))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(i a+c(v-2h)+w+2(i p+s+f(v-2h))\sqrt{z}\right)^2}{i p+s+f(v-2h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((i a+c(v-2h)+w)\left(i a+c(v-2h)+w+2(i p+s+f(v-2h))\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(i a+c(v-2h)+w+2(i p+s+f(v-2h))\sqrt{z}\right)^2}{4(i p+s+f(v-2h))}\Bigg)+$$

$$2(i p+s+f(v-2h))\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(i a+c(v-2h)+w+2(i p+s+f(v-2h))\sqrt{z}\right)^2}{4(i p+s+f(v-2h))}\right)$$

$$\sqrt{-\frac{\left(i a+c(v-2h)+w+2(i p+s+f(v-2h))\sqrt{z}\right)^2}{i p+s+f(v-2h)}}\Bigg)\Bigg)\Bigg/;\ n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving powers of cos, powers of sinh and power

Involving $z^{\alpha-1}\cos^m(a z^r+q)\sinh^u(w z^r+t)\cosh^v(c z^r+g)$

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$$\int z^{\alpha-1}\cos^m(a z^r+q)\sinh^u(w z^r+t)\cosh^v(c z^r+g)\,dz==$$

$$-\frac{(i^u\,2^{-m-u-v}\,z^\alpha)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(m\bmod 2-1)(u\bmod 2-1)(v\bmod 2-1)}{\alpha}-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u \bmod 2)\,(1-v \bmod 2)\sum_{h=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{h}\left(e^{2\,i\,h\,q-i\,m\,q}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,i\,a\,h+i\,a\,m)\,z^r\right)\right.\right.$$

$$\left.\left.((-2\,i\,a\,h+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}+e^{i\,m\,q-2\,i\,h\,q}\,((2\,i\,a\,h-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,a\,h-i\,a\,m)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)\,(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{2\,g\,h-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(c\,v-2\,c\,h)\,z^r\right)((c\,v-2\,c\,h)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$\left.\left.e^{g\,v-2\,g\,h}\,((2\,c\,h-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,h-c\,v)\,z^r\right)\right)\right)-\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}\right.$$

$$(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{2\,k\,t-u\,t+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{\alpha}{r},\,(u\,w-2\,k\,w)\,z^r\right)((u\,w-2\,k\,w)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$\left.\left.e^{-2\,k\,t+u\,t-\frac{i\,\pi\,u}{2}}\,((2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,k\,w-u\,w)\,z^r\right)\right)\right)-\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{u}{\frac{u}{2}}(1-u \bmod 2)\right.$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{2\,g\,h+2\,i\,j\,q-i\,m\,q-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v)\,z^r\right)((-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$

$$e^{2\,g\,h-2\,i\,j\,q+i\,m\,q-g\,v}\,((-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v)\,z^r\right)+$$

$$e^{-2\,g\,h+2\,i\,j\,q-i\,m\,q+g\,v}\,((2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v)\,z^r\right)+$$

$$\left.\left.e^{-2\,g\,h-2\,i\,j\,q+i\,m\,q+g\,v}\,((2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\,2^{-m-u-v}\,z^\alpha\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{2\,i\,j\,q-i\,m\,q+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\right.\right.$$

$$\Gamma\left(\frac{\alpha}{r},\,(-2\,a\,i\,j+i\,a\,m-2\,k\,w+u\,w)\,z^r\right)((-2\,a\,i\,j+i\,a\,m-2\,k\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}+$$

$$e^{-2\,i\,j\,q+i\,m\,q+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,((2\,i\,a\,j-i\,a\,m-2\,k\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,a\,j-i\,a\,m-2\,k\,w+u\,w)\,z^r\right)+$$

$$e^{2\,i\,j\,q-i\,m\,q-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((-2\,a\,i\,j+i\,a\,m+2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-2\,a\,i\,j+i\,a\,m+2\,k\,w-u\,w)\,z^r\right)+$$

$$\left.\left.e^{-2\,i\,j\,q+i\,m\,q-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((2\,i\,a\,j-i\,a\,m+2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(2\,i\,a\,j-i\,a\,m+2\,k\,w-u\,w)\,z^r\right)\right)\right)-$$

$$\frac{1}{r}\left(i^u\, 2^{-m-u-v}\, z^\alpha \binom{m}{\frac{m}{2}} (1-m \bmod 2) \sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor} (-1)^k \binom{u}{k} \sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{h} \left(e^{2gh+2kt-tu+\frac{i\pi u}{2}-gv}\right.\right.$$

$$\Gamma\left(\frac{\alpha}{r}, (-2ch+cv-2kw+uw)z^r\right)((-2ch+cv-2kw+uw)z^r)^{-\frac{\alpha}{r}} +$$

$$e^{-2gh+2kt-tu+\frac{i\pi u}{2}+gv}((2ch-cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (2ch-cv-2kw+uw)z^r\right) +$$

$$e^{2gh-2kt+tu-gv-\frac{i\pi u}{2}}((-2ch+cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (-2ch+cv+2kw-uw)z^r\right) +$$

$$\left.\left.e^{-2gh-2kt+tu+gv-\frac{i\pi u}{2}}((2ch-cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (2ch-cv+2kw-uw)z^r\right)\right)\right) -$$

$$\frac{1}{r}\left(i^u\, 2^{-m-u-v}\, z^\alpha \sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor} \binom{v}{h} \sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} \binom{m}{j} \sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor} (-1)^k \binom{u}{k} \left(e^{2gh+2ijq-imq+2kt-tu+\frac{i\pi u}{2}-gv}\Gamma\left(\frac{\alpha}{r},\right.\right.\right.$$

$$(-2ch-2iaj+iam+cv-2kw+uw)z^r\Big)((-2ch-2iaj+iam+cv-2kw+uw)z^r)^{-\frac{\alpha}{r}} +$$

$$e^{2gh-2ijq+imq+2kt-tu+\frac{i\pi u}{2}-gv}((-2ch+2iaj-iam+cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\right.$$

$$(-2ch+2iaj-iam+cv-2kw+uw)z^r\Big) + e^{-2gh+2ijq-imq+2kt-tu+\frac{i\pi u}{2}+gv}$$

$$((2ch-2iaj+iam-cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (2ch-2iaj+iam-cv-2kw+uw)z^r\right) +$$

$$e^{-2gh-2ijq+imq+2kt-tu+\frac{i\pi u}{2}+gv}((2ch+2iaj-iam-cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\right.$$

$$(2ch+2iaj-iam-cv-2kw+uw)z^r\Big) + e^{2gh+2ijq-imq-2kt+tu-gv-\frac{i\pi u}{2}}$$

$$((-2ch-2iaj+iam+cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (-2ch-2iaj+iam+cv+2kw-uw)\right.$$

$$z^r\Big) + e^{2gh-2ijq+imq-2kt+tu-gv-\frac{i\pi u}{2}}((-2ch+2iaj-iam+cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\Big($$

$$\frac{\alpha}{r}, (-2ch+2iaj-iam+cv+2kw-uw)z^r\Big) + e^{-2gh+2ijq-imq-2kt+tu+gv-\frac{i\pi u}{2}}$$

$$((2ch-2iaj+iam-cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r}, (2ch-2iaj+iam-cv+2kw-uw)z^r\right) +$$

$$e^{-2gh-2ijq+imq-2kt+tu+gv-\frac{i\pi u}{2}}((2ch+2iaj-iam-cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},\right.$$

$$\left.\left.\left.(2ch+2iaj-iam-cv+2kw-uw)z^r\Big)\right)\right); m \in \mathbb{Z} \wedge m > 0 \wedge u \in \mathbb{Z} \wedge u > 0 \wedge v \in \mathbb{Z} \wedge v > 0$$

Involving $z^n \cos^m(a z^r + p z + q) \sinh^u(w z^r + s z + t) \cosh^v(c z^r + f z + g)$

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$$\int z^n \cos^m\left(a z^2+p z+q\right) \sinh^u\left(w z^2+s z+t\right) \cosh^v\left(c z^2+f z+g\right) dz ==$$

$$\frac{i^u\, 2^{-m-u-v}\, z^{n+1}\, (1-m \bmod 2)\, (1-u \bmod 2)\, (1-v \bmod 2)}{n+1} \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} - i^u\, 2^{-m-u-v-1} \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} (1-u \bmod 2)$$

$$(1-v \bmod 2) \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \left(e^{\frac{i\,(2\,j-m)\,q}{-\frac{i\,(2\,j-m)\,p^2}{4\,a}}} (i\,a\,(2\,j-m))^{-n-1} \sum_{l=0}^{n} 2^{l-n}\, (-i\,(2\,j-m)\,p)^{n-l}\, (i\,(2\,j-m)\,p+2\,a\,i\,(2\,j-m)\,z)^{l+1} \right.$$

$$\left(\frac{i\,(i\,(2\,j-m)\,p+2\,a\,i\,(2\,j-m)\,z)^2}{a\,(2\,j-m)} \right)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\left(\frac{l+1}{2},\ \frac{i\,(i\,(2\,j-m)\,p+2\,a\,i\,(2\,j-m)\,z)^2}{4\,a\,(2\,j-m)} \right) +$$

$$e^{\frac{i\,(m-2\,j)\,q}{-\frac{i\,(m-2\,j)\,p^2}{4\,a}}} (i\,a\,(m-2\,j))^{-n-1} \sum_{l=0}^{n} 2^{l-n}\, (-i\,(m-2\,j)\,p)^{n-l}\, (i\,(m-2\,j)\,p+2\,a\,i\,(m-2\,j)\,z)^{l+1}$$

$$\left. \left(\frac{i\,(i\,(m-2\,j)\,p+2\,a\,i\,(m-2\,j)\,z)^2}{a\,(m-2\,j)} \right)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\left(\frac{l+1}{2},\ \frac{i\,(i\,(m-2\,j)\,p+2\,a\,i\,(m-2\,j)\,z)^2}{4\,a\,(m-2\,j)} \right) \right) -$$

$$i^u\, 2^{-m-u-v-1} \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} (1-m \bmod 2)\, (1-u \bmod 2) \sum_{j=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{j} \left(e^{g\,(2\,j-v)-\frac{f^2\,(2\,j-v)}{4\,c}} (c\,(2\,j-v))^{-n-1} \right.$$

$$\sum_{l=0}^{n} 2^{l-n}\, (-f\,(2\,j-v))^{n-l}\, (f\,(2\,j-v)+2\,c\,z\,(2\,j-v))^{l+1} \left(-\frac{(f\,(2\,j-v)+2\,c\,z\,(2\,j-v))^2}{c\,(2\,j-v)} \right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l} \Gamma\left(\frac{l+1}{2},\ -\frac{(f\,(2\,j-v)+2\,c\,z\,(2\,j-v))^2}{4\,c\,(2\,j-v)} \right) + e^{g\,(v-2\,j)-\frac{f^2\,(v-2\,j)}{4\,c}} (c\,(v-2\,j))^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n}\, (-f\,(v-2\,j))^{n-l}\, (f\,(v-2\,j)+2\,c\,z\,(v-2\,j))^{l+1} \left(-\frac{(f\,(v-2\,j)+2\,c\,z\,(v-2\,j))^2}{c\,(v-2\,j)} \right)^{\frac{1}{2}(-l-1)}$$

$$\left. \binom{n}{l} \Gamma\left(\frac{l+1}{2},\ -\frac{(f\,(v-2\,j)+2\,c\,z\,(v-2\,j))^2}{4\,c\,(v-2\,j)} \right) \right) - i^u\, 2^{-m-u-v-1} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\, (1-v \bmod 2)$$

$$\sum_{i=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^i \binom{u}{i} \left(e^{-\frac{(2\,i-u)\,s^2}{4\,w}+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}} ((2\,i-u)\,w)^{-n-1} \sum_{l=0}^{n} 2^{l-n}\, (-s\,(2\,i-u))^{n-l}\, (s\,(2\,i-u)+2\,w\,z\,(2\,i-u))^{l+1} \right.$$

$$\left(-\frac{(s\,(2\,i-u)+2\,w\,z\,(2\,i-u))^2}{(2\,i-u)\,w} \right)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\left(\frac{l+1}{2},\ -\frac{(s\,(2\,i-u)+2\,w\,z\,(2\,i-u))^2}{4\,(2\,i-u)\,w} \right) +$$

$$e^{-\frac{(u-2\,i)\,s^2}{4\,w}-\frac{i\,\pi\,u}{2}+t\,(u-2\,i)} ((u-2\,i)\,w)^{-n-1} \sum_{l=0}^{n} 2^{l-n}\, (-s\,(u-2\,i))^{n-l}\, (s\,(u-2\,i)+2\,w\,z\,(u-2\,i))^{l+1}$$

$$\left(-\frac{(s\,(u-2\,i)+2\,w\,z\,(u-2\,i))^2}{(u-2\,i)\,w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(s\,(u-2\,i)+2\,w\,z\,(u-2\,i))^2}{4\,(u-2\,i)\,w}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\Bigg(e^{-\frac{(i\,(2\,k-m)\,p+f\,(2\,j-v))^2}{4\,(a\,i\,(2\,k-m)+c\,(2\,j-v))}+i\,(2\,k-m)\,q+g\,(2\,j-v)}\,(a\,i\,(2\,k-m)+c\,(2\,j-v))^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(2\,k-m)\,p-f\,(2\,j-v))^{n-l}\,(i\,(2\,k-m)\,p+f\,(2\,j-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,j-v))\,z)^{l+1}$$

$$\left(-\frac{(i\,(2\,k-m)\,p+f\,(2\,j-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,j-v))\,z)^2}{a\,i\,(2\,k-m)+c\,(2\,j-v)}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,(2\,k-m)\,p+f\,(2\,j-v)+2\,(a\,i\,(2\,k-m)+c\,(2\,j-v))\,z)^2}{4\,(a\,i\,(2\,k-m)+c\,(2\,j-v))}\right)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p+f\,(2\,j-v))^2}{4\,(a\,i\,(m-2\,k)+c\,(2\,j-v))}+i\,(m-2\,k)\,q+g\,(2\,j-v)}\,(a\,i\,(m-2\,k)+c\,(2\,j-v))^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(m-2\,k)\,p-f\,(2\,j-v))^{n-l}\,(i\,(m-2\,k)\,p+f\,(2\,j-v)+2\,(a\,i\,(m-2\,k)+c\,(2\,j-v))\,z)^{l+1}$$

$$\left(-\frac{(i\,(m-2\,k)\,p+f\,(2\,j-v)+2\,(a\,i\,(m-2\,k)+c\,(2\,j-v))\,z)^2}{a\,i\,(m-2\,k)+c\,(2\,j-v)}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,(m-2\,k)\,p+f\,(2\,j-v)+2\,(a\,i\,(m-2\,k)+c\,(2\,j-v))\,z)^2}{4\,(a\,i\,(m-2\,k)+c\,(2\,j-v))}\right)+$$

$$e^{-\frac{(i\,(2\,k-m)\,p+f\,(v-2\,j))^2}{4\,(a\,i\,(2\,k-m)+c\,(v-2\,j))}+i\,(2\,k-m)\,q+g\,(v-2\,j)}\,(a\,i\,(2\,k-m)+c\,(v-2\,j))^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(2\,k-m)\,p-f\,(v-2\,j))^{n-l}\,(i\,(2\,k-m)\,p+f\,(v-2\,j)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,j))\,z)^{l+1}$$

$$\left(-\frac{(i\,(2\,k-m)\,p+f\,(v-2\,j)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,j))\,z)^2}{a\,i\,(2\,k-m)+c\,(v-2\,j)}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,(2\,k-m)\,p+f\,(v-2\,j)+2\,(a\,i\,(2\,k-m)+c\,(v-2\,j))\,z)^2}{4\,(a\,i\,(2\,k-m)+c\,(v-2\,j))}\right)+$$

$$e^{-\frac{(i\,(m-2\,k)\,p+f\,(v-2\,j))^2}{4\,(a\,i\,(m-2\,k)+c\,(v-2\,j))}+i\,(m-2\,k)\,q+g\,(v-2\,j)}\,(a\,i\,(m-2\,k)+c\,(v-2\,j))^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(m-2\,k)\,p-f\,(v-2\,j))^{n-l}\,(i\,(m-2\,k)\,p+f\,(v-2\,j)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^{l+1}$$

$$\left(-\frac{(i\,(m-2\,k)\,p+f\,(v-2\,j)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^2}{a\,i\,(m-2\,k)+c\,(v-2\,j)}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(i\,(m-2\,k)\,p+f\,(v-2\,j)+2\,(a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^2}{4\,(a\,i\,(m-2\,k)+c\,(v-2\,j))}\right)\Bigg)-$$

$$i^u\, 2^{-m-u-v-1} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \sum_{i=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^i \binom{u}{i} \left(e^{-\frac{(i(2j-m)p+s(2i-u))^2}{4(a\,i(2j-m)+(2i-u)w)}+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}} \right.$$

$$\left(\sum_{l=0}^{n} 2^{l-n} (-i(2j-m)p-s(2i-u))^{n-l} (i(2j-m)p+s(2i-u)+2(a\,i(2j-m)+(2i-u)w)z)^{l+1} \right.$$

$$\left(-\frac{(i(2j-m)p+s(2i-u)+2(a\,i(2j-m)+(2i-u)w)z)^2}{a\,i(2j-m)+(2i-u)w} \right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\left. \Gamma\left(\frac{l+1}{2}, -\frac{(i(2j-m)p+s(2i-u)+2(a\,i(2j-m)+(2i-u)w)z)^2}{4(a\,i(2j-m)+(2i-u)w)} \right) \right)$$

$$(a\,i(2j-m)+(2i-u)w)^{-n-1} + e^{-\frac{(i(m-2j)p+s(2i-u))^2}{4(a\,i(m-2j)+(2i-u)w)}+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}} (a\,i(m-2j)+(2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-i(m-2j)p-s(2i-u))^{n-l} (i(m-2j)p+s(2i-u)+2(a\,i(m-2j)+(2i-u)w)z)^{l+1}$$

$$\left(-\frac{(i(m-2j)p+s(2i-u)+2(a\,i(m-2j)+(2i-u)w)z)^2}{a\,i(m-2j)+(2i-u)w} \right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(i(m-2j)p+s(2i-u)+2(a\,i(m-2j)+(2i-u)w)z)^2}{4(a\,i(m-2j)+(2i-u)w)} \right) +$$

$$e^{-\frac{(i(2j-m)p+s(u-2i))^2}{4(a\,i(2j-m)+(u-2i)w)}+i(2j-m)q+t(u-2i)-\frac{i\pi u}{2}} (a\,i(2j-m)+(u-2i)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-i(2j-m)p-s(u-2i))^{n-l} (i(2j-m)p+s(u-2i)+2(a\,i(2j-m)+(u-2i)w)z)^{l+1}$$

$$\left(-\frac{(i(2j-m)p+s(u-2i)+2(a\,i(2j-m)+(u-2i)w)z)^2}{a\,i(2j-m)+(u-2i)w} \right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(i(2j-m)p+s(u-2i)+2(a\,i(2j-m)+(u-2i)w)z)^2}{4(a\,i(2j-m)+(u-2i)w)} \right) +$$

$$e^{-\frac{(i(m-2j)p+s(u-2i))^2}{4(a\,i(m-2j)+(u-2i)w)}+i(m-2j)q+t(u-2i)-\frac{i\pi u}{2}} (a\,i(m-2j)+(u-2i)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-i(m-2j)p-s(u-2i))^{n-l} (i(m-2j)p+s(u-2i)+2(a\,i(m-2j)+(u-2i)w)z)^{l+1}$$

$$\left(-\frac{(i(m-2j)p+s(u-2i)+2(a\,i(m-2j)+(u-2i)w)z)^2}{a\,i(m-2j)+(u-2i)w} \right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\left. \left. \Gamma\left(\frac{l+1}{2}, -\frac{(i(m-2j)p+s(u-2i)+2(a\,i(m-2j)+(u-2i)w)z)^2}{4(a\,i(m-2j)+(u-2i)w)} \right) \right) -$$

$$i^u\, 2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(e^{-\frac{(s(2i-u)+f(2j-v))^2}{4(c(2j-v)+(2i-u)w)}+t(2i-u)+\frac{i\pi u}{2}+g(2j-v)}\right.$$

$$\left(\sum_{l=0}^{n}2^{l-n}(-s(2i-u)-f(2j-v))^{n-l}(s(2i-u)+f(2j-v)+2(c(2j-v)+(2i-u)w)z)^{l+1}\right.$$

$$\left(-\frac{(s(2i-u)+f(2j-v)+2(c(2j-v)+(2i-u)w)z)^2}{c(2j-v)+(2i-u)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\left.\left.\Gamma\left(\frac{l+1}{2},-\frac{(s(2i-u)+f(2j-v)+2(c(2j-v)+(2i-u)w)z)^2}{4(c(2j-v)+(2i-u)w)}\right)\right)\right.$$

$$(c(2j-v)+(2i-u)w)^{-n-1}+e^{-\frac{(s(2i-u)+f(v-2j))^2}{4(c(v-2j)+(2i-u)w)}+t(2i-u)+\frac{i\pi u}{2}+g(v-2j)}(c(v-2j)+(2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}(-s(2i-u)-f(v-2j))^{n-l}(s(2i-u)+f(v-2j)+2(c(v-2j)+(2i-u)w)z)^{l+1}$$

$$\left(-\frac{(s(2i-u)+f(v-2j)+2(c(v-2j)+(2i-u)w)z)^2}{c(v-2j)+(2i-u)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(s(2i-u)+f(v-2j)+2(c(v-2j)+(2i-u)w)z)^2}{4(c(v-2j)+(2i-u)w)}\right)+$$

$$e^{-\frac{(s(u-2i)+f(2j-v))^2}{4(c(2j-v)+(u-2i)w)}-\frac{i\pi u}{2}+t(u-2i)+g(2j-v)}(c(2j-v)+(u-2i)w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}(-s(u-2i)-f(2j-v))^{n-l}(s(u-2i)+f(2j-v)+2(c(2j-v)+(u-2i)w)z)^{l+1}$$

$$\left(-\frac{(s(u-2i)+f(2j-v)+2(c(2j-v)+(u-2i)w)z)^2}{c(2j-v)+(u-2i)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(s(u-2i)+f(2j-v)+2(c(2j-v)+(u-2i)w)z)^2}{4(c(2j-v)+(u-2i)w)}\right)+$$

$$e^{-\frac{(s(u-2i)+f(v-2j))^2}{4(c(v-2j)+(u-2i)w)}-\frac{i\pi u}{2}+t(u-2i)+g(v-2j)}(c(v-2j)+(u-2i)w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}(-s(u-2i)-f(v-2j))^{n-l}(s(u-2i)+f(v-2j)+2(c(v-2j)+(u-2i)w)z)^{l+1}$$

$$\left(-\frac{(s(u-2i)+f(v-2j)+2(c(v-2j)+(u-2i)w)z)^2}{c(v-2j)+(u-2i)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\left.\left.\Gamma\left(\frac{l+1}{2},-\frac{(s(u-2i)+f(v-2j)+2(c(v-2j)+(u-2i)w)z)^2}{4(c(v-2j)+(u-2i)w)}\right)\right)-\right.$$

$$i^u\, 2^{-m-u-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \sum_{i=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^i \binom{u}{i} \Bigg(e^{-\frac{(i(2j-m)p+s(2i-u)+f(2k-v))^2}{4(a\,i(2j-m)+c(2k-v)+(2i-u)w)}+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)}$$

$$\Bigg(\sum_{l=0}^{n} 2^{l-n} (-i(2j-m)p - s(2i-u) - f(2k-v))^{n-l}$$

$$(i(2j-m)p + s(2i-u) + f(2k-v) + 2(a\,i(2j-m) + c(2k-v) + (2i-u)w)z)^{l+1}$$

$$\Big(-(i(2j-m)p + s(2i-u) + f(2k-v) + 2(a\,i(2j-m) + c(2k-v) + (2i-u)w)z)^2 \Big/$$

$$(a\,i(2j-m) + c(2k-v) + (2i-u)w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\Bigg(\frac{l+1}{2},$$

$$-(i(2j-m)p + s(2i-u) + f(2k-v) + 2(a\,i(2j-m) + c(2k-v) + (2i-u)w)z)^2 \Big/$$

$$(4(a\,i(2j-m) + c(2k-v) + (2i-u)w))\Bigg)\Bigg) (a\,i(2j-m) + c(2k-v) + (2i-u)w)^{-n-1} +$$

$$e^{-\frac{(i(m-2j)p+s(2i-u)+f(2k-v))^2}{4(a\,i(m-2j)+c(2k-v)+(2i-u)w)}+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)} (a\,i(m-2j) + c(2k-v) + (2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-i(m-2j)p - s(2i-u) - f(2k-v))^{n-l}$$

$$(i(m-2j)p + s(2i-u) + f(2k-v) + 2(a\,i(m-2j) + c(2k-v) + (2i-u)w)z)^{l+1}$$

$$\Big(-(i(m-2j)p + s(2i-u) + f(2k-v) + 2(a\,i(m-2j) + c(2k-v) + (2i-u)w)z)^2 \Big/$$

$$(a\,i(m-2j) + c(2k-v) + (2i-u)w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\Bigg(\frac{l+1}{2},$$

$$-(i(m-2j)p + s(2i-u) + f(2k-v) + 2(a\,i(m-2j) + c(2k-v) + (2i-u)w)z)^2 \Big/$$

$$(4(a\,i(m-2j) + c(2k-v) + (2i-u)w))\Bigg) +$$

$$e^{-\frac{(i(2j-m)p+s(2i-u)+f(v-2k))^2}{4(a\,i(2j-m)+c(v-2k)+(2i-u)w)}+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}+g(v-2k)} (a\,i(2j-m) + c(v-2k) + (2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-i(2j-m)p - s(2i-u) - f(v-2k))^{n-l}$$

$$(i(2j-m)p + s(2i-u) + f(v-2k) + 2(a\,i(2j-m) + c(v-2k) + (2i-u)w)z)^{l+1}$$

$$\Big(-(i(2j-m)p + s(2i-u) + f(v-2k) + 2(a\,i(2j-m) + c(v-2k) + (2i-u)w)z)^2 \Big/$$

$$(a\,i(2j-m) + c(v-2k) + (2i-u)w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\Bigg(\frac{l+1}{2},$$

$$-(i(2j-m)p + s(2i-u) + f(v-2k) + 2(a\,i(2j-m) + c(v-2k) + (2i-u)w)z)^2 \Big/$$

$$(4(a\,i(2j-m) + c(v-2k) + (2i-u)w))\Bigg) +$$

$$e^{-\frac{(i(m-2j)p+s(2i-u)+f(v-2k))^2}{4(a\,i(m-2j)+c(v-2k)+(2i-u)w)}+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}+g(v-2k)} (a\,i(m-2j) + c(v-2k) + (2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-i(m-2j)p - s(2i-u) - f(v-2k))^{n-l}$$

$$(i(m-2j)p + s(2i-u) + f(v-2k) + 2(a\,i(m-2j) + c(v-2k) + (2i-u)w)z)^{l+1}$$

$$\Big(-(i(m-2j)p + s(2i-u) + f(v-2k) + 2(a\,i(m-2j) + c(v-2k) + (2i-u)w)z)^2 \Big/$$

$$(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},$$

$$-(i\,(m-2\,j)\,p+s\,(2\,i-u)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)\,z)^2\Big/$$

$$(4\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w))\Big)+$$

$$e^{-\frac{(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)}+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(2\,j-m)\,p-s\,(u-2\,i)-f\,(2\,k-v))^{n-l}$$

$$(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\Big(-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},$$

$$-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)}+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(m-2\,j)\,p-s\,(u-2\,i)-f\,(2\,k-v))^{n-l}$$

$$(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\Big(-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},$$

$$-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k))^2}{4\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)}+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(2\,j-m)\,p-s\,(u-2\,i)-f\,(v-2\,k))^{n-l}$$

$$(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\Big(-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},$$

$$-(i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(4\,(a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k))^2}{4\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)}+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-i\,(m-2\,j)\,p-s\,(u-2\,i)-f\,(v-2\,k))^{n-l}$$

$$(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\left(-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/\right.$$
$$(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\right.$$
$$\left.\left.-(i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w))\right)\right)/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\cos^m\left(\sqrt{z}\ a+q+p\,z\right)\sinh^u\left(t+s\,z+w\,\sqrt{z}\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz==$$

$$\frac{\left(i^u\,2^{-m-u-v}\,z^{n+1}\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)}{n+1}+2^{-m-2\,n-u-v-1}\,i^u\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)$$

$$(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\left(e^{i\,(2\,k-m)\,q-\frac{i\,a^2\,(2\,k-m)}{4\,p}}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a\,(2\,k-m))^{-i-l+2\,n}\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^{i+l}\right.\right.$$

$$\left(\frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{(2\,k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(a\,i\,(2\,k-m)\right.$$

$$\left.\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)\Gamma\left(\frac{1}{2}(i+l+1),\ \frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,(2\,k-m)\,p}\right)+2\right.$$

$$i\,(2\,k-m)\,p\sqrt{\frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{(2\,k-m)\,p}}$$

$$\left.\left.\left.\Gamma\left(\frac{1}{2}(i+l+2),\ \frac{i\left(a\,i\,(2\,k-m)+2\,i\,p\,\sqrt{z}\ (2\,k-m)\right)^2}{4\,(2\,k-m)\,p}\right)\right)\right)(i\,(2\,k-m)\,p)^{-2\,n-2}+$$

$$e^{i\,(m-2\,k)\,q-\frac{i\,a^2\,(m-2\,k)}{4\,p}}\,(i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(i\,a\,(m-2\,k))^{-i-l+2\,n}\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)^{i+l}$$

$$\left(\frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)^2}{(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(a\,i\,(m-2\,k)\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)\right.$$

$$\left.\Gamma\left(\frac{1}{2}(i+l+1),\ \frac{i\left(a\,i\,(m-2\,k)+2\,i\,p\,\sqrt{z}\ (m-2\,k)\right)^2}{4\,(m-2\,k)\,p}\right)+2\,i\,(m-2\,k)\,p\right.$$

$$\sqrt{\frac{i\left(a\,i\,(m-2k)+2\,i\,p\,\sqrt{z}\,(m-2k)\right)^2}{(m-2k)\,p}}\;\Gamma\left(\frac{1}{2}(i+l+2),\;\frac{i\left(a\,i\,(m-2k)+2\,i\,p\,\sqrt{z}\,(m-2k)\right)^2}{4\,(m-2k)\,p}\right)\Bigg)\Bigg)+$$

$$2^{-m-2n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{(2k-u)w^2}{4s}+t(2k-u)+\frac{i\pi u}{2}}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,((2k-u)\,w)^{-i-l+2n}\left(w(2k-u)+2s\sqrt{z}\,(2k-u)\right)^{i+l}$$

$$\left(-\frac{\left(w(2k-u)+2s\sqrt{z}\,(2k-u)\right)^2}{s(2k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((2k-u)\,w\left(w(2k-u)+2s\sqrt{z}\,(2k-u)\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),\;-\frac{\left(w(2k-u)+2s\sqrt{z}\,(2k-u)\right)^2}{4s(2k-u)}\right)+2s(2k-u)$$

$$\sqrt{-\frac{\left(w(2k-u)+2s\sqrt{z}\,(2k-u)\right)^2}{s(2k-u)}}\;\Gamma\left(\frac{1}{2}(i+l+2),\;-\frac{\left(w(2k-u)+2s\sqrt{z}\,(2k-u)\right)^2}{4s(2k-u)}\right)\Bigg)\Bigg)$$

$$(s(2k-u))^{-2n-2}+e^{-\frac{(u-2k)w^2}{4s}-\frac{i\pi u}{2}+t(u-2k)}\,(s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,((u-2k)\,w)^{-i-l+2n}$$

$$\left(w(u-2k)+2s\sqrt{z}\,(u-2k)\right)^{i+l}\left(-\frac{\left(w(u-2k)+2s\sqrt{z}\,(u-2k)\right)^2}{s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((u-2k)\,w$$

$$\left(w(u-2k)+2s\sqrt{z}\,(u-2k)\right)\Gamma\left(\frac{1}{2}(i+l+1),\;-\frac{\left(w(u-2k)+2s\sqrt{z}\,(u-2k)\right)^2}{4s(u-2k)}\right)+2s(u-2k)$$

$$\sqrt{-\frac{\left(w(u-2k)+2s\sqrt{z}\,(u-2k)\right)^2}{s(u-2k)}}\;\Gamma\left(\frac{1}{2}(i+l+2),\;-\frac{\left(w(u-2k)+2s\sqrt{z}\,(u-2k)\right)^2}{4s(u-2k)}\right)\Bigg)\Bigg)+$$

$$2^{-m-2n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{g(2h-v)-\frac{c^2(2h-v)}{4f}}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c(2h-v))^{-i-l+2n}\right.\right.$$

$$\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^{i+l}\left(-\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{f(2h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(c(2h-v)\right.$$

$$\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{4f(2h-v)}\right)+2f(2h-v)$$

$$\left.\left.\sqrt{-\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{f(2h-v)}}\;\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c(2h-v)+2f\sqrt{z}\,(2h-v)\right)^2}{4f(2h-v)}\right)\right)\right)$$

$$(f(2h-v))^{-2n-2}+e^{g(v-2h)-\frac{c^2(v-2h)}{4f}}(f(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c(v-2h))^{-i-l+2n}$$

$$\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^{i+l}\left(-\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{f(v-2h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(c(v-2h)\right.$$

$$\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{4f(v-2h)}\right)+2f(v-2h)$$

$$\left.\left.\sqrt{-\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{f(v-2h)}}\;\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(c(v-2h)+2f\sqrt{z}\,(v-2h)\right)^2}{4f(v-2h)}\right)\right)\right)+$$

$$2^{-m-2n-u-v-1}\,i^u\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(a\,i\,(2k-m)+(2j-u)w)^2}{4(i(2k-m)p+s(2j-u))}+i(2k-m)q+t(2j-u)+\frac{i\pi u}{2}}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2k-m)+(2j-u)w)^{-i-l+2n}\right.$$

$$\left(a\,i\,(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^{i+l}\left(-\left(a\,i\,(2k-m)+(2j-u)w+\right.\right.$$

$$\left.\left.2(i(2k-m)p+s(2j-u))\sqrt{z}\right)^2\Big/(i(2k-m)p+s(2j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((a\,i\,(2k-m)+(2j-u)w)\left(a\,i\,(2k-m)+(2j-u)w+2(i(2k-m)p+s(2j-u))\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.2\,(i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\Bigg)$$

$$(i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}+e^{-\frac{(a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}\,(i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}\left(-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.$$
$$\left.\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(m-2\,k)+(2\,j-u)\,w)\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Bigg)+$$

$$e^{-\frac{(a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j))}+i\,(2\,k-m)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$
$$(a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(2\,k-m)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(2\,k-m)+(u-2\,j)\,w)\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\big(a\,i\,(2\,k-m)+(u-2\,j)\,w+$$

$$2\,(i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j))}+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{i\,\pi\,u}{2}}\,(i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}\,\big(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^{i+l}$$

$$\Big(-\big(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^2\Big/$$

$$(i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(m-2\,k)+(u-2\,j)\,w)\,\big(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\big(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\big(a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\big(a\,i\,(m-2\,k)+(u-2\,j)\,w+$$

$$2\,(i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^2\Big/(i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Big(e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(i\,(2\,k-m)\,p+f\,(2\,h-v))}+i\,(2\,k-m)\,q+g\,(2\,h-v)}$$

$$\Big(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(2\,h-v))^{-i-l+2\,n}\,\big(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))$$

$$\sqrt{z}\big)^{i+l}\,\Big(-\big(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$

$$(i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(2\,k-m)+c\,(2\,h-v))\,\big(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\big(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+f\,(2\,h-v)))\Big)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\big(a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+f\,(2\,h-v)))\Big)\sqrt{\Big(-\big(a\,i\,(2\,k-m)+c\,(2\,h-v)+$$

$$2\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)\Big)\Big)$$

$$(i\,(2\,k-m)\,p+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(i\,(m-2\,k)\,p+f\,(2\,h-v))}+i\,(m-2\,k)\,q+g\,(2\,h-v)}\,(i\,(m-2\,k)\,p+f\,(2\,h-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2\,k)+c\,(2\,h-v))^{-i-l+2\,n}$$

$$\Big(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^{i+l}\Big(-\Big(a\,i\,(m-2\,k)+c\,(2\,h-v)+$$

$$2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(m-2\,k)+c\,(2\,h-v))\,\Big(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+f\,(2\,h-v)))\Big)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(i\,(m-2\,k)\,p+f\,(2\,h-v)))\Big)\sqrt{\Big(-\Big(a\,i\,(m-2\,k)+c\,(2\,h-v)+$$

$$2\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(i\,(m-2\,k)\,p+f\,(2\,h-v))\Big)\Big)+$$

$$e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(i\,(2\,k-m)\,p+f\,(v-2\,h))}+i\,(2\,k-m)\,q+g\,(v-2\,h)}\,(i\,(2\,k-m)\,p+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(a\,i\,(2\,k-m)+c\,(v-2\,h))^{-i-l+2\,n}\,\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(i\,(2\,k-m)\,p+f\,(v-2\,h))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,i\,(2\,k-m)+c\,(v-2\,h))\,\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+f\,(v-2\,h)))\Big)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(i\,(2\,k-m)\,p+f\,(v-2\,h)))\Big)\sqrt{\Big(-\Big(a\,i\,(2\,k-m)+c\,(v-2\,h)+$$

$$2\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(i\,(2\,k-m)\,p+f\,(v-2\,h))\Big)\Big)+$$

$$e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(i\,(m-2\,k)\,p+f\,(v-2\,h))}+i\,(m-2\,k)\,q+g\,(v-2\,h)}\,(i\,(m-2\,k)\,p+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(a\,i\,(m-2\,k)+c\,(v-2\,h))^{-i-l+2\,n}\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(m-2\,k)\,p+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(m-2\,k)+c\,(v-2\,h))\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+f\,(v-2\,h)))\right)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+f\,(v-2\,h)))\right)\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.}$$
$$\left.\left.2\,(i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+f\,(v-2\,h))\right)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{-\frac{(c\,(2\,h-v)+(2\,k-u)\,w)^2}{4\,(s\,(2\,k-u)+f\,(2\,h-v))}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}\right.$$
$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c\,(2\,h-v)+(2\,k-u)\,w)^{-i-l+2\,n}\right.$$
$$\left(2\,\sqrt{z}\,(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^{i+l}$$
$$\left(-\left(2\,\sqrt{z}\,(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2\Big/(s\,(2\,k-u)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}$$
$$\binom{i}{l}\binom{n}{i}\left((c\,(2\,h-v)+(2\,k-u)\,w)\left(2\,\sqrt{z}\,(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(2\,\sqrt{z}\,(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2\Big/\right.$$
$$\left.(4\,(s\,(2\,k-u)+f\,(2\,h-v)))\right)+2\,(s\,(2\,k-u)+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$
$$\left.-\left(2\,\sqrt{z}\,(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2\Big/(4\,(s\,(2\,k-u)+f\,(2\,h-v)))\right)$$
$$\left.\left.\sqrt{\left(-\left(2\,\sqrt{z}\,(s\,(2\,k-u)+f\,(2\,h-v))+c\,(2\,h-v)+(2\,k-u)\,w\right)^2\Big/(s\,(2\,k-u)+f\,(2\,h-v))\right)}\right)\right)$$
$$(s\,(2\,k-u)+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(c\,(2\,h-v)+(u-2\,k)\,w)^2}{4\,(s\,(u-2\,k)+f\,(2\,h-v))}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(2\,h-v)}(s\,(u-2\,k)+f\,(2\,h-v))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(c\,(2\,h-v)+(u-2\,k)\,w)^{-i-l+2\,n}$$
$$\left(2\,\sqrt{z}\,(s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^{i+l}$$

$$\left(-\frac{\left(2\sqrt{z}\ (s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2}{s\,(u-2\,k)+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((c\,(2\,h-v)+(u-2\,k)\,w)\left(2\sqrt{z}\ (s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\ -\left(2\sqrt{z}\ (s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2\Big/\right.$$

$$\left.(4\,(s\,(u-2\,k)+f\,(2\,h-v)))\right)+2\,(s\,(u-2\,k)+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$\left.\left.-\left(2\sqrt{z}\ (s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2\Big/(4\,(s\,(u-2\,k)+f\,(2\,h-v)))\right)\right.$$

$$\left.\sqrt{\left(-\left(2\sqrt{z}\ (s\,(u-2\,k)+f\,(2\,h-v))+c\,(2\,h-v)+(u-2\,k)\,w\right)^2\Big/(s\,(u-2\,k)+f\,(2\,h-v))\right)}\right)+$$

$$e^{-\frac{(c\,(v-2\,h)+(2\,k-u)\,w)^2}{4\,(s\,(2\,k-u)+f\,(v-2\,h))}+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(s\,(2\,k-u)+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(c\,(v-2\,h)+(2\,k-u)\,w)^{-i-l+2\,n}\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{s\,(2\,k-u)+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((c\,(v-2\,h)+(2\,k-u)\,w)\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\ -\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(s\,(2\,k-u)+f\,(v-2\,h)))\right)+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$\left.\left.-\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(4\,(s\,(2\,k-u)+f\,(v-2\,h)))\right)\right.$$

$$\left.\sqrt{\left(-\left(c\,(v-2\,h)+(2\,k-u)\,w+2\,(s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(s\,(2\,k-u)+f\,(v-2\,h))\right)}\right)+$$

$$e^{-\frac{(c\,(v-2\,h)+(u-2\,k)\,w)^2}{4\,(s\,(u-2\,k)+f\,(v-2\,h))}-\frac{i\,\pi\,u}{2}+t\,(u-2\,k)+g\,(v-2\,h)}\,(s\,(u-2\,k)+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i$$

$$(c\,(v-2\,h)+(u-2\,k)\,w)^{-i-l+2\,n}\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2}{s\,(u-2\,k)+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((c\,(v-2\,h)+(u-2\,k)\,w)\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\ -\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4\,(s\,(u-2\,k)+f\,(v-2\,h)))\right)+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$-\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(s\,(u-2\,k)+f\,(v-2\,h))\right)\Bigg)$$

$$\sqrt{\left(-\left(c\,(v-2\,h)+(u-2\,k)\,w+2\,(s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(s\,(u-2\,k)+f\,(v-2\,h)\right)\right)}\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+\right.$$

$$\left.2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$\left.-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right.\right.$$

$$\left.\left.\sqrt{z}\right)^2\Big/\left(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)\right)+$$

$$2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(2\,k-m)+\right.\right.$$

$$\left.\left.c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right.\right.$$

$$\left.\left.\sqrt{z}\right)^2\Big/\left(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)\right)$$

$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.}$$

$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)\right)\right)}\Bigg)\Bigg)$$

$$(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+\right.\right.$$
$$\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(m-2\,k)+\right.\right.$$
$$\left.\left.c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\right)+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\right)$$
$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.\right.$$
$$\left.\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)}+$$
$$e^{-\frac{(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+\right.\right.$$
$$\left.2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(2\,k-m)+\right.\right.$$
$$\left.\left.c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\right)+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\right)$$
$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.\right.$$
$$\left.\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)}+$$
$$e^{-\frac{(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\Bigg)\binom{n}{i}$$
$$\left(\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w\right)\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+\right.\right.$$
$$\left.2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(m-2\,k)+\right.\right.$$
$$\left.\left.c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.\left.(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\right)+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\right)$$
$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.\right.$$
$$\left.\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\right)+$$
$$e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\Bigg)\binom{n}{i}$$
$$\left(\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w\right)\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+\right.\right.$$
$$\left.2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(2\,k-m)+\right.\right.$$
$$\left.\left.c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.\left.(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)))\right)+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right.$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(4\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)))\right)$$
$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.\right.\right.$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\right)+$$
$$e^{-\frac{(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+\right.\right.$$

$$\left.2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(m-2\,k)+\right.\right.$$

$$\left.\left.c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)))\right)+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.$$

$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\left(4\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\right)$$

$$\sqrt{\left(-\left(a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.}$$

$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\left(i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\right)+$$

$$e^{-\frac{(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^{2}}{4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+\right.\right.$$

$$\left.2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(a\,i\,(2\,k-m)+\right.\right.$$

$$\left.\left.c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)))\right)+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.$$

$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\left(4\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)$$

$$\sqrt{\left(-\left(a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.}$$

$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(\dot{\imath}\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$e^{-\frac{(a\,\dot{\imath}\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+\dot{\imath}\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(a\,\dot{\imath}\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(a\,\dot{\imath}\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(a\,\dot{\imath}\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((a\,\dot{\imath}\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\left(a\,\dot{\imath}\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+\right.$$

$$\left.2\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\left(a\,\dot{\imath}\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.$$

$$\left.\sqrt{z}\right)^2\Big/\left(4\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\Big)+$$

$$2\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\left(a\,\dot{\imath}\,(m-2\,k)+\right.$$

$$\left.c\,(v-2\,h)+(u-2\,j)\,w+2\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/$$

$$\left(4\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\sqrt{\Big(-\left(a\,\dot{\imath}\,(m-2\,k)+\right.}$$

$$\left.c\,(v-2\,h)+(u-2\,j)\,w+2\,(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/$$

$$\left.\left.(\dot{\imath}\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving functions of the direct function, hyperbolic, exponential, trigonometric and a power functions

Involving powers of the direct function, hyperbolic, exponential, trigonometric and a power functions

Involving sin, sinh, exp and power

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\,\sin\left(a\,z^r+q\right)\sinh\left(w\,z^r+t\right)\cosh^v\left(c\,z^r+g\right)$

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$$\int z^{\alpha-1}\, e^{b\,z^r+e} \sin(a\,z^r+q) \sinh(w\,z^r+t) \cosh^{\nu}(c\,z^r+g)\, dz ==$$

$$-\frac{1}{r}\left(\left(i\,2^{-\nu-2}\,z^{\alpha}\right)\binom{\nu}{\frac{\nu}{2}}\left(-e^{e+i\,q+t}\,\Gamma\left(\frac{\alpha}{r},\,(-b-i\,a-w)\,z^r\right)((-b-i\,a-w)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$e^{e-i\,q+t}\,((-b+i\,a-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+i\,a-w)\,z^r\right)+e^{e+i\,q-t}\,((-b-i\,a+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-i\,a+w)\,z^r\right)-$$

$$\left.\left.e^{e-i\,q-t}\,((-b+i\,a+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+i\,a+w)\,z^r\right)\right)(1-\nu \bmod 2)\right)-$$

$$\frac{1}{r}\left(\left(i\,2^{-\nu-2}\,z^{\alpha}\right)\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-e^{e+2\,g\,h+i\,q+t-g\,\nu}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h-i\,a+c\,\nu-w)\,z^r\right)((-b-2\,c\,h-i\,a+c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}+\right.\right.$$

$$e^{e+2\,g\,h-i\,q+t-g\,\nu}\,((-b-2\,c\,h+i\,a+c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h+i\,a+c\,\nu-w)\,z^r\right)-$$

$$e^{e-2\,g\,h+i\,q+t+g\,\nu}\,((-b+2\,c\,h-i\,a-c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h-i\,a-c\,\nu-w)\,z^r\right)+$$

$$e^{e-2\,g\,h-i\,q+t+g\,\nu}\,((-b+2\,c\,h+i\,a-c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h+i\,a-c\,\nu-w)\,z^r\right)+$$

$$e^{e+2\,g\,h+i\,q-t-g\,\nu}\,((-b-2\,c\,h-i\,a+c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h-i\,a+c\,\nu+w)\,z^r\right)-$$

$$e^{e+2\,g\,h-i\,q-t-g\,\nu}\,((-b-2\,c\,h+i\,a+c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h+i\,a+c\,\nu+w)\,z^r\right)+$$

$$e^{e-2\,g\,h+i\,q-t+g\,\nu}\,((-b+2\,c\,h-i\,a-c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h-i\,a-c\,\nu+w)\,z^r\right)-$$

$$\left.\left.e^{e-2\,g\,h-i\,q-t+g\,\nu}\,((-b+2\,c\,h+i\,a-c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h+i\,a-c\,\nu+w)\,z^r\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

Involving $z^n\, e^{b\,z^r+d\,z+e} \sin(a\,z^r+p\,z+q) \sinh(w\,z^r+s\,z+t) \cosh^{\nu}(c\,z^r+f\,z+g)$

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$$\int z^n\, e^{b\,z^2+d\,z+e} \sin(a\,z^2+p\,z+q) \sinh(w\,z^2+s\,z+t) \cosh^{\nu}(c\,z^2+f\,z+g)\, dz ==$$

$$-i\,2^{-\nu-3}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(-e^{-\frac{(d-i\,p-s)^2}{4\,(b-i\,a-w)}+e-i\,q-t}\left(\sum_{i=0}^{n}2^{i-n}\,(-d+i\,p+s)^{n-i}\,(d-i\,p-s+2\,(b-i\,a-w)\,z)^{i+1}\right.\right.$$

$$\left.\left(-\frac{(d-i\,p-s+2\,(b-i\,a-w)\,z)^2}{b-i\,a-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-i\,p-s+2\,(b-i\,a-w)\,z)^2}{4\,(b-i\,a-w)}\right)\right)$$

$$(b-i\,a-w)^{-n-1}+e^{-\frac{(d+i\,p-s)^2}{4\,(b+i\,a-w)}+e+i\,q-t}\,(b+i\,a-w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d-i\,p+s)^{n-i}\,(d+i\,p-s+2\,(b+i\,a-w)\,z)^{i+1}$$

$$\left(-\frac{(d+i\,p-s+2\,(b+i\,a-w)\,z)^2}{b+i\,a-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+i\,p-s+2\,(b+i\,a-w)\,z)^2}{4\,(b+i\,a-w)}\right)+$$

$$e^{-\frac{(d-i\,p+s)^2}{4\,(b-i\,a\,+w)}+e-i\,q+t}\,(b-i\,a\,+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d+i\,p-s)^{n-i}\,(d-i\,p+s+2\,(b-i\,a\,+w)\,z)^{i+1}$$

$$\left(-\frac{(d-i\,p+s+2\,(b-i\,a\,+w)\,z)^2}{b-i\,a\,+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d-i\,p+s+2\,(b-i\,a\,+w)\,z)^2}{4\,(b-i\,a\,+w)}\right)-$$

$$e^{-\frac{(d+i\,p+s)^2}{4\,(b+i\,a\,+w)}+e+i\,q+t}\,(b+i\,a\,+w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d-i\,p-s)^{n-i}\,(d+i\,p+s+2\,(b+i\,a\,+w)\,z)^{i+1}$$

$$\left(-\frac{(d+i\,p+s+2\,(b+i\,a\,+w)\,z)^2}{b+i\,a\,+w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+i\,p+s+2\,(b+i\,a\,+w)\,z)^2}{4\,(b+i\,a\,+w)}\right)\Bigg)-$$

$$i\,2^{-v-3}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(-e^{-\frac{(d-i\,p-s+f\,(2\,h-v))^2}{4\,(b-i\,a\,+c\,(2\,h-v)-w)}+e-i\,q-t+g\,(2\,h-v)}\left(\sum_{i=0}^{n}2^{i-n}\,(-d+i\,p+s-f\,(2\,h-v))^{n-i}\right.$$

$$(d-i\,p-s+f\,(2\,h-v)+2\,(b-i\,a\,+c\,(2\,h-v)-w)\,z)^{i+1}$$

$$\left(-\frac{(d-i\,p-s+f\,(2\,h-v)+2\,(b-i\,a\,+c\,(2\,h-v)-w)\,z)^2}{b-i\,a\,+c\,(2\,h-v)-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\left.\Gamma\left(\frac{i+1}{2},-\frac{(d-i\,p-s+f\,(2\,h-v)+2\,(b-i\,a\,+c\,(2\,h-v)-w)\,z)^2}{4\,(b-i\,a\,+c\,(2\,h-v)-w)}\right)\right)$$

$$(b-i\,a\,+c\,(2\,h-v)-w)^{-n-1}+e^{-\frac{(d+i\,p-s+f\,(2\,h-v))^2}{4\,(b+i\,a\,+c\,(2\,h-v)-w)}+e+i\,q-t+g\,(2\,h-v)}\,(b+i\,a\,+c\,(2\,h-v)-w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,p+s-f\,(2\,h-v))^{n-i}\,(d+i\,p-s+f\,(2\,h-v)+2\,(b+i\,a\,+c\,(2\,h-v)-w)\,z)^{i+1}$$

$$\left(-\frac{(d+i\,p-s+f\,(2\,h-v)+2\,(b+i\,a\,+c\,(2\,h-v)-w)\,z)^2}{b+i\,a\,+c\,(2\,h-v)-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(d+i\,p-s+f\,(2\,h-v)+2\,(b+i\,a\,+c\,(2\,h-v)-w)\,z)^2}{4\,(b+i\,a\,+c\,(2\,h-v)-w)}\right)-$$

$$e^{-\frac{(d-i\,p-s+f\,(v-2\,h))^2}{4\,(b-i\,a\,+c\,(v-2\,h)-w)}+e-i\,q-t+g\,(v-2\,h)}\,(b-i\,a\,+c\,(v-2\,h)-w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-d+i\,p+s-f\,(v-2\,h))^{n-i}\,(d-i\,p-s+f\,(v-2\,h)+2\,(b-i\,a\,+c\,(v-2\,h)-w)\,z)^{i+1}$$

$$\left(-\frac{(d-i\,p-s+f\,(v-2\,h)+2\,(b-i\,a\,+c\,(v-2\,h)-w)\,z)^2}{b-i\,a\,+c\,(v-2\,h)-w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2},-\frac{(d-i\,p-s+f\,(v-2\,h)+2\,(b-i\,a\,+c\,(v-2\,h)-w)\,z)^2}{4\,(b-i\,a\,+c\,(v-2\,h)-w)}\right)+$$

$$e^{-\frac{(d+i\,p-s+f\,(v-2\,h))^2}{4\,(b+i\,a\,+c\,(v-2\,h)-w)}+e+i\,q-t+g\,(v-2\,h)}\,(b+i\,a\,+c\,(v-2\,h)-w)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-d - i\, p + s - f\,(v-2\,h)\right)^{n-i} \left(d + i\, p - s + f\,(v-2\,h) + 2\,(b + i\, a + c\,(v-2\,h) - w)\,z\right)^{i+1}$$

$$\left(-\frac{\left(d + i\, p - s + f\,(v-2\,h) + 2\,(b + i\, a + c\,(v-2\,h) - w)\,z\right)^2}{b + i\, a + c\,(v-2\,h) - w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{\left(d + i\, p - s + f\,(v-2\,h) + 2\,(b + i\, a + c\,(v-2\,h) - w)\,z\right)^2}{4\,(b + i\, a + c\,(v-2\,h) - w)}\right) +$$

$$e^{-\frac{(d-i\,p+s+f\,(2\,h-v))^2}{4\,(b-i\,a+c\,(2\,h-v)+w)} + e - i\,q + t + g\,(2\,h-v)} \left(b - i\, a + c\,(2\,h-v) + w\right)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-d + i\, p - s - f\,(2\,h-v)\right)^{n-i} \left(d - i\, p + s + f\,(2\,h-v) + 2\,(b - i\, a + c\,(2\,h-v) + w)\,z\right)^{i+1}$$

$$\left(-\frac{\left(d - i\, p + s + f\,(2\,h-v) + 2\,(b - i\, a + c\,(2\,h-v) + w)\,z\right)^2}{b - i\, a + c\,(2\,h-v) + w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{\left(d - i\, p + s + f\,(2\,h-v) + 2\,(b - i\, a + c\,(2\,h-v) + w)\,z\right)^2}{4\,(b - i\, a + c\,(2\,h-v) + w)}\right) -$$

$$e^{-\frac{(d+i\,p+s+f\,(2\,h-v))^2}{4\,(b+i\,a+c\,(2\,h-v)+w)} + e + i\,q + t + g\,(2\,h-v)} \left(b + i\, a + c\,(2\,h-v) + w\right)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-d - i\, p - s - f\,(2\,h-v)\right)^{n-i} \left(d + i\, p + s + f\,(2\,h-v) + 2\,(b + i\, a + c\,(2\,h-v) + w)\,z\right)^{i+1}$$

$$\left(-\frac{\left(d + i\, p + s + f\,(2\,h-v) + 2\,(b + i\, a + c\,(2\,h-v) + w)\,z\right)^2}{b + i\, a + c\,(2\,h-v) + w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{\left(d + i\, p + s + f\,(2\,h-v) + 2\,(b + i\, a + c\,(2\,h-v) + w)\,z\right)^2}{4\,(b + i\, a + c\,(2\,h-v) + w)}\right) +$$

$$e^{-\frac{(d-i\,p+s+f\,(v-2\,h))^2}{4\,(b-i\,a+c\,(v-2\,h)+w)} + e - i\,q + t + g\,(v-2\,h)} \left(b - i\, a + c\,(v-2\,h) + w\right)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-d + i\, p - s - f\,(v-2\,h)\right)^{n-i} \left(d - i\, p + s + f\,(v-2\,h) + 2\,(b - i\, a + c\,(v-2\,h) + w)\,z\right)^{i+1}$$

$$\left(-\frac{\left(d - i\, p + s + f\,(v-2\,h) + 2\,(b - i\, a + c\,(v-2\,h) + w)\,z\right)^2}{b - i\, a + c\,(v-2\,h) + w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\Gamma\left(\frac{i+1}{2}, -\frac{\left(d - i\, p + s + f\,(v-2\,h) + 2\,(b - i\, a + c\,(v-2\,h) + w)\,z\right)^2}{4\,(b - i\, a + c\,(v-2\,h) + w)}\right) -$$

$$e^{-\frac{(d+i\,p+s+f\,(v-2\,h))^2}{4\,(b+i\,a+c\,(v-2\,h)+w)} + e + i\,q + t + g\,(v-2\,h)} \left(b + i\, a + c\,(v-2\,h) + w\right)^{-n-1}$$

$$\sum_{i=0}^{n} 2^{i-n} \left(-d - i\, p - s - f\,(v-2\,h)\right)^{n-i} \left(d + i\, p + s + f\,(v-2\,h) + 2\,(b + i\, a + c\,(v-2\,h) + w)\,z\right)^{i+1}$$

$$\left(-\frac{\left(d + i\, p + s + f\,(v-2\,h) + 2\,(b + i\, a + c\,(v-2\,h) + w)\,z\right)^2}{b + i\, a + c\,(v-2\,h) + w}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i}$$

$$\backslash$$

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$$\int z^n e^{\sqrt{z}\,(b+e+d\,z)} \sin\left(\sqrt{z}\,(a+q+p\,z)\right) \sinh\left(t+s\,z+w\sqrt{z}\right) \cosh^{\nu}\left(\sqrt{z}\,(c+g+f\,z)\right) dz =$$

$$2^{-2n-\nu-3}\, i \binom{\nu}{\frac{\nu}{2}} (1-\nu \bmod 2) \left(e^{-\frac{(b+i\,a-w)^2}{4(d+i\,p-s)}+e+i\,q-t} \left(\sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l}\, 4^i\, (b+i\,a-w)^{-i-l+2n} \left(b+i\,a-w+2(d+i\,p-s)\sqrt{z}\right)^{i+l} \right.\right.$$

$$\left(-\frac{\left(b+i\,a-w+2(d+i\,p-s)\sqrt{z}\right)^2}{d+i\,p-s} \right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l} \binom{n}{i} \left((b+i\,a-w)\left(b+i\,a-w+2(d+i\,p-s)\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1), -\frac{\left(b+i\,a-w+2(d+i\,p-s)\sqrt{z}\right)^2}{4(d+i\,p-s)}\right) + 2\sqrt{-\frac{\left(b+i\,a-w+2(d+i\,p-s)\sqrt{z}\right)^2}{d+i\,p-s}}$$

$$\left.\left.\left. (d+i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2), -\frac{\left(b+i\,a-w+2(d+i\,p-s)\sqrt{z}\right)^2}{4(d+i\,p-s)}\right) \right) \right) (d+i\,p-s)^{-2n-2} -$$

$$e^{-\frac{(b-i\,a-w)^2}{4(d-i\,p-s)}+e-i\,q-t} (d-i\,p-s)^{-2n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l}\, 4^i\, (b-i\,a-w)^{-i-l+2n} \left(b-i\,a-w+2(d-i\,p-s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i\,a-w+2(d-i\,p-s)\sqrt{z}\right)^2}{d-i\,p-s} \right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l} \binom{n}{i} \left((b-i\,a-w)\left(b-i\,a-w+2(d-i\,p-s)\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1), -\frac{\left(b-i\,a-w+2(d-i\,p-s)\sqrt{z}\right)^2}{4(d-i\,p-s)}\right) + 2\sqrt{-\frac{\left(b-i\,a-w+2(d-i\,p-s)\sqrt{z}\right)^2}{d-i\,p-s}}$$

$$\left. (d-i\,p-s)\,\Gamma\left(\frac{1}{2}(i+l+2), -\frac{\left(b-i\,a-w+2(d-i\,p-s)\sqrt{z}\right)^2}{4(d-i\,p-s)}\right) \right) -$$

$$e^{-\frac{(b+i\,a+w)^2}{4(d+i\,p+s)}+e+i\,q+t} (d+i\,p+s)^{-2n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l}\, 4^i\, (b+i\,a+w)^{-i-l+2n} \left(b+i\,a+w+2(d+i\,p+s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i\,a+w+2(d+i\,p+s)\sqrt{z}\right)^2}{d+i\,p+s} \right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l} \binom{n}{i} \left((b+i\,a+w)\left(b+i\,a+w+2(d+i\,p+s)\sqrt{z}\right) \right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{4(d+i p+s)}\right)+2\sqrt{-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{d+i p+s}}$$

$$(d+i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{4(d+i p+s)}\right)\Bigg)+$$

$$e^{-\frac{(b-i a+w)^2}{4(d-i p+s)}+e-i q+t}(d-i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-i a+w)^{-i-l+2n}\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{d-i p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b-i a+w)\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{4(d-i p+s)}\right)+2\sqrt{-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{d-i p+s}}$$

$$(d-i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{4(d-i p+s)}\right)\Bigg)\Bigg)+$$

$$2^{-2n-v-3}i\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{-\frac{(b+i a+c(2h-v)-w)^2}{4(d+i p-s+f(2h-v))}+e+i q-t+g(2h-v)}\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+i a+c(2h-v)-w)^{-i-l+2n}$$

$$\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)^2}{d+i p-s+f(2h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+i a+c(2h-v)-w)\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)^2\Big/\right.$$

$$\left.(4(d+i p-s+f(2h-v)))\right)+2(d+i p-s+f(2h-v))\Gamma\left(\frac{1}{2}(i+l+2),\right.$$

$$\left.-\left(b+i a+c(2h-v)-w+2(d+i p-s+f(2h-v))\sqrt{z}\right)^2\Big/(4(d+i p-s+f(2h-v)))\right)$$

$$\sqrt{\left(-\left(b+i\,a\,+c\,(2\,h-v)-w+2\,(d+i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,p-s+f\,(2\,h-v)\right)\right)}\Bigg)$$

$$(d+i\,p-s+f\,(2\,h-v))^{-2\,n-2}-e^{-\frac{(b-i\,a+c\,(2\,h-v)-w)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}+e-i\,q-t+g\,(2\,h-v)}\,(d-i\,p-s+f\,(2\,h-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-i\,a\,+c\,(2\,h-v)-w)^{-i-l+2\,n}\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-i\,a\,+c\,(2\,h-v)-w)\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}\right)+2\,(d-i\,p-s+f\,(2\,h-v))\,\Gamma\Bigg($$

$$\left.\frac{1}{2}\,(i+l+2),-\frac{\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}\right)$$

$$\left.\sqrt{\left(-\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d-i\,p-s+f\,(2\,h-v)\right)\right)}\right)-$$

$$e^{-\frac{(b+i\,a+c\,(2\,h-v)+w)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}+e+i\,q+t+g\,(2\,h-v)}\,(d+i\,p+s+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+i\,a\,+c\,(2\,h-v)+w)^{-i-l+2\,n}$$

$$\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+i\,a\,+c\,(2\,h-v)+w)\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}\right)+2\,(d+i\,p+s+f\,(2\,h-v))\,\Gamma\Bigg($$

$$\frac{1}{2}(i+l+2),-\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}\Bigg)$$

$$\sqrt{-\frac{\left(b+i\,a+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}}\Bigg)+$$

$$e^{-\frac{(b-i\,a+c\,(2\,h-v)+w)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}+e-i\,q+t+g\,(2\,h-v)}\,(d-i\,p+s+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-i\,a+c\,(2\,h-v)+w)^{-i-l+2\,n}$$

$$\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b-i\,a+c\,(2\,h-v)+w)\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),$$

$$-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}\Bigg)+2\,(d-i\,p+s+f\,(2\,h-v))\,\Gamma\Bigg($$

$$\frac{1}{2}(i+l+2),-\frac{\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(2\,h-v))}\Bigg)$$

$$\sqrt{\left(-\left(b-i\,a+c\,(2\,h-v)+w+2\,(d-i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(d-i\,p+s+f\,(2\,h-v))\right)}\Bigg)+$$

$$e^{-\frac{(b+i\,a+c\,(v-2\,h)-w)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}+e+i\,q-t+g\,(v-2\,h)}\,(d+i\,p-s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+i\,a+c\,(v-2\,h)-w)^{-i-l+2\,n}$$

$$\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p-s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+i\,a+c\,(v-2\,h)-w)\left(b+i\,a+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),$$

$$-\frac{\left(b+i\,a\,+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}\Bigg)+2\,(d+i\,p-s+f\,(v-2\,h))\,\Gamma\Bigg($$

$$\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+i\,a\,+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p-s+f\,(v-2\,h))}\Bigg)$$

$$\sqrt{\left(-\left(b+i\,a\,+c\,(v-2\,h)-w+2\,(d+i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\,(d+i\,p-s+f\,(v-2\,h))\right)}\Bigg)-$$

$$e^{-\frac{(b-i\,a+c\,(v-2\,h)-w)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}+e-i\,q-t+g\,(v-2\,h)}\,(d-i\,p-s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-i\,a\,+c\,(v-2\,h)-w)^{-i-l+2\,n}$$

$$\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p-s+f\,(v-2\,h)}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b-i\,a\,+c\,(v-2\,h)-w)\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}\,(i+l+1),$$

$$-\frac{\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}\Bigg)+2\,(d-i\,p-s+f\,(v-2\,h))\,\Gamma\Bigg($$

$$\frac{1}{2}\,(i+l+2),\,-\frac{\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p-s+f\,(v-2\,h))}\Bigg)$$

$$\sqrt{\left(-\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\,(d-i\,p-s+f\,(v-2\,h))\right)}\Bigg)-$$

$$e^{-\frac{(b+i\,a+c\,(v-2\,h)+w)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}+e+i\,q+t+g\,(v-2\,h)}\,(d+i\,p+s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+i\,a\,+c\,(v-2\,h)+w)^{-i-l+2\,n}$$

$$\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+i\,a+c\,(v-2\,h)+w)\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.\left.-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}\right)+2\,(d+i\,p+s+f\,(v-2\,h))\,\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}\,(i+l+2),-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}\right)\right.$$

$$\left.\sqrt{-\frac{\left(b+i\,a+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}}\right)+$$

$$e^{-\frac{(b-i\,a+c\,(v-2\,h)+w)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}+e-i\,q+t+g\,(v-2\,h)}\,(d-i\,p+s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-i\,a+c\,(v-2\,h)+w)^{-i-l+2\,n}$$

$$\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(v-2\,h)}\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-i\,a+c\,(v-2\,h)+w)\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.\left.-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}\right)+2\,(d-i\,p+s+f\,(v-2\,h))\,\Gamma\left(\right.\right.$$

$$\left.\left.\frac{1}{2}\,(i+l+2),-\frac{\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}\right)\right.$$

$$\left.\sqrt{\left(-\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.}\right.$$

$$\left.\left.(d-i\,p+s+f\,(v-2\,h))\right)\right)\Bigg/;\,n\in\mathbb{N}\bigwedge v\in\mathbb{N}^+$$

Involving powers of sin, powers of sinh, exp and power

Involving $z^{\alpha-1}\, e^{b\, z^r+e} \sin^m(a\, z^r+q) \sinh^u(w\, z^r+t) \cosh^v(c\, z^r+g)$

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$$\int z^{\alpha-1}\, e^{b\, z^r+e} \sin^m(a\, z^r+q) \sinh^u(w\, z^r+t) \cosh^v(c\, z^r+g)\, dz ==$$

$$-\frac{i^u\, 2^{-m-u-v}\, e^e\, z^\alpha\, (1-m \bmod 2)\, (1-u \bmod 2)\, (1-v \bmod 2)}{r} \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} (-b\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, -b\, z^r\right) -$$

$$\frac{i^u\, 2^{-m-u-v}\, z^\alpha}{r} \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} (1-u \bmod 2)\, (1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{e+2\, i\, k\, q-i\, m\, q+\frac{i\, m\, \pi}{2}}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\, i\, a\, k+i\, a\, m)\, z^r\right) ((-b-2\, i\, a\, k+i\, a\, m)\, z^r)^{-\frac{\alpha}{r}} + \right.$$

$$\left. e^{e-2\, i\, k\, q+i\, m\, q-\frac{i\, m\, \pi}{2}}\, ((-b+2\, i\, a\, k-i\, a\, m)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\, i\, a\, k-i\, a\, m)\, z^r\right) \right) -$$

$$\frac{i^u\, 2^{-m-u-v}\, z^\alpha}{r} \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} (1-m \bmod 2)\, (1-u \bmod 2) \sum_{h=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{h} \left(e^{e+2\, g\, h-g\, v}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\, c\, h+c\, v)\, z^r\right) \right.$$

$$\left. ((-b-2\, c\, h+c\, v)\, z^r)^{-\frac{\alpha}{r}} + e^{e-2\, g\, h+g\, v}\, ((-b+2\, c\, h-c\, v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\, c\, h-c\, v)\, z^r\right) \right) -$$

$$\frac{i^u\, 2^{-m-u-v}\, z^\alpha}{r} \binom{m}{\frac{m}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\, (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^k \binom{u}{k} \left(e^{e+2\, k\, t-t\, u+\frac{i\, \pi\, u}{2}}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\, k\, w+u\, w)\, z^r\right) \right.$$

$$\left. ((-b-2\, k\, w+u\, w)\, z^r)^{-\frac{\alpha}{r}} + e^{e-2\, k\, t+t\, u-\frac{i\, \pi\, u}{2}}\, ((-b+2\, k\, w-u\, w)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\, k\, w-u\, w)\, z^r\right) \right) -$$

$$\frac{i^u\, 2^{-m-u-v}\, z^\alpha}{r} \binom{u}{\frac{u}{2}} (1-u \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{h=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{h} \left(e^{e+2\, g\, h+2\, i\, k\, q-i\, m\, q-g\, v+\frac{i\, m\, \pi}{2}} \right.$$

$$\Gamma\left(\frac{\alpha}{r}, (-b-2\, c\, h-2\, i\, a\, k+i\, a\, m+c\, v)\, z^r\right) ((-b-2\, c\, h-2\, i\, a\, k+i\, a\, m+c\, v)\, z^r)^{-\frac{\alpha}{r}} +$$

$$e^{e+2\, g\, h-2\, i\, k\, q+i\, m\, q-g\, v-\frac{i\, m\, \pi}{2}}\, ((-b-2\, c\, h+2\, i\, a\, k-i\, a\, m+c\, v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b-2\, c\, h+2\, i\, a\, k-i\, a\, m+c\, v)\, z^r\right) +$$

$$e^{e-2\, g\, h+2\, i\, k\, q-i\, m\, q+g\, v+\frac{i\, m\, \pi}{2}}\, ((-b+2\, c\, h-2\, i\, a\, k+i\, a\, m-c\, v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\, c\, h-2\, i\, a\, k+i\, a\, m-c\, v)\, z^r\right) +$$

$$\left. e^{e-2\, g\, h-2\, i\, k\, q+i\, m\, q+g\, v-\frac{i\, m\, \pi}{2}}\, ((-b+2\, c\, h+2\, i\, a\, k-i\, a\, m-c\, v)\, z^r)^{-\frac{\alpha}{r}}\, \Gamma\left(\frac{\alpha}{r}, (-b+2\, c\, h+2\, i\, a\, k-i\, a\, m-c\, v)\, z^r\right) \right) -$$

$$\frac{i^u\, 2^{-m-u-v}\, z^\alpha}{r} \binom{v}{\frac{v}{2}} (1-v \bmod 2) \sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \sum_{j=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^j \binom{u}{j} \left(e^{e+2\, i\, k\, q-i\, m\, q+2\, j\, t-t\, u+\frac{i\, \pi\, u}{2}+\frac{i\, m\, \pi}{2}} \right.$$

$$\Gamma\left(\frac{\alpha}{r}, (-b-2\, i\, a\, k+i\, a\, m-2\, j\, w+u\, w)\, z^r\right) ((-b-2\, i\, a\, k+i\, a\, m-2\, j\, w+u\, w)\, z^r)^{-\frac{\alpha}{r}} +$$

$$e^{e-2\, i\, k\, q+i\, m\, q+2\, j\, t-t\, u+\frac{i\, \pi\, u}{2}-\frac{i\, m\, \pi}{2}}\, ((-b+2\, i\, a\, k-i\, a\, m-2\, j\, w+u\, w)\, z^r)^{-\frac{\alpha}{r}}$$

$$\left. \Gamma\left(\frac{\alpha}{r}, (-b+2\, i\, a\, k-i\, a\, m-2\, j\, w+u\, w)\, z^r\right) + e^{e+2\, i\, k\, q-i\, m\, q-2\, j\, t+t\, u-\frac{i\, \pi\, u}{2}+\frac{i\, m\, \pi}{2}} \right.$$

$$((-b-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b-2\,i\,a\,k+i\,a\,m+2\,j\,w-u\,w)\,z^r\right)+$$

$$e^{e-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,((-b+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b+2\,i\,a\,k-i\,a\,m+2\,j\,w-u\,w)\,z^r\right)\Bigg)-\frac{i^u\,2^{-m-u-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}$$

$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{e+2\,g\,h+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}-g\,v}\,\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,h+c\,v-2\,k\,w+u\,w)\,z^r\right)((-b-2\,c\,h+c\,v-2\,k\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}+$$

$$e^{e-2\,g\,h+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}+g\,v}\,((-b+2\,c\,h-c\,v-2\,k\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,h-c\,v-2\,k\,w+u\,w)\,z^r\right)+$$

$$e^{e+2\,g\,h-2\,k\,t+t\,u-g\,v-\frac{i\,\pi\,u}{2}}\,((-b-2\,c\,h+c\,v+2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,h+c\,v+2\,k\,w-u\,w)\,z^r\right)+$$

$$e^{e-2\,g\,h-2\,k\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}}\,((-b+2\,c\,h-c\,v+2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,h-c\,v+2\,k\,w-u\,w)\,z^r\right)\Bigg)-$$

$$\frac{i^u\,2^{-m-u-v}\,z^\alpha}{r}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{e+2\,g\,h+2\,i\,k\,q-i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}-g\,v+\frac{i\,m\,\pi}{2}}\,\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,h-\right.$$

$$\left.2\,i\,a\,k+i\,a\,m+c\,v-2\,j\,w+u\,w)\,z^r\right)((-b-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v-2\,j\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}+$$

$$e^{e+2\,g\,h-2\,i\,k\,q+i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}-g\,v-\frac{i\,m\,\pi}{2}}\,((-b-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v-2\,j\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v-2\,j\,w+u\,w)\,z^r\right)+$$

$$e^{e-2\,g\,h+2\,i\,k\,q-i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}+g\,v+\frac{i\,m\,\pi}{2}}\,((-b+2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v-2\,j\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v-2\,j\,w+u\,w)\,z^r\right)+$$

$$e^{e-2\,g\,h+2\,i\,k\,q+i\,m\,q+2\,j\,t-t\,u+\frac{i\,\pi\,u}{2}+g\,v-\frac{i\,m\,\pi}{2}}\,((-b+2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v-2\,j\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v-2\,j\,w+u\,w)\,z^r\right)+$$

$$e^{e+2\,g\,h+2\,i\,k\,q-i\,m\,q-2\,j\,t+t\,u-g\,v-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,((-b-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,h-2\,i\,a\,k+i\,a\,m+c\,v+2\,j\,w-u\,w)\,z^r\right)+$$

$$e^{e+2\,g\,h-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u-g\,v-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,((-b-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b-2\,c\,h+2\,i\,a\,k-i\,a\,m+c\,v+2\,j\,w-u\,w)\,z^r\right)+$$

$$e^{e-2\,g\,h+2\,i\,k\,q-i\,m\,q-2\,j\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,((-b+2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,h-2\,i\,a\,k+i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r\right)+$$

$$e^{e-2\,g\,h-2\,i\,k\,q+i\,m\,q-2\,j\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,((-b+2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}$$

$$\Gamma\left(\frac{\alpha}{r},(-b+2\,c\,h+2\,i\,a\,k-i\,a\,m-c\,v+2\,j\,w-u\,w)\,z^r\right)\Bigg)/;\,m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\,\sin^m\left(a\,z^r+p\,z+q\right)\sinh^u\left(w\,z^r+s\,z+t\right)\cosh^v\left(c\,z^r+f\,z+g\right)$

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$$\int z^n e^{b z^2+d z+e} \sin^m\left(a z^2+p z+q\right) \sinh^u\left(w z^2+s z+t\right) \cosh^v\left(c z^2+f z+g\right) dz ==$$

$$2^{-m-u-v-1} e^{e-\frac{d^2}{4 b}} (-i^u) \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2) (1-u \bmod 2) (1-v \bmod 2)$$

$$\left(\sum_{i=0}^{n} 2^{i-n} (-d)^{n-i} (d+2 b z)^{i+1} \left(-\frac{(d+2 b z)^2}{b}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d+2 b z)^2}{4 b}\right)\right) b^{-n-1} -$$

$$i^u 2^{-m-u-v-1} \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} (1-u \bmod 2) (1-v \bmod 2)$$

$$\sum_{k=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{(d+i (2 k-m) p)^2}{4 (b+a i (2 k-m))}+e+i (2 k-m) q+\frac{i m \pi}{2}} (b+a i (2 k-m))^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-d-i (2 k-m) p)^{n-i} \right.$$

$$(d+i (2 k-m) p+2 (b+a i (2 k-m)) z)^{i+1} \left(-\frac{(d+i (2 k-m) p+2 (b+a i (2 k-m)) z)^2}{b+a i (2 k-m)}\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d+i (2 k-m) p+2 (b+a i (2 k-m)) z)^2}{4 (b+a i (2 k-m))}\right) +$$

$$e^{-\frac{(d+i (m-2 k) p)^2}{4 (b+a i (m-2 k))}+e+i (m-2 k) q-\frac{i m \pi}{2}} (b+a i (m-2 k))^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-d-i (m-2 k) p)^{n-i}$$

$$(d+i (m-2 k) p+2 (b+a i (m-2 k)) z)^{i+1} \left(-\frac{(d+i (m-2 k) p+2 (b+a i (m-2 k)) z)^2}{b+a i (m-2 k)}\right)^{\frac{1}{2}(-i-1)}$$

$$\left. \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d+i (m-2 k) p+2 (b+a i (m-2 k)) z)^2}{4 (b+a i (m-2 k))}\right) \right) -$$

$$i^u 2^{-m-u-v-1} \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} (1-m \bmod 2) (1-u \bmod 2) \sum_{h=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{h} \left(e^{-\frac{(d+f (2 h-v))^2}{4 (b+c (2 h-v))}+e+g (2 h-v)} (b+c (2 h-v))^{-n-1} \right.$$

$$\sum_{i=0}^{n} 2^{i-n} (-d-f (2 h-v))^{n-i} (d+f (2 h-v)+2 (b+c (2 h-v)) z)^{i+1}$$

$$\left(-\frac{(d+f (2 h-v)+2 (b+c (2 h-v)) z)^2}{b+c (2 h-v)}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d+f (2 h-v)+2 (b+c (2 h-v)) z)^2}{4 (b+c (2 h-v))}\right) +$$

$$e^{-\frac{(d+f (v-2 h))^2}{4 (b+c (v-2 h))}+e-g (2 h-v)} (b+c (v-2 h))^{-n-1} \sum_{i=0}^{n} 2^{i-n} (-d-f (v-2 h))^{n-i} (d+f (v-2 h)+2 (b+c (v-2 h)) z)^{i+1}$$

$$\left. \left(-\frac{(d+f (v-2 h)+2 (b+c (v-2 h)) z)^2}{b+c (v-2 h)}\right)^{\frac{1}{2}(-i-1)} \binom{n}{i} \Gamma\left(\frac{i+1}{2}, -\frac{(d+f (v-2 h)+2 (b+c (v-2 h)) z)^2}{4 (b+c (v-2 h))}\right) \right) -$$

$$i^u\, 2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)\,(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{(d+s(2k-u))^2}{4(b+(2k-u)w)}+e+t(2k-u)+\frac{i\pi u}{2}}$$

$$(b+(2k-u)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}(-d-s(2k-u))^{n-i}(d+s(2k-u)+2(b+(2k-u)w)z)^{i+1}$$

$$\left(-\frac{(d+s(2k-u)+2(b+(2k-u)w)z)^2}{b+(2k-u)w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+s(2k-u)+2(b+(2k-u)w)z)^2}{4(b+(2k-u)w)}\right)+$$

$$e^{-\frac{(d+s(u-2k))^2}{4(b+(u-2k)w)}+e+t(u-2k)-\frac{i\pi u}{2}}(b+(u-2k)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}(-d-s(u-2k))^{n-i}(d+s(u-2k)+2(b+(u-2k)w)z)^{i+1}$$

$$\left(-\frac{(d+s(u-2k)+2(b+(u-2k)w)z)^2}{b+(u-2k)w}\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+s(u-2k)+2(b+(u-2k)w)z)^2}{4(b+(u-2k)w)}\right)\Bigg)-$$

$$i^u\, 2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{-\frac{(d+i(2k-m)p+f(2h-v))^2}{4(b+ai(2k-m)+c(2h-v))}+e+i(2k-m)q+g(2h-v)+\frac{im\pi}{2}}$$

$$(b+ai(2k-m)+c(2h-v))^{-n-1}\sum_{i=0}^{n}2^{i-n}(-d-i(2k-m)p-f(2h-v))^{n-i}$$

$$(d+i(2k-m)p+f(2h-v)+2(b+ai(2k-m)+c(2h-v))z)^{i+1}$$

$$\Big(-(d+i(2k-m)p+f(2h-v)+2(b+ai(2k-m)+c(2h-v))z)^2\Big/$$

$$(b+ai(2k-m)+c(2h-v))\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Bigg(\frac{i+1}{2},-(d+i(2k-m)p+f(2h-v)+$$

$$2(b+ai(2k-m)+c(2h-v))z)^2\Big/(4(b+ai(2k-m)+c(2h-v)))\Bigg)+$$

$$e^{-\frac{(d+i(m-2k)p+f(2h-v))^2}{4(b+ai(m-2k)+c(2h-v))}+e+i(m-2k)q+g(2h-v)-\frac{im\pi}{2}}(b+ai(m-2k)+c(2h-v))^{-n-1}\sum_{i=0}^{n}2^{i-n}$$

$$(-d-i(m-2k)p-f(2h-v))^{n-i}(d+i(m-2k)p+f(2h-v)+2(b+ai(m-2k)+c(2h-v))z)^{i+1}$$

$$\Big(-(d+i(m-2k)p+f(2h-v)+2(b+ai(m-2k)+c(2h-v))z)^2\Big/$$

$$(b+ai(m-2k)+c(2h-v))\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Bigg(\frac{i+1}{2},-(d+i(m-2k)p+f(2h-v)+$$

$$2(b+ai(m-2k)+c(2h-v))z)^2\Big/(4(b+ai(m-2k)+c(2h-v)))\Bigg)+$$

$$e^{-\frac{(d+i(2k-m)p+f(v-2h))^2}{4(b+ai(2k-m)+c(v-2h))}+e+i(2k-m)q+g(v-2h)+\frac{im\pi}{2}}(b+ai(2k-m)+c(v-2h))^{-n-1}\sum_{i=0}^{n}2^{i-n}$$

$$(-d-i(2k-m)p-f(v-2h))^{n-i}(d+i(2k-m)p+f(v-2h)+2(b+ai(2k-m)+c(v-2h))z)^{i+1}$$

$$\Big(-(d+i(2k-m)p+f(v-2h)+2(b+ai(2k-m)+c(v-2h))z)^2\Big/$$

$$(b+ai(2k-m)+c(v-2h))\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\Bigg(\frac{i+1}{2},-(d+i(2k-m)p+f(v-2h)+$$

$$2(b+ai(2k-m)+c(v-2h))z)^2\Big/(4(b+ai(2k-m)+c(v-2h)))\Bigg)+$$

$$e^{-\frac{(d+i(m-2k)p+f(v-2h))^2}{4(b+ai(m-2k)+c(v-2h))}+ei(m-2k)q+g(v-2h)-\frac{im\pi}{2}}(b+ai(m-2k)+c(v-2h))^{-n-1}\sum_{i=0}^{n}2^{i-n}$$
$$(-d-i(m-2k)p-f(v-2h))^{n-i}(d+i(m-2k)p+f(v-2h)+2(b+ai(m-2k)+c(v-2h))z)^{i+1}$$
$$\left(-(d+i(m-2k)p+f(v-2h)+2(b+ai(m-2k)+c(v-2h))z)^2\Big/\right.$$
$$(b+ai(m-2k)+c(v-2h))\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(d+i(m-2k)p+f(v-2h)+\right.$$
$$\left.\left.2(b+ai(m-2k)+c(v-2h))z)^2\Big/(4(b+ai(m-2k)+c(v-2h))\right)\right)-$$

$$i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(d+i(2k-m)p+s(2j-u))^2}{4(b+ai(2k-m)+(2j-u)w)}+ei(2k-m)q+t(2j-u)+\frac{1}{2}i\pi(m+u)}\right.$$
$$(b+ai(2k-m)+(2j-u)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}(-d-i(2k-m)p-s(2j-u))^{n-i}$$
$$(d+i(2k-m)p+s(2j-u)+2(b+ai(2k-m)+(2j-u)w)z)^{i+1}$$
$$\left(-(d+i(2k-m)p+s(2j-u)+2(b+ai(2k-m)+(2j-u)w)z)^2\Big/\right.$$
$$(b+ai(2k-m)+(2j-u)w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(d+i(2k-m)p+s(2j-u)+\right.$$
$$\left.\left.2(b+ai(2k-m)+(2j-u)w)z)^2\Big/(4(b+ai(2k-m)+(2j-u)w))\right)\right)+$$
$$e^{-\frac{(d+i(m-2k)p+s(2j-u))^2}{4(b+ai(m-2k)+(2j-u)w)}+ei(m-2k)q+t(2j-u)+\frac{1}{2}i\pi(u-m)}(b+ai(m-2k)+(2j-u)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}$$
$$(-d-i(m-2k)p-s(2j-u))^{n-i}(d+i(m-2k)p+s(2j-u)+2(b+ai(m-2k)+(2j-u)w)z)^{i+1}$$
$$\left(-(d+i(m-2k)p+s(2j-u)+2(b+ai(m-2k)+(2j-u)w)z)^2\Big/\right.$$
$$(b+ai(m-2k)+(2j-u)w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(d+i(m-2k)p+s(2j-u)+\right.$$
$$\left.\left.2(b+ai(m-2k)+(2j-u)w)z)^2\Big/(4(b+ai(m-2k)+(2j-u)w))\right)\right)+$$
$$e^{-\frac{(d+i(2k-m)p+s(u-2j))^2}{4(b+ai(2k-m)+(u-2j)w)}+ei(2k-m)q+\frac{1}{2}i\pi(m-u)+t(u-2j)}(b+ai(2k-m)+(u-2j)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}$$
$$(-d-i(2k-m)p-s(u-2j))^{n-i}(d+i(2k-m)p+s(u-2j)+2(b+ai(2k-m)+(u-2j)w)z)^{i+1}$$
$$\left(-(d+i(2k-m)p+s(u-2j)+2(b+ai(2k-m)+(u-2j)w)z)^2\Big/\right.$$
$$(b+ai(2k-m)+(u-2j)w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(d+i(2k-m)p+s(u-2j)+\right.$$
$$\left.\left.2(b+ai(2k-m)+(u-2j)w)z)^2\Big/(4(b+ai(2k-m)+(u-2j)w))\right)\right)+$$
$$e^{-\frac{(d+i(m-2k)p+s(u-2j))^2}{4(b+ai(m-2k)+(u-2j)w)}+ei(m-2k)q+t(u-2j)-\frac{1}{2}i\pi(m+u)}(b+ai(m-2k)+(u-2j)w)^{-n-1}\sum_{i=0}^{n}2^{i-n}$$
$$(-d-i(m-2k)p-s(u-2j))^{n-i}(d+i(m-2k)p+s(u-2j)+2(b+ai(m-2k)+(u-2j)w)z)^{i+1}$$
$$\left(-(d+i(m-2k)p+s(u-2j)+2(b+ai(m-2k)+(u-2j)w)z)^2\Big/\right.$$
$$(b+ai(m-2k)+(u-2j)w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},-(d+i(m-2k)p+s(u-2j)+\right.$$

$$2\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)\,z)^2\Big/(4\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w))\Big)\Big)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{-\frac{(d+s\,(2\,k-u)+f\,(2\,h-v))^2}{4\,(b+c\,(2\,h-v)+(2\,k-u)\,w)}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$(b+c\,(2\,h-v)+(2\,k-u)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-d-s\,(2\,k-u)-f\,(2\,h-v))^{n-i}\,(d+s\,(2\,k-u)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(2\,k-u)\,w)\,z)^{i+1}$$

$$\left(-(d+s\,(2\,k-u)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2\Big/(b+c\,(2\,h-v)+(2\,k-u)\,w)\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+s\,(2\,k-u)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(2\,k-u)\,w)\,z)^2}{4\,(b+c\,(2\,h-v)+(2\,k-u)\,w)}\right)+$$

$$e^{-\frac{(d+s\,(2\,k-u)+f\,(v-2\,h))^2}{4\,(b+c\,(v-2\,h)+(2\,k-u)\,w)}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(b+c\,(v-2\,h)+(2\,k-u)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-d-s\,(2\,k-u)-f\,(v-2\,h))^{n-i}\,(d+s\,(2\,k-u)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(2\,k-u)\,w)\,z)^{i+1}$$

$$\left(-(d+s\,(2\,k-u)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2\Big/(b+c\,(v-2\,h)+(2\,k-u)\,w)\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+s\,(2\,k-u)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(2\,k-u)\,w)\,z)^2}{4\,(b+c\,(v-2\,h)+(2\,k-u)\,w)}\right)+$$

$$e^{-\frac{(d+s\,(u-2\,k)+f\,(2\,h-v))^2}{4\,(b+c\,(2\,h-v)+(u-2\,k)\,w)}+e+t\,(u-2\,k)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\,(b+c\,(2\,h-v)+(u-2\,k)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-d-s\,(u-2\,k)-f\,(2\,h-v))^{n-i}\,(d+s\,(u-2\,k)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(u-2\,k)\,w)\,z)^{i+1}$$

$$\left(-(d+s\,(u-2\,k)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(u-2\,k)\,w)\,z)^2\Big/(b+c\,(2\,h-v)+(u-2\,k)\,w)\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+s\,(u-2\,k)+f\,(2\,h-v)+2\,(b+c\,(2\,h-v)+(u-2\,k)\,w)\,z)^2}{4\,(b+c\,(2\,h-v)+(u-2\,k)\,w)}\right)+$$

$$e^{-\frac{(d+s\,(u-2\,k)+f\,(v-2\,h))^2}{4\,(b+c\,(v-2\,h)+(u-2\,k)\,w)}+e+t\,(u-2\,k)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(b+c\,(v-2\,h)+(u-2\,k)\,w)^{-n-1}$$

$$\sum_{i=0}^{n}2^{i-n}\,(-d-s\,(u-2\,k)-f\,(v-2\,h))^{n-i}\,(d+s\,(u-2\,k)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(u-2\,k)\,w)\,z)^{i+1}$$

$$\left(-(d+s\,(u-2\,k)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(u-2\,k)\,w)\,z)^2\Big/(b+c\,(v-2\,h)+(u-2\,k)\,w)\right)^{\frac{1}{2}(-i-1)}$$

$$\binom{n}{i}\Gamma\left(\frac{i+1}{2},-\frac{(d+s\,(u-2\,k)+f\,(v-2\,h)+2\,(b+c\,(v-2\,h)+(u-2\,k)\,w)\,z)^2}{4\,(b+c\,(v-2\,h)+(u-2\,k)\,w)}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}$$

$$(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)^{-n-1}\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(2\,k-m)\,p-s\,(2\,j-u)-f\,(2\,h-v))^{n-i}$$

$$(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^{i+1}$$

$$\left(-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(m-2\,k)\,p-s\,(2\,j-u)-f\,(2\,h-v))^{n-i}$$
$$(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^{i+1}$$
$$\left(-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w))\right)+$$

$$e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(2\,k-m)\,p-s\,(2\,j-u)-f\,(v-2\,h))^{n-i}$$
$$(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^{i+1}$$
$$\left(-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.-(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(m-2\,k)\,p-s\,(2\,j-u)-f\,(v-2\,h))^{n-i}$$
$$(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^{i+1}$$
$$\left(-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\right)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.-(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\,z)^2\right/$$
$$\left.(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w))\right)+$$

$$e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(2\,k-m)\,p-s\,(u-2\,j)-f\,(2\,h-v))^{n-i}$$
$$(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^{i+1}$$

$$\left(-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.\left.-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(m-2\,k)\,p-s\,(u-2\,j)-f\,(2\,h-v))^{n-i}$$
$$(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\left(-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.\left.-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)+2\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w))\right)+$$

$$e^{-\frac{(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(2\,k-m)\,p-s\,(u-2\,j)-f\,(v-2\,h))^{n-i}$$
$$(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\left(-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.\left.-(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^{-n-1}$$
$$\sum_{i=0}^{n}2^{i-n}\,(-d-i\,(m-2\,k)\,p-s\,(u-2\,j)-f\,(v-2\,h))^{n-i}$$
$$(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^{i+1}$$
$$\left(-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/\right.$$
$$(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\Big)^{\frac{1}{2}(-i-1)}\binom{n}{i}\Gamma\left(\frac{i+1}{2},\right.$$
$$\left.\left.-(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\,z)^2\Big/\right.\right.$$
$$\left.\left.(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w))\right)\right)/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n e^{\sqrt{z}\,b+d\,z+e} \sin^m\left(\sqrt{z}\,a+p\,z+q\right) \sinh^u\left(w\sqrt{z}+s\,z+t\right) \cosh^v\left(\sqrt{z}\,c+f\,z+g\right) dz ==$$

$$2^{-m-2\,n-u-v-1}\, e^{e-\frac{b^2}{4\,d}}\, i^u \binom{m}{\frac{m}{2}} \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} (1-m \bmod 2)\,(1-u \bmod 2)\,(1-v \bmod 2)$$

$$d^{-2\,n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l}\, 4^i\, b^{-i-l+2\,n} \left(b+2\,d\sqrt{z}\right)^{i+l} \left(-\frac{\left(b+2\,d\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l} \binom{n}{i}$$

$$\left(b\left(b+2\,d\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1), -\frac{\left(b+2\,d\sqrt{z}\right)^2}{4\,d}\right) + 2\sqrt{-\frac{\left(b+2\,d\sqrt{z}\right)^2}{d}}\; d\,\Gamma\left(\frac{1}{2}(i+l+2), -\frac{\left(b+2\,d\sqrt{z}\right)^2}{4\,d}\right)\right) +$$

$$2^{-m-2\,n-u-v-1}\, i^u \binom{u}{\frac{u}{2}} \binom{v}{\frac{v}{2}} (1-u \bmod 2)\,(1-v \bmod 2) \sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor} (-1)^k \binom{m}{k} \left(e^{-\frac{(b+a\,i\,(2\,k-m))^2}{4\,(d+i\,(2\,k-m)\,p)}+e+i\,(2\,k-m)\,q+\frac{i\,m\,\pi}{2}}\right.$$

$$(d+i\,(2\,k-m)\,p)^{-2\,n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l}\, 4^i\, (b+a\,i\,(2\,k-m))^{-i-l+2\,n} \left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l} \binom{n}{i} \left((b+a\,i\,(2\,k-m))\left(b+a\,i\,(2\,k-m)+\right.\right.$$

$$\left.2\,(d+i\,(2\,k-m)\,p)\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1), -\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right) +$$

$$2\,(d+i\,(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}(i+l+2), -\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)$$

$$\left.\left.\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\right) + e^{-\frac{(b+a\,i\,(m-2\,k))^2}{4\,(d+i\,(m-2\,k)\,p)}+e+i\,(m-2\,k)\,q-\frac{i\,m\,\pi}{2}}$$

$$(d+i\,(m-2\,k)\,p)^{-2\,n-2} \sum_{i=0}^{n} \sum_{l=0}^{i} (-1)^{i-l}\, 4^i\, (b+a\,i\,(m-2\,k))^{-i-l+2\,n} \left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)} \binom{i}{l} \binom{n}{i} \left((b+a\,i\,(m-2\,k))\left(b+a\,i\,(m-2\,k)+\right.\right.$$

$$2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\Big)\,\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)+$$

$$2\,(d+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\Bigg)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{(b+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}$$

$$(d+s\,(2\,k-u))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+(2\,k-u)\,w)^{-i-l+2\,n}\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{d+s\,(2\,k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+(2\,k-u)\,w)\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$\left.-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u))}\right)+2\sqrt{-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{d+s\,(2\,k-u)}}$$

$$(d+s\,(2\,k-u))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u))}\right)\Bigg)+$$

$$e^{-\frac{(b+(u-2\,k)\,w)^2}{4\,(d+s\,(u-2\,k))}+e+t\,(u-2\,k)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,k))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+(u-2\,k)\,w)^{-i-l+2\,n}$$

$$\left(b+(u-2\,k)\,w+2\,(d+s\,(u-2\,k))\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+(u-2\,k)\,w+2\,(d+s\,(u-2\,k))\,\sqrt{z}\right)^2}{d+s\,(u-2\,k)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b+(u-2k)w)\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$
$$\left.-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}\right)+2(d+s(u-2k))\Gamma\left(\frac{1}{2}(i+l+2),$$
$$\left.\left.-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}\right)\sqrt{-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{d+s(u-2k)}}\right)+$$

$$2^{-m-2n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{-\frac{(b+c(2h-v))^2}{4(d+f(2h-v))}+e+g(2h-v)}(d+f(2h-v))^{-2n-2}\right.$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c(2h-v))^{-i-l+2n}\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^{i+l}$$
$$\left(-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{d+f(2h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((b+c(2h-v))\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$
$$\left.-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{4(d+f(2h-v))}\right)+2\sqrt{-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{d+f(2h-v)}}$$
$$\left.(d+f(2h-v))\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{4(d+f(2h-v))}\right)\right)+$$

$$e^{-\frac{(b+c(v-2h))^2}{4(d+f(v-2h))}+e-g(2h-v)}(d+f(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c(v-2h))^{-i-l+2n}$$
$$\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c(v-2h)+2(d+f(v-2h))\sqrt{z}\right)^2}{d+f(v-2h)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left((b+c\,(v-2\,h))\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,h))}\right)+2\,(d+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$\left.\left.-\frac{\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,h))}\right)\sqrt{-\frac{\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+f\,(v-2\,h)}}\right)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{1}{2}\,i\,\pi\,(m+u)}\right.$$

$$(d+i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+a\,i\,(2\,k-m)+(2\,j-u)\,w)\right.$$

$$\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.\left.(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.\right.$$

$$\left.\left.\left.2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\right)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{1}{2}\,i\,\pi\,(u-m)}\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+a\,i\,(m-2\,k)+(2\,j-u)\,w)\right.$$

$$\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e+i\,(2\,k-m)\,q+\frac{1}{2}\,i\,\pi\,(m-u)+t\,(u-2\,j)}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+a\,i\,(2\,k-m)+(u-2\,j)\,w\right)$$
$$\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))$$
$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.\right.}$$
$$\left.\left.2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)-\frac{1}{2}\,i\,\pi\,(m+u)}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}\,(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+a\,i\,(m-2\,k)+(u-2\,j)\,w\right)$$
$$\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$

$$(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+$$
$$2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\big)^2\Big/(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^k\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Big(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+g\,(2\,h-v)+\frac{i\,m\,\pi}{2}}$$
$$(d+i\,(2\,k-m)\,p+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v))^{-i-l+2\,n}$$
$$\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^{i+l}$$
$$\Big(-\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$
$$(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(2\,k-m)+c\,(2\,h-v))$$
$$\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v)))\Big)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v)))\Big)\sqrt{\Big(-\big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+$$
$$2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+g\,(2\,h-v)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v))^{-i-l+2\,n}$$
$$\big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^{i+l}$$
$$\Big(-\big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$
$$(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(m-2\,k)+c\,(2\,h-v))$$
$$\big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\big)$$
$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\big)^2\Big/$$
$$(4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v)))\Big)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))$$

$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v)))\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\right)\Big)+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+g\,(v-2\,h)+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h))^{-i-l+2\,n}$$
$$\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(2\,k-m)+c\,(v-2\,h))$$
$$\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h)))\right)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h)))\right)\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.}$$
$$\left.\left.2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\right)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+g\,(v-2\,h)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h))^{-i-l+2\,n}$$
$$\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(m-2\,k)+c\,(v-2\,h))$$
$$\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h)))\right)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h)))\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.}$$

$$2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\Big)\Big)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{-\frac{(b+c\,(2\,h-v)+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u)+f\,(2\,h-v))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}$$

$$(d+s\,(2\,k-u)+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c\,(2\,h-v)+(2\,k-u)\,w)^{-i-l+2\,n}$$

$$\Big(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(d+s\,(2\,k-u)+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((b+c\,(2\,h-v)+(2\,k-u)\,w)\Big(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(2\,k-u)+f\,(2\,h-v)))\Big)+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(2\,k-u)+f\,(2\,h-v)))\Big)\sqrt{\Big(-\Big(b+c\,(2\,h-v)+(2\,k-u)\,w+$$

$$2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(d+s\,(2\,k-u)+f\,(2\,h-v))\Big)\Big)+$$

$$e^{-\frac{(b+c\,(2\,h-v)+(u-2\,k)\,w)^2}{4\,(d+s\,(u-2\,k)+f\,(2\,h-v))}+e+t\,(u-2\,k)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,k)+f\,(2\,h-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c\,(2\,h-v)+(u-2\,k)\,w)^{-i-l+2\,n}$$

$$\Big(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(d+s\,(u-2\,k)+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((b+c\,(2\,h-v)+(u-2\,k)\,w)\Big(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(u-2\,k)+f\,(2\,h-v)))\Big)+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(u-2\,k)+f\,(2\,h-v)))\Big)\sqrt{\Big(-\Big(b+c\,(2\,h-v)+(u-2\,k)\,w+$$

$$2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(d+s\,(u-2\,k)+f\,(2\,h-v))\Big)\Big)+$$

$$e^{-\frac{(b+c\,(v-2\,h)+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u)+f\,(v-2\,h))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(d+s\,(2\,k-u)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c\,(v-2\,h)+(2\,k-u)\,w)^{-i-l+2\,n}$$

$$\Big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(d+s\,(2\,k-u)+f\,(v-2\,h))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((b+c\,(v-2\,h)+(2\,k-u)\,w)\,\Big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(2\,k-u)+f\,(v-2\,h)))\Big)+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(2\,k-u)+f\,(v-2\,h)))\Big)\sqrt{\Big(-\Big(b+c\,(v-2\,h)+(2\,k-u)\,w+$$

$$2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+s\,(2\,k-u)+f\,(v-2\,h))\Big)\Big)+$$

$$e^{-\frac{(b+c\,(v-2\,h)+(u-2\,k)\,w)^2}{4\,(d+s\,(u-2\,k)+f\,(v-2\,h))}+e+t\,(u-2\,k)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,k)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c\,(v-2\,h)+(u-2\,k)\,w)^{-i-l+2\,n}$$

$$\Big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(d+s\,(u-2\,k)+f\,(v-2\,h))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Big((b+c\,(v-2\,h)+(u-2\,k)\,w)\,\Big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(u-2\,k)+f\,(v-2\,h)))\Big)+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+s\,(u-2\,k)+f\,(v-2\,h)))\Big)\sqrt{\Big(-\Big(b+c\,(v-2\,h)+(u-2\,k)\,w+$$

$$2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+s\,(u-2\,k)+f\,(v-2\,h))\Big)\Big)\Big)+$$

$$2^{-m-2n-u-v-1}\,i^{u}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}(-1)^{k}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^{j}\binom{u}{j}\Bigg(e^{-\frac{(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w)^2}{4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))}+e+i\,(2k-m)\,q+t\,(2j-u)+\frac{i\,\pi\,u}{2}+g\,(2h-v)+\frac{i\,m\,\pi}{2}}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w)^{-i-l+2n}\Big(b+a\,i\,(2k-m)+$$

$$c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))$$

$$\sqrt{z}\Big)^{2}\Big/(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Bigg((b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w)\Big(b+a\,i\,(2k-m)+c\,(2h-v)+$$

$$(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\Big)\Gamma\Big(\frac{1}{2}(i+l+1),$$

$$-\Big(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+$$

$$f\,(2h-v))\,\sqrt{z}\Big)^{2}\Big/(4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v)))\Big)+$$

$$2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))\,\Gamma\Big(\frac{1}{2}(i+l+2),$$

$$-\Big(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+$$

$$f\,(2h-v))\,\sqrt{z}\Big)^{2}\Big/(4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v)))\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(2k-m)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+$$

$$s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\Big)^{2}\Big/(d+i\,(2k-m)\,p+s\,(2j-u)+$$

$$f\,(2h-v))\Big)}\Bigg)(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(2h-v))^{-2n-2}+$$

$$e^{-\frac{(b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w)^2}{4\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))}+e+i\,(m-2k)\,q+t\,(2j-u)+\frac{i\,\pi\,u}{2}+g\,(2h-v)-\frac{i\,m\,\pi}{2}}(d+i\,(m-2k)\,p+s\,(2j-u)+$$

$$f\,(2h-v))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w)^{-i-l+2n}$$

$$\Big(b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))$$

$$\sqrt{z}\Big)^{2}\Big/(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Bigg((b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w)\Big(b+a\,i\,(m-2k)+c\,(2h-v)+$$

$$(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v))\,\sqrt{z}\Big)\Gamma\Big(\frac{1}{2}(i+l+1),$$

$$-\Big(b+a\,i\,(m-2k)+c\,(2h-v)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+$$

$$f\,(2h-v))\,\sqrt{z}\Big)^{2}\Big/(4\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(2h-v)))\Big)+$$

$$2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\Big)}+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Big((b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\,\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\Big)+$$

$$2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)))\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\Big)}+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Big((b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)\,\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+$$

$$(u-2j)\,w+2\,(d+i\,(m-2k)\,p+s\,(u-2j)+f\,(2h-v))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),$$
$$-\Big(b+a\,i\,(m-2k)+c\,(2h-v)+(u-2j)\,w+2\,(d+i\,(m-2k)\,p+s\,(u-2j)+$$
$$f\,(2h-v))\,\sqrt{z}\Big)^2\Big/\,(4\,(d+i\,(m-2k)\,p+s\,(u-2j)+f\,(2h-v)))\Big)+$$
$$2\,(d+i\,(m-2k)\,p+s\,(u-2j)+f\,(2h-v))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(m-2k)+$$
$$c\,(2h-v)+(u-2j)\,w+2\,(d+i\,(m-2k)\,p+s\,(u-2j)+f\,(2h-v))$$
$$\sqrt{z}\Big)^2\Big/\,(4\,(d+i\,(m-2k)\,p+s\,(u-2j)+f\,(2h-v)))\Big)$$
$$\sqrt{\Big(-\Big(b+a\,i\,(m-2k)+c\,(2h-v)+(u-2j)\,w+2\,(d+i\,(m-2k)\,p+s\,(u-2j)+$$
$$f\,(2h-v))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2k)\,p+s\,(u-2j)+f\,(2h-v))\Big)\Big)+$$
$$e^{-\frac{(b+a\,i\,(2k-m)+c\,(v-2h)+(2j-u)\,w)^2}{4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))}+e+i\,(2k-m)\,q+t\,(2j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2h)+\frac{i\,m\,\pi}{2}}\,(d+i\,(2k-m)\,p+s\,(2j-u)+$$
$$f\,(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2k-m)+c\,(v-2h)+(2j-u)\,w)^{-i-l+2n}$$
$$\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))\,\sqrt{z}\Big)^{i+l}$$
$$\Big(-\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))$$
$$\sqrt{z}\Big)^2\Big/\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$
$$\binom{n}{i}\Big((b+a\,i\,(2k-m)+c\,(v-2h)+(2j-u)\,w)\Big(b+a\,i\,(2k-m)+c\,(v-2h)+$$
$$(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),$$
$$-\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+$$
$$f\,(v-2h))\,\sqrt{z}\Big)^2\Big/\,(4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h)))\Big)+$$
$$2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(2k-m)+$$
$$c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))$$
$$\sqrt{z}\Big)^2\Big/\,(4\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h)))\Big)$$
$$\sqrt{\Big(-\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(2k-m)\,p+s\,(2j-u)+$$
$$f\,(v-2h))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2k-m)\,p+s\,(2j-u)+f\,(v-2h))\Big)\Big)+$$
$$e^{-\frac{(b+a\,i\,(m-2k)+c\,(v-2h)+(2j-u)\,w)^2}{4\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))}+e+i\,(m-2k)\,q+t\,(2j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2h)-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2k)\,p+s\,(2j-u)+$$
$$f\,(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2k)+c\,(v-2h)+(2j-u)\,w)^{-i-l+2n}$$
$$\Big(b+a\,i\,(m-2k)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))\,\sqrt{z}\Big)^{i+l}$$
$$\Big(-\Big(b+a\,i\,(m-2k)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))$$

$$\sqrt{z}\Big)^2\Big/\left(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h)\right)\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Big(\left(b+a\,i\,(m-2k)+c\,(v-2h)+(2j-u)\,w\right)\Big(b+a\,i\,(m-2k)+c\,(v-2h)+$$

$$(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}(i+l+1),$$

$$-\Big(b+a\,i\,(m-2k)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+$$

$$f\,(v-2h))\,\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))\right)\Big)+$$

$$2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))\,\Gamma\Big(\frac{1}{2}(i+l+2),\,-\Big(b+a\,i\,(m-2k)+$$

$$c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))$$

$$\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h))\right)\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(m-2k)+c\,(v-2h)+(2j-u)\,w+2\,(d+i\,(m-2k)\,p+s\,(2j-u)+$$

$$f\,(v-2h))\,\sqrt{z}\Big)^2\Big/\left(d+i\,(m-2k)\,p+s\,(2j-u)+f\,(v-2h)\right)\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w)^2}{4\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))}+e+i\,(2k-m)\,q+t\,(u-2j)+g\,(v-2h)-\frac{i\,\pi\,u}{2}+\frac{i\,m\,\pi}{2}}\,(d+i\,(2k-m)\,p+s\,(u-2j)+$$

$$f\,(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w)^{-i-l+2n}$$

$$\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w+2\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w+2\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))$$

$$\sqrt{z}\Big)^2\Big/\left(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h)\right)\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Big(\left(b+a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w\right)\Big(b+a\,i\,(2k-m)+c\,(v-2h)+$$

$$(u-2j)\,w+2\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}(i+l+1),$$

$$-\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w+2\,(d+i\,(2k-m)\,p+s\,(u-2j)+$$

$$f\,(v-2h))\,\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\right)\Big)+$$

$$2\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\,\Gamma\Big(\frac{1}{2}(i+l+2),\,-\Big(b+a\,i\,(2k-m)+$$

$$c\,(v-2h)+(u-2j)\,w+2\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))$$

$$\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h))\right)\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(2k-m)+c\,(v-2h)+(u-2j)\,w+2\,(d+i\,(2k-m)\,p+s\,(u-2j)+$$

$$f\,(v-2h))\,\sqrt{z}\Big)^2\Big/\left(d+i\,(2k-m)\,p+s\,(u-2j)+f\,(v-2h)\right)\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2k)+c\,(v-2h)+(u-2j)\,w)^2}{4\,(d+i\,(m-2k)\,p+s\,(u-2j)+f\,(v-2h))}+e+i\,(m-2k)\,q+t\,(u-2j)+g\,(v-2h)-\frac{i\,\pi\,u}{2}-\frac{i\,m\,\pi}{2}}\,(d+i\,(m-2k)\,p+s\,(u-2j)+$$

$$f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right.$$

$$\left.\sqrt{z}\right)^{2}\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\left(\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w\right)\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.$$

$$\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.$$

$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)+$$

$$2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+\right.\right.$$

$$\left.c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/$$

$$\left.\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.}$$

$$\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/$$

$$\left.\left.\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^{+}\bigwedge u\in\mathbb{N}^{+}\bigwedge v\in\mathbb{N}^{+}$$

Involving cos, sinh, exp and power

Involving $z^{\alpha-1}\,e^{b\,z^{r}+e}\cos\left(a\,z^{r}+q\right)\sinh\left(w\,z^{r}+t\right)\cosh^{v}\left(c\,z^{r}+g\right)$

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$$\int z^{\alpha-1}\, e^{b\,z^r+e}\cos(a\,z^r+q)\sinh(w\,z^r+t)\cosh^{\nu}(c\,z^r+g)\,dz ==$$

$$\frac{1}{r}\left(\left(2^{-\nu-2}\,z^{\alpha}\right)\binom{\nu}{\frac{\nu}{2}}\left(-e^{e+i\,q+t}\,\Gamma\left(\frac{\alpha}{r},\,(-b-i\,a\,-w)\,z^r\right)((-b-i\,a\,-w)\,z^r)^{-\frac{\alpha}{r}}-\right.\right.$$

$$e^{e-i\,q+t}\,((-b+i\,a\,-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+i\,a\,-w)\,z^r\right)+e^{e+i\,q-t}\,((-b-i\,a\,+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-i\,a\,+w)\,z^r\right)+$$

$$\left.\left.e^{e-i\,q-t}\,((-b+i\,a\,+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+i\,a\,+w)\,z^r\right)\right)(1-\nu\bmod 2)\right)+$$

$$\frac{1}{r}\left(\left(2^{-\nu-2}\,z^{\alpha}\right)\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\left(-e^{e+2\,g\,h+i\,q+t-g\,\nu}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h-i\,a\,+c\,\nu-w)\,z^r\right)((-b-2\,c\,h-i\,a\,+c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}-\right.\right.$$

$$e^{e+2\,g\,h-i\,q+t-g\,\nu}\,((-b-2\,c\,h+i\,a\,+c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h+i\,a\,+c\,\nu-w)\,z^r\right)-$$

$$e^{e-2\,g\,h+i\,q+t+g\,\nu}\,((-b+2\,c\,h-i\,a\,-c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h-i\,a\,-c\,\nu-w)\,z^r\right)-$$

$$e^{e-2\,g\,h-i\,q+t+g\,\nu}\,((-b+2\,c\,h+i\,a\,-c\,\nu-w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h+i\,a\,-c\,\nu-w)\,z^r\right)+$$

$$e^{e+2\,g\,h+i\,q-t-g\,\nu}\,((-b-2\,c\,h-i\,a\,+c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h-i\,a\,+c\,\nu+w)\,z^r\right)+$$

$$e^{e+2\,g\,h-i\,q-t-g\,\nu}\,((-b-2\,c\,h+i\,a\,+c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h+i\,a\,+c\,\nu+w)\,z^r\right)+$$

$$e^{e-2\,g\,h+i\,q-t+g\,\nu}\,((-b+2\,c\,h-i\,a\,-c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h-i\,a\,-c\,\nu+w)\,z^r\right)+$$

$$\left.\left.e^{e-2\,g\,h-i\,q-t+g\,\nu}\,((-b+2\,c\,h+i\,a\,-c\,\nu+w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h+i\,a\,-c\,\nu+w)\,z^r\right)\right)\right)/;\,\nu\in\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cos(a\,z^r+p\,z+q)\sinh(w\,z^r+s\,z+t)\cosh^{\nu}(c\,z^r+f\,z+g)$

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$$\int z^n\, e^{b\,z^2+d\,z+e}\cos(a\,z^2+p\,z+q)\sinh(w\,z^2+s\,z+t)\cosh^{\nu}(c\,z^2+f\,z+g)\,dz ==$$

$$2^{-\nu-3}\binom{\nu}{\frac{\nu}{2}}(1-\nu\bmod 2)\left(e^{-\frac{(d-i\,p-s)^2}{4\,(b-i\,a\,-w)}+e-i\,q-t}\left(\sum_{l=0}^{n}2^{l-n}\,(-d+i\,p+s)^{n-l}\,(d-i\,p-s+2\,(b-i\,a\,-w)\,z)^{l+1}\right.\right.$$

$$\left.\left(-\frac{(d-i\,p-s+2\,(b-i\,a\,-w)\,z)^2}{b-i\,a\,-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-i\,p-s+2\,(b-i\,a\,-w)\,z)^2}{4\,(b-i\,a\,-w)}\right)\right)$$

$$(b-i\,a\,-w)^{-n-1}+e^{-\frac{(d+i\,p-s)^2}{4\,(b+i\,a\,-w)}+e+i\,q-t}\,(b+i\,a\,-w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-i\,p+s)^{n-l}\,(d+i\,p-s+2\,(b+i\,a\,-w)\,z)^{l+1}$$

$$\left(-\frac{(d+i\,p-s+2\,(b+i\,a\,-w)\,z)^2}{b+i\,a\,-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+i\,p-s+2\,(b+i\,a\,-w)\,z)^2}{4\,(b+i\,a\,-w)}\right)-$$

$$e^{-\frac{(d-i\,p+s)^2}{4\,(b-i\,a\,+w)}+e-i\,q+t}\,(b-i\,a\,+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d+i\,p-s)^{n-l}\,(d-i\,p+s+2\,(b-i\,a\,+w)\,z)^{l+1}$$

$$\left(-\frac{(d-i\,p+s+2\,(b-i\,a\,+w)\,z)^2}{b-i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-i\,p+s+2\,(b-i\,a\,+w)\,z)^2}{4\,(b-i\,a\,+w)}\right)-$$

$$e^{-\frac{(d+i\,p+s)^2}{4\,(b+i\,a\,+w)}+e+i\,q+t}\,(b+i\,a\,+w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-i\,p-s)^{n-l}\,(d+i\,p+s+2\,(b+i\,a\,+w)\,z)^{l+1}$$

$$\left(-\frac{(d+i\,p+s+2\,(b+i\,a\,+w)\,z)^2}{b+i\,a\,+w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+i\,p+s+2\,(b+i\,a\,+w)\,z)^2}{4\,(b+i\,a\,+w)}\right)\Bigg)+$$

$$2^{-v-3}\sum_{k=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{k}\Bigg(e^{-\frac{(d-i\,p-s+f\,(2\,k-v))^2}{4\,(b-i\,a+c\,(2\,k-v)-w)}+e-i\,q-t+g\,(2\,k-v)}\left(\sum_{l=0}^{n}2^{l-n}\,(-d+i\,p+s-f\,(2\,k-v))^{n-l}\,(d-i\,p-s+f\,(2\,k-v)+2\,(b-i\,a\,+\right.$$

$$\left.c\,(2\,k-v)-w)\,z)^{l+1}\left(-\frac{(d-i\,p-s+f\,(2\,k-v)+2\,(b-i\,a\,+c\,(2\,k-v)-w)\,z)^2}{b-i\,a\,+c\,(2\,k-v)-w}\right)^{\frac{1}{2}(-l-1)}\right.$$

$$\left.\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d-i\,p-s+f\,(2\,k-v)+2\,(b-i\,a\,+c\,(2\,k-v)-w)\,z)^2}{4\,(b-i\,a\,+c\,(2\,k-v)-w)}\right)\right)$$

$$(b-i\,a\,+c\,(2\,k-v)-w)^{-n-1}+e^{-\frac{(d+i\,p-s+f\,(2\,k-v))^2}{4\,(b+i\,a+c\,(2\,k-v)-w)}+e+i\,q-t+g\,(2\,k-v)}\,(b+i\,a\,+c\,(2\,k-v)-w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-d-i\,p+s-f\,(2\,k-v))^{n-l}\,(d+i\,p-s+f\,(2\,k-v)+2\,(b+i\,a\,+c\,(2\,k-v)-w)\,z)^{l+1}$$

$$\left(-\frac{(d+i\,p-s+f\,(2\,k-v)+2\,(b+i\,a\,+c\,(2\,k-v)-w)\,z)^2}{b+i\,a\,+c\,(2\,k-v)-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(d+i\,p-s+f\,(2\,k-v)+2\,(b+i\,a\,+c\,(2\,k-v)-w)\,z)^2}{4\,(b+i\,a\,+c\,(2\,k-v)-w)}\right)+$$

$$e^{-\frac{(d-i\,p-s+f\,(v-2\,k))^2}{4\,(b-i\,a+c\,(v-2\,k)-w)}+e-i\,q-t+g\,(v-2\,k)}\,(b-i\,a\,+c\,(v-2\,k)-w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-d+i\,p+s-f\,(v-2\,k))^{n-l}\,(d-i\,p-s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)-w)\,z)^{l+1}$$

$$\left(-\frac{(d-i\,p-s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)-w)\,z)^2}{b-i\,a\,+c\,(v-2\,k)-w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2},-\frac{(d-i\,p-s+f\,(v-2\,k)+2\,(b-i\,a\,+c\,(v-2\,k)-w)\,z)^2}{4\,(b-i\,a\,+c\,(v-2\,k)-w)}\right)+$$

$$e^{-\frac{(d+i\,p-s+f\,(v-2\,k))^2}{4\,(b+i\,a+c\,(v-2\,k)-w)}+e+i\,q-t+g\,(v-2\,k)}\,(b+i\,a\,+c\,(v-2\,k)-w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d - i\,p + s - f\,(v-2\,k))^{n-l} (d + i\,p - s + f\,(v-2\,k) + 2\,(b + i\,a + c\,(v-2\,k) - w)\,z)^{l+1}$$

$$\left(-\frac{(d + i\,p - s + f\,(v-2\,k) + 2\,(b + i\,a + c\,(v-2\,k) - w)\,z)^2}{b + i\,a + c\,(v-2\,k) - w}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d + i\,p - s + f\,(v-2\,k) + 2\,(b + i\,a + c\,(v-2\,k) - w)\,z)^2}{4\,(b + i\,a + c\,(v-2\,k) - w)}\right) -$$

$$e^{-\frac{(d-i\,p+s+f\,(2\,k-v))^2}{4\,(b-i\,a+c\,(2\,k-v)+w)} + e - i\,q + t + g\,(2\,k-v)} (b - i\,a + c\,(2\,k-v) + w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d + i\,p - s - f\,(2\,k-v))^{n-l} (d - i\,p + s + f\,(2\,k-v) + 2\,(b - i\,a + c\,(2\,k-v) + w)\,z)^{l+1}$$

$$\left(-\frac{(d - i\,p + s + f\,(2\,k-v) + 2\,(b - i\,a + c\,(2\,k-v) + w)\,z)^2}{b - i\,a + c\,(2\,k-v) + w}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d - i\,p + s + f\,(2\,k-v) + 2\,(b - i\,a + c\,(2\,k-v) + w)\,z)^2}{4\,(b - i\,a + c\,(2\,k-v) + w)}\right) -$$

$$e^{-\frac{(d+i\,p+s+f\,(2\,k-v))^2}{4\,(b+i\,a+c\,(2\,k-v)+w)} + e + i\,q + t + g\,(2\,k-v)} (b + i\,a + c\,(2\,k-v) + w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d - i\,p - s - f\,(2\,k-v))^{n-l} (d + i\,p + s + f\,(2\,k-v) + 2\,(b + i\,a + c\,(2\,k-v) + w)\,z)^{l+1}$$

$$\left(-\frac{(d + i\,p + s + f\,(2\,k-v) + 2\,(b + i\,a + c\,(2\,k-v) + w)\,z)^2}{b + i\,a + c\,(2\,k-v) + w}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d + i\,p + s + f\,(2\,k-v) + 2\,(b + i\,a + c\,(2\,k-v) + w)\,z)^2}{4\,(b + i\,a + c\,(2\,k-v) + w)}\right) -$$

$$e^{-\frac{(d-i\,p+s+f\,(v-2\,k))^2}{4\,(b-i\,a+c\,(v-2\,k)+w)} + e - i\,q + t + g\,(v-2\,k)} (b - i\,a + c\,(v-2\,k) + w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d + i\,p - s - f\,(v-2\,k))^{n-l} (d - i\,p + s + f\,(v-2\,k) + 2\,(b - i\,a + c\,(v-2\,k) + w)\,z)^{l+1}$$

$$\left(-\frac{(d - i\,p + s + f\,(v-2\,k) + 2\,(b - i\,a + c\,(v-2\,k) + w)\,z)^2}{b - i\,a + c\,(v-2\,k) + w}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

$$\Gamma\left(\frac{l+1}{2}, -\frac{(d - i\,p + s + f\,(v-2\,k) + 2\,(b - i\,a + c\,(v-2\,k) + w)\,z)^2}{4\,(b - i\,a + c\,(v-2\,k) + w)}\right) -$$

$$e^{-\frac{(d+i\,p+s+f\,(v-2\,k))^2}{4\,(b+i\,a+c\,(v-2\,k)+w)} + e + i\,q + t + g\,(v-2\,k)} (b + i\,a + c\,(v-2\,k) + w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d - i\,p - s - f\,(v-2\,k))^{n-l} (d + i\,p + s + f\,(v-2\,k) + 2\,(b + i\,a + c\,(v-2\,k) + w)\,z)^{l+1}$$

$$\left(-\frac{(d + i\,p + s + f\,(v-2\,k) + 2\,(b + i\,a + c\,(v-2\,k) + w)\,z)^2}{b + i\,a + c\,(v-2\,k) + w}\right)^{\frac{1}{2}(-l-1)} \binom{n}{l}$$

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$$\int z^n e^{\sqrt{z}\,b+e+d z}\cos\left(\sqrt{z}\,a+q+p z\right)\sinh\left(t+s z+w\sqrt{z}\right)\cosh^{\nu}\left(\sqrt{z}\,c+g+f z\right)dz ==$$

$$-2^{-2n-\nu-3}\binom{\nu}{\frac{\nu}{2}}(1-\nu \bmod 2)\left(e^{-\frac{(b+i a-w)^2}{4(d+i p-s)}+e+i q-t}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+i a-w)^{-i-l+2n}\left(b+i a-w+2(d+i p-s)\sqrt{z}\right)^{i+l}\right.\right.$$

$$\left(-\frac{\left(b+i a-w+2(d+i p-s)\sqrt{z}\right)^2}{d+i p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+i a-w)\left(b+i a-w+2(d+i p-s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+i a-w+2(d+i p-s)\sqrt{z}\right)^2}{4(d+i p-s)}\right)+2\sqrt{-\frac{\left(b+i a-w+2(d+i p-s)\sqrt{z}\right)^2}{d+i p-s}}$$

$$\left.\left.(d+i p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+i a-w+2(d+i p-s)\sqrt{z}\right)^2}{4(d+i p-s)}\right)\right)\right)(d+i p-s)^{-2n-2}+$$

$$e^{-\frac{(b-i a-w)^2}{4(d-i p-s)}+e-i q-t}(d-i p-s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-i a-w)^{-i-l+2n}\left(b-i a-w+2(d-i p-s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i a-w+2(d-i p-s)\sqrt{z}\right)^2}{d-i p-s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b-i a-w)\left(b-i a-w+2(d-i p-s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-i a-w+2(d-i p-s)\sqrt{z}\right)^2}{4(d-i p-s)}\right)+2\sqrt{-\frac{\left(b-i a-w+2(d-i p-s)\sqrt{z}\right)^2}{d-i p-s}}$$

$$\left.(d-i p-s)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-i a-w+2(d-i p-s)\sqrt{z}\right)^2}{4(d-i p-s)}\right)\right)-$$

$$e^{-\frac{(b+i a+w)^2}{4(d+i p+s)}+e+i q+t}(d+i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+i a+w)^{-i-l+2n}\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{d+i p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+i a+w)\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{4(d+i p+s)}\right)+2\sqrt{-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{d+i p+s}}$$

$$(d+i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+i a+w+2(d+i p+s)\sqrt{z}\right)^2}{4(d+i p+s)}\right)\Bigg)-$$

$$e^{-\frac{(b-i a+w)^2}{4(d-i p+s)}+e-i q+t}(d-i p+s)^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-i a+w)^{-i-l+2n}\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{d-i p+s}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b-i a+w)\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)$$

$$\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{4(d-i p+s)}\right)+2\sqrt{-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{d-i p+s}}$$

$$(d-i p+s)\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b-i a+w+2(d-i p+s)\sqrt{z}\right)^2}{4(d-i p+s)}\right)\Bigg)\Bigg)-$$

$$2^{-2n-\nu-3}\sum_{h=0}^{\left\lfloor\frac{\nu-1}{2}\right\rfloor}\binom{\nu}{h}\Bigg(e^{-\frac{(b+i a+c(2h-\nu)-w)^2}{4(d+i p-s+f(2h-\nu))}+e+i q-t+g(2h-\nu)}\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+i a+c(2h-\nu)-w)^{-i-l+2n}$$

$$\left(b+i a+c(2h-\nu)-w+2(d+i p-s+f(2h-\nu))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i a+c(2h-\nu)-w+2(d+i p-s+f(2h-\nu))\sqrt{z}\right)^2}{d+i p-s+f(2h-\nu)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+i a+c(2h-\nu)-w)\left(b+i a+c(2h-\nu)-w+2(d+i p-s+f(2h-\nu))\sqrt{z}\right)$$

$$\Gamma\Bigg(\frac{1}{2}(i+l+1),-\left(b+i a+c(2h-\nu)-w+2(d+i p-s+f(2h-\nu))\sqrt{z}\right)^2\Big/$$

$$(4(d+i p-s+f(2h-\nu)))\Bigg)+2(d+i p-s+f(2h-\nu))\Gamma\Bigg(\frac{1}{2}(i+l+2),$$

$$-\left(b+i a+c(2h-\nu)-w+2(d+i p-s+f(2h-\nu))\sqrt{z}\right)^2\Big/(4(d+i p-s+f(2h-\nu)))\Bigg)$$

$$\sqrt{\left(-\left(b+i\,a\,+c\,(2\,h-v)-w+2\,(d+i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,p-s+f\,(2\,h-v)\right)\right)}\Bigg)$$

$$(d+i\,p-s+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(b-i\,a+c\,(2\,h-v)-w)^2}{4\,(d-i\,p-s+f\,(2\,h-v))}+e-i\,q-t+g\,(2\,h-v)}\,(d-i\,p-s+f\,(2\,h-v))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-i\,a\,+c\,(2\,h-v)-w)^{-i-l+2\,n}\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d-i\,p-s+f\,(2\,h-v)\right)\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b-i\,a\,+c\,(2\,h-v)-w)\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),\,-\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(d-i\,p-s+f\,(2\,h-v)))\Bigg)+2\,(d-i\,p-s+f\,(2\,h-v))\,\Gamma\Bigg(\frac{1}{2}(i+l+2),$$

$$-\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(d-i\,p-s+f\,(2\,h-v)))\Bigg)$$

$$\sqrt{\left(-\left(b-i\,a\,+c\,(2\,h-v)-w+2\,(d-i\,p-s+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d-i\,p-s+f\,(2\,h-v)\right)\right)}\Bigg)-$$

$$e^{-\frac{(b+i\,a+c\,(2\,h-v)+w)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}+e+i\,q+t+g\,(2\,h-v)}\,(d+i\,p+s+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+i\,a\,+c\,(2\,h-v)+w)^{-i-l+2\,n}$$

$$\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+i\,a\,+c\,(2\,h-v)+w)\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Bigg(\frac{1}{2}(i+l+1),$$

$$-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}\Bigg)+2\,(d+i\,p+s+f\,(2\,h-v))\,\Gamma\Bigg($$

$$\frac{1}{2}(i+l+2),\,-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(2\,h-v))}\Bigg)$$

$$\sqrt{-\frac{\left(b+i\,a\,+c\,(2\,h-v)+w+2\,(d+i\,p+s+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(2\,h-v)}}\Bigg)-$$

$$e^{-\frac{(b-i a+c(2h-v)+w)^2}{4(d-i p+s+f(2h-v))}+e-i q+t+g(2h-v)}(d-i p+s+f(2h-v))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-i a+c(2h-v)+w)^{-i-l+2n}$$

$$\left(b-i a+c(2h-v)+w+2(d-i p+s+f(2h-v))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i a+c(2h-v)+w+2(d-i p+s+f(2h-v))\sqrt{z}\right)^2}{d-i p+s+f(2h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-i a+c(2h-v)+w)\left(b-i a+c(2h-v)+w+2(d-i p+s+f(2h-v))\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}(i+l+1),-\left(b-i a+c(2h-v)+w+2(d-i p+s+f(2h-v))\sqrt{z}\right)^2\Big/$$

$$\left.(4(d-i p+s+f(2h-v)))\right)+2(d-i p+s+f(2h-v))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$

$$\left.\left.-\left(b-i a+c(2h-v)+w+2(d-i p+s+f(2h-v))\sqrt{z}\right)^2\Big/(4(d-i p+s+f(2h-v)))\right)\right.$$

$$\left.\sqrt{\left(-\left(b-i a+c(2h-v)+w+2(d-i p+s+f(2h-v))\sqrt{z}\right)^2\Big/(d-i p+s+f(2h-v))\right)}\right)+$$

$$e^{-\frac{(b+i a+c(v-2h)-w)^2}{4(d+i p-s+f(v-2h))}+e+i q-t+g(v-2h)}(d+i p-s+f(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b+i a+c(v-2h)-w)^{-i-l+2n}$$

$$\left(b+i a+c(v-2h)-w+2(d+i p-s+f(v-2h))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i a+c(v-2h)-w+2(d+i p-s+f(v-2h))\sqrt{z}\right)^2}{d+i p-s+f(v-2h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+i a+c(v-2h)-w)\left(b+i a+c(v-2h)-w+2(d+i p-s+f(v-2h))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+i a+c(v-2h)-w+2(d+i p-s+f(v-2h))\sqrt{z}\right)^2}{4(d+i p-s+f(v-2h))}\right)+2(d+i p-s+f(v-2h))\,\Gamma\left(\right.$$

$$\left.\frac{1}{2}(i+l+2),-\frac{\left(b+i a+c(v-2h)-w+2(d+i p-s+f(v-2h))\sqrt{z}\right)^2}{4(d+i p-s+f(v-2h))}\right)$$

$$\left.\left.\sqrt{\left(-\left(b+i a+c(v-2h)-w+2(d+i p-s+f(v-2h))\sqrt{z}\right)^2\Big/(d+i p-s+f(v-2h))\right)}\right)+\right.$$

$$e^{-\frac{(b-i a+c(v-2h)-w)^2}{4(d-i p-s+f(v-2h))}+e-i q-t+g(v-2h)}(d-i p-s+f(v-2h))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}4^i(b-i a+c(v-2h)-w)^{-i-l+2n}$$

$$\left(b-i a+c(v-2h)-w+2(d-i p-s+f(v-2h))\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d-i\,p-s+f\,(v-2\,h)\right)\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\left(\left(b-i\,a\,+c\,(v-2\,h)-w\right)\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\right.\right.$$

$$\frac{1}{2}\,(i+l+1),\,-\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/$$

$$\left.\left(4\,(d-i\,p-s+f\,(v-2\,h))\right)\right)+2\,(d-i\,p-s+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$\left.-\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d-i\,p-s+f\,(v-2\,h))\right)\right)$$

$$\sqrt{\left(-\left(b-i\,a\,+c\,(v-2\,h)-w+2\,(d-i\,p-s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d-i\,p-s+f\,(v-2\,h)\right)\right)}\,-$$

$$e^{-\frac{(b+i\,a\,+c\,(v-2\,h)+w)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}+e+i\,q+t+g\,(v-2\,h)}\,(d+i\,p+s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+i\,a\,+c\,(v-2\,h)+w)^{-i-l+2\,n}$$

$$\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left(\left(b+i\,a\,+c\,(v-2\,h)+w\right)\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$

$$\left.-\frac{\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}\right)+2\,(d+i\,p+s+f\,(v-2\,h))\,\Gamma\left(\right.$$

$$\left.\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+i\,p+s+f\,(v-2\,h))}\right)$$

$$\left.\sqrt{-\frac{\left(b+i\,a\,+c\,(v-2\,h)+w+2\,(d+i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+i\,p+s+f\,(v-2\,h)}}\right)-$$

$$e^{-\frac{(b-i\,a\,+c\,(v-2\,h)+w)^2}{4\,(d-i\,p+s+f\,(v-2\,h))}+e-i\,q+t+g\,(v-2\,h)}\,(d-i\,p+s+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b-i\,a\,+c\,(v-2\,h)+w)^{-i-l+2\,n}$$

$$\left(b-i\,a\,+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b-i\,a\,+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d-i\,p+s+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b-i\,a+c\,(v-2\,h)+w)\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.\right.$$
$$\left.-\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d-i\,p+s+f\,(v-2\,h))\right)\Big)+$$
$$2\,(d-i\,p+s+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b-i\,a+c\,(v-2\,h)+w+2\,(d-i\,p+s+f\,(v-2\,h))\right.\right.$$
$$\left.\left.\sqrt{z}\right)^2\Big/\left(4\,(d-i\,p+s+f\,(v-2\,h))\right)\Big)\sqrt{\left(-\left(b-i\,a+c\,(v-2\,h)+w+\right.\right.}$$
$$\left.\left.\left.2\,(d-i\,p+s+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d-i\,p+s+f\,(v-2\,h)\right)\right)\right)\Bigg/;\,n\in\mathbb{N}\wedge v\in\mathbb{N}^+$$

Involving powers of cos, powers of sinh, exp and power

Involving $z^{\alpha-1}\,e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)$

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$$\int z^{\alpha-1}\,e^{b\,z^r+e}\cos^m(a\,z^r+q)\sinh^u(w\,z^r+t)\cosh^v(c\,z^r+g)\,dz==$$
$$-\frac{e^e\,i^u\,2^{-m-u-v}\,(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)}{r}\,z^\alpha\,(-b\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,-b\,z^r\right)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}-\frac{i^u\,2^{-m-u-v}\,z^\alpha}{r}\binom{u}{\frac{u}{2}}$$
$$\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)\sum_{h=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{h}\left(e^{e+2\,i\,h\,q-i\,m\,q}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,i\,a\,h+i\,a\,m)\,z^r\right)((-b-2\,i\,a\,h+i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}+\right.$$
$$\left.e^{e-2\,i\,h\,q+i\,m\,q}\,((-b+2\,i\,a\,h-i\,a\,m)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,i\,a\,h-i\,a\,m)\,z^r\right)\right)-\frac{i^u\,2^{-m-u-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}$$
$$(1-m\bmod 2)\,(1-u\bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{e+2\,g\,h-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h+c\,v)\,z^r\right)((-b-2\,c\,h+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$
$$\left.e^{e-2\,g\,h+g\,v}\,((-b+2\,c\,h-c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h-c\,v)\,z^r\right)\right)-\frac{i^u\,2^{-m-u-v}\,z^\alpha}{r}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)$$
$$(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\left(e^{e+2\,k\,t-t\,u+\frac{i\,\pi\,u}{2}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,k\,w+u\,w)\,z^r\right)((-b-2\,k\,w+u\,w)\,z^r)^{-\frac{\alpha}{r}}+\right.$$
$$\left.e^{e-2\,k\,t+t\,u-\frac{i\,\pi\,u}{2}}\,((-b+2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,k\,w-u\,w)\,z^r\right)\right)-\frac{i^u\,2^{-m-u-v}\,z^\alpha}{r}\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}$$
$$\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\left(e^{e+2\,g\,h+2\,i\,j\,q-i\,m\,q-g\,v}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v)\,z^r\right)((-b-2\,c\,h-2\,i\,a\,j+i\,a\,m+c\,v)\,z^r)^{-\frac{\alpha}{r}}+\right.$$
$$\left.e^{e+2\,g\,h-2\,i\,j\,q+i\,m\,q-g\,v}\,((-b-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b-2\,c\,h+2\,i\,a\,j-i\,a\,m+c\,v)\,z^r\right)+\right.$$

$$e^{e-2gh+2ijq-imq+gv}((-b+2ch-2iaj+iam-cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+2ch-2iaj+iam-cv)z^r\right)+$$
$$e^{e-2gh-2ijq+imq+gv}((-b+2ch+2iaj-iam-cv)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+2ch+2iaj-iam-cv)z^r\right)\Bigg)-$$
$$\frac{i^u 2^{-m-u-v}z^\alpha}{r}\binom{v}{\frac{v}{2}}(1-v \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\Bigg(e^{e+2ijq-imq+2kt-tu+\frac{i\pi u}{2}}$$
$$\Gamma\left(\frac{\alpha}{r},(-b-2iaj+iam-2kw+uw)z^r\right)((-b-2iaj+iam-2kw+uw)z^r)^{-\frac{\alpha}{r}}+$$
$$e^{e-2ijq+imq+2kt-tu+\frac{i\pi u}{2}}((-b+2iaj-iam-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+2iaj-iam-2kw+uw)z^r\right)+$$
$$e^{e+2ijq-imq-2kt+tu-\frac{i\pi u}{2}}((-b-2iaj+iam+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-2iaj+iam+2kw-uw)z^r\right)+$$
$$e^{e-2ijq+imq-2kt+tu-\frac{i\pi u}{2}}((-b+2iaj-iam+2kw-uw)z^r)^{-\frac{\alpha}{r}}$$
$$\Gamma\left(\frac{\alpha}{r},(-b+2iaj-iam+2kw-uw)z^r\right)\Bigg)-\frac{i^u 2^{-m-u-v}z^\alpha}{r}\binom{m}{\frac{m}{2}}(1-m \bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}$$
$$\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{e+2gh+2kt-tu+\frac{i\pi u}{2}-gv}\Gamma\left(\frac{\alpha}{r},(-b-2ch+cv-2kw+uw)z^r\right)((-b-2ch+cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}+$$
$$e^{e-2gh+2kt-tu+\frac{i\pi u}{2}+gv}((-b+2ch-cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+2ch-cv-2kw+uw)z^r\right)+$$
$$e^{e+2gh-2kt+tu-gv-\frac{i\pi u}{2}}((-b-2ch+cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-2ch+cv+2kw-uw)z^r\right)+$$
$$e^{e-2gh-2kt+tu+gv-\frac{i\pi u}{2}}((-b+2ch-cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+2ch-cv+2kw-uw)z^r\right)\Bigg)-$$
$$\frac{i^u 2^{-m-u-v}z^\alpha}{r}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{e+2gh+2ijq-imq+2kt-tu+\frac{i\pi u}{2}-gv}\Gamma\left(\frac{\alpha}{r},(-b-2ch-2iaj+\right.$$
$$\left.iam+cv-2kw+uw)z^r\right)((-b-2ch-2iaj+iam+cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}+$$
$$e^{e+2gh-2ijq+imq+2kt-tu+\frac{i\pi u}{2}-gv}((-b-2ch+2iaj-iam+cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}$$
$$\Gamma\left(\frac{\alpha}{r},(-b-2ch+2iaj-iam+cv-2kw+uw)z^r\right)+e^{e-2gh+2ijq-imq+2kt-tu+\frac{i\pi u}{2}+gv}$$
$$((-b+2ch-2iaj+iam-cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b+2ch-2iaj+iam-cv-2kw+\right.$$
$$\left.uw)z^r\right)+e^{e-2gh-2ijq+imq+2kt-tu+\frac{i\pi u}{2}+gv}((-b+2ch+2iaj-iam-cv-2kw+uw)z^r)^{-\frac{\alpha}{r}}$$
$$\Gamma\left(\frac{\alpha}{r},(-b+2ch+2iaj-iam-cv-2kw+uw)z^r\right)+e^{e+2gh+2ijq-imq-2kt+tu-gv-\frac{i\pi u}{2}}$$
$$((-b-2ch-2iaj+iam+cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}\Gamma\left(\frac{\alpha}{r},(-b-2ch-2iaj+iam+cv+2kw-\right.$$
$$\left.uw)z^r\right)+e^{e+2gh-2ijq+imq-2kt+tu-gv-\frac{i\pi u}{2}}((-b-2ch+2iaj-iam+cv+2kw-uw)z^r)^{-\frac{\alpha}{r}}$$
$$\Gamma\left(\frac{\alpha}{r},(-b-2ch+2iaj-iam+cv+2kw-uw)z^r\right)+e^{e-2gh+2ijq-imq-2kt+tu+gv-\frac{i\pi u}{2}}$$

$$((-b+2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h-2\,i\,a\,j+i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r\right)+e^{e-2\,g\,h-2\,i\,j\,q+i\,m\,q-2\,k\,t+t\,u+g\,v-\frac{i\,\pi\,u}{2}}\,((-b+2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r)^{-\frac{\alpha}{r}}\,\Gamma\left(\frac{\alpha}{r},\,(-b+2\,c\,h+2\,i\,a\,j-i\,a\,m-c\,v+2\,k\,w-u\,w)\,z^r\right)\Big)\Big/;\,m\in\mathbb{N}^+\wedge u\in\mathbb{N}^+\wedge v\in\mathbb{N}^+$$

Involving $z^n\,e^{b\,z^r+d\,z+e}\cos^m(a\,z^r+p\,z+q)\sinh^u(w\,z^r+s\,z+t)\cosh^v(c\,z^r+f\,z+g)$

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$$\int z^n\,e^{b\,z^2+d\,z+e}\cos^m(a\,z^2+p\,z+q)\sinh^u(w\,z^2+s\,z+t)\cosh^v(c\,z^2+f\,z+g)\,dz==$$

$$2^{-m-u-v-1}\,e^{e-\frac{d^2}{4\,b}}\,(-i^u)\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)\,b^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-d)^{n-l}\,(d+2\,b\,z)^{l+1}\left(-\frac{(d+2\,b\,z)^2}{b}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-\frac{(d+2\,b\,z)^2}{4\,b}\right)-i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}$$

$$(1-u\bmod 2)\,(1-v\bmod 2)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\Bigg(e^{-\frac{(d+i\,(2\,j-m)\,p)^2}{4\,(b+a\,i\,(2\,j-m))}+e+i\,(2\,j-m)\,q}\,(b+a\,i\,(2\,j-m))^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-i\,(2\,j-m)\,p)^{n-l}$$

$$(d+i\,(2\,j-m)\,p+2\,(b+a\,i\,(2\,j-m))\,z)^{l+1}\left(-\frac{(d+i\,(2\,j-m)\,p+2\,(b+a\,i\,(2\,j-m))\,z)^2}{b+a\,i\,(2\,j-m)}\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-\frac{(d+i\,(2\,j-m)\,p+2\,(b+a\,i\,(2\,j-m))\,z)^2}{4\,(b+a\,i\,(2\,j-m))}\right)+e^{-\frac{(d+i\,(m-2\,j)\,p)^2}{4\,(b+a\,i\,(m-2\,j))}+e+i\,(m-2\,j)\,q}$$

$$(b+a\,i\,(m-2\,j))^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-i\,(m-2\,j)\,p)^{n-l}\,(d+i\,(m-2\,j)\,p+2\,(b+a\,i\,(m-2\,j))\,z)^{l+1}$$

$$\left(-\frac{(d+i\,(m-2\,j)\,p+2\,(b+a\,i\,(m-2\,j))\,z)^2}{b+a\,i\,(m-2\,j)}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Bigg(\frac{l+1}{2},$$

$$-\frac{(d+i\,(m-2\,j)\,p+2\,(b+a\,i\,(m-2\,j))\,z)^2}{4\,(b+a\,i\,(m-2\,j))}\Bigg)\Bigg)-i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m\bmod 2)\,(1-u\bmod 2)$$

$$\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\Bigg(e^{-\frac{(d+f\,(2\,j-v))^2}{4\,(b+c\,(2\,j-v))}+e+g\,(2\,j-v)}\,(b+c\,(2\,j-v))^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-f\,(2\,j-v))^{n-l}\,(d+f\,(2\,j-v)+2\,(b+c\,(2\,j-v))\,z)^{l+1}$$

$$\left(-\frac{(d+f\,(2\,j-v)+2\,(b+c\,(2\,j-v))\,z)^2}{b+c\,(2\,j-v)}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-\frac{(d+f\,(2\,j-v)+2\,(b+c\,(2\,j-v))\,z)^2}{4\,(b+c\,(2\,j-v))}\right)+$$

$$e^{-\frac{(d+f\,(v-2\,j))^2}{4\,(b+c\,(v-2\,j))}+e+g\,(v-2\,j)}\,(b+c\,(v-2\,j))^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-f\,(v-2\,j))^{n-l}\,(d+f\,(v-2\,j)+2\,(b+c\,(v-2\,j))\,z)^{l+1}$$

$$\left(-\frac{(d+f(v-2j)+2(b+c(v-2j))z)^2}{b+c(v-2j)}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+f(v-2j)+2(b+c(v-2j))z)^2}{4(b+c(v-2j))}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m \bmod 2)(1-v \bmod 2)\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\Bigg(e^{-\frac{(d+s(2i-u))^2}{4(b+(2i-u)w)}+e+t(2i-u)+\frac{i\pi u}{2}}$$

$$(b+(2i-u)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-d-s(2i-u))^{n-l}(d+s(2i-u)+2(b+(2i-u)w)z)^{l+1}$$

$$\left(-\frac{(d+s(2i-u)+2(b+(2i-u)w)z)^2}{b+(2i-u)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+s(2i-u)+2(b+(2i-u)w)z)^2}{4(b+(2i-u)w)}\right)+$$

$$e^{-\frac{(d+s(u-2i))^2}{4(b+(u-2i)w)}+e+t(u-2i)-\frac{i\pi u}{2}}(b+(u-2i)w)^{-n-1}\sum_{l=0}^{n}2^{l-n}(-d-s(u-2i))^{n-l}(d+s(u-2i)+2(b+(u-2i)w)z)^{l+1}$$

$$\left(-\frac{(d+s(u-2i)+2(b+(u-2i)w)z)^2}{b+(u-2i)w}\right)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-\frac{(d+s(u-2i)+2(b+(u-2i)w)z)^2}{4(b+(u-2i)w)}\right)\Bigg)-$$

$$i^u\,2^{-m-u-v-1}\binom{u}{\frac{u}{2}}(1-u \bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\Bigg(e^{-\frac{(d+i(2k-m)p+f(2j-v))^2}{4(b+ai(2k-m)+c(2j-v))}+e+i(2k-m)q+g(2j-v)}(b+ai(2k-m)+c(2j-v))^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}(-d-i(2k-m)p-f(2j-v))^{n-l}(d+i(2k-m)p+f(2j-v)+2(b+ai(2k-m)+c(2j-v))$$

$$z)^{l+1}\left(-(d+i(2k-m)p+f(2j-v)+2(b+ai(2k-m)+c(2j-v))z)^2\right/$$

$$(b+ai(2k-m)+c(2j-v)))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-(d+i(2k-m)p+f(2j-v)+\right.$$

$$\left.2(b+ai(2k-m)+c(2j-v))z)^2\right/(4(b+ai(2k-m)+c(2j-v)))\Bigg)+$$

$$e^{-\frac{(d+i(m-2k)p+f(2j-v))^2}{4(b+ai(m-2k)+c(2j-v))}+e+i(m-2k)q+g(2j-v)}(b+ai(m-2k)+c(2j-v))^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-d-i(m-2k)p-f(2j-v))^{n-l}(d+i(m-2k)p+f(2j-v)+2(b+ai(m-2k)+c(2j-v))z)^{l+1}$$
$$\left(-(d+i(m-2k)p+f(2j-v)+2(b+ai(m-2k)+c(2j-v))z)^2\right/$$

$$(b+ai(m-2k)+c(2j-v)))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},-(d+i(m-2k)p+f(2j-v)+\right.$$

$$\left.2(b+ai(m-2k)+c(2j-v))z)^2\right/(4(b+ai(m-2k)+c(2j-v)))\Bigg)+$$

$$e^{-\frac{(d+i(2k-m)p+f(v-2j))^2}{4(b+ai(2k-m)+c(v-2j))}+e+i(2k-m)q+g(v-2j)}(b+ai(2k-m)+c(v-2j))^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-d-i(2k-m)p-f(v-2j))^{n-l}(d+i(2k-m)p+f(v-2j)+2(b+ai(2k-m)+c(v-2j))z)^{l+1}$$
$$\left(-(d+i(2k-m)p+f(v-2j)+2(b+ai(2k-m)+c(v-2j))z)^2\right/$$

$$(b+a\,i\,(2\,k-m)+c\,(v-2\,j))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d+i\,(2\,k-m)\,p+f\,(v-2\,j)+\right.$$

$$\left.2\,(b+a\,i\,(2\,k-m)+c\,(v-2\,j))\,z)^2\Big/(4\,(b+a\,i\,(2\,k-m)+c\,(v-2\,j)))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,k)\,p+f\,(v-2\,j))^2}{4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))}+e+i\,(m-2\,k)\,q+g\,(v-2\,j)}\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-d-i\,(m-2\,k)\,p-f\,(v-2\,j))^{n-l}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,j)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^{l+1}$$
$$\left(-(d+i\,(m-2\,k)\,p+f\,(v-2\,j)+2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^2\Big/\right.$$

$$(b+a\,i\,(m-2\,k)+c\,(v-2\,j))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d+i\,(m-2\,k)\,p+f\,(v-2\,j)+\right.$$

$$\left.\left.2\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j))\,z)^2\Big/(4\,(b+a\,i\,(m-2\,k)+c\,(v-2\,j)))\right)\right)-$$

$$i^u\,2^{-m-u-v-1}\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{j=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(2\,i-u))^2}{4\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)}+e+i\,(2\,j-m)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\right.$$

$$(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}\,(-d-i\,(2\,j-m)\,p-s\,(2\,i-u))^{n-l}$$

$$(d+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^{l+1}$$
$$\left(-(d+i\,(2\,j-m)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/\right.$$

$$(b+a\,i\,(2\,j-m)+(2\,i-u)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d+i\,(2\,j-m)\,p+s\,(2\,i-u)+\right.$$

$$\left.2\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w)\,z)^2\Big/(4\,(b+a\,i\,(2\,j-m)+(2\,i-u)\,w))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(2\,i-u))^2}{4\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)}+e+i\,(m-2\,j)\,q+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}}\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-d-i\,(m-2\,j)\,p-s\,(2\,i-u))^{n-l}\,(d+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^{l+1}$$
$$\left(-(d+i\,(m-2\,j)\,p+s\,(2\,i-u)+2\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/\right.$$

$$(b+a\,i\,(m-2\,j)+(2\,i-u)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d+i\,(m-2\,j)\,p+s\,(2\,i-u)+\right.$$

$$\left.2\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w)\,z)^2\Big/(4\,(b+a\,i\,(m-2\,j)+(2\,i-u)\,w))\right)+$$

$$e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(u-2\,i))^2}{4\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)}+e+i\,(2\,j-m)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-d-i\,(2\,j-m)\,p-s\,(u-2\,i))^{n-l}\,(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\left(-(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/\right.$$

$$(b+a\,i\,(2\,j-m)+(u-2\,i)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+\right.$$

$$\left.2\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w)\,z)^2\Big/(4\,(b+a\,i\,(2\,j-m)+(u-2\,i)\,w))\right)+$$

$$e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(u-2\,i))^2}{4\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)}+e+i\,(m-2\,j)\,q+t\,(u-2\,i)-\frac{i\,\pi\,u}{2}}\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)^{-n-1}\sum_{l=0}^{n}2^{l-n}$$

$$(-d-i\,(m-2\,j)\,p-s\,(u-2\,i))^{n-l}\,(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\left(-(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+2\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/\right.$$

$$(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+\right.$$

$$\left.\left.2\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w)\,z)^2\Big/(4\,(b+a\,i\,(m-2\,j)+(u-2\,i)\,w))\right)\right)-i^u\,2^{-m-u-v-1}$$

$$\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{j=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{j}\sum_{i=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^i\binom{u}{i}\left(e^{-\frac{(d+s\,(2\,i-u)+f\,(2\,j-v))^2}{4\,(b+c\,(2\,j-v)+(2\,i-u)\,w)}+e+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}+g\,(2\,j-v)}\,(b+c\,(2\,j-v)+(2\,i-u)\,w)^{-n-1}\right.$$

$$\sum_{l=0}^{n}2^{l-n}\,(-d-s\,(2\,i-u)-f\,(2\,j-v))^{n-l}\,(d+s\,(2\,i-u)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(2\,i-u)\,w)\,z)^{l+1}$$

$$\left(-(d+s\,(2\,i-u)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(2\,i-u)\,w)\,z)^2\Big/(b+c\,(2\,j-v)+(2\,i-u)\,w)\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-\frac{(d+s\,(2\,i-u)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(2\,i-u)\,w)\,z)^2}{4\,(b+c\,(2\,j-v)+(2\,i-u)\,w)}\right)+$$

$$e^{-\frac{(d+s\,(2\,i-u)+f\,(v-2\,j))^2}{4\,(b+c\,(v-2\,j)+(2\,i-u)\,w)}+e+t\,(2\,i-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,j)}\,(b+c\,(v-2\,j)+(2\,i-u)\,w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-d-s\,(2\,i-u)-f\,(v-2\,j))^{n-l}\,(d+s\,(2\,i-u)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(2\,i-u)\,w)\,z)^{l+1}$$

$$\left(-(d+s\,(2\,i-u)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(2\,i-u)\,w)\,z)^2\Big/(b+c\,(v-2\,j)+(2\,i-u)\,w)\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-\frac{(d+s\,(2\,i-u)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(2\,i-u)\,w)\,z)^2}{4\,(b+c\,(v-2\,j)+(2\,i-u)\,w)}\right)+$$

$$e^{-\frac{(d+s\,(u-2\,i)+f\,(2\,j-v))^2}{4\,(b+c\,(2\,j-v)+(u-2\,i)\,w)}+e+t\,(u-2\,i)+g\,(2\,j-v)-\frac{i\,\pi\,u}{2}}\,(b+c\,(2\,j-v)+(u-2\,i)\,w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-d-s\,(u-2\,i)-f\,(2\,j-v))^{n-l}\,(d+s\,(u-2\,i)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\left(-(d+s\,(u-2\,i)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(u-2\,i)\,w)\,z)^2\Big/(b+c\,(2\,j-v)+(u-2\,i)\,w)\right)^{\frac{1}{2}(-l-1)}$$

$$\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-\frac{(d+s\,(u-2\,i)+f\,(2\,j-v)+2\,(b+c\,(2\,j-v)+(u-2\,i)\,w)\,z)^2}{4\,(b+c\,(2\,j-v)+(u-2\,i)\,w)}\right)+$$

$$e^{-\frac{(d+s\,(u-2\,i)+f\,(v-2\,j))^2}{4\,(b+c\,(v-2\,j)+(u-2\,i)\,w)}+e+t\,(u-2\,i)+g\,(v-2\,j)-\frac{i\,\pi\,u}{2}}\,(b+c\,(v-2\,j)+(u-2\,i)\,w)^{-n-1}$$

$$\sum_{l=0}^{n}2^{l-n}\,(-d-s\,(u-2\,i)-f\,(v-2\,j))^{n-l}\,(d+s\,(u-2\,i)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(u-2\,i)\,w)\,z)^{l+1}$$

$$\left(-(d+s\,(u-2\,i)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(u-2\,i)\,w)\,z)^2\Big/(b+c\,(v-2\,j)+(u-2\,i)\,w)\right)^{\frac{1}{2}(-l-1)}$$

$$\left.\binom{n}{l}\Gamma\left(\frac{l+1}{2},\,-\frac{(d+s\,(u-2\,i)+f\,(v-2\,j)+2\,(b+c\,(v-2\,j)+(u-2\,i)\,w)\,z)^2}{4\,(b+c\,(v-2\,j)+(u-2\,i)\,w)}\right)\right)-$$

$$i^u\, 2^{-m-u-v-1} \sum_{k=0}^{\left\lfloor \frac{v-1}{2} \right\rfloor} \binom{v}{k} \sum_{j=0}^{\left\lfloor \frac{m-1}{2} \right\rfloor} \binom{m}{j} \sum_{i=0}^{\left\lfloor \frac{u-1}{2} \right\rfloor} (-1)^i \binom{u}{i} \Bigg(e^{-\frac{(d+i(2j-m)p+s(2i-u)+f(2k-v))^2}{4(b+ai(2j-m)+c(2k-v)+(2i-u)w)}+e+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)}$$

$$(b+ai(2j-m)+c(2k-v)+(2i-u)w)^{-n-1} \sum_{l=0}^{n} 2^{l-n} (-d-i(2j-m)p-s(2i-u)-f(2k-v))^{n-l}$$

$$(d+i(2j-m)p+s(2i-u)+f(2k-v)+2(b+ai(2j-m)+c(2k-v)+(2i-u)w)z)^{l+1}$$

$$\Big(-(d+i(2j-m)p+s(2i-u)+f(2k-v)+2(b+ai(2j-m)+c(2k-v)+(2i-u)w)z)^2 \Big/$$

$$(b+ai(2j-m)+c(2k-v)+(2i-u)w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\Bigg(\frac{l+1}{2},$$

$$-(d+i(2j-m)p+s(2i-u)+f(2k-v)+2(b+ai(2j-m)+c(2k-v)+(2i-u)w)z)^2 \Big/$$

$$(4(b+ai(2j-m)+c(2k-v)+(2i-u)w))\Bigg) +$$

$$e^{-\frac{(d+i(m-2j)p+s(2i-u)+f(2k-v))^2}{4(b+ai(m-2j)+c(2k-v)+(2i-u)w)}+e+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}+g(2k-v)} (b+ai(m-2j)+c(2k-v)+(2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d-i(m-2j)p-s(2i-u)-f(2k-v))^{n-l}$$

$$(d+i(m-2j)p+s(2i-u)+f(2k-v)+2(b+ai(m-2j)+c(2k-v)+(2i-u)w)z)^{l+1}$$

$$\Big(-(d+i(m-2j)p+s(2i-u)+f(2k-v)+2(b+ai(m-2j)+c(2k-v)+(2i-u)w)z)^2 \Big/$$

$$(b+ai(m-2j)+c(2k-v)+(2i-u)w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\Bigg(\frac{l+1}{2},$$

$$-(d+i(m-2j)p+s(2i-u)+f(2k-v)+2(b+ai(m-2j)+c(2k-v)+(2i-u)w)z)^2 \Big/$$

$$(4(b+ai(m-2j)+c(2k-v)+(2i-u)w))\Bigg) +$$

$$e^{-\frac{(d+i(2j-m)p+s(2i-u)+f(v-2k))^2}{4(b+ai(2j-m)+c(v-2k)+(2i-u)w)}+e+i(2j-m)q+t(2i-u)+\frac{i\pi u}{2}+g(v-2k)} (b+ai(2j-m)+c(v-2k)+(2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d-i(2j-m)p-s(2i-u)-f(v-2k))^{n-l}$$

$$(d+i(2j-m)p+s(2i-u)+f(v-2k)+2(b+ai(2j-m)+c(v-2k)+(2i-u)w)z)^{l+1}$$

$$\Big(-(d+i(2j-m)p+s(2i-u)+f(v-2k)+2(b+ai(2j-m)+c(v-2k)+(2i-u)w)z)^2 \Big/$$

$$(b+ai(2j-m)+c(v-2k)+(2i-u)w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\Bigg(\frac{l+1}{2},$$

$$-(d+i(2j-m)p+s(2i-u)+f(v-2k)+2(b+ai(2j-m)+c(v-2k)+(2i-u)w)z)^2 \Big/$$

$$(4(b+ai(2j-m)+c(v-2k)+(2i-u)w))\Bigg) +$$

$$e^{-\frac{(d+i(m-2j)p+s(2i-u)+f(v-2k))^2}{4(b+ai(m-2j)+c(v-2k)+(2i-u)w)}+e+i(m-2j)q+t(2i-u)+\frac{i\pi u}{2}+g(v-2k)} (b+ai(m-2j)+c(v-2k)+(2i-u)w)^{-n-1}$$

$$\sum_{l=0}^{n} 2^{l-n} (-d-i(m-2j)p-s(2i-u)-f(v-2k))^{n-l}$$

$$(d+i(m-2j)p+s(2i-u)+f(v-2k)+2(b+ai(m-2j)+c(v-2k)+(2i-u)w)z)^{l+1}$$

$$\Big(-(d+i(m-2j)p+s(2i-u)+f(v-2k)+2(b+ai(m-2j)+c(v-2k)+(2i-u)w)z)^2 \Big/$$

$$(b+ai(m-2j)+c(v-2k)+(2i-u)w)\Big)^{\frac{1}{2}(-l-1)} \binom{n}{l} \Gamma\Bigg(\frac{l+1}{2},$$

$$-(d+i\,(m-2\,j)\,p+s\,(2\,i-u)+f\,(v-2\,k)+2\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(2\,i-u)\,w))\Big)+$$

$$e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)}+e+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}\,(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)^{-n-1}$$
$$\sum_{l=0}^{n}2^{l-n}\,(-d-i\,(2\,j-m)\,p-s\,(u-2\,i)-f\,(2\,k-v))^{n-l}$$
$$(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},$$
$$-(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(2\,j-m)+c\,(2\,k-v)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v))^2}{4\,(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)}+e+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(2\,k-v)-\frac{i\,\pi\,u}{2}}\,(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)^{-n-1}$$
$$\sum_{l=0}^{n}2^{l-n}\,(-d-i\,(m-2\,j)\,p-s\,(u-2\,i)-f\,(2\,k-v))^{n-l}$$
$$(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},$$
$$-(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(2\,k-v)+2\,(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(m-2\,j)+c\,(2\,k-v)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k))^2}{4\,(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)}+e+i\,(2\,j-m)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}\,(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)^{-n-1}$$
$$\sum_{l=0}^{n}2^{l-n}\,(-d-i\,(2\,j-m)\,p-s\,(u-2\,i)-f\,(v-2\,k))^{n-l}$$
$$(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\Big)^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\Big(\frac{l+1}{2},$$
$$-(d+i\,(2\,j-m)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/$$
$$(4\,(b+a\,i\,(2\,j-m)+c\,(v-2\,k)+(u-2\,i)\,w))\Big)+$$

$$e^{-\frac{(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k))^2}{4\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)}+e+i\,(m-2\,j)\,q+t\,(u-2\,i)+g\,(v-2\,k)-\frac{i\,\pi\,u}{2}}\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)^{-n-1}$$
$$\sum_{l=0}^{n}2^{l-n}\,(-d-i\,(m-2\,j)\,p-s\,(u-2\,i)-f\,(v-2\,k))^{n-l}$$
$$(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^{l+1}$$
$$\Big(-(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/$$

$$(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w))^{\frac{1}{2}(-l-1)}\binom{n}{l}\Gamma\left(\frac{l+1}{2},\right.$$

$$\left.-(d+i\,(m-2\,j)\,p+s\,(u-2\,i)+f\,(v-2\,k)+2\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w)\,z)^2\Big/\right.$$

$$\left.(4\,(b+a\,i\,(m-2\,j)+c\,(v-2\,k)+(u-2\,i)\,w))\right)\Big/;\ n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

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$$\int z^n\,e^{\sqrt{z}\ b+e+d\,z}\cos^m\left(\sqrt{z}\ a+q+p\,z\right)\sinh^u\left(t+s\,z+w\,\sqrt{z}\right)\cosh^v\left(\sqrt{z}\ c+g+f\,z\right)dz==$$

$$2^{-m-2\,n-u-v-1}\,e^{e-\frac{b^2}{4\,d}}\,i^u\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-u\bmod 2)\,(1-v\bmod 2)$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,b^{-i-l+2\,n}\left(b+2\,d\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\right.$$

$$\left.\left(b\left(b+2\,d\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)+2\sqrt{-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{d}}\ d\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+2\,d\,\sqrt{z}\right)^2}{4\,d}\right)\right)\right)$$

$$d^{-2\,n-2}+2^{-m-2\,n-u-v-1}\,i^u\binom{u}{\frac{u}{2}}\binom{v}{\frac{v}{2}}(1-u\bmod 2)\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}$$

$$\left(e^{-\frac{(b+a\,i\,(2\,k-m))^2}{4\,(d+i\,(2\,k-m)\,p)}+e+i\,(2\,k-m)\,q}\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m))^{-i-l+2\,n}\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^{i+l}\right.\right.$$

$$\left.\left(-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\right.$$

$$\left.\left((b+a\,i\,(2\,k-m))\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)\right.\right.$$

$$\left.\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)+2\right.$$

$$\left.\left.(d+i\,(2\,k-m)\,p)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(2\,k-m)\,p)}\right)\right)\right)$$

$$\sqrt{-\frac{\left(b+a\,i\,(2\,k-m)+2\,(d+i\,(2\,k-m)\,p)\,\sqrt{z}\right)^2}{d+i\,(2\,k-m)\,p}}\Bigg)\Bigg)(d+i\,(2\,k-m)\,p)^{-2\,n-2}+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k))^2}{4\,(d+i\,(m-2\,k)\,p)}+e+i\,(m-2\,k)\,q}\,(d+i\,(m-2\,k)\,p)^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k))^{-i-l+2\,n}$$

$$\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+a\,i\,(m-2\,k))\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)\Gamma\Bigg($$

$$\frac{1}{2}(i+l+1),-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\Bigg)+$$

$$2\,(d+i\,(m-2\,k)\,p)\,\Gamma\left(\frac{1}{2}(i+l+2),-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{4\,(d+i\,(m-2\,k)\,p)}\right)$$

$$\sqrt{-\frac{\left(b+a\,i\,(m-2\,k)+2\,(d+i\,(m-2\,k)\,p)\,\sqrt{z}\right)^2}{d+i\,(m-2\,k)\,p}}\Bigg)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}\binom{v}{\frac{v}{2}}(1-m\bmod 2)\,(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^k\binom{u}{k}\Bigg(e^{-\frac{(b+(2\,k-u)\,w)^2}{4\,(d+s\,(2\,k-u))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+(2\,k-u)\,w)^{-i-l+2\,n}\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{d+s\,(2\,k-u)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b+(2\,k-u)\,w)\left(b+(2\,k-u)\,w+\right.$$

$$\left.2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),-\frac{\left(b+(2\,k-u)\,w+2\,(d+s\,(2\,k-u))\,\sqrt{z}\right)^2}{4\,(d+s\,(2\,k-u))}\right)+2$$

$$\sqrt{-\frac{\left(b+(2k-u)w+2(d+s(2k-u))\sqrt{z}\right)^2}{d+s(2k-u)}}\ (d+s(2k-u))$$

$$\Gamma\left(\frac{1}{2}(i+l+2),\ -\frac{\left(b+(2k-u)w+2(d+s(2k-u))\sqrt{z}\right)^2}{4(d+s(2k-u))}\right)\Bigg)(d+s(2k-u))^{-2n-2}+$$

$$e^{-\frac{(b+(u-2k)w)^2}{4(d+s(u-2k))}+e+t(u-2k)-\frac{i\pi u}{2}}(d+s(u-2k))^{-2n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+(u-2k)w)^{-i-l+2n}$$

$$\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{d+s(u-2k)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+(u-2k)w)\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.$$

$$\left.-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}\right)+2(d+s(u-2k))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$

$$\left.-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{4(d+s(u-2k))}\right)\sqrt{-\frac{\left(b+(u-2k)w+2(d+s(u-2k))\sqrt{z}\right)^2}{d+s(u-2k)}}\Bigg)\Bigg)+$$

$$2^{-m-2n-u-v-1}\,i^u\binom{m}{\frac{m}{2}}\binom{u}{\frac{u}{2}}(1-m \bmod 2)\,(1-u \bmod 2)\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Bigg(e^{-\frac{(b+c(2h-v))^2}{4(d+f(2h-v))}+e+g(2h-v)}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c(2h-v))^{-i-l+2n}\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^{i+l}$$

$$\left(-\frac{\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)^2}{d+f(2h-v)}\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\Bigg((b+c(2h-v))\left(b+c(2h-v)+2(d+f(2h-v))\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.$$

$$-\frac{\left(b+c\,(2\,h-v)+2\,(d+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,h-v))}\Bigg)+2\sqrt{-\frac{\left(b+c\,(2\,h-v)+2\,(d+f\,(2\,h-v))\,\sqrt{z}\right)^2}{d+f\,(2\,h-v)}}$$

$$(d+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\frac{\left(b+c\,(2\,h-v)+2\,(d+f\,(2\,h-v))\,\sqrt{z}\right)^2}{4\,(d+f\,(2\,h-v))}\right)\Bigg)\Bigg)$$

$$(d+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(b+c\,(v-2\,h))^2}{4\,(d+f\,(v-2\,h))}+e-g\,(2\,h-v)}\,(d+f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+c\,(v-2\,h))^{-i-l+2\,n}$$

$$\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}\left(-\frac{\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+f\,(v-2\,h)}\right)^{\frac{1}{2}(-i-l-1)}$$

$$\binom{i}{l}\binom{n}{i}\Bigg((b+c\,(v-2\,h))\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,h))}\right)+2\,(d+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\right.$$

$$\left.-\frac{\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^2}{4\,(d+f\,(v-2\,h))}\right)\sqrt{-\frac{\left(b+c\,(v-2\,h)+2\,(d+f\,(v-2\,h))\,\sqrt{z}\right)^2}{d+f\,(v-2\,h)}}\Bigg)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{v}{\frac{v}{2}}(1-v\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\Bigg(e^{-\frac{(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}$$

$$\Bigg(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$

$$\left.(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Bigg((b+a\,i\,(2\,k-m)+(2\,j-u)\,w)$$

$$\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)$$

$$\Gamma\Bigg(\frac{1}{2}\,(i+l+1),\,-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/$$

$$(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)))\Bigg)+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))$$

$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+s\,(2\,j-u))\right)\Bigg)$$

$$(d+i\,(2\,k-m)\,p+s\,(2\,j-u))^{-2\,n-2}+e^{-\frac{(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}}$$
$$(d+i\,(m-2\,k)\,p+s\,(2\,j-u))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w\right)$$
$$\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)))\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+(2\,j-u)\,w+\right.\right.}$$
$$\left.\left.2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\,\sqrt{z}\right)^2\Big/(d+i\,(m-2\,k)\,p+s\,(2\,j-u))\right)\Bigg)+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))}+e+i\,(2\,k-m)\,q-\frac{i\,\pi\,u}{2}+t\,(u-2\,j)}(d+i\,(2\,k-m)\,p+s\,(u-2\,j))^{-2\,n-2}$$
$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w\right)$$
$$\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)))\right)\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+(u-2\,j)\,w+\right.\right.}$$

$$2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j))\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))}+e+i\,(m-2\,k)\,q-\frac{i\,\pi\,u}{2}+t\,(u-2\,j)}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(m-2\,k)+(u-2\,j)\,w)$$

$$\Big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)))\Big)\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+(u-2\,j)\,w+$$

$$2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j))\Big)\Big)\Big)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\binom{u}{\frac{u}{2}}(1-u\bmod 2)\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\Big(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+g\,(2\,h-v)}$$

$$\Big(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v))^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(2\,k-m)+c\,(2\,h-v))$$

$$\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v)))\Big)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v)))\Big)\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+$$

$$2\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+f\,(2\,h-v))\Big)\Big)\Big]$$

$$(d+i\,(2\,k-m)\,p+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+g\,(2\,h-v)}$$

$$(d+i\,(m-2\,k)\,p+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v))^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(m-2\,k)+c\,(2\,h-v))$$

$$\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v)))\Big)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v)))\Big)\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+$$

$$2\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(m-2\,k)\,p+f\,(2\,h-v))\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h))^2}{4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+g\,(v-2\,h)}\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h))^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\Big((b+a\,i\,(2\,k-m)+c\,(v-2\,h))$$

$$\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+1),\,-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h)))\Big)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))$$

$$\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/$$

$$(4\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h)))\Big)\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+$$

$$2\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\,(d+i\,(2\,k-m)\,p+f\,(v-2\,h))\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h))^2}{4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+g\,(v-2\,h)}\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h))^{-i-l+2\,n}$$

$$\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+a\,i\,(m-2\,k)+c\,(v-2\,h))\right.$$

$$\left.\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h)))\right)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h)))\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.}$$

$$\left.\left.2\,(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/(d+i\,(m-2\,k)\,p+f\,(v-2\,h))\right)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^{u}\binom{m}{\frac{m}{2}}(1-m\bmod 2)\sum_{k=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^{k}\binom{u}{k}\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\left(e^{-\frac{(b+c\,(2\,h-v)+(2\,k-u)\,w)^{2}}{4\,(d+s\,(2\,k-u)+f\,(2\,h-v))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}\right.$$

$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+c\,(2\,h-v)+(2\,k-u)\,w)^{-i-l+2\,n}\right.$$

$$\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d+s\,(2\,k-u)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}\left((b+c\,(2\,h-v)+(2\,k-u)\,w)\right.$$

$$\left.\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+s\,(2\,k-u)+f\,(2\,h-v)))\right)+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+s\,(2\,k-u)+f\,(2\,h-v)))\right)\sqrt{\left(-\left(b+c\,(2\,h-v)+(2\,k-u)\,w+\right.\right.}$$

$$\left.\left.2\,(d+s\,(2\,k-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/(d+s\,(2\,k-u)+f\,(2\,h-v))\right)\Bigg)\Bigg)$$

$$(d+s\,(2\,k-u)+f\,(2\,h-v))^{-2\,n-2}+e^{-\frac{(b+c\,(2\,h-v)+(u-2\,k)\,w)^{2}}{4\,(d+s\,(u-2\,k)+f\,(2\,h-v))}+e+t\,(u-2\,k)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}$$

$$(d+s\,(u-2\,k)+f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+c\,(2\,h-v)+(u-2\,k)\,w)^{-i-l+2\,n}$$

$$\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d+s\,(u-2\,k)+f\,(2\,h-v))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+c\,(2\,h-v)+(u-2\,k)\,w)\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+s\,(u-2\,k)+f\,(2\,h-v)))\right)+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+s\,(u-2\,k)+f\,(2\,h-v)))\right)\sqrt{\left(-\left(b+c\,(2\,h-v)+(u-2\,k)\,w+\right.\right.}$$

$$\left.\left.2\,(d+s\,(u-2\,k)+f\,(2\,h-v))\,\sqrt{z}\right)^{2}\Big/(d+s\,(u-2\,k)+f\,(2\,h-v))\right)\Bigg)+$$

$$e^{-\frac{(b+c\,(v-2\,h)+(2\,k-u)\,w)^{2}}{4\,(d+s\,(2\,k-u)+f\,(v-2\,h))}+e+t\,(2\,k-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(d+s\,(2\,k-u)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+c\,(v-2\,h)+(2\,k-u)\,w)^{-i-l+2\,n}$$

$$\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(d+s\,(2\,k-u)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$

$$\left((b+c\,(v-2\,h)+(2\,k-u)\,w)\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$

$$\Gamma\left(\frac{1}{2}\,(i+l+1),\,-\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+s\,(2\,k-u)+f\,(v-2\,h)))\right)+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))$$

$$\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+c\,(v-2\,h)+(2\,k-u)\,w+2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/\right.$$

$$\left.(4\,(d+s\,(2\,k-u)+f\,(v-2\,h)))\right)\sqrt{\left(-\left(b+c\,(v-2\,h)+(2\,k-u)\,w+\right.\right.}$$

$$\left.\left.2\,(d+s\,(2\,k-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{2}\Big/(d+s\,(2\,k-u)+f\,(v-2\,h))\right)\Bigg)+$$

$$e^{-\frac{(b+c\,(v-2\,h)+(u-2\,k)\,w)^{2}}{4\,(d+s\,(u-2\,k)+f\,(v-2\,h))}+e+t\,(u-2\,k)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(d+s\,(u-2\,k)+f\,(v-2\,h))^{-2\,n-2}$$

$$\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^{i}\,(b+c\,(v-2\,h)+(u-2\,k)\,w)^{-i-l+2\,n}$$

$$\left(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(d+s\,(u-2\,k)+f\,(v-2\,h))\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}\binom{n}{i}$$
$$\left((b+c\,(v-2\,h)+(u-2\,k)\,w)\left(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)\right.$$
$$\Gamma\left(\frac{1}{2}(i+l+1),\,-\left(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+s\,(u-2\,k)+f\,(v-2\,h)))\right)+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))$$
$$\Gamma\left(\frac{1}{2}(i+l+2),\,-\left(b+c\,(v-2\,h)+(u-2\,k)\,w+2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.(4\,(d+s\,(u-2\,k)+f\,(v-2\,h)))\right)\sqrt{\left(-\left(b+c\,(v-2\,h)+(u-2\,k)\,w+\right.\right.}$$
$$\left.\left.\left.2\,(d+s\,(u-2\,k)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/(d+s\,(u-2\,k)+f\,(v-2\,h))\right)\right)\Bigg)+$$

$$2^{-m-2\,n-u-v-1}\,i^u\sum_{h=0}^{\left\lfloor\frac{v-1}{2}\right\rfloor}\binom{v}{h}\sum_{k=0}^{\left\lfloor\frac{m-1}{2}\right\rfloor}\binom{m}{k}\sum_{j=0}^{\left\lfloor\frac{u-1}{2}\right\rfloor}(-1)^j\binom{u}{j}\left(e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}\right.$$
$$\left(\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)^{-i-l+2\,n}\left(b+a\,i\,(2\,k-m)+\right.\right.$$
$$\left.c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)\right)\right.$$
$$\left.\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$
$$\binom{n}{i}\left((b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w)\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+\right.\right.$$
$$\left.(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}(i+l+1),\right.$$
$$-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\right)+$$
$$2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}(i+l+2),\right.$$
$$-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.$$
$$\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v)))\Big)$$
$$\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+\right.\right.}$$
$$\left.\left.s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+$$

$$f\,(2\,h-v)\Big)\Big)\Big)\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(2\,h-v))^{-2\,n-2}+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(2\,h-v)}\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$

$$f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)\right)\right.$$

$$\left.\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)\right)\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Big((b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w)\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.$$

$$\left.(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.$$

$$\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)\Big)+$$

$$2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+\right.$$

$$\left.c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)\right)$$

$$\left.\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v))\right)\Big)$$

$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+\right.\right.}$$

$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(2\,h-v)\right)\right)\Big)+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$

$$f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$

$$\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right.$$

$$\left.\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Big((b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w)\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+\right.$$

$$\left.(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.$$

$$\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Big)+$$

$$2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(2\,k-m)+\right.$$

$$c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$
$$\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Bigg)$$
$$\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.}$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right)+$$
$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(2\,h-v)-\frac{i\,\pi\,u}{2}}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+$$
$$f\,(2\,h-v))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right.$$
$$\left.\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\Bigg)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$
$$\binom{n}{i}\Bigg(\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w\right)\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+\right.$$
$$\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$
$$-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Bigg)+$$
$$2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+\right.\right.$$
$$c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))$$
$$\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v))\right)\Bigg)$$
$$\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(2\,h-v)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.\right.}$$
$$\left.\left.f\,(2\,h-v))\,\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(2\,h-v)\right)\right)+$$
$$e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+$$
$$f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w)^{-i-l+2\,n}$$
$$\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\right.$$
$$\left.\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Bigg)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$
$$\binom{n}{i}\Bigg(\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w\right)\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.$$
$$\left.(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$
$$-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+\right.$$

$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)+$$

$$2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(2\,k-m)+$$

$$c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+$$

$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+t\,(2\,j-u)+\frac{i\,\pi\,u}{2}+g\,(v-2\,h)}\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$

$$f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\sqrt{z}\Big)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\Big((b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w)\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+$$

$$(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\sqrt{z}\Big)\,\Gamma\Big(\frac{1}{2}\,(i+l+1),$$

$$-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$

$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)+$$

$$2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\,\Gamma\Big(\frac{1}{2}\,(i+l+2),\,-\Big(b+a\,i\,(m-2\,k)+$$

$$c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))$$

$$\sqrt{z}\Big)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h))\right)\Big)$$

$$\sqrt{\Big(-\Big(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(2\,j-u)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+$$

$$f\,(v-2\,h))\,\sqrt{z}\Big)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(2\,j-u)+f\,(v-2\,h)\right)\Big)\Big)+$$

$$e^{-\frac{(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+e+i\,(2\,k-m)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+$$

$$f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)^{-i-l+2\,n}$$

$$\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\Big)^{i+l}$$

$$\Big(-\Big(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))$$

$$\sqrt{z}\Big)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\Big)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$

$$\binom{n}{i}\left((b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w)\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+\right.\right.$$
$$\left.(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$
$$-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)+$$
$$2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(2\,k-m)+\right.\right.$$
$$\left.c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.$$
$$\left.\left.\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)$$
$$\sqrt{\left(-\left(b+a\,i\,(2\,k-m)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+\right.\right.\right.$$
$$\left.\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(d+i\,(2\,k-m)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)}+$$
$$e^{-\frac{(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^2}{4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))}+e+i\,(m-2\,k)\,q+t\,(u-2\,j)+g\,(v-2\,h)-\frac{i\,\pi\,u}{2}}\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+$$
$$f\,(v-2\,h))^{-2\,n-2}\sum_{i=0}^{n}\sum_{l=0}^{i}(-1)^{i-l}\,4^i\,(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)^{-i-l+2\,n}$$
$$\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^{i+l}$$
$$\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right.\right.$$
$$\left.\left.\sqrt{z}\right)^2\Big/\left(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h)\right)\right)^{\frac{1}{2}(-i-l-1)}\binom{i}{l}$$
$$\binom{n}{i}\left((b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w)\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.$$
$$\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)\Gamma\left(\frac{1}{2}\,(i+l+1),\right.$$
$$-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+\right.$$
$$\left.\left.f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)+$$
$$2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\Gamma\left(\frac{1}{2}\,(i+l+2),\,-\left(b+a\,i\,(m-2\,k)+\right.\right.$$
$$\left.\left.c\,(v-2\,h)+(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.$$
$$\left.\left(4\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\sqrt{\left(-\left(b+a\,i\,(m-2\,k)+c\,(v-2\,h)+\right.\right.\right.$$
$$\left.\left.\left.(u-2\,j)\,w+2\,(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\,\sqrt{z}\right)^2\Big/\right.\right.$$
$$\left.\left.\left.(d+i\,(m-2\,k)\,p+s\,(u-2\,j)+f\,(v-2\,h))\right)\right)\right)\Big/;\,n\in\mathbb{N}\bigwedge m\in\mathbb{N}^+\bigwedge u\in\mathbb{N}^+\bigwedge v\in\mathbb{N}^+$$

Definite integration

For the direct function itself

01.20.21.0017.01

$$\int_a^b \frac{\cosh(t)}{t}\, dt == \text{Chi}(b) - \text{Chi}(a)$$

Involving the direct function

01.20.21.0018.01

$$\int_0^1 \cosh(n\,t)\cosh(m\,t)\, dt == \frac{m\sinh(m-n) + n\sinh(m-n) + m\sinh(m+n) - n\sinh(m+n)}{2\,(m-n)\,(m+n)}$$

01.20.21.0019.01

$$\int_0^1 \cosh^2(n\,t)\, dt == \frac{2\,n + \sinh(2\,n)}{4\,n}$$

Involving related functions

01.20.21.0020.01

$$\int_0^\infty e^{a\,t}\cosh(b\,t)\, dt == \frac{a}{b^2 - a^2} \;/;\; \text{Re}(a) < -|\text{Re}(b)|$$

01.20.21.0021.01

$$\int_0^1 \cosh(n\,t)\sinh(m\,t)\, dt == \frac{m}{(n-m)\,(m+n)} + \frac{n\cosh(m+n) - m\cosh(m-n) - n\cosh(m-n) - m\cosh(m+n)}{2\,(n-m)\,(m+n)}$$

Integral transforms

Laplace transforms

01.20.22.0001.01

$$\mathcal{L}_t[\cosh(t)](z) == \frac{z}{z^2 - 1}$$

Summation

Finite summation

01.20.23.0001.01

$$\sum_{k=0}^{n} \cosh(a\,k) == \text{csch}\left(\frac{a}{2}\right)\sinh\left(\frac{a\,(n+1)}{2}\right)\cosh\left(\frac{a\,n}{2}\right)$$

01.20.23.0002.01

$$\sum_{k=0}^{n} \cosh(a\,k + z) == \text{csch}\left(\frac{a}{2}\right)\sinh\left(\frac{a\,(n+1)}{2}\right)\cosh\left(\frac{a\,n}{2} + z\right)$$

01.20.23.0003.01

$$\sum_{k=1}^{n} \cosh((2\,k-1)\,a) == \frac{1}{2}\,\text{csch}(a)\sinh(2\,n\,a)$$

01.20.23.0004.01

$$\sum_{k=1}^{n} k\cosh(k\,a) == \frac{1}{4}\,\text{csch}^2\left(\frac{a}{2}\right)(n\cosh((n+1)\,a) - (n+1)\cosh(n\,a) + 1)$$

01.20.23.0005.01

$$\sum_{k=1}^{n} z^k \cosh(k\,a) == \frac{z}{z^2 - 2\cosh(a)\,z + 1}\left(\cosh(a\,n)\,z^{n+1} - \cosh(n\,a + a)\,z^n - z + \cosh(a)\right)$$

Infinite summation

01.20.23.0006.01

$$\sum_{k=0}^{\infty} z^k \cosh(k\,x) == \frac{1 - z\cosh(x)}{z^2 - 2\cosh(x)\,z + 1} /;\ \mathrm{Re}(x + \log(z)) < 0$$

01.20.23.0007.01

$$\sum_{k=1}^{\infty} \frac{z^k \cosh(k\,x)}{k} == \log\left(\frac{1}{\sqrt{z^2 - 2\cosh(x)\,z + 1}}\right) /;\ 0 < \mathrm{Im}(x) < 2\,\pi \wedge |z| < 1$$

01.20.23.0008.01

$$\sum_{k=0}^{\infty} \frac{\cosh(k\,x)}{k!} == e^{\cosh(x)}\cosh(\sinh(x))$$

01.20.23.0009.01

$$\sum_{k=0}^{\infty} \frac{z^k \cosh(k\,x)}{k!} == e^{z\cosh(x)}\cosh(z\sinh(x))$$

Representations through more general functions

Through hypergeometric functions

Involving ${}_0F_1$

01.20.26.0001.01

$$\cosh(z) == {}_0F_1\left(;\frac{1}{2};\frac{z^2}{4}\right)$$

01.20.26.0083.01

$$\cosh(z) == -\left(i\,z - \frac{\pi}{2}\right){}_0F_1\left(;\frac{3}{2};-\frac{1}{4}\left(i\,z - \frac{\pi}{2}\right)^2\right)$$

01.20.26.0002.01

$$\cosh^2(z) == \frac{1}{2} + \frac{1}{2}\,{}_0F_1\left(;\frac{1}{2};z^2\right)$$

01.20.26.0084.01

$$\cosh^3(z) == \frac{3}{4}\,{}_0F_1\left(;\frac{1}{2};\frac{z^2}{4}\right) + \frac{1}{4}\,{}_0F_1\left(;\frac{1}{2};\frac{9\,z^2}{4}\right)$$

Involving ${}_pF_q$

01.20.26.0085.01

$$\cosh(z) == \left(\frac{\pi}{2} - i\,z\right){}_3F_2\left(\frac{i\,z}{\pi} - \frac{1}{2}, \frac{i\,z}{\pi} - \frac{1}{2}, \frac{i\,z}{\pi} - \frac{1}{2}; 1, 1; -1\right) - \frac{2}{\pi^2}\left(\frac{\pi}{2} - i\,z\right)^3 {}_3F_2\left(\frac{i\,z}{\pi} + \frac{1}{2}, \frac{i\,z}{\pi} + \frac{1}{2}, \frac{i\,z}{\pi} + \frac{1}{2}; 2, 2; -1\right)$$

Brychkov Yu.A. (2005)

01.20.26.0086.01

$$\cosh^2(z) = \left(i\,z - \frac{\pi}{2}\right)^2 {}_1F_2\left(1;\, 2,\, \frac{3}{2};\, -\left(i\,z - \frac{\pi}{2}\right)^2\right)$$

Through Meijer *G*

Classical cases for the direct function itself

01.20.26.0003.01

$$\cosh(z) == \sqrt{\pi}\; G_{0,2}^{1,0}\left(-\frac{z^2}{4}\,\middle|\, \begin{matrix} \\ 0,\, \frac{1}{2} \end{matrix}\right)$$

01.20.26.0004.01

$$\cosh\left(\sqrt{z}\right) == \pi^{3/2}\, G_{1,3}^{1,0}\left(\frac{z}{4}\,\middle|\, \begin{matrix} \frac{1}{2} \\ 0,\, \frac{1}{2},\, \frac{1}{2} \end{matrix}\right)$$

Classical cases for powers of cosh

01.20.26.0005.01

$$\cosh^n\left(\sqrt{z}\right) == 2^{-n-1}\left((-1)^n + 1\right)\binom{n}{\frac{n}{2}} + 2^{1-n}\,\pi^{3/2} \sum_{k=0}^{\left\lfloor \frac{n-1}{2} \right\rfloor} \binom{n}{k} G_{1,3}^{1,0}\left(\frac{1}{4}\,z\,(n-2\,k)^2\,\middle|\, \begin{matrix} \frac{1}{2} \\ 0,\, \frac{1}{2},\, \frac{1}{2} \end{matrix}\right) /;\; n \in \mathbb{N}^+$$

Classical cases involving exp

01.20.26.0006.01

$$e^{-z}\cosh(z) == G_{0,1}^{1,0}(2\,z\,|\;0) + \frac{1}{2}\,G_{1,2}^{1,1}\left(2\,z\,\middle|\, \begin{matrix} 1 \\ 1,\, 0 \end{matrix}\right)$$

01.20.26.0075.01

$$e^{z}\cosh(z) == \pi\,G_{1,2}^{1,0}\left(2\,z\,\middle|\, \begin{matrix} \frac{1}{2} \\ 0,\, \frac{1}{2} \end{matrix}\right) + \frac{1}{2}\,\pi\,G_{2,3}^{1,1}\left(2\,z\,\middle|\, \begin{matrix} 1,\, \frac{1}{2} \\ 1,\, 0,\, \frac{1}{2} \end{matrix}\right)$$

Classical cases involving sin

01.20.26.0076.01

$$\sin\left(\sqrt[4]{z}\right)\cosh\left(\sqrt[4]{z}\right) == \sqrt{2}\;\pi^{3/2}\,G_{1,5}^{2,0}\left(\frac{z}{64}\,\middle|\, \begin{matrix} \frac{1}{2} \\ \frac{1}{4},\, \frac{3}{4},\, 0,\, \frac{1}{2},\, \frac{1}{2} \end{matrix}\right)$$

Classical cases involving cos

01.20.26.0007.01

$$\cos(z)\cosh(z) == \sqrt{2}\;\pi^{3/2}\,G_{0,4}^{1,0}\left(\frac{z^4}{64}\,\middle|\, 0,\, \frac{1}{4},\, \frac{1}{2},\, \frac{3}{4}\right)$$

Classical cases involving $\sinh^{-1}$in the arguments

01.20.26.0008.01

$$\cosh\left(\nu\,\sinh^{-1}\left(\sqrt{z}\right)\right) == -\frac{\nu}{2\sqrt{\pi}}\,\sin\left(\frac{\pi\,\nu}{2}\right)G_{2,2}^{1,2}\left(z\,\middle|\, \begin{matrix} \frac{\nu}{2}+1,\, 1-\frac{\nu}{2} \\ 0,\, \frac{1}{2} \end{matrix}\right)$$

01.20.26.0009.01

$$\frac{\cosh\left(\nu \sinh^{-1}\left(\sqrt{z}\right)\right)}{\sqrt{z+1}} == \frac{1}{\sqrt{\pi}} \cos\left(\frac{\pi\,\nu}{2}\right) G^{1,2}_{2,2}\left(z \left| \begin{matrix} \frac{\nu+1}{2}, \frac{1-\nu}{2} \\ 0, \frac{1}{2} \end{matrix} \right.\right)$$

Classical cases involving csch^{-1} in the arguments

01.20.26.0010.01

$$\cosh\left(\nu \operatorname{csch}^{-1}\left(\sqrt{z}\right)\right) == -\frac{\nu}{2\sqrt{\pi}} \sin\left(\frac{\pi\,\nu}{2}\right) G^{2,1}_{2,2}\left(z \left| \begin{matrix} 1, \frac{1}{2} \\ \frac{\nu}{2}, -\frac{\nu}{2} \end{matrix} \right.\right)$$

01.20.26.0011.01

$$\frac{1}{\sqrt{z+1}} \cosh\left(\nu \operatorname{csch}^{-1}\left(\sqrt{z}\right)\right) == \frac{1}{\sqrt{\pi}} \cos\left(\frac{\pi\,\nu}{2}\right) G^{2,1}_{2,2}\left(z \left| \begin{matrix} \frac{1}{2}, 0 \\ \frac{\nu}{2}, -\frac{\nu}{2} \end{matrix} \right.\right) /;\ z \notin (-\infty, -1)$$

Classical cases involving $\cosh^{-1}$ in the arguments and unit step θ

01.20.26.0012.01

$$\frac{\theta(|z|-1)}{\sqrt{z-1}} \cosh\left(\nu \cosh^{-1}\left(\sqrt{z}\right)\right) == \sqrt{\pi}\ G^{0,2}_{2,2}\left(z \left| \begin{matrix} \frac{1-\nu}{2}, \frac{\nu+1}{2} \\ 0, \frac{1}{2} \end{matrix} \right.\right)$$

Classical cases involving sech^{-1} in the arguments and unit step θ

01.20.26.0013.01

$$\frac{\theta(1-|z|)}{\sqrt{1-z}} \cosh\left(\nu \operatorname{sech}^{-1}\left(\sqrt{z}\right)\right) == \sqrt{\pi}\ G^{2,0}_{2,2}\left(z \left| \begin{matrix} 0, \frac{1}{2} \\ -\frac{\nu}{2}, \frac{\nu}{2} \end{matrix} \right.\right) /;\ z \notin (-1, 0)$$

Classical cases involving $\tanh^{-1}$ in the arguments and unit step θ

01.20.26.0014.01

$$\frac{\theta(1-|z|)}{\sqrt{1-z}} \cosh\left(\nu \tanh^{-1}\left(\sqrt{1-z}\right)\right) == \sqrt{\pi}\ G^{2,0}_{2,2}\left(z \left| \begin{matrix} 0, \frac{1}{2} \\ -\frac{\nu}{2}, \frac{\nu}{2} \end{matrix} \right.\right)$$

01.20.26.0015.01

$$\frac{\theta(|z|-1)}{\sqrt{z-1}} \cosh\left(\nu \tanh^{-1}\left(\sqrt{1-\frac{1}{z}}\right)\right) == \sqrt{\pi}\ G^{0,2}_{2,2}\left(z \left| \begin{matrix} \frac{1-\nu}{2}, \frac{\nu+1}{2} \\ 0, \frac{1}{2} \end{matrix} \right.\right) /;\ z \notin (-\infty, -1)$$

Classical cases involving $\tanh^{-1}$ in the arguments and Abs

01.20.26.0016.01

$$|1-x|^{\nu} \cosh\left(\nu \tanh^{-1}\left(\frac{2\sqrt{x}}{x+1}\right)\right) == \frac{\sqrt{\pi}}{\Gamma(-\nu)} \Gamma\left(\nu+\frac{1}{2}\right) G^{1,1}_{2,2}\left(x \left| \begin{matrix} \nu+1, \nu+\frac{1}{2} \\ 0, \frac{1}{2} \end{matrix} \right.\right) /;\ x > 0$$

Classical cases involving $\coth^{-1}$ in the arguments and Abs

01.20.26.0017.01

$$|1-x|^{\nu} \cosh\left(\nu \coth^{-1}\left(\frac{1+x}{2\sqrt{x}}\right)\right) == \frac{\sqrt{\pi}}{\Gamma(-\nu)} \Gamma\left(\nu+\frac{1}{2}\right) G^{1,1}_{2,2}\left(x \left| \begin{matrix} \nu+1, \nu+\frac{1}{2} \\ 0, \frac{1}{2} \end{matrix} \right.\right) /;\ x > 0$$

Classical cases involving $\tanh^{-1}$ in the arguments and sgn

01.20.26.0018.01

$$((1-z)\operatorname{sgn}(1-|z|))^{\nu}\cosh\left(\nu\tanh^{-1}\left(\frac{2\sqrt{z}}{z+1}\right)\right)==\frac{\sqrt{\pi}}{\Gamma(-\nu)}\Gamma\left(\nu+\frac{1}{2}\right)G_{2,2}^{1,1}\left(z\left|\begin{matrix}\nu+1,\ \nu+\frac{1}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right.\right)$$

Classical cases involving $\coth^{-1}$ in the arguments and sgn

01.20.26.0019.01

$$((1-z)\operatorname{sgn}(1-|z|))^{\nu}\cosh\left(\nu\coth^{-1}\left(\frac{1+z}{2\sqrt{z}}\right)\right)==\frac{\sqrt{\pi}}{\Gamma(-\nu)}\Gamma\left(\nu+\frac{1}{2}\right)G_{2,2}^{1,1}\left(z\left|\begin{matrix}\nu+1,\ \nu+\frac{1}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right.\right)$$

Classical cases involving Bessel *I*

01.20.26.0020.01

$$\cosh\left(\sqrt{z}\right)I_{\nu}\left(\sqrt{z}\right)==-\frac{\pi}{\sqrt{2}}\csc\left(\frac{\pi\nu}{2}\right)G_{3,5}^{1,2}\left(z\left|\begin{matrix}\frac{1}{4},\ \frac{3}{4},\ 0\\ \frac{\nu}{2},\ 0,\ -\frac{\nu}{2},\ \frac{1-\nu}{2},\ \frac{\nu+1}{2}\end{matrix}\right.\right)$$

Classical cases involving sin, *I*

01.20.26.0077.01

$$\cosh\left(\sqrt{z}\right)I_{-\nu}\left(\sqrt{z}\right)+\sinh\left(\sqrt{z}\right)I_{\nu}\left(\sqrt{z}\right)==\sqrt{2}\,\pi\,G_{2,4}^{2,0}\left(z\left|\begin{matrix}\frac{1}{4},\ \frac{3}{4}\\ -\frac{\nu}{2},\ \frac{\nu+1}{2},\ \frac{\nu}{2},\ \frac{1-\nu}{2}\end{matrix}\right.\right)$$

01.20.26.0021.01

$$\cosh\left(\sqrt{z}\right)I_{-\nu}\left(\sqrt{z}\right)-\sinh\left(\sqrt{z}\right)I_{\nu}\left(\sqrt{z}\right)==\frac{\cos(\pi\nu)}{\sqrt{2}\,\pi}G_{2,4}^{2,2}\left(z\left|\begin{matrix}\frac{1}{4},\ \frac{3}{4}\\ -\frac{\nu}{2},\ \frac{\nu+1}{2},\ \frac{\nu}{2},\ \frac{1-\nu}{2}\end{matrix}\right.\right)$$

01.20.26.0087.01

$$\sinh(z)\,I_{-\nu}\left(\sqrt{z}\right)-\cosh(z)\,I_{\nu}\left(\sqrt{z}\right)=-\frac{\cos(\pi\nu)}{\sqrt{2}\,\pi}G_{2,4}^{2,2}\left(z\left|\begin{matrix}\frac{1}{4},\ \frac{3}{4}\\ \frac{\nu}{2},\ \frac{1-\nu}{2},\ -\frac{\nu}{2},\ \frac{\nu+1}{2}\end{matrix}\right.\right)$$

01.20.26.0088.01

$$\cosh(z)\,I_{\nu}\left(\sqrt{z}\right)+\sinh(z)\,I_{-\nu}\left(\sqrt{z}\right)=\sqrt{2}\,\pi\,G_{2,4}^{2,0}\left(z\left|\begin{matrix}\frac{1}{4},\ \frac{3}{4}\\ \frac{\nu}{2},\ \frac{1-\nu}{2},\ -\frac{\nu}{2},\ \frac{\nu+1}{2}\end{matrix}\right.\right)$$

Classical cases involving Bessel *K*

01.20.26.0022.01

$$\cosh\left(\sqrt{z}\right)K_{\nu}\left(\sqrt{z}\right)==\frac{1}{2\sqrt{2}}G_{2,4}^{2,2}\left(z\left|\begin{matrix}\frac{1}{4},\ \frac{3}{4}\\ -\frac{\nu}{2},\ \frac{\nu}{2},\ \frac{1-\nu}{2},\ \frac{\nu+1}{2}\end{matrix}\right.\right)$$

Classical cases involving parabolic cylinder function *D*

01.20.26.0089.01

$$\cosh(z)\,D_{\nu}\left(2\sqrt{z}\right)=2^{\frac{\nu}{2}-1}G_{1,2}^{2,0}\left(2z\left|\begin{matrix}\frac{1-\nu}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right.\right)+\frac{2^{-\frac{\nu}{2}-2}}{\sqrt{\pi}\,\Gamma(-\nu)}G_{1,2}^{2,1}\left(2z\left|\begin{matrix}\frac{\nu}{2}+1\\ 0,\ \frac{1}{2}\end{matrix}\right.\right)$$

01.20.26.0090.01

$$\cosh(z)\,D_\nu\left(-2\sqrt{z}\right)=2^{\frac{\nu}{2}-1}\,G_{2,3}^{2,1}\left(2z\,\middle|\,\begin{matrix}\frac{1-\nu}{2},\ \frac{\nu+1}{2}\\ 0,\ \frac{1}{2},\ \frac{\nu+1}{2}\end{matrix}\right)+\frac{2^{-\frac{1}{2}(\nu+1)}\,\pi^{3/2}}{\Gamma(-\nu)}\,G_{3,4}^{2,1}\left(2z\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{8},\ \frac{5}{8}\\ 0,\ \frac{1}{2},\ \frac{1}{8},\ \frac{5}{8}\end{matrix}\right)$$

01.20.26.0091.01

$$\cosh(z)\left(D_\nu\left(-2\sqrt{z}\right)+D_\nu\left(2\sqrt{z}\right)\right)=2^{\nu/2}\cos\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right)+\frac{2^{-\frac{1}{2}(\nu+1)}\,\pi^{3/2}}{\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{4}\\ 0,\ \frac{1}{2},\ \frac{1}{4}\end{matrix}\right)$$

01.20.26.0092.01

$$\cosh(z)\left(D_\nu\left(2\sqrt{z}\right)-D_\nu\left(-2\sqrt{z}\right)\right)=\frac{2^{-\frac{1}{2}(\nu+1)}\,\pi^{3/2}}{\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{4}\\ \frac{1}{2},\ 0,\ \frac{1}{4}\end{matrix}\right)+2^{\nu/2}\sin\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ \frac{1}{2},\ 0\end{matrix}\right)$$

01.20.26.0093.01

$$\cosh\left(z^2\right)D_\nu(2z)=2^{\frac{\nu}{2}-1}\,G_{1,2}^{2,0}\left(2z^2\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right)+\frac{2^{-\frac{\nu}{2}-2}}{\sqrt{\pi}\ \Gamma(-\nu)}\,G_{1,2}^{2,1}\left(2z^2\,\middle|\,\begin{matrix}\frac{\nu}{2}+1\\ 0,\ \frac{1}{2}\end{matrix}\right)/;\ -\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

01.20.26.0094.01

$$\cosh\left(z^2\right)D_\nu(-2z)=2^{\frac{\nu}{2}-1}\,G_{2,3}^{2,1}\left(2z^2\,\middle|\,\begin{matrix}\frac{1-\nu}{2},\ \frac{\nu+1}{2}\\ 0,\ \frac{1}{2},\ \frac{\nu+1}{2}\end{matrix}\right)+\frac{2^{-\frac{1}{2}(\nu+1)}\,\pi^{3/2}}{\Gamma(-\nu)}\,G_{3,4}^{2,1}\left(2z^2\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{8},\ \frac{5}{8}\\ 0,\ \frac{1}{2},\ \frac{1}{8},\ \frac{5}{8}\end{matrix}\right)/;\ -\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

01.20.26.0095.01

$$\cosh\left(z^2\right)(D_\nu(-2z)+D_\nu(2z))=2^{\nu/2}\cos\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(2z^2\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right)+\frac{2^{-\frac{1}{2}(\nu+1)}\,\pi^{3/2}}{\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(2z^2\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{4}\\ 0,\ \frac{1}{2},\ \frac{1}{4}\end{matrix}\right)/;\ -\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

01.20.26.0096.01

$$\cosh\left(z^2\right)(D_\nu(2z)-D_\nu(-2z))=\frac{2^{-\frac{1}{2}(\nu+1)}\,\pi^{3/2}}{\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(2z^2\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{4}\\ \frac{1}{2},\ 0,\ \frac{1}{4}\end{matrix}\right)+2^{\nu/2}\,G_{1,2}^{1,1}\left(2z^2\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ \frac{1}{2},\ 0\end{matrix}\right)\sin\left(\frac{\pi\,\nu}{2}\right)/;\ -\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

Classical cases involving exp and Hermite *H*

01.20.26.0097.01

$$e^{-z}\cosh(z)\,H_\nu\left(\sqrt{2z}\right)=2^{\nu-1}\,G_{1,2}^{2,0}\left(z\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right)+\frac{1}{4\sqrt{\pi}\ \Gamma(-\nu)}\,G_{1,2}^{2,1}\left(z\,\middle|\,\begin{matrix}\frac{\nu}{2}+1\\ 0,\ \frac{1}{2}\end{matrix}\right)$$

01.20.26.0098.01

$$e^{-z}\cosh(z)\,H_\nu\left(-\sqrt{2z}\right)=2^{\nu-1}\,G_{2,3}^{2,1}\left(2z\,\middle|\,\begin{matrix}\frac{1-\nu}{2},\ \frac{\nu+1}{2}\\ 0,\ \frac{1}{2},\ \frac{\nu+1}{2}\end{matrix}\right)+\frac{\pi^{3/2}}{\sqrt{2}\ \Gamma(-\nu)}\,G_{3,4}^{2,1}\left(2z\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{8},\ \frac{5}{8}\\ 0,\ \frac{1}{2},\ \frac{1}{8},\ \frac{5}{8}\end{matrix}\right)$$

01.20.26.0099.01

$$e^{-z}\cosh(z)\left(H_\nu\left(-\sqrt{2z}\right)+H_\nu\left(\sqrt{2z}\right)\right)=2^{\nu}\cos\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right)+\frac{\pi^{3/2}}{\sqrt{2}\ \Gamma(-\nu)}\,G_{2,3}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{4}\\ 0,\ \frac{1}{2},\ \frac{1}{4}\end{matrix}\right)$$

01.20.26.0100.01

$$e^{-z}\cosh(z)\left(H_\nu\left(\sqrt{2z}\right)-H_\nu\left(-\sqrt{2z}\right)\right)=\frac{\pi^{3/2}}{\sqrt{2}\ \Gamma(-\nu)}\,G_{2,3}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\ \frac{1}{4}\\ \frac{1}{2},\ 0,\ \frac{1}{4}\end{matrix}\right)+2^{\nu}\sin\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(2z\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ \frac{1}{2},\ 0\end{matrix}\right)$$

01.20.26.0101.01

$$e^{-z^2}\cosh\left(z^2\right)H_\nu\left(\sqrt{2}\,z\right)=2^{\nu-1}\,G_{1,2}^{2,0}\left(2\,z^2\left|\begin{matrix}\frac{1-\nu}{2}\\0,\,\frac{1}{2}\end{matrix}\right.\right)+\frac{1}{4\sqrt{\pi}\,\Gamma(-\nu)}\,G_{1,2}^{2,1}\left(2\,z^2\left|\begin{matrix}\frac{\nu}{2}+1\\0,\,\frac{1}{2}\end{matrix}\right.\right)/;\,-\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

01.20.26.0102.01

$$e^{-z^2}\cosh\left(z^2\right)H_\nu\left(-\sqrt{2}\,z\right)=2^{\nu-1}\,G_{2,3}^{2,1}\left(2\,z^2\left|\begin{matrix}\frac{1-\nu}{2},\,\frac{\nu+1}{2}\\0,\,\frac{1}{2},\,\frac{\nu+1}{2}\end{matrix}\right.\right)+\frac{\pi^{3/2}}{\sqrt{2}\,\Gamma(-\nu)}\,G_{3,4}^{2,1}\left(2\,z^2\left|\begin{matrix}\frac{\nu}{2}+1,\,\frac{1}{8},\,\frac{5}{8}\\0,\,\frac{1}{2},\,\frac{1}{8},\,\frac{5}{8}\end{matrix}\right.\right)/;\,-\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

01.20.26.0103.01

$$e^{-z^2}\cosh\left(z^2\right)\left(H_\nu\left(-\sqrt{2}\,z\right)+H_\nu\left(\sqrt{2}\,z\right)\right)=2^\nu\cos\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(2\,z^2\left|\begin{matrix}\frac{1-\nu}{2}\\0,\,\frac{1}{2}\end{matrix}\right.\right)+\frac{\pi^{3/2}}{\sqrt{2}\,\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(z^2\left|\begin{matrix}\frac{\nu}{2}+1,\,\frac{1}{4}\\0,\,\frac{1}{2},\,\frac{1}{4}\end{matrix}\right.\right)/;\,-\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

01.20.26.0104.01

$$e^{-z^2}\cosh\left(z^2\right)\left(H_\nu\left(\sqrt{2}\,z\right)-H_\nu\left(-\sqrt{2}\,z\right)\right)=\frac{\pi^{3/2}}{\sqrt{2}\,\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(z^2\left|\begin{matrix}\frac{\nu}{2}+1,\,\frac{1}{4}\\\frac{1}{2},\,0,\,\frac{1}{4}\end{matrix}\right.\right)+2^\nu\,G_{1,2}^{1,1}\left(2\,z^2\left|\begin{matrix}\frac{1-\nu}{2}\\\frac{1}{2},\,0\end{matrix}\right.\right)\sin\left(\frac{\pi\,\nu}{2}\right)/;\,-\frac{\pi}{2}<\arg(z)\le\frac{\pi}{2}$$

Classical cases involving ${}_0F_1$

01.20.26.0023.01

$$\cosh\left(z\right){}_0F_1\left(;\,b;\,\frac{z^2}{4}\right)==2^{b-\frac{3}{2}}\,\pi\sec\left(\frac{b\,\pi}{2}\right)\Gamma\left(b\right)G_{3,5}^{1,2}\left(z^2\left|\begin{matrix}\frac{1}{4}\,(3-2\,b),\,\frac{1}{4}\,(5-2\,b),\,\frac{1-b}{2}\\0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1-b}{2}\end{matrix}\right.\right)$$

01.20.26.0105.01

$$\cosh(a+z)\,{}_0F_1\left(;\,b;\,\frac{z^2}{4}\right)=2^{b-\frac{3}{2}}\,\Gamma(b)\,G_{3,5}^{2,2}\left(-z^2\left|\begin{matrix}\frac{1}{4}\,(3-2\,b),\,\frac{1}{4}\,(5-2\,b),\,\frac{1}{2}+\frac{i\,a}{\pi}\\0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1}{2}+\frac{i\,a}{\pi}\end{matrix}\right.\right)/;\,-\pi<\arg(z)\le 0$$

01.20.26.0078.01

$$\cosh(a+z)\,{}_0F_1\left(;\,b;\,\frac{z^2}{4}\right)==\frac{2^{2\,b-3}\,\Gamma(b)}{\sqrt{\pi}}\left(e^{-a}\,G_{1,2}^{1,1}\left(2\,z\left|\begin{matrix}\frac{3}{2}-b\\0,\,2-2\,b\end{matrix}\right.\right)+e^{a}\,\pi\csc(b\,\pi)\,G_{2,3}^{1,1}\left(2\,z\left|\begin{matrix}\frac{3}{2}-b,\,1-b\\0,\,2-2\,b,\,1-b\end{matrix}\right.\right)\right)$$

01.20.26.0106.01

$$\cosh\left(2\,\sqrt{z}\right){}_0F_1(;\,b;\,z)==2^{b-\frac{3}{2}}\,\pi\sec\left(\frac{b\,\pi}{2}\right)\Gamma\left(b\right)G_{3,5}^{1,2}\left(4\,z\left|\begin{matrix}\frac{3-2\,b}{4},\,\frac{5-2\,b}{4},\,\frac{1-b}{2}\\0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1-b}{2}\end{matrix}\right.\right)$$

01.20.26.0107.01

$$\cosh\left(a+2\,\sqrt{z}\right){}_0F_1(;\,b;\,z)=\frac{2^{2\,b-3}\,e^{-a}\,\Gamma(b)}{\sqrt{\pi}}\left(G_{1,2}^{1,1}\left(4\,\sqrt{z}\left|\begin{matrix}\frac{3}{2}-b\\0,\,2-2\,b\end{matrix}\right.\right)+e^{2\,a}\,\pi\csc(b\,\pi)\,G_{2,3}^{1,1}\left(4\,\sqrt{z}\left|\begin{matrix}\frac{3}{2}-b,\,1-b\\0,\,2-2\,b,\,1-b\end{matrix}\right.\right)\right)$$

Classical cases involving ${}_0\tilde{F}_1$

01.20.26.0024.01

$$\cosh\left(z\right){}_0\tilde{F}_1\left(;\,b;\,\frac{z^2}{4}\right)==2^{b-\frac{3}{2}}\,\pi\sec\left(\frac{b\,\pi}{2}\right)G_{3,5}^{1,2}\left(z^2\left|\begin{matrix}\frac{1}{4}\,(3-2\,b),\,\frac{1}{4}\,(5-2\,b),\,\frac{1-b}{2}\\0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1-b}{2}\end{matrix}\right.\right)$$

01.20.26.0108.01

$$\cosh(a+z)\,{}_0\tilde{F}_1\left(;\,b;\,\frac{z^2}{4}\right)=2^{b-\frac{3}{2}}\,G_{3,5}^{2,2}\left(-z^2\left|\begin{matrix}\frac{1}{4}\,(3-2\,b),\,\frac{1}{4}\,(5-2\,b),\,\frac{1}{2}+\frac{i\,a}{\pi}\\0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1}{2}+\frac{i\,a}{\pi}\end{matrix}\right.\right)/;\,-\pi<\arg(z)\le 0$$

01.20.26.0079.01

$$\cosh(a+z)\,{}_0\tilde{F}_1\left(;\,b;\,\frac{z^2}{4}\right) == \frac{2^{2b-3}}{\sqrt{\pi}}\left(e^{-a}\,G^{1,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}\frac{3}{2}-b\\ 0,\,2-2b\end{matrix}\right)+e^{a}\,\pi\csc(b\pi)\,G^{1,1}_{2,3}\left(2z\,\middle|\,\begin{matrix}\frac{3}{2}-b,\,1-b\\ 0,\,2-2b,\,1-b\end{matrix}\right)\right)$$

01.20.26.0109.01

$$\cosh\left(2\sqrt{z}\right)\,{}_0\tilde{F}_1(;\,b;\,z) = 2^{b-\frac{3}{2}}\,\pi\sec\left(\frac{b\pi}{2}\right)G^{1,2}_{3,5}\left(4z\,\middle|\,\begin{matrix}\frac{1}{4}(3-2b),\,\frac{1}{4}(5-2b),\,\frac{1-b}{2}\\ 0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1-b}{2}\end{matrix}\right)$$

01.20.26.0110.01

$$\cosh\left(a+2\sqrt{z}\right)\,{}_0\tilde{F}_1(;\,b;\,z) = \frac{2^{2b-3}\,e^{-a}}{\sqrt{\pi}}\left(G^{1,1}_{1,2}\left(4\sqrt{z}\,\middle|\,\begin{matrix}\frac{3}{2}-b\\ 0,\,2-2b\end{matrix}\right)+e^{2a}\,\pi\csc(b\pi)\,G^{1,1}_{2,3}\left(4\sqrt{z}\,\middle|\,\begin{matrix}\frac{3}{2}-b,\,1-b\\ 0,\,2-2b,\,1-b\end{matrix}\right)\right)$$

Classical cases involving exp and ${}_1F_1$

01.20.26.0111.01

$$e^{-z}\cosh(z)\,{}_1F_1(a;\,b;\,2z) = \frac{\pi\,\Gamma(b)}{2\,\Gamma(a)}\,G^{1,1}_{2,3}\left(2z\,\middle|\,\begin{matrix}1-a,\,\frac{1}{2}\\ 0,\,1-b,\,\frac{1}{2}\end{matrix}\right)+\frac{\Gamma(b)}{2\,\Gamma(b-a)}\,G^{1,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}a-b+1\\ 0,\,1-b\end{matrix}\right)$$

Classical cases involving exp and ${}_1\tilde{F}_1$

01.20.26.0112.01

$$e^{-z}\cosh(z)\,{}_1\tilde{F}_1(a;\,b;\,2z) = \frac{\pi}{2\,\Gamma(a)}\,G^{1,1}_{2,3}\left(2z\,\middle|\,\begin{matrix}1-a,\,\frac{1}{2}\\ 0,\,1-b,\,\frac{1}{2}\end{matrix}\right)+\frac{1}{2\,\Gamma(b-a)}\,G^{1,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}a-b+1\\ 0,\,1-b\end{matrix}\right)$$

Classical cases involving exp and hypergeometric U

01.20.26.0113.01

$$e^{-z}\cosh(z)\,U(a,\,b,\,2z) = \frac{1}{2\,\Gamma(a)\,\Gamma(a-b+1)}\,G^{2,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}1-a\\ 0,\,1-b\end{matrix}\right)+\frac{1}{2}\,G^{2,0}_{1,2}\left(2z\,\middle|\,\begin{matrix}a-b+1\\ 0,\,1-b\end{matrix}\right)$$

Classical cases involving exp and Laguerre L

01.20.26.0114.01

$$e^{-z}\cosh(z)\,L_\nu(2z) = \frac{1}{2}\,\Gamma(\nu+1)\,G^{1,0}_{1,2}\left(2z\,\middle|\,\begin{matrix}\nu+1\\ 0,\,0\end{matrix}\right)+\frac{1}{2\,\Gamma(\nu+1)}\,G^{1,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}-\nu\\ 0,\,0\end{matrix}\right)$$

01.20.26.0115.01

$$e^{-z}\cosh(z)\,L^\lambda_\nu(2z) = \frac{1}{2}\,\Gamma(\lambda+\nu+1)\,G^{1,0}_{1,2}\left(2z\,\middle|\,\begin{matrix}\nu+1\\ 0,\,-\lambda\end{matrix}\right)+\frac{1}{2\,\Gamma(\nu+1)}\,G^{1,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}-\lambda-\nu\\ 0,\,-\lambda\end{matrix}\right)$$

Classical cases involving WhittakerM M

01.20.26.0116.01

$$\cosh(z)\,M_{\nu,\mu}(2z) = \frac{1}{2}\,\Gamma(2\mu+1)\left(\frac{1}{\Gamma\left(\mu+\nu+\frac{1}{2}\right)}\,G^{1,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}1-\nu\\ \mu+\frac{1}{2},\,\frac{1}{2}-\mu\end{matrix}\right)+\frac{\pi}{\Gamma\left(\mu-\nu+\frac{1}{2}\right)}\,G^{1,1}_{2,3}\left(2z\,\middle|\,\begin{matrix}\nu+1,\,\mu+1\\ \mu+\frac{1}{2},\,\frac{1}{2}-\mu,\,\mu+1\end{matrix}\right)\right)$$

Classical cases involving WhittakerW W

01.20.26.0117.01

$$\cosh(z)\,W_{\nu,\mu}(2z) = \frac{1}{2}\,G^{2,0}_{1,2}\left(2z\,\middle|\,\begin{matrix}1-\nu\\ \mu+\frac{1}{2},\,\frac{1}{2}-\mu\end{matrix}\right)+\frac{1}{2\,\Gamma\left(-\mu-\nu+\frac{1}{2}\right)\Gamma\left(\mu-\nu+\frac{1}{2}\right)}\,G^{2,1}_{1,2}\left(2z\,\middle|\,\begin{matrix}\nu+1\\ \mu+\frac{1}{2},\,\frac{1}{2}-\mu\end{matrix}\right)$$

Generalized cases for the direct function itself

01.20.26.0025.01

$$\cosh(z) == \sqrt{\pi}\, G^{1,0}_{0,2}\left(\frac{i z}{2}, \frac{1}{2} \middle| 0, \tfrac{1}{2}\right)$$

01.20.26.0026.01

$$\cosh(z) == \sqrt{2\pi^3}\, G^{1,0}_{1,3}\left(\frac{z}{2}, \frac{1}{2} \middle| \begin{matrix} \frac{3}{4} \\ 0, \frac{3}{4}, \frac{1}{2} \end{matrix}\right)$$

01.20.26.0118.01

$$\cosh(a+z) = \sqrt{\pi}\, G^{2,0}_{1,3}\left(\frac{i z}{2}, \frac{1}{2} \middle| \begin{matrix} \frac{1}{2}+\frac{i a}{\pi} \\ 0, \frac{1}{2}, \frac{1}{2}+\frac{i a}{\pi} \end{matrix}\right)$$

Generalized cases for powers of cosh

01.20.26.0027.01

$$\cosh^n(z) == 2^{-n-1}\left((-1)^n+1\right)\binom{n}{\frac{n}{2}} + 2^{1-n}\pi^{3/2}\sum_{k=0}^{\left\lfloor\frac{n-1}{2}\right\rfloor}\binom{n}{k} G^{1,0}_{1,3}\left(\frac{1}{2}z(n-2k), \frac{1}{2} \middle| \begin{matrix} \frac{1}{2} \\ 0, \frac{1}{2}, \frac{1}{2} \end{matrix}\right) /; n \in \mathbb{N}^+$$

01.20.26.0080.01

$$\cosh^{2n}(z) == 1 - 2^{1-2n}\pi^{3/2}\sum_{k=0}^{n-1}\binom{2n}{k} G^{1,1}_{2,4}\left((n-k)z, \frac{1}{2} \middle| \begin{matrix} 1, \frac{1}{2} \\ 1, 0, \frac{1}{2}, \frac{1}{2} \end{matrix}\right) /; n \in \mathbb{N}^+$$

Generalized cases involving sin

01.20.26.0028.01

$$\sin(z)\cosh(z) == \sqrt{2}\,\pi^{3/2} G^{2,0}_{1,5}\left(\frac{z}{2\sqrt{2}}, \frac{1}{4} \middle| \begin{matrix} \frac{1}{2} \\ \frac{1}{4}, \frac{3}{4}, 0, \frac{1}{2}, \frac{1}{2} \end{matrix}\right)$$

Generalized cases involving cos

01.20.26.0081.01

$$\cos(z)\cosh(z) == \sqrt{2}\,\pi^{3/2} G^{1,0}_{0,4}\left(\frac{z}{2\sqrt{2}}, \frac{1}{4} \middle| 0, \tfrac{1}{4}, \tfrac{1}{2}, \tfrac{3}{4}\right)$$

Generalized cases involving $\sinh^{-1}$ in the arguments

01.20.26.0029.01

$$\cosh\left(\nu \sinh^{-1}(z)\right) == -\frac{\nu \sin\left(\frac{\pi\nu}{2}\right)}{2\sqrt{\pi}} G^{1,2}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{\nu}{2}+1, 1-\frac{\nu}{2} \\ 0, \frac{1}{2} \end{matrix}\right)$$

01.20.26.0030.01

$$\frac{\cosh\left(\nu \sinh^{-1}(z)\right)}{\sqrt{z^2+1}} == \frac{\cos\left(\frac{\pi\nu}{2}\right)}{\sqrt{\pi}} G^{1,2}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{\nu+1}{2}, \frac{1-\nu}{2} \\ 0, \frac{1}{2} \end{matrix}\right)$$

Generalized cases involving csch^{-1} in the arguments

01.20.26.0031.01

$$\cosh\left(\nu \operatorname{csch}^{-1}(z)\right) == -\frac{\nu \sin\left(\frac{\pi\nu}{2}\right)}{2\sqrt{\pi}} G^{2,1}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} 1, \frac{1}{2} \\ \frac{\nu}{2}, -\frac{\nu}{2} \end{matrix}\right)$$

01.20.26.0032.01

$$\frac{1}{\sqrt{z^2+1}} \cosh\left(\nu \operatorname{csch}^{-1}(z)\right) == \frac{\cos\left(\frac{\pi\nu}{2}\right)}{\sqrt{\pi}} G^{2,1}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{2}, 0 \\ \frac{\nu}{2}, -\frac{\nu}{2} \end{matrix}\right) /; \operatorname{Re}(z) > 0$$

Generalized cases involving $\cosh^{-1}$ in the arguments and unit step θ

01.20.26.0033.01

$$\frac{\theta(|z|-1)}{\sqrt{z^2-1}} \cosh\left(\nu \cosh^{-1}(z)\right) == \sqrt{\pi}\, G^{0,2}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{\nu+1}{2}, \frac{1-\nu}{2} \\ 0, \frac{1}{2} \end{matrix}\right) /; \operatorname{Re}(z) > 0$$

Generalized cases involving sech^{-1} in the arguments and unit step θ

01.20.26.0034.01

$$\frac{\theta(1-|z|)}{\sqrt{1-z^2}} \cosh\left(\nu \operatorname{sech}^{-1}(z)\right) == \sqrt{\pi}\, G^{2,0}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} 0, \frac{1}{2} \\ -\frac{\nu}{2}, \frac{\nu}{2} \end{matrix}\right)$$

Generalized cases involving $\tanh^{-1}$ in the arguments and unit step θ

01.20.26.0035.01

$$\frac{\theta(|z|-1)}{\sqrt{z^2-1}} \cosh\left(\nu \tanh^{-1}\left(\frac{\sqrt{z^2-1}}{z}\right)\right) == \sqrt{\pi}\, G^{0,2}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1-\nu}{2}, \frac{\nu+1}{2} \\ 0, \frac{1}{2} \end{matrix}\right) /; \operatorname{Re}(z) > 0$$

Generalized cases involving $\tanh^{-1}$ in the arguments and Abs

01.20.26.0036.01

$$\left|1-x^2\right|^{\nu} \cosh\left(\nu \tanh^{-1}\left(\frac{2x}{x^2+1}\right)\right) == \frac{\sqrt{\pi}\,\Gamma\left(\nu+\frac{1}{2}\right)}{\Gamma(-\nu)} G^{1,1}_{2,2}\left(x, \frac{1}{2} \middle| \begin{matrix} \nu+1, \nu+\frac{1}{2} \\ 0, \frac{1}{2} \end{matrix}\right) /; x > 0$$

Generalized cases involving $\coth^{-1}$ in the arguments and Abs

01.20.26.0037.01

$$\left|1-x^2\right|^{\nu} \cosh\left(\nu \coth^{-1}\left(\frac{x^2+1}{2x}\right)\right) == \frac{\sqrt{\pi}\,\Gamma\left(\nu+\frac{1}{2}\right)}{\Gamma(-\nu)} G^{1,1}_{2,2}\left(x, \frac{1}{2} \middle| \begin{matrix} \nu+1, \nu+\frac{1}{2} \\ 0, \frac{1}{2} \end{matrix}\right) /; x > 0$$

Generalized cases involving $\tanh^{-1}$ in the arguments and sgn

01.20.26.0038.01

$$\left(\left(1-z^2\right)\operatorname{sgn}(1-|z|)\right)^{\nu} \cosh\left(\nu \tanh^{-1}\left(\frac{2z}{z^2+1}\right)\right) == \frac{\sqrt{\pi}\,\Gamma\left(\nu+\frac{1}{2}\right)}{\Gamma(-\nu)} G^{1,1}_{2,2}\left(z, \frac{1}{2} \middle| \begin{matrix} \nu+1, \nu+\frac{1}{2} \\ 0, \frac{1}{2} \end{matrix}\right) /; \operatorname{Re}(z) > 0$$

Generalized cases involving $\coth^{-1}$ in the arguments and sgn

01.20.26.0039.01

$$\left(\left(1-z^2\right)\operatorname{sgn}\left(1-|z|\right)\right)^{\nu}\cosh\left(\nu\coth^{-1}\left(\frac{z^2+1}{2z}\right)\right)==\frac{\sqrt{\pi}\,\Gamma\left(\nu+\frac{1}{2}\right)}{\Gamma\left(-\nu\right)}G_{2,2}^{1,1}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}\nu+1,\ \nu+\frac{1}{2}\\ 0,\ \frac{1}{2}\end{matrix}\right)/;\ \operatorname{Re}\left(z\right)>0$$

Generalized cases involving Ai

01.20.26.0040.01

$$\cosh\left(z\right)\operatorname{Ai}\left(\left(\frac{3}{2}\right)^{2/3}z^{2/3}\right)==\sqrt[6]{\frac{2}{3}}\,\pi\,G_{2,4}^{2,0}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{5}{12},\ \frac{11}{12}\\ 0,\ \frac{1}{3},\ \frac{1}{2},\ \frac{5}{6}\end{matrix}\right)$$

01.20.26.0119.01

$$\cosh\left(\frac{2z^{3/2}}{3}\right)\operatorname{Ai}(z)=\sqrt[6]{\frac{2}{3}}\,\pi\,G_{2,4}^{2,0}\left(\left(\frac{2}{3}\right)^{2/3}z,\frac{1}{3}\,\middle|\,\begin{matrix}\frac{5}{12},\ \frac{11}{12}\\ 0,\ \frac{1}{3},\ \frac{1}{2},\ \frac{5}{6}\end{matrix}\right)$$

Generalized cases involving Ai′

01.20.26.0041.01

$$\cosh\left(z\right)\operatorname{Ai}'\left(\left(\frac{3}{2}\right)^{2/3}z^{2/3}\right)==-\frac{1}{4\pi}\sqrt[6]{\frac{3}{2}}\,G_{2,4}^{2,2}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{7}{12},\ \frac{13}{12}\\ 0,\ \frac{2}{3},\ \frac{1}{2},\ \frac{7}{6}\end{matrix}\right)$$

01.20.26.0120.01

$$\cosh\left(\frac{2z^{3/2}}{3}\right)\operatorname{Ai}'(z)=-\frac{\sqrt[6]{\frac{3}{2}}}{4\pi}G_{2,4}^{2,2}\left(\left(\frac{2}{3}\right)^{2/3}z,\frac{1}{3}\,\middle|\,\begin{matrix}\frac{7}{12},\ \frac{13}{12}\\ 0,\ \frac{2}{3},\ \frac{1}{2},\ \frac{7}{6}\end{matrix}\right)$$

Generalized cases involving Bi

01.20.26.0042.01

$$\cosh\left(z\right)\operatorname{Bi}\left(\left(\frac{3}{2}\right)^{2/3}z^{2/3}\right)==\sqrt[6]{\frac{2}{3}}\,\pi\,G_{4,6}^{2,2}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{5}{12},\ \frac{11}{12},\ \frac{1}{6},\ \frac{2}{3}\\ 0,\ \frac{1}{3},\ \frac{1}{6},\ \frac{1}{2},\ \frac{2}{3},\ \frac{5}{6}\end{matrix}\right)$$

01.20.26.0121.01

$$\cosh\left(\frac{2z^{3/2}}{3}\right)\operatorname{Bi}(z)=\sqrt[6]{\frac{2}{3}}\,\pi\,G_{4,6}^{2,2}\left(\left(\frac{2}{3}\right)^{2/3}z,\frac{1}{3}\,\middle|\,\begin{matrix}\frac{5}{12},\ \frac{11}{12},\ \frac{1}{6},\ \frac{2}{3}\\ 0,\ \frac{1}{3},\ \frac{1}{6},\ \frac{1}{2},\ \frac{2}{3},\ \frac{5}{6}\end{matrix}\right)$$

Generalized cases involving Bi′

01.20.26.0043.01

$$\cosh\left(z\right)\operatorname{Bi}'\left(\left(\frac{3}{2}\right)^{2/3}z^{2/3}\right)==\sqrt[6]{\frac{3}{2}}\,\pi\,G_{4,6}^{2,2}\left(z,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{7}{12},\ \frac{13}{12},\ \frac{1}{3},\ \frac{5}{6}\\ 0,\ \frac{2}{3},\ \frac{1}{3},\ \frac{1}{2},\ \frac{5}{6},\ \frac{7}{6}\end{matrix}\right)$$

01.20.26.0122.01

$$\cosh\left(\frac{2z^{3/2}}{3}\right)\operatorname{Bi}'(z)=\sqrt[6]{\frac{3}{2}}\,\pi\,G_{4,6}^{2,2}\left(\left(\frac{2}{3}\right)^{2/3}z,\frac{1}{3}\,\middle|\,\begin{matrix}\frac{7}{12},\ \frac{13}{12},\ \frac{1}{3},\ \frac{5}{6}\\ 0,\ \frac{2}{3},\ \frac{1}{3},\ \frac{1}{2},\ \frac{5}{6},\ \frac{7}{6}\end{matrix}\right)$$

Generalized cases involving Bessel *I*

01.20.26.0044.01

$$\cosh(z)\, I_\nu(z) == -\frac{\pi \csc\left(\frac{\pi \nu}{2}\right)}{\sqrt{2}}\, G^{1,2}_{3,5}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{4}, \frac{3}{4}, 0 \\ \frac{\nu}{2}, 0, -\frac{\nu}{2}, \frac{1-\nu}{2}, \frac{\nu+1}{2} \end{matrix}\right)$$

01.20.26.0123.01

$$\cosh(a+z)\, I_\nu(z) = \frac{z^\nu}{\sqrt{2}}\, G^{2,2}_{3,5}\left(i\, z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{4}(1-2\nu), \frac{1}{4}(3-2\nu), \frac{1}{2}+\frac{i\, a}{\pi} \\ 0, \frac{1}{2}, \frac{1}{2}-\nu, -\nu, \frac{1}{2}+\frac{i\, a}{\pi} \end{matrix}\right)$$

Classical cases involving sin, *I*

01.20.26.0082.01

$$\cosh(z)\, I_{-\nu}(z) + \sinh(z)\, I_\nu(z) == \sqrt{2}\ \pi\, G^{2,0}_{2,4}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{4}, \frac{3}{4} \\ -\frac{\nu}{2}, \frac{\nu+1}{2}, \frac{\nu}{2}, \frac{1-\nu}{2} \end{matrix}\right)$$

01.20.26.0045.01

$$\cosh(z)\, I_{-\nu}(z) - \sinh(z)\, I_\nu(z) == \frac{\cos(\pi \nu)}{\sqrt{2}\ \pi}\, G^{2,2}_{2,4}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{4}, \frac{3}{4} \\ -\frac{\nu}{2}, \frac{\nu+1}{2}, \frac{\nu}{2}, \frac{1-\nu}{2} \end{matrix}\right)$$

01.20.26.0124.01

$$\sinh(z)\, I_{-\nu}(z) - \cosh(z)\, I_\nu(z) == -\frac{\cos(\pi \nu)}{\sqrt{2}\ \pi}\, G^{2,2}_{2,4}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{4}, \frac{3}{4} \\ \frac{\nu}{2}, \frac{1-\nu}{2}, -\frac{\nu}{2}, \frac{\nu+1}{2} \end{matrix}\right)$$

01.20.26.0125.01

$$\cosh(z)\, I_\nu(z) + \sinh(z)\, I_{-\nu}(z) == \sqrt{2}\ \pi\, G^{2,0}_{2,4}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{4}, \frac{3}{4} \\ \frac{\nu}{2}, \frac{1-\nu}{2}, -\frac{\nu}{2}, \frac{\nu+1}{2} \end{matrix}\right)$$

Generalized cases involving Bessel *K*

01.20.26.0047.01

$$\cosh(z)\, K_\nu(z) == \frac{1}{2\sqrt{2}}\, G^{2,2}_{2,4}\left(z, \frac{1}{2} \middle| \begin{matrix} \frac{1}{4}, \frac{3}{4} \\ -\frac{\nu}{2}, \frac{\nu}{2}, \frac{1-\nu}{2}, \frac{\nu+1}{2} \end{matrix}\right)$$

Generalized cases involving parabolic cylinder function *D*

01.20.26.0126.01

$$\cosh\left(z^2\right) D_\nu(2\, z) = 2^{\frac{\nu}{2}-1}\, G^{2,0}_{1,2}\left(\sqrt{2}\ z, \frac{1}{2} \middle| \begin{matrix} \frac{1-\nu}{2} \\ 0, \frac{1}{2} \end{matrix}\right) + \frac{2^{-\frac{\nu}{2}-2}}{\sqrt{\pi}\ \Gamma(-\nu)}\, G^{2,1}_{1,2}\left(\sqrt{2}\ z, \frac{1}{2} \middle| \begin{matrix} \frac{\nu}{2}+1 \\ 0, \frac{1}{2} \end{matrix}\right)$$

01.20.26.0127.01

$$\cosh\left(z^2\right) D_\nu(-2\, z) = 2^{\frac{\nu}{2}-1}\, G^{2,1}_{2,3}\left(\sqrt{2}\ z, \frac{1}{2} \middle| \begin{matrix} \frac{1-\nu}{2}, \frac{\nu+1}{2} \\ 0, \frac{1}{2}, \frac{\nu+1}{2} \end{matrix}\right) + \frac{2^{-\frac{1}{2}(\nu+1)}\, \pi^{3/2}}{\Gamma(-\nu)}\, G^{2,1}_{3,4}\left(\sqrt{2}\ z, \frac{1}{2} \middle| \begin{matrix} \frac{\nu}{2}+1, \frac{1}{8}, \frac{5}{8} \\ 0, \frac{1}{2}, \frac{1}{8}, \frac{5}{8} \end{matrix}\right)$$

01.20.26.0128.01

$$\cosh\left(z^2\right)\left(D_\nu(-2\, z) + D_\nu(2\, z)\right) = 2^{\nu/2} \cos\left(\frac{\pi \nu}{2}\right) G^{1,1}_{1,2}\left(\sqrt{2}\ z, \frac{1}{2} \middle| \begin{matrix} \frac{1-\nu}{2} \\ 0, \frac{1}{2} \end{matrix}\right) + \frac{2^{-\frac{1}{2}(\nu+1)}\, \pi^{3/2}}{\Gamma(-\nu)}\, G^{1,1}_{2,3}\left(\sqrt{2}\ z, \frac{1}{2} \middle| \begin{matrix} \frac{\nu}{2}+1, \frac{1}{4} \\ 0, \frac{1}{2}, \frac{1}{4} \end{matrix}\right)$$

01.20.26.0129.01

$$\cosh\left(z^2\right)\left(D_\nu(2\,z)-D_\nu(-2\,z)\right)=\frac{2^{-\frac{1}{2}(\nu+1)}\,\pi^{3/2}}{\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\,\frac{1}{4}\\ \frac{1}{2},\,0,\,\frac{1}{4}\end{matrix}\right)+2^{\nu/2}\sin\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ \frac{1}{2},\,0\end{matrix}\right)$$

Generalized cases involving exp and Hermite H

01.20.26.0130.01

$$e^{-z^2}\cosh\left(z^2\right)H_\nu\left(\sqrt{2}\,z\right)=2^{\nu-1}\,G_{1,2}^{2,0}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ 0,\,\frac{1}{2}\end{matrix}\right)+\frac{1}{4\sqrt{\pi}\,\Gamma(-\nu)}\,G_{1,2}^{2,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{\nu}{2}+1\\ 0,\,\frac{1}{2}\end{matrix}\right)$$

01.20.26.0131.01

$$e^{-z^2}\cosh\left(z^2\right)H_\nu\left(-\sqrt{2}\,z\right)=2^{\nu-1}\,G_{2,3}^{2,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1-\nu}{2},\,\frac{\nu+1}{2}\\ 0,\,\frac{1}{2},\,\frac{\nu+1}{2}\end{matrix}\right)+\frac{\pi^{3/2}}{\sqrt{2}\,\Gamma(-\nu)}\,G_{3,4}^{2,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\,\frac{1}{8},\,\frac{5}{8}\\ 0,\,\frac{1}{2},\,\frac{1}{8},\,\frac{5}{8}\end{matrix}\right)$$

01.20.26.0132.01

$$e^{-z^2}\cosh\left(z^2\right)\left(H_\nu\left(\sqrt{2}\,z\right)+H_\nu\left(-\sqrt{2}\,z\right)\right)=2^\nu\cos\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ 0,\,\frac{1}{2}\end{matrix}\right)+\frac{\pi^{3/2}}{\sqrt{2}\,\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\,\frac{1}{4}\\ 0,\,\frac{1}{2},\,\frac{1}{4}\end{matrix}\right)$$

01.20.26.0133.01

$$e^{-z^2}\cosh\left(z^2\right)\left(H_\nu\left(\sqrt{2}\,z\right)-H_\nu\left(-\sqrt{2}\,z\right)\right)=\frac{\pi^{3/2}}{\sqrt{2}\,\Gamma(-\nu)}\,G_{2,3}^{1,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{\nu}{2}+1,\,\frac{1}{4}\\ \frac{1}{2},\,0,\,\frac{1}{4}\end{matrix}\right)+2^\nu\sin\left(\frac{\pi\,\nu}{2}\right)G_{1,2}^{1,1}\left(\sqrt{2}\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1-\nu}{2}\\ \frac{1}{2},\,0\end{matrix}\right)$$

Generalized cases involving ${}_0F_1$

01.20.26.0134.01

$$\cosh(z)\,{}_0F_1\left(;\,b;\,\frac{z^2}{4}\right)=2^{b-\frac{3}{2}}\,\pi\sec\left(\frac{b\,\pi}{2}\right)\Gamma(b)\,G_{3,5}^{1,2}\left(z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1}{4}(3-2\,b),\,\frac{1}{4}(5-2\,b),\,\frac{1-b}{2}\\ 0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1-b}{2}\end{matrix}\right)$$

01.20.26.0135.01

$$\cosh(a+z)\,{}_0F_1\left(;\,b;\,\frac{z^2}{4}\right)==2^{b-\frac{3}{2}}\,\Gamma(b)\,G_{3,5}^{2,2}\left(i\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1}{4}(3-2\,b),\,\frac{1}{4}(5-2\,b),\,\frac{1}{2}+\frac{i\,a}{\pi}\\ 0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1}{2}+\frac{i\,a}{\pi}\end{matrix}\right)$$

Generalized cases involving ${}_0\tilde{F}_1$

01.20.26.0136.01

$$\cosh(z)\,{}_0\tilde{F}_1\left(;\,b;\,\frac{z^2}{4}\right)=2^{b-\frac{3}{2}}\,\pi\sec\left(\frac{b\,\pi}{2}\right)G_{3,5}^{1,2}\left(z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1}{4}(3-2\,b),\,\frac{1}{4}(5-2\,b),\,\frac{1-b}{2}\\ 0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1-b}{2}\end{matrix}\right)$$

01.20.26.0137.01

$$\cosh(a+z)\,{}_0\tilde{F}_1\left(;\,b;\,\frac{z^2}{4}\right)=2^{b-\frac{3}{2}}\,G_{3,5}^{2,2}\left(i\,z,\,\frac{1}{2}\,\middle|\,\begin{matrix}\frac{1}{4}(3-2\,b),\,\frac{1}{4}(5-2\,b),\,\frac{1}{2}+\frac{i\,a}{\pi}\\ 0,\,\frac{1}{2},\,1-b,\,\frac{3}{2}-b,\,\frac{1}{2}+\frac{i\,a}{\pi}\end{matrix}\right)$$

Through other functions

Involving Bessel functions

01.20.26.0048.01

$$\cosh(z) == \sqrt{\frac{\pi i z}{2}}\, J_{-\frac{1}{2}}(i z)$$

01.20.26.0049.01

$$\cosh(z) == \sqrt{\frac{\pi z}{2}}\, I_{-\frac{1}{2}}(z)$$

01.20.26.0050.01

$$\cosh(z) == -\sqrt{\frac{\pi i z}{2}}\, Y_{\frac{1}{2}}(i z)$$

01.20.26.0051.01

$$\cosh(z) == \sqrt{-\frac{z}{2\pi}}\, K_{-\frac{1}{2}}(-z) + \sqrt{\frac{z}{2\pi}}\, K_{-\frac{1}{2}}(z)$$

Involving Jacobi functions

01.20.26.0052.01

$$\cosh(z) == \mathrm{cd}(i z \mid 0)$$

01.20.26.0053.01

$$\cosh(z) == \mathrm{cn}(i z \mid 0)$$

01.20.26.0054.01

$$\cosh(z) == \frac{1}{\mathrm{cn}(z \mid 1)}$$

01.20.26.0055.01

$$\cosh(z) == -\frac{i}{\mathrm{cs}\left(\frac{\pi i}{2} - z \,\middle|\, 1\right)}$$

01.20.26.0056.01

$$\cosh(z) == \frac{1}{\mathrm{dc}(i z \mid 0)}$$

01.20.26.0057.01

$$\cosh(z) == \frac{1}{\mathrm{dn}(z \mid 1)}$$

01.20.26.0058.01

$$\cosh(z) == \frac{1}{\mathrm{ds}\left(\frac{\pi}{2} - i z \,\middle|\, 0\right)}$$

01.20.26.0059.01

$$\cosh(z) == -\frac{i}{\mathrm{ds}\left(\frac{\pi i}{2} - z \,\middle|\, 1\right)}$$

01.20.26.0060.01

$$\cosh(z) == \frac{1}{\mathrm{nc}(i z \mid 0)}$$

01.20.26.0061.01

$$\cosh(z) == \mathrm{nc}(z \mid 1)$$

01.20.26.0062.01

$$\cosh(z) == \mathrm{nd}(z \mid 1)$$

01.20.26.0063.01

$$\cosh(z) == \frac{1}{\mathrm{ns}\left(\frac{\pi}{2} - i\,z \,\middle|\, 0\right)}$$

01.20.26.0064.01

$$\cosh(z) == -i\,\mathrm{sc}\left(\frac{\pi\,i}{2} - z \,\middle|\, 1\right)$$

01.20.26.0065.01

$$\cosh(z) == -i\,\mathrm{sd}\left(\frac{\pi\,i}{2} - z \,\middle|\, 1\right)$$

01.20.26.0066.01

$$\cosh(z) == \mathrm{sd}\left(\frac{\pi}{2} - i\,z \,\middle|\, 0\right)$$

01.20.26.0067.01

$$\cosh(z) == \mathrm{sn}\left(\frac{\pi}{2} - i\,z \,\middle|\, 0\right)$$

Involving Mathieu functions

01.20.26.0068.01

$$\cosh\left(\sqrt{a}\ z\right) == \frac{1}{\sqrt{a}}\,\mathrm{Se}_z(a,\,0,\,i\,z)$$

01.20.26.0069.01

$$\cosh\left(\sqrt{a}\ z\right) == \mathrm{Ce}(a,\,0,\,i\,z)$$

Involving some elliptic-type functions

01.20.26.0070.01

$$\cosh(z) == E\left(\frac{\pi}{2} - i\,z \,\middle|\, 1\right) /;\ -\pi \le \mathrm{Im}(z) \le 0$$

Involving some hypergeometric-type functions

01.20.26.0071.01

$$\cosh(\pi\,z) == \frac{\pi}{\Gamma\left(\frac{1}{2} - i\,z\right)\Gamma\left(\frac{1}{2} + i\,z\right)}$$

01.20.26.0072.01

$$\cosh(z) == 1 - \sqrt{\frac{\pi\,i\,z}{2}}\ \boldsymbol{H}_{\frac{1}{2}}(i\,z)$$

01.20.26.0073.01

$$\cosh(z) == 1 + \sqrt{\frac{\pi\,z}{2}}\ \boldsymbol{L}_{\frac{1}{2}}(z)$$

01.20.26.0074.01

$$\cosh(n\,z) == T_n(\cosh(z))$$

Representations through equivalent functions

With inverse function

01.20.27.0001.01

$$\cosh\left(\cosh^{-1}(z)\right) == z$$

01.20.27.0003.02

$$\cosh^{-1}(\cosh(z)) = z \;/;\; (\mathrm{Re}(z) > 0 \wedge -\pi < \mathrm{Im}(z) \leq \pi) \vee (\mathrm{Re}(z) = 0 \wedge 0 \leq \mathrm{Im}(z) \leq \pi)$$

01.20.27.0054.01

$$\cosh^{-1}(\cosh(z)) = -z \;/;\; (\mathrm{Re}(z) < 0 \wedge -\pi \leq \mathrm{Im}(z) < \pi) \vee (\mathrm{Re}(z) = 0 \wedge -\pi \leq \mathrm{Im}(z) \leq 0)$$

01.20.27.0002.02

$$\cosh^{-1}(\cosh(z)) == \sqrt{z^2} \;/;\; -\pi < \mathrm{Im}(z) < \pi \vee (\mathrm{Im}(z) == -\pi \wedge \mathrm{Re}(z) \leq 0) \vee (\mathrm{Im}(z) == \pi \wedge \mathrm{Re}(z) \geq 0)$$

01.20.27.0055.01

$$\cosh^{-1}(\cosh(z)) == \sqrt{z^2}\left(1 - \frac{2\pi i k}{z}\right) /;$$
$$(((2k-1)\pi < \mathrm{Im}(z) < (2k+1)\pi \bigvee \mathrm{Im}(z) == (2k-1)\pi \bigwedge \mathrm{Re}(z) < 0 \bigvee \mathrm{Im}(z) == (2k+1)\pi \bigwedge \mathrm{Re}(z) > 0) \bigwedge k \in \mathbb{Z}) \bigvee$$
$$(z == (2k-1)\pi i \bigwedge -k \in \mathbb{N}) \bigvee (z == (2k+1)\pi i \bigwedge k \in \mathbb{N})$$

01.20.27.0004.01

$$\cosh^{-1}(\cosh(z)) ==$$
$$\left(\sqrt{z^2} - \frac{\pi i}{2} e^{i\pi\left\lfloor\frac{1}{2}-\frac{\arg(z)}{\pi}\right\rfloor}\left(2\left\lfloor\frac{\mathrm{Im}(z)}{\pi}\right\rfloor - (-1)^{\left\lfloor\frac{\mathrm{Im}(z)}{\pi}\right\rfloor} + 1\right)\right)(1-\delta_{\mathrm{Re}(z)}) - \pi i\,\theta(\mathrm{Im}(z))\left(1 + (-1)^{\left\lfloor\frac{\mathrm{Im}(z)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\mathrm{Im}(z)}{2\pi}-\frac{1}{2}\right\rfloor}\right)\delta_{\mathrm{Re}(z)} +$$
$$\left((-1)^{\left\lfloor\frac{\mathrm{Im}(z)}{\pi}\right\rfloor}\left(z - \pi i\left\lfloor\frac{\mathrm{Im}(z)}{\pi}\right\rfloor - \frac{\pi i}{2}\right) + \frac{i\pi}{2}\right)\delta_{\mathrm{Re}(z)} + \frac{\pi i}{2}\left(e^{i\pi\left\lfloor\frac{1}{2}-\frac{\arg(z)}{\pi}\right\rfloor} + 1\right)\left(1 + (-1)^{\left\lfloor\frac{\mathrm{Im}(z)}{2\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\mathrm{Im}(z)}{2\pi}-\frac{1}{2}\right\rfloor}\right)\theta(\mathrm{Re}(z))$$

01.20.27.0056.01

$$\cosh^{-1}(\cosh(z)) = \begin{cases} \frac{\pi i}{2} - (-1)^{\left\lfloor\frac{\pi - iz}{\pi}\right\rfloor}\left(z - \pi i\left\lfloor\frac{\pi - iz}{S\pi}\right\rfloor + \frac{\pi i}{2}\right) & \mathrm{Re}(z) = 0 \\ \sqrt{z^2}\left(1 - \frac{2\pi i}{z}\left\lfloor\frac{\mathrm{Im}(z)-\pi}{2\pi}\right\rfloor\right) & \frac{\mathrm{Im}(z)+\pi}{2\pi} \in \mathbb{Z} \bigwedge \mathrm{Re}(z) > 0 \\ \sqrt{z^2}\left(1 - \frac{2\pi i}{z}\left\lfloor\frac{\mathrm{Im}(z)+\pi}{2\pi}\right\rfloor\right) & \mathrm{True} \end{cases}$$

With related functions

Involving exp

01.20.27.0005.01

$$\cosh(z) == \frac{e^z + e^{-z}}{2}$$

Involving sin

01.20.27.0006.01

$$\cosh(z) == \sin\left(\frac{\pi}{2} - z\,i\right)$$

01.20.27.0007.01

$$\cosh(z) == \sin\left(i\,z + \frac{\pi}{2}\right)$$

01.20.27.0008.01

$$\cosh(z) == \sqrt{1 - \sin^2(i\,z)} \;/;\; |\mathrm{Im}(z)| < \frac{\pi}{2}$$

01.20.27.0009.01

$$\cosh(z) == \sqrt{1 - \sin^2(i\,z)}\;\; (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} + \frac{1}{2} \right\rfloor} \left(1 - \left(1 + (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} + \frac{1}{2} \right\rfloor + \left\lfloor -\frac{\mathrm{Im}(z)}{\pi} - \frac{1}{2} \right\rfloor}\right) \theta(\mathrm{Re}(z))\right)$$

01.20.27.0010.01

$$\cosh^2(z) == 1 - \sin^2(i\,z)$$

Involving cos

01.20.27.0011.01

$$\cosh(z) == \cos(i\,z)$$

01.20.27.0012.01

$$\cosh(i\,z) == \cos(z)$$

Involving tan

01.20.27.0013.01

$$\cosh(z) == \frac{1 - \tan^2\left(\frac{i\,z}{2}\right)}{1 + \tan^2\left(\frac{i\,z}{2}\right)}$$

01.20.27.0014.01

$$\cosh(z) == \frac{1}{\sqrt{1 + \tan^2(i\,z)}} \;/;\; |\mathrm{Im}(z)| < \frac{\pi}{2}$$

01.20.27.0015.01

$$\cosh(z) == \frac{1}{\sqrt{1 + \tan^2(i\,z)}}\; (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} + \frac{1}{2} \right\rfloor} \left(1 - \left(1 + (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} + \frac{1}{2} \right\rfloor + \left\lfloor -\frac{\mathrm{Im}(z)}{\pi} - \frac{1}{2} \right\rfloor}\right) \theta(-\mathrm{Re}(z))\right)$$

01.20.27.0016.01

$$\cosh^2(z) == \frac{1}{\tan^2(i\,z) + 1}$$

Involving cot

01.20.27.0017.01

$$\cosh(z) == \frac{\cot^2\left(\frac{i\,z}{2}\right) - 1}{\cot^2\left(\frac{i\,z}{2}\right) + 1}$$

01.20.27.0018.01

$$\cosh(z) == \frac{\cot(i\,z)}{\sqrt{\cot^2(i\,z) + 1}} \;/;\; -\pi < \mathrm{Im}(z) < 0$$

01.20.27.0019.01

$$\cosh(z) == \frac{\cot(i\,z)}{\sqrt{\cot^2(i\,z) + 1}}\; (-1)^{\left\lfloor -\frac{\mathrm{Im}(z)}{\pi} \right\rfloor} \left(1 - \left(1 + (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} \right\rfloor + \left\lfloor -\frac{\mathrm{Im}(z)}{\pi} \right\rfloor}\right) \theta(\mathrm{Re}(z))\right)$$

01.20.27.0020.01

$$\cosh^2(z) == \frac{\cot^2(i\,z)}{\cot^2(i\,z)+1}$$

Involving csc

01.20.27.0021.01

$$\cosh(z) == \frac{1}{\csc\left(\frac{\pi}{2}-i\,z\right)}$$

01.20.27.0022.01

$$\cosh(z) == \frac{1}{\csc\left(\frac{\pi}{2}+i\,z\right)}$$

01.20.27.0023.01

$$\cosh(z) == -\frac{i\sqrt{z^2}}{z}\,\frac{\sqrt{1-\csc^2(i\,z)}}{\csc(i\,z)}\;/;\;\mathrm{Re}(z)\neq 0$$

01.20.27.0024.01

$$\cosh(z) == i\,z\sqrt{-\frac{1}{z^2}}\,\frac{\sqrt{\csc^2(i\,z)-1}}{\csc(i\,z)}\;/;\;|\mathrm{Im}(z)|<\frac{\pi}{2}$$

01.20.27.0025.01

$$\cosh^2(z) == \frac{\csc^2(i\,z)-1}{\csc^2(i\,z)}$$

Involving sec

01.20.27.0026.01

$$\cosh(z) == \frac{1}{\sec(i\,z)}$$

Involving sinh

01.20.27.0027.01

$$\cosh(z) == -i\sinh\left(\frac{\pi\,i}{2}-z\right)$$

01.20.27.0028.01

$$\cosh(z) == -i\sinh\left(\frac{\pi\,i}{2}+z\right)$$

01.20.27.0029.01

$$\cosh(z) == \sqrt{1+\sinh^2(z)}\;/;\;|\mathrm{Im}(z)|<\frac{\pi}{2}$$

01.20.27.0030.01

$$\cosh(z) == \sqrt{1+\sinh^2(z)}\;(-1)^{\left\lfloor\frac{\mathrm{Im}(z)}{\pi}+\frac{1}{2}\right\rfloor}\left(1-\left(1+(-1)^{\left\lfloor\frac{\mathrm{Im}(z)}{\pi}+\frac{1}{2}\right\rfloor+\left\lfloor-\frac{\mathrm{Im}(z)}{\pi}-\frac{1}{2}\right\rfloor}\right)\theta(\mathrm{Re}(z))\right)$$

01.20.27.0031.01

$$\cosh^2(z) == 1+\sinh^2(z)$$

01.20.27.0032.01

$$\cosh^2(z)+\sinh^2(z) == \cosh(2\,z)$$

01.20.27.0033.01

$$\cosh^2(z) - \sinh^2(z) == 1$$

01.20.27.0034.01

$$\cosh(z) + i \sinh(z) == i \sqrt{2}\ \sinh\left(z - \frac{i \pi}{4}\right)$$

01.20.27.0035.01

$$\cosh(z) - i \sinh(z) == -i \sqrt{2}\ \sinh\left(z + \frac{i \pi}{4}\right)$$

01.20.27.0036.01

$$\cosh(z) + \sinh(z) == e^z$$

01.20.27.0037.01

$$\cosh(z) - \sinh(z) == e^{-z}$$

01.20.27.0038.01

$$a \cosh(z) + b \sinh(z) == \sqrt{1 - \frac{b^2}{a^2}}\ a \cosh\left(z + \tanh^{-1}\left(\frac{b}{a}\right)\right)$$

01.20.27.0039.01

$$\cosh\left(\frac{\pi i}{2} + z\right) == i \sinh(z)$$

01.20.27.0040.01

$$\cosh\left(\frac{\pi i}{2} - z\right) == -i \sinh(z)$$

Involving tanh

01.20.27.0041.01

$$\cosh(z) == \frac{1 + \tanh^2\left(\frac{z}{2}\right)}{1 - \tanh^2\left(\frac{z}{2}\right)}$$

01.20.27.0042.01

$$\cosh(z) == \frac{1}{\sqrt{1 - \tanh^2(z)}}\ /;\ |\mathrm{Im}(z)| < \frac{\pi}{2}$$

01.20.27.0043.01

$$\cosh(z) == \frac{1}{\sqrt{1 - \tanh^2(z)}}\ (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} + \frac{1}{2} \right\rfloor} \left(1 - \left(1 + (-1)^{\left\lfloor \frac{\mathrm{Im}(z)}{\pi} + \frac{1}{2} \right\rfloor - \left\lceil \frac{\mathrm{Im}(z)}{\pi} + \frac{1}{2} \right\rceil}\right) \theta(-\mathrm{Re}(z))\right)$$

01.20.27.0044.01

$$\cosh^2(z) == \frac{1}{1 - \tanh^2(z)}$$

Involving coth

01.20.27.0045.01

$$\cosh(z) == \frac{\coth^2\left(\frac{z}{2}\right) + 1}{\coth^2\left(\frac{z}{2}\right) - 1}$$

01.20.27.0046.01

$$\cosh(z) == \frac{i \coth(z)}{\sqrt{1 - \coth^2(z)}} /; 0 < \operatorname{Im}(z) < \pi$$

01.20.27.0047.01

$$\cosh(z) == \frac{i \coth(z)}{\sqrt{1 - \coth^2(z)}} (-1)^{\left\lfloor -\frac{\operatorname{Im}(z)}{\pi} \right\rfloor} \left(\left(1 + (-1)^{\left\lfloor \frac{\operatorname{Im}(z)}{\pi} \right\rfloor + \left\lfloor -\frac{\operatorname{Im}(z)}{\pi} \right\rfloor} \right) \theta(\operatorname{Re}(z)) - 1 \right)$$

01.20.27.0048.01

$$\cosh^2(z) == \frac{\coth^2(z)}{\coth^2(z) - 1}$$

Involving csch

01.20.27.0049.01

$$\cosh(z) == -\frac{i}{\operatorname{csch}\left(\frac{i\pi}{2} - z\right)}$$

01.20.27.0050.01

$$\cosh(z) == -\frac{i}{\operatorname{csch}\left(\frac{i\pi}{2} + z\right)}$$

01.20.27.0051.01

$$\cosh(z) == \frac{\sqrt{z^2}}{z} \frac{\sqrt{\operatorname{csch}^2(z) + 1}}{\operatorname{csch}(z)} /; \operatorname{Re}(z) \neq 0$$

01.20.27.0052.01

$$\cosh^2(z) == \frac{\operatorname{csch}^2(z) + 1}{\operatorname{csch}^2(z)}$$

Involving sech

01.20.27.0053.01

$$\cosh(z) == \frac{1}{\operatorname{sech}(z)}$$

Inequalities

01.20.29.0001.01

$$\cosh(x) \geq 1 /; x \in \mathbb{R}$$

01.20.29.0002.01

$$\cosh(x) \geq |\cos(x)| /; x \in \mathbb{R}$$

01.20.29.0003.01

$$|\cosh(z)| \leq \cosh(\operatorname{Re}(z))$$

Zeros

01.20.30.0001.01

$$\cosh(z) == 0 \;/;\; z == \pi\, k\, i + \frac{\pi\, i}{2} \bigwedge k \in \mathbb{Z}$$

Theorems

Catenoid

The function $r(z) == \alpha \cosh\left(\frac{z-z_0}{\alpha}\right)$ in polar coordinates defines a minimal surface called the catenoid.

History

– V. Riccati (1757)
– D. Foncenex (1759)
– J.H. Lambert (1768)

The function cosh is encountered often in mathematics and the natural sciences.

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